

Operating Manual

SurroundControl 31900 series/31960 series

RTW

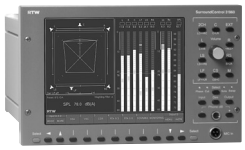
Operating Manual for

RTW SurroundControl 31900 series

and

RTW SurroundControl 31960 series





Manual Version: 1.1
Erstellt/Issued: 31.07.2008
Software-Version: 03.00.06 (06.2008)

© RTW

RADIO-TECHNISCHE WERKSTÄTTEN GmbH & Co. KG
Fax: +49 (0)221 70913-32 • Phone: +49 (0)221 70913-33
Elbeallee 19 • **50765** Köln • Germany
P. O. box 71 06 54 • **50746** Köln • Germany
Internet: www.rtw.de • E-Mail: rtw@rtw.de

Reg.-no.:	DE 90666819
Category:	9
Device type:	These instruments comply with and fall under category 9 Monitoring and control equipment of Annex 1B of the RoHS-Directive 2002/95/EC.

Note:
The photos and graphics in this manual are provided to illustrate the functions and displays of the instrument and make the descriptions and instructions more comprehensible. Ongoing product development may result in minor design changes, so that your version of the instrument may look slightly different from the illustrations. This applies in particular to the screen displays.

Note:
The picture on the cover page shows the main unit 31900 with Remote Control 30050 and the optional Remote Display 30010

CE

Dolby, the double-D symbol and the Dolby signs are registered trademarks or trademarks of Dolby Laboratories.

Index of Contents

Index of Contents **3**

1 Before you begin **9**
1.1 Preface **9**
1.2 About this manual **11**
1.3 Safety Symbols and terms **12**
1.4 General Safety Summary **12**
1.5 Environmental Considerations **13**
1.6 Package Contents **14**
1.6.1 Package Content 14
1.6.2 Optional Accessoires 15

2 Key Features **17**
2.1 Program Meter in Window 2 ..... **19**
2.1.1 Multi-Standard Peak Program Meter 19
2.1.2 ITU BS.1771 Loudness Meter 20
2.2 Selected Instruments in Window 3 ..... **21**
2.2.1 Surround Sound Analyzer (SSA) 21
2.2.2 Audio Vectorscope (VSC) (Lissajous) 22
2.2.3 Correlator (CORR) 23
2.2.4 Third Octave Real Time Analyzer (RTA 1/3) 24
2.2.5 Sixth Octave Real Time Analyzer (RTA 1/6) 25
2.2.6 (Two-Channel) Downmix Meter (Downmix) 26
2.2.7 Monitoring Controller Instruments (MONITORING) 27
The CAL Instrument (sub-function of the Monitoring instrument) 28
2.2.8 AES/EBU Status Monitor (AES/EBU STATUS) 29
2.2.9 SDI Channel Status Monitor (SDI STATUS) 30
2.2.10 SDI Interface Status Monitor (SDI INTERFACE) 31
2.2.11 Hardware Status Monitor (HARDWARE STATUS) 32
2.2.12 Dolby® Meta Data Monitor (DOLBY® META DATA) 33
2.2.13 Dialnorm Meter (DIALNORM) 34
2.2.14 BLITS 5.1 Surround Identification (BLITS) 35
2.3 Status Box in Window 4 ..... **36**
2.4 Function and Monitoring Control **37**
2.4.1 The Remote Control 30050 for the 31900 series 37
2.4.2 The Control Panel of the 31960 series 38

3 Quick start **39**
3.1 System Startup **39**
3.2 Setting clocking reference and sample rate **41**
3.3 Using Presets **43**
3.4 Recalling Factory Presets **44**
3.5 Switching Input Sources by using Sub Presets **45**
3.6 Switching Instruments in Window 3 ..... **46**
3.7 Controlling Loudspeaker Monitoring **48**
3.7.1 Switching monitoring outputs 48
3.7.2 Controlling the volume 49
3.7.3 Setting the preset volume 49
3.7.4 Soloing individual channels 49
3.7.5 Muting individual channels 50
3.7.6 Switching polarity of individual channels 50
3.7.7 Swapping channels 50

3.8 Menu Access **51**
3.9 Saving Presets **53**
3.10 Adapting the Routing **54**
3.11 Defining the Power On Preset **57**
3.12 Changing Scales and Reference Levels **59**
3.13 Using Loudness Display Options **60**

4 Common Operation **63**
4.1 General **63**
4.2 Operating Options **64**
4.3 The Function and Control Keys in Detail **67**
4.3.1 The Monitoring Sound Pressure Level Display (SPL) 67
4.3.2 The Function Keys 69
4.3.3 The Control Keys and the Select Key 69
4.3.4 Function Selector for the Channel Keys 70
4.3.5 The Channel Keys 71
4.3.6 The 2C Key 71
4.3.7 The EX Key 72
4.3.8 The CS Channel Key 73
4.3.9 The LF Channel Key 73
4.3.10 The Mono Key 73
4.3.11 The Volume control 74
4.3.12 The Input Key (input switcher) 74
4.3.13 The Dim Key 75
4.3.14 The Output Key (output switcher) 76
4.4 External control via GP IO connector **78**
4.4.1 GP IO inputs 78
4.4.2 GP IO outputs 79

5 Instruments (Display Modes) **81**
5.1 Controlling the instruments **81**
5.1.1 The Control Keys and the Toolbar 82
5.1.2 Toolbar Modes: Function Select and Instrument Select 83
5.2 The Program Meter Instrument **84**
5.2.1 The Peak Program Meter (PPM) 85
5.2.1.1 Changing the parameters of the Peak Program Meter 87
5.2.1.2 The functions of the Peak Program Meter 88
5.2.2 The ITU BS.1771 Loudness Meter 90
5.2.2.1 Background – the ITU BS.1771 Loudness Measurement Function 91
5.2.2.2 Changing the parameters of the ITU BS. 1771 Loudness Meter 92
5.2.2.3 The functions of the ITU BS.1771 Loudness Meter 93
5.3 The SSA Instrument **95**
5.3.1 What is monitored in the SSA instrument? 96
Graphical display of overall loudness 96
The critical center channel 96
Phase meter for low frequencies 97
Loudness-based level control 97
Examples of the Surround Sound Analyzer's displays 98
5.3.2 The functions of the SSA instrument 99
5.3.2.1 Surround Sound Analyzer functions in Surround modes 99
5.3.2.2 Stereo Sound Analyzer functions in 2-Channel Stereo mode 100

5.4 The VSC Instrument 101
5.4.1 Changing the parameters of the Vectorscope 102
5.4.2 The functions of the VSC instrument 103
5.4.2.1 Vectorscope functions in Surround modes 103
5.4.2.2 Vectorscope functions in Multi-Channel modes 106
5.4.2.3 Vectorscope functions in 2-Channel Stereo mode 107
5.5 The CORR Instrument 108
5.5.1 The Functions of the CORR instrument 110
5.6 The RTA 1/3 and RTA 1/6 Instruments 111
5.6.1 Changing the parameters of the RTA 112
5.6.2. The functions of the RTA instruments 113
5.6.2.1 RTA functions in Surround modes 113
5.6.2.2 RTA functions in Multi-Channel modes 115
5.6.2.3 RTA functions in 2-Channel Stereo mode 118
5.7 The DOWNMIX Instrument 121
5.7.1 Background – the Downmix Matrix 122
5.7.2 Changing the parameters of the Downmix Meter 124
5.7.3 The functions of the DOWNMIX instrument 126
5.8 The MONITORING Instrument 128
5.8.1 Changing parameters 129
5.8.2 The functions of the MONITORING instrument 130
5.8.3 The functions of the CAL Instrument 134
5.8.4 The CAL Instrument's Signal Select functions (Monitoring) 138
5.8.4.1 P-Noise 140
5.8.4.3 Sine 143
5.8.5 The CAL Instrument's SPL Meter functions (Monitoring) 144
5.9 The AES/EBU STATUS Instrument 145
5.10 The SDI STATUS Instrument 147
5.11 The SDI INTERFACE Instrument 149
5.12 The HARDWARE STATUS Instrument 150
5.12.1 Changing parameters 151
5.13 The DOLBY® META DATA Instrument 152
5.13.1 Activating the Decoder and changing parameters 153
5.13.2 The functions of the DOLBY® META DATA instrument 155
5.14 The DIALNORM Instrument 158
5.14.1 Background – calculating Dialnorm values 159
5.14.2 The functions of the DIALNORM instrument 160
5.15 The BLITS Instrument 162
5.15.1 Background – The BLITS 5.1 Surround Identification 163
5.15.2 Changing parameters of the BLITS instrument 164
5.15.2.1 Selecting the outputs for the BLITS generator 164
5.15.2.2 Loading a wave intro for the BLITS sequence 165
5.15.3 The functions of the BLITS instrument 166

6 Menu 167
6.1 Introduction 167
6.1.1 Local vs. Global Settings 169
6.1.2 Sub Presets 171
6.1.3 Channel Organization and Signal Routing 172
6.2 Menu Structure Reference 173

6.3 Instrument Settings: The Instrument Settings Menu 179
6.3.1 Edit selected Preset: General Presets 180
6.3.2 Edit selected Preset: Local Input/Output Routing and Instrument Settings 182
6.3.3 Edit selected Preset: Vectorscope 183
6.3.4 Edit selected Preset: RTA 184
6.4 General Settings: The Global General Settings Menu 186
6.5 Input/Output Routing: The Global Routing Settings 188
6.5.1 Meter Input Routing 190
6.5.2 Monitoring Input Routing 192
6.5.2.1. Main Settings 198
6.5.2.2 Decoder 202
6.5.2.3 Monitoring Routing 204
6.5.2.4 Lext/Rext Routing 209
6.5.2.5 Downmix Routing 211
6.5.2.6 Peakmeter Settings for Monitoring Routing section 213
6.5.2.7 Downmix and Peakmeter Settings for Downmix Routing section 217
6.5.2.8 Peakmeter Parameters available in the channel groups 219
6.5.2.9 Loudness Settings for Monitoring Routing section 229
6.5.2.10 Parameters available in the Loudness Channel Group 231
6.5.2.11 Parameters available in the Loudness Sum Group 235
6.5.3 Monitoring Output Routing 239
6.6 Audio System 241
6.7 Reference Levels 246
6.8 Generator and BLITS Settings 248
6.9 Over Indicator 250
6.10 Communication and Time 251
6.11 Alarm Configuration 253
6.11.1 Alarms General Settings 253
6.11.2 Alarms Threshold Settings 255
6.11.3 Alarms Timing 256
6.11.4 Alarm-Event Type Selection 256
6.12 GPIO Configuration 259
6.13 Key Settings 261
6.13.1 Preset Recall Mode 262
6.13.2 Display Mode for External Monitoring 262
6.13.3 Display Mode for Downmix Monitoring 263
6.13.4 Disable Keys/GPI 263
6.13.5 Function Mode for Monitoring Channel Keys 265
6.14. Dolby® Settings 266

7 Installation 267
7.1 Safety information 267
7.2 Installation and Setup 268
7.3 Connections 270
7.3.1 Power Supply 271
7.3.2 Remote Connector 271
7.3.3 VGA-OUT Monitor Connector 272
7.3.4 LAN Connector 272
7.3.5 USB A Connector 272
7.3.6 USB B Connector 272
7.3.7 XLR Connector 272
7.3.8 Meter In Analog Connector 274
7.3.9 Analog 1 In Connector 275
7.3.10 Analog 2 In Connector 276

7.3.11 Digital 3 In/Out Connector ... 277
7.3.12 Digital 4 In/Out Connector ... 278
7.3.13 Analog Out Connector ... 279
7.3.14 HD/SD SDI In/Through Connector ... 280
7.3.15 Ref Sync In Connector ... 281
7.3.16 GP IO Connector (General-purpose Input/Output) ... 283

8 Service ... 285
8.1 Connecting several Remote Control 30050 ... 285
8.1.1 31900 series ... 285
8.1.1.1 Addressing ... 285
8.1.1.2 Operating priority ... 286
8.1.2 31960 series ... 287
8.1.2.1 Addressing ... 287
8.1.2.2 Operating priority ... 288
8.2 Software Update ... 289
8.2.1 General ... 289
8.2.2 Proceeding a Software Update ... 290
8.2.3 Proceeding the export of the User Presets ... 295
8.2.4 Proceeding the import of the User Presets ... 299
8.2.5 Proceeding a BLITS intro update ... 303

9 Mechanical Layout ... 307
9.1 Dimensions 31900 series ... 307
9.2 Dimensions 31960 series ... 308

Appendix A: Presets ... 309
General ... 309
Peakmeter Settings ... 309
General PPM Settings ... 309
Main Peakmeter Channel Group Settings ... 309
ITU BS.1771 Loudness Settings ... 310
General Loudness Settings ... 310
Main Loudness Channel Group Settings ... 310
Main Loudness Sum Group Settings ... 310
Factory Preset F8: 5.1 (5.1 Surround) ... 311
Factory Preset F9: 2-CH (2-Channel Stereo) ... 313
Factory Preset F10: MULTI (Multi-Channel) ... 315
Factory Preset F11: SPEC (Special) ... 317
Factory Preset F12: 3.1 (3.1 Surround) ... 319
Factory Preset F13: 6.1 (6.1 Surround) ... 321
Factory Preset F14: 7.1 (7.1 Surround) ... 323

Appendix B: Specifications ... 325

Appendix C: Declaration of Conformity ... 335

Appendix D: Licenses ... 337
Information on the licenses that apply to the software supplied with the product ... 337

Appendix E: GNU GENERAL PUBLIC LICENSE ... 339

Appendix F: Index ... 349

1 Before you begin

1.1 Preface



Fig. 1-1: SurroundControl 31900 series with Remote Control 30050 included (left, Remote Display 30010 is optional) and SurroundControl 31960 series (right),

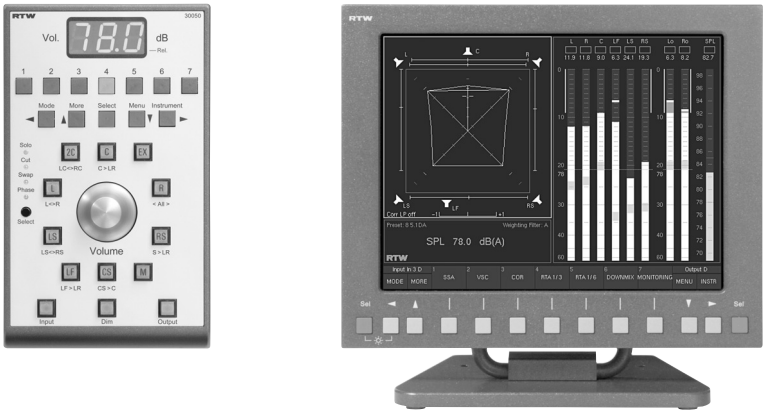


Fig. 1-2: RTW options: Remote Control 30050 (left) and Remote Display 30010 (right)

The SurroundControl 31900 series and SurroundControl 31960 series are 8-channel analog and digital monitoring controller with extensive level metering and signal analysis functions for comprehensive metering and monitoring of your audio programmes. The combination of metering and monitoring controller functions in single units with many different signal and control interfaces make the SurroundControl units ideal for surround sound productions. They are the perfect choice for visualizing analog and digital audio surround, stereo and multichannel formats in several professional audio applications like broadcast, pre and post production environments, music production, DVD mastering and cinema surround sound. Additional features like the integrated multi-channel test signal generator and the connection for a calibration microphone extend the SurroundControl's scope to calibration and general maintenance of your entire studio monitoring setup.

The multifunctional units feature et al. Peak Program Meter (plus separate SPL/LEQ-Bargraph), ITU BS.1771 Loudness Meter, Surround Sound Analyzer, Multi-Correlator, Vectorscope (Lissajous), 1/3 and 1/6 RTA, AES/EBU Status Monitor, Blits and Dialnorm. Depending on the model HD/SD SDI signals can be de-embedded or Dolby® E and Dolby® AC-3 signals can be decoded, the signal's status and their data can be displayed. Furthermore there are different display modes for the extenxive monitoring functions like Mono Mode, DIM Level, Solo Mode, Surround Mode Settings, Volume Sensibility, Listening Level, Channel Setting and the different options for Calibration.

The functions selected by the user are presented in up to three separate display sections, which are displayed on an external VGA monitor (31900 series) using the VGA output or on the built-in VGA color display (31960 series). The right display section shows a PPM- or Loudness display. The two left display sections can be programmed to show individual instrument functions at the same time. A fourth lower display section always shows the Toolbar with the key functions for operation.

The internal menu system contains in-depth configuration options for all global settings, for all the display functions and for the comprehensive signal routing. Individual setups for different applications can be stored as user presets inside the unit and these are accessible directly from normal operation with a single button.

The electronics of the SurroundControl 31900 series are installed in a 19"/1U housing. The instruments are operated with Remote Control 30050 remote control units. Up to three remote control units can be connected simultaneously. To view the instrument's output you need an external CRT or TFT display, such as the optional 8.4" Remote Display 30010 from RTW (see Fig. 1-3), the colour and design of which match the main SurroundControl 31900 units.

The electronics of the SurroundControl 31960 series are installed in a half-19"/3U rack-mountable module for standard 19" installation racks as used in video studios. The instruments are operated with front panel control. Optional up to two RTW Remote Control 30050 units can be connected simultaneously. The instrument's output is displayed on the integrated 6.5" TFT display, but optional you can connect an external CRT or TFT display, such as the optional 8.4" Remote Display 30010 from RTW (see Fig. 1-3), the colour and design of which match the SurroundControl 31960 units.

Basic operations and concepts are presented in this manual in detail.

1.2 About this manual

This manual is the operating handbook for the SurroundControl 31900 series and the SurroundControl 31960 series. Features and functionality of the instrument are described in 9 chapters containing the following topics:

- Chapter 1: Before you begin
  Safety information, package contents etc.
- Chapter 2: Key Features
  A short summary of basic instrument display modes and features
- Chapter 3: Quick Start
  Startup information on recalling and saving presets, accessing display modes, navigating the menu, etc.
- Chapter 4: Remote Control 30050
  Monitor controlling and operating with the remote control
- Chapter 5: Display Modes
  Explanation of all available display modes
- Chapter 6: Menu
  Menu structure overview and description of all menu options
- Chapter 7: Installation
  Information about installing, connecting and remote control and important additional information about safety
- Chapter 8: Service
  Information about how to make software updates
- Chapter 9: Drawings
  Mechanical Dimensions and configuration scheme
- Appendix A: List of Factory Presets and their Sub Presets
  Tables with the main routing settings and default instruments
- Appendix B: Specifications
  A summary of the main technical data
- Appendix C: EC declaration of confirmity
- Appendix D: Licenses
- Appendix E: GNU General Public License
- Appendix F: Index

Symbols used in this manual:

 This symbol draws your attention to related topics.

→ Press the button/key or select the menu tab or menu item ...

Displayed menu item

 Warning! (see Safety Symbols description on the next page)

 Attention! (see the next page)

 Functional earth terminal (see the next page)

 Protective earth terminal (see the next page)

1.3 Safety Symbols and terms

The following symbols may be marked on the panels or covers of equipment or module and are used in this manuals with these terms:



WARNING! - This symbol alerts you to a potentially hazardous condition, such as the presence of dangerous voltage that could pose a risk of electrical shock. Refer to the accompanying Warning Label or Tag, and exercise extreme caution.



ATTENTION! - This symbol alerts you to important operating considerations or a potential operating condition that could damage equipment. If you see this marked on equipment, consult the Operating manual for precautionary instructions.



FUNCTIONAL EARTH TERMINAL - This symbol marks a terminal that is electrically connected to a reference point and is intended to be earthed for any functional purpose other than safety.



PROTECTIVE EARTH TERMINAL - This symbol marks a terminal that is bonded to conductive parts of the instrument. Confirm that this terminal is connected to an external protective earthing system.

1.4 General Safety Summary

Before installing and configuring the SurroundControl 31900/31960 series please study the following safety information carefully and observe all the recommendations to avoid injury and prevent damage to this product or any products connected to it.



To prevent possible electrical shock, fire, injuries and malfunctions, use this product only as specified.

- Only qualified personnel should perform service procedures.
- Do not open the housing.
- Do not insert your fingers or any other objects into the housing.
- Do not cover the unit and do not place any objects or anything containing liquids on it.
- Use proper power supply. Use only the power cord and power supply specified for this product and certified for the country of use.
- Connect and disconnect properly. Use only connectors specified for this product and fix them tight before use.
- Observe all terminal ratings. To avoid fire or shock hazard, observe all ratings and markings on the product. Consult the operating manual for further ratings information before making connections to this product.
- Do not apply a potential to any terminal that exceeds the maximum rating of that terminal.
- Power disconnect. The power cord of the external power supply disconnects the product from the power source. Do not block the power cord or power supply; it must remain accessible to the user at all times.

- Do not operate without covers. Do not operate this product with cover plates or panels removed.
- Use proper fuse. Use only fuse type and rating specified for this product.
- Avoid exposed circuitry. Do not touch exposed connections and components when power is present.
- Do not operate with suspected failures. If you suspect there is damage to this product, have it inspected by qualified service personnel.
- Do not operate in wet/damp conditions.
- Do not operate in explosive atmosphere.
- Do not operate in dusty environments.
- Do not operate the unit without adequate ventilation.
- Turn off and disconnect the power supply immediately it the unit produces unusual smells, noises or smoke, or if foreign substances (e. g. liquids) or foreign objects enter the unit.
- Keep product surfaces clean and dry.



There are no user-serviceable parts in the SurroundControl 31900/31960 units. Please always have any necessary servicing performed by a properly qualified technician. Never remove any parts from the unit and do not make any modifications to the unit without the express written consent of RTW. Modifications can cause both safety hazards and affect the unit's EMI-CE conformity.



The SurroundControl 31900/31960 units are designed for indoor use only and may only be operated with a power supply unit provided for it.

1.5 Environmental Considerations

This section provides information about the environmental impact of the product.

Product End-of-Life Handling
Observe the following guidelines when recycling an instrument or component:

- **Equipment Recycling.**
  Production of this equipment required the extraction and use of natural resources. The equipment may contain substances that could be harmful to the environment or human health if improperly handled at the product's end of life. In order to avoid release of such substances into the environment and to reduce the use of natural resources, we encourage you to recycle this product in an appropriate system that will ensure that most of the materials are reused or recycled appropriately.

- **Battery Recycling.**
  This product may contain a Nickel Cadmium (NiCd) or lithium ion (Li-ion) rechargeable battery, which must be recycled or disposed of properly. Please properly dispose of or recycle the battery according to your local government regulations.

- **Restriction of Hazardous Substances**
  This product has been classified as Monitoring and Control equipment, and is outside the scope of the 2002/95/EC RoHS Directive. This product may contain lead, cadmium and/or mercury in slight quantities. Please dispose of or recycle the electronic parts or devices according to your local government regulations.

1.6 Package Contents

Unpack the instrument, and check that you received all items listed as Package Content. Recommended accessories, instrument options and upgrades are also listed in this section.

1.6.1 Package Content

Model 31900:
- SurroundControl 19“/1U main unit
- Remote Control 30050
- Earthed 3-wire power cord
- This manual

Model 31900S:
- SurroundControl 19“/1U main unit with HD/SD SDI de-embedder interface
- Remote Control 30050
- Earthed 3-wire power cord
- This manual

Model 31900D:
- SurroundControl 19“/1U main unit with Dolby® E and Dolby® AC-3 decoder
- Remote Control 30050
- Earthed 3-wire power cord
- This manual

Model 31900SD:
- SurroundControl 19“/1U main unit with HD/SD SDI de-embedder interface and Dolby® E and Dolby® AC-3 decoder
- Remote Control 30050
- Earthed 3-wire power cord
- This manual

Model 31960:
- SurroundControl (rack-mountable module for standard 19“ installation racks for waveform monitors)
- Rack-mounting adapters for cases with 407 mm mounting depth
- Counter plug for power supply
- This manual

Model 31960S:
- SurroundControl (rack-mountable module for standard 19“ installation racks for waveform monitors) with HD/SD SDI de-embedder interface
- Rack-mounting adapters for cases with 407 mm mounting depth
- Counter plug for power supply
- This manual

Model 31960D:

- SurroundControl (rack-mountable module for standard 19“ installation racks for waveform monitors) with Dolby® E and Dolby® AC-3 decoder
- Rack-mounting adapters for cases with 407 mm mounting depth
- Counter plug for power supply
- This manual

Model 31960SD:

- SurroundControl (rack-mountable module for standard 19“ installation racks for waveform monitors) with HD/SD SDI de-embedder interface and Dolby® E and Dolby® AC-3 decoder
- Rack-mounting adapters for cases with 407 mm mounting depth
- Counter plug for power supply
- This manual

1.6.2 Optional Accessoires

- **VGA display**
  - Remote Display 30010 with 8.4“ VGA color TFT display with function control keys
  - VGA connecting cable, Bürklin type 13M4240 5 m long with ferrite and all pins wired, connects the 30010 with 31900 and 31960 series

- **External Power Supplies**
  - Wide voltage power supply with Euro plug and locking 4-pin low voltage connector, 90 - 264 V AC/24 V DC, 3.0 A, Cat. no. 1177A-R (for 31960 only)
  - Wide voltage power supply with Euro plug and locking 4-pin low voltage connector, 90 - 240 V AC/24 V DC, 630 mA, Cat. no. 1171-R (for 30010 only)
  - Wide voltage power supply with different plugs (Euro, UK, US, AUS) and locking 4-pin low voltage connector, 90 - 240 V AC/24 V DC, 630 mA, Cat. no. 1172-R (for 30010 only)

- **Audio Cable**
  - 25 pin sub-D-M to 8 x XLR 3p-F snake cable 4 m for analog input signals for connection to the Analog In connectors, Cat. no. 1186
  - 25 pin sub-D-M to 8 x XLR 3p-M snake cable 4 m for analog output signals for connection to the Analog Out connector, Cat. no. 1163
  - 25 pin sub-D-M to 4 x XLR 3p-F and 4 x XLR 3p-M snake cable 4 m for digital input and output signals for connection to the Digital In/Out connectors, Cat. no. 1167

- **Measuring microphone**
  - Measuring microphone MM1 for connecting to the XLR connector on the front of 31900 series

2 Key Features

The SurroundControl units feature comprehensive display modes for analyzing surround, multichannel or stereo audio signals in various ways. These modes are referred to as “instruments”.

For operation in parallel three different instruments and the Toolbar with several buttons divide the display into up to four sections or windows.

Usually, all four windows are visible, but sometimes larger instruments can cover other instruments. The sizes and positions of the instruments on the screen are fixed and cannot be adjusted by the user. A detailed description follows on the next page.

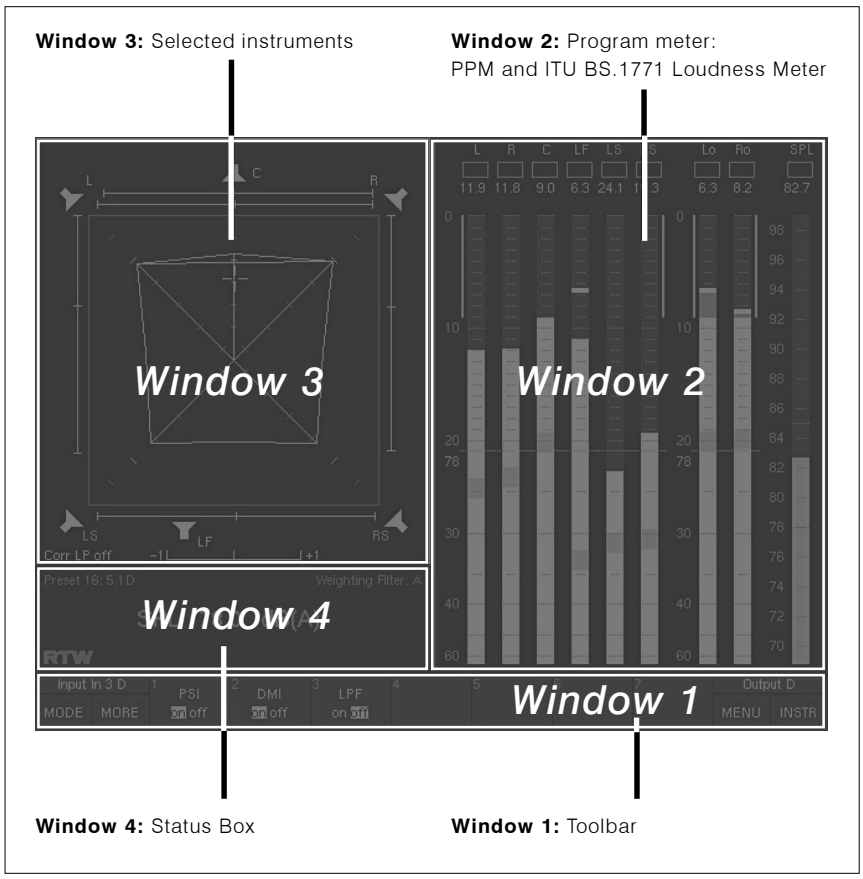


Fig. 2-1: The four screen display windows

- **Window 1: Toolbar**
  The Toolbar is always visible. It contains the controls for all the instruments' functions and the instrument selections and displays information on current operating modes. You can control the functions in three ways: With the Remote Control 30050 (31900 series) resp. the control panel (31960 series), with the keys on the Remote Display 30010 or with an optional computer mouse.

- **Window 2: Program Meter**
  The right half of the screen is normally occupied by the Program Meter display. Depending on the settings it shows the Peak Program Meter bargraphs with Peak Hold and RMS (SPL) displays or the ITU BS.1771 Loudness Meter bargraphs for each channel with momentary, integrated and longterm loudness value displays. The Program Meter will only be covered when the RTA 1/6 instrument is activated.

- **Window 3: Selected Instruments**
  The upper left part of the screen is used to display the instruments selected with the buttons in the Toolbar, the function keys on the Remote Control 30050 (31900 series) resp. on the front panel of the 31960 series or with an optional mouse.

- **Window 4: Status Box**
  Depending on the selected modes this window is used to display current status information (e. g. selected preset, SPL value), messages etc. or a chart recorder. Some of the instruments cover the Status Box when they are activated.



Note:
A short description and examples for the displays of the instruments follow on the next pages. For more detailed information about the Display Modes of the SurroundControl 31900 series and the SurroundControl 31960 series and how to get there please refer to Chapter 5.

See Chapter 5 for details

→ INSTR (Instrument), until Window 2 is highlighted with a white frame

2.1 Program Meter in Window 2

See Chapter 5.2.1 for operating instructions

2.1.1 Multi-Standard Peak Program Meter

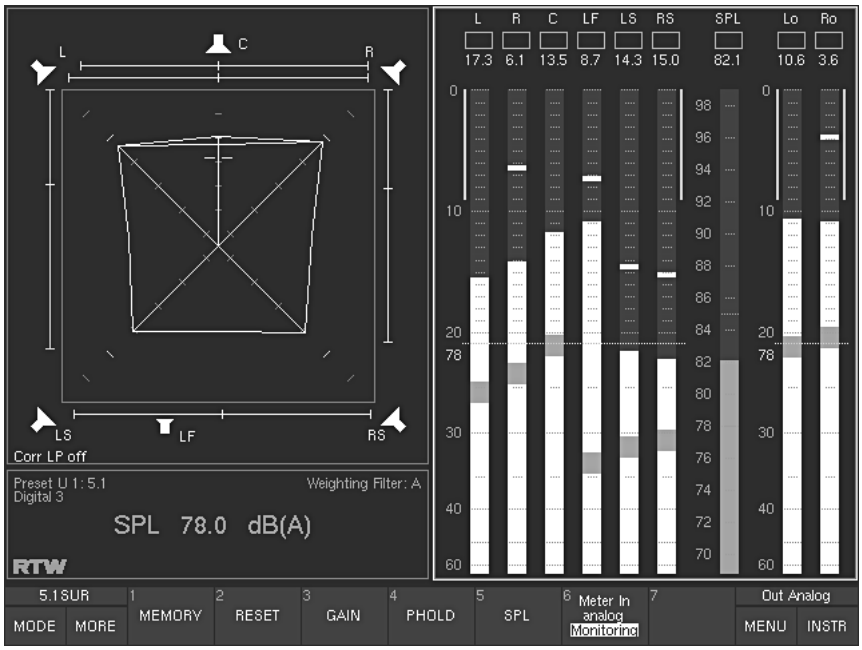


Fig. 2-2: Display elements of the Program Meter instrument in Window 2 (highlighted with a white frame) with PPM mode in 5.1 Surround format selected

Window 2 in the screen display is permanently assigned to the peakmeter groups when PPM mode is selected for the Program Meter. They are always displayed in the right-hand window, only the RTA 1/6 instrument overwrites the PPM instrument. The display of the Peakmeter and according to that the display of other instruments depends on the Mode selected with the combo box in the Monitoring Input Routing sub menus.

See Chapter 5.2.2 for operating instructions and Chapter 6.5.2 for selection

The ITU BS.1771 Loudness Meter is **only** available in digital 5.1 Surround and 2-ch. Stereo modes

2.1.2 ITU BS.1771 Loudness Meter

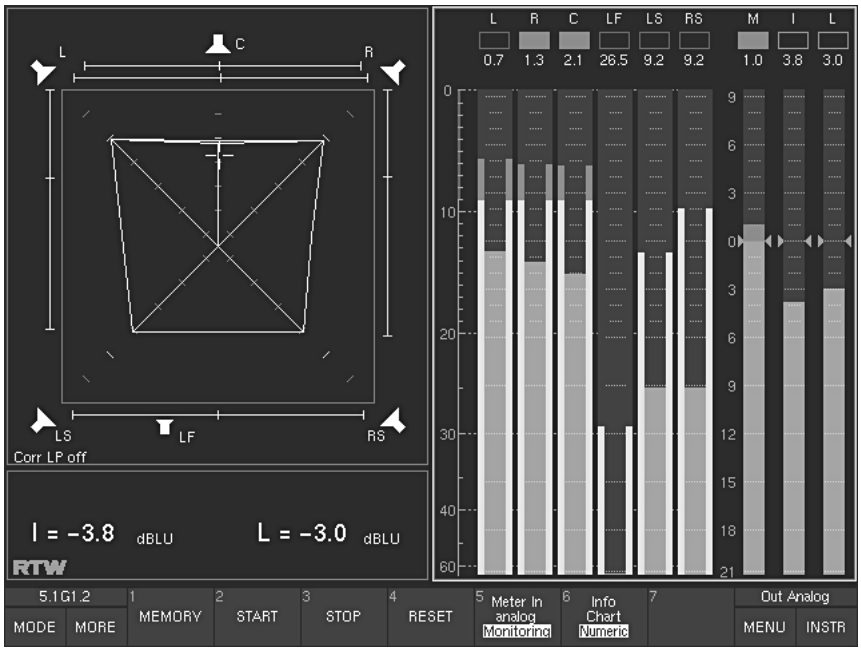


Fig. 2-3: Display elements of the Program Meter instrument in Window 2 (highlighted with a white frame) with ITU BS.1771 Loudness Meter mode selected in 5.1 Surround format, combined with peakmeter display

For the digital 5.1 Surround and 2-channel Stereo modes the integrated ITU BS.1771 Loudness Meter can be displayed in Window 2 alternatively or in addition to the Peak Program Meter. It shows high resolution loudness level bargraphs according to ITU BS.1771 standard for up to six channels for the display of the momentary single values and three additional bargraphs for the display of the summed momentary loudness reading (bargraph **M**), for a loudness value which has been integrated for a longer time (bargraph **I**) as well as the loundness value of a long-term reading for up to more than seven days (bargraph **L**). The scale is acc. to ITU BS.1771 (–21 to +9 dB LU) with weighting filter R2LB-RMS, alarm and digital error display. Also available is a chart recorder which can display the run of the M and L values in a dynamic time frame in the Status Box in Window 4.

→ INSTR (Instrument), until Window 3 is highlighted with a white frame

2.2 Selected Instruments in Window 3

→ MODE, → SSA. See Chapter 5.3 for operating instructions

2.2.1 Surround Sound Analyzer (SSA)

The SSA instrument is **only** available in Surround and 2-ch. Stereo modes!

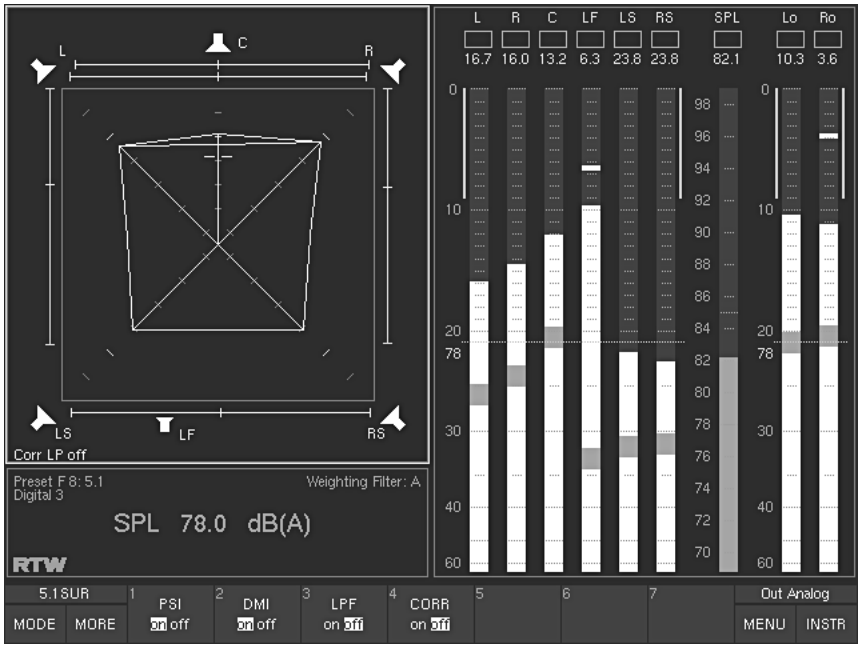


Fig. 2-4: The Surround Sound Analyzer instrument (SSA) displayed in Window 3 (highlighted with a white frame)

The Surround Sound Analyzer is a powerful tool for visualizing serveral aspects of surround signals in parallel, e. g. the balance between front and surround channels and between L-C-R channels, display of either phantom sound sources or correlators or both, total volume indication, dominant sound events, phase relationships and many others. The dynamic behaviour of all display elements corresponds to the subjective listening impression, enabling you to see the balance of your surround programme intuitively and at a glance.

→ MODE, → VSC.
See Chapter 5.4 for operating instructions

2.2.2 Audio Vectorscope (VSC) (Lissajous)

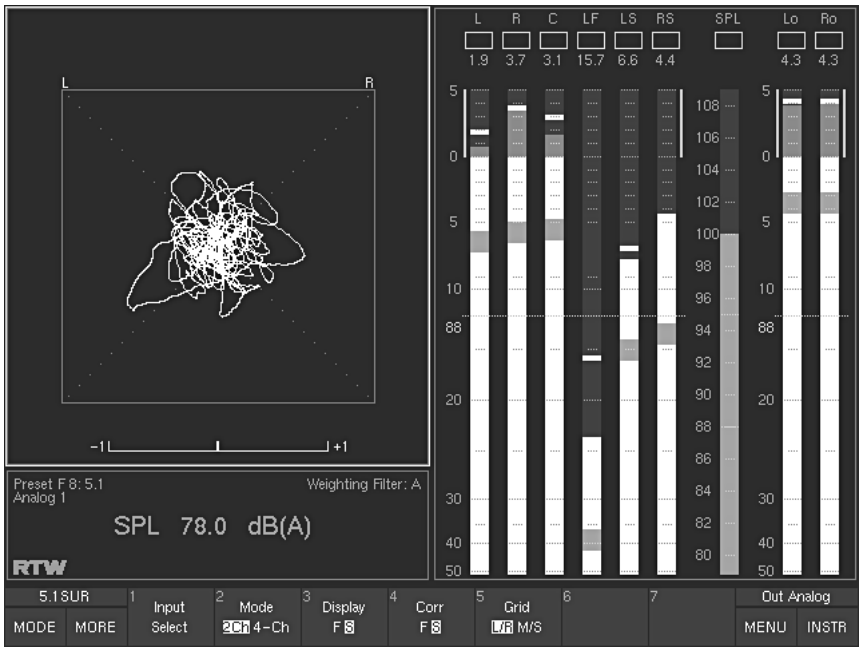


Fig. 2-5: The Audio Vectorscope instrument (VSC) displayed in Window 3 (highlighted with a white frame)

The Audio Vectorscope is a high quality Lissajous display for stereo signals available in the surround modes and for all modes with stereo channel pairs. This display mode also includes a phase meter (correlator).
In Surround modes it is switchable between 2-channel and 4-channel mode with channel pairs L-R and LS-RS and displays separate phase meters for these channel pairs.

→ MODE, → CORR.
See Chapter 5.5 for operating instructions

2.2.3 Correlator (CORR)

The CORR instrument is **only** available in 5.1, 6.1, 7.1 Surround modes and for the stereo channel pairs in Multi-Channel mode!

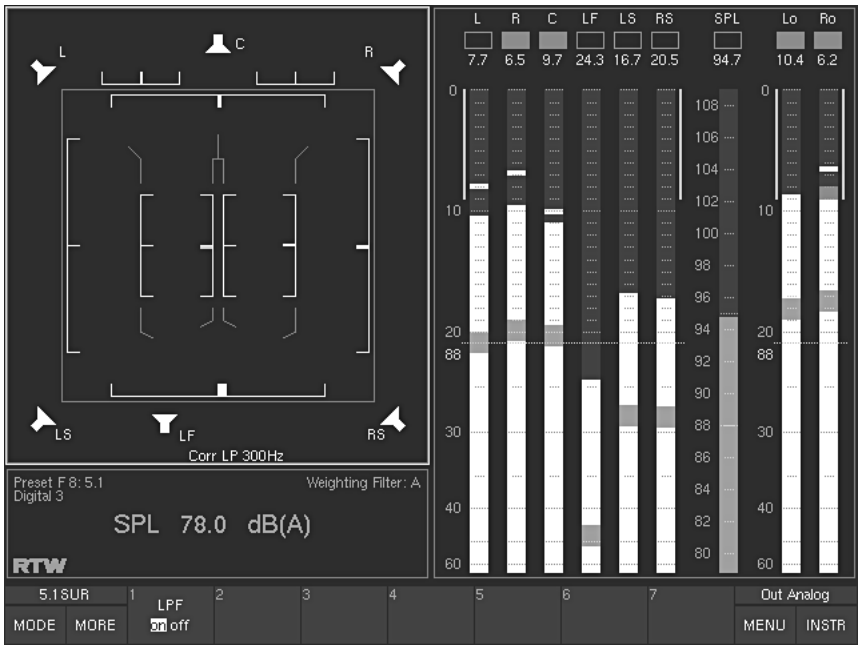


Fig. 2-6: The Correlator instrument (CORR) with phase meters for every channel pair displayed in Window 3 (highlighted with a white frame)

The Correlator is a multi-fold display mode with up to ten phase meters for all possible channel pairs, graphically placed inside a 5.1 speaker setup. In 5.1 surround mode the Correlator display shows a clear graphical representation of all 10 channel pairs. You can also activate an optional 300 Hz low pass filter upstream from the instrument to obtain a view of the “surround envelopment” effect. This makes it possible to identify correlations at low frequencies that detract from the sense of envelopment.

In 6.1 surround mode the system does not yet have a separate display for the surround center channel.

In 7.1 mode the levels of the additional front channels are mixed with those of the front center channel. There is thus only one common front center indicator.

In Multi-Channel modes it can be used for the display of the phase correlationship of the defined stereo channel pairs.

In 3.1 Surround and 2-Channel Stereo modes this instrument is not available. For this mode the phase meter is integrated in the Vectorscope instrument (VSC – see Chapter 2.2.2).

→ MODE, → RTA 1/3. See Chapter 5.6 for operating instructions

2.2.4 Third Octave Real Time Analyzer (RTA 1/3)

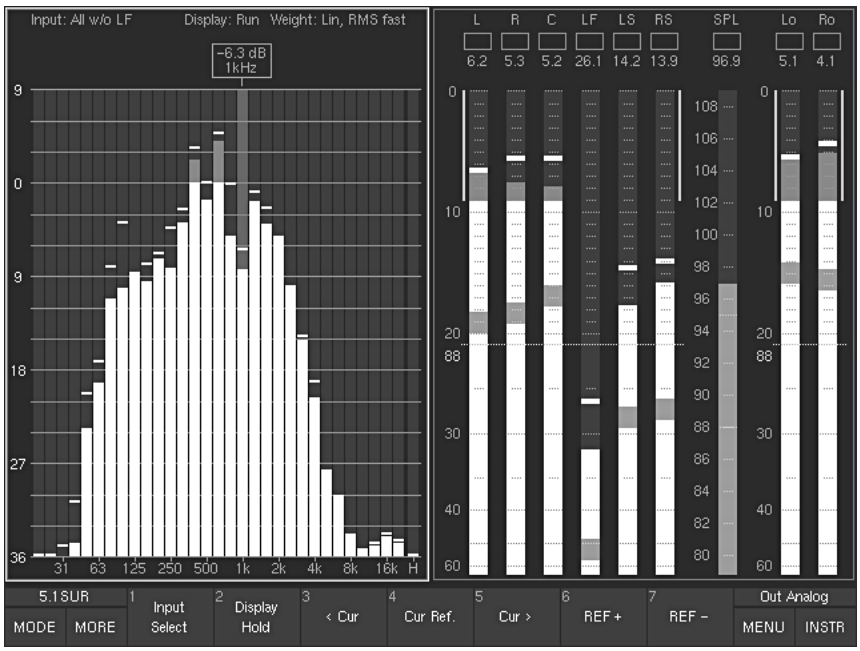


Fig. 2-7: The 1/3rd octave Real Time Analyzer instrument (RTA 1/3) displayed in Window 3 and Window 4 (highlighted with a white frame)

The third octave Real Time Analyzer (real filter type) displays the spectral distribution of individual channels or channel groups. When the RTA 1/3 instrument is activated it covers the Status Box (Window 4).

→ MODE, → RTA 1/6.
See Chapter 5.6 for operating instructions

2.2.5 Sixth Octave Real Time Analyzer (RTA 1/6)

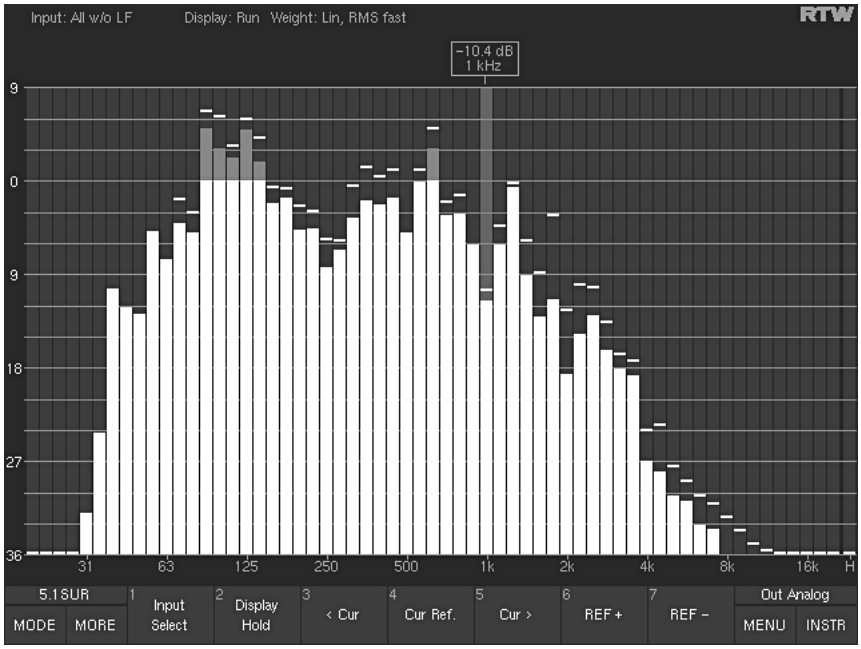


Fig. 2-8: The 1/6th octave Real Time Analyzer instrument (RTA 1/6) displayed in Window 2, Window 3 and Window 4

The RTA 1/6 is the only instrument that covers Window 2 with the Program Meter when it is activated. This is necessary because the 1/6 octave analyzer needs more space to be displayed legibly. The functions and controls are identical to those of the RTA 1/3 instrument, with one exception:

See Chapter 5.8.3

When you are calibrating the monitoring system you can activate RTA 1/6 from the CAL instrument (see Chapter 5.8.3) for evaluation of the signal from the calibration microphone.

→ MODE, → DOWNMIX. See Chapter 5.7 for operating instructions

The DOWNMIX instrument is **only** available in Surround modes!

2.2.6 (Two-Channel) Downmix Meter (DOWNMIX)

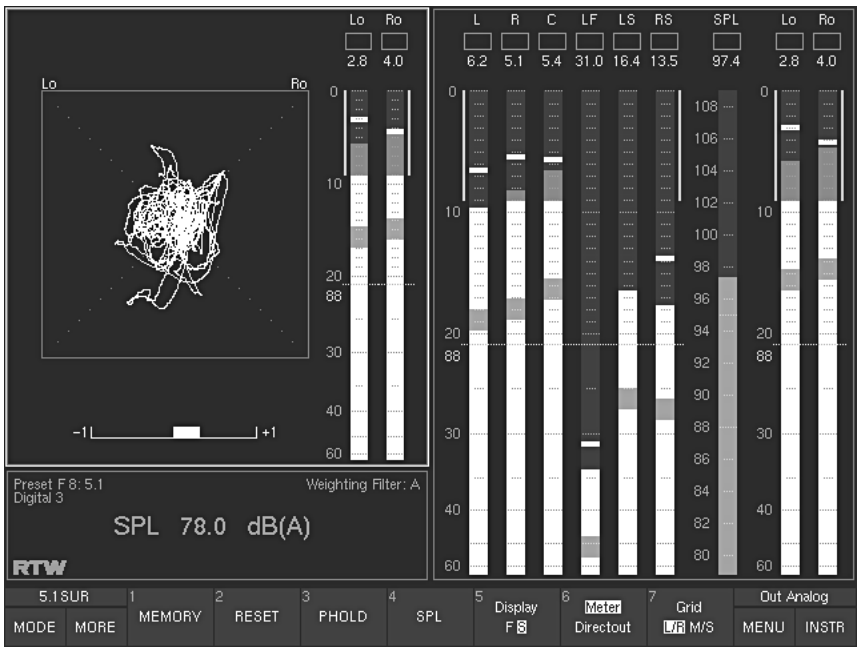


Fig. 2-9: The Two Channel Downmix Meter instrument (DOWNMIX) displayed in Window 3 (highlighted with a white frame)

The (Two-Channel) Downmix Meter instrument displays the levels and the correlation of the internally-generated two-channel downmix signal. It either can be metered and switched to the front loudspeakers or directly given out via the output connectors and then be monitored with the Downmix Meters. The instrument also features an audio vectorscope function.

→ MODE, → MONITORING. See Chapter 5.8 for operating instructions

2.2.7 Monitoring Controller Instruments (MONITORING)

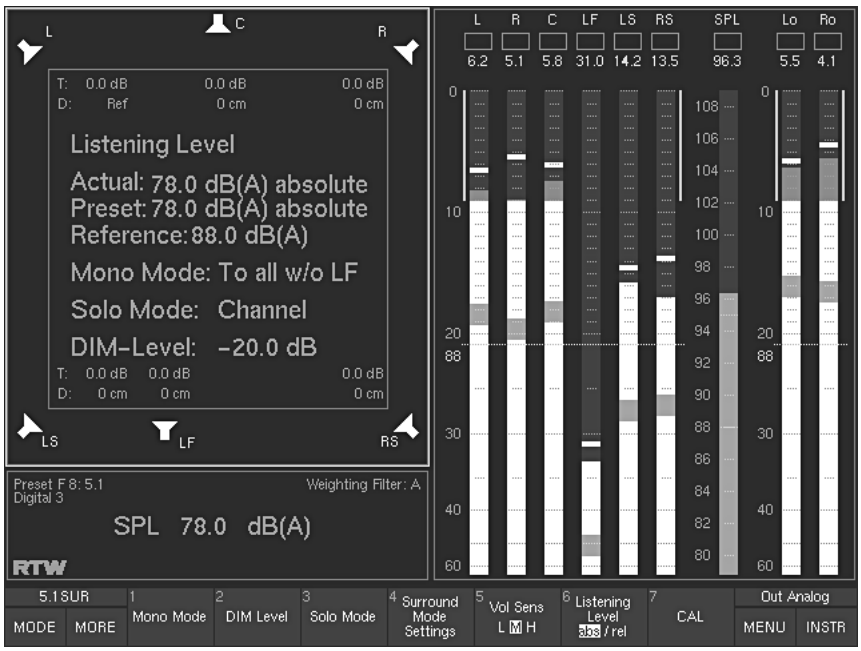


Fig. 2-10: The Monitoring controller instruments (MONITORING) displayed in Window 3 (highlighted with a white frame)

This instrument is used to manage the functions configuration settings of the Monitoring Controller. When the Monitoring instrument is activated Window 3 shows symbols for the loudspeakers and the values of the level trim offset, the delay, the listening level setting, the reference level, the dimming level and the selected mode for the generation of a mono signal. It also features the CAL instrument including the functions for the setting of the Trim and Delay values, the SPL Meter, and a test signal generator with different adjustable signals for calibrating the studio monitoring environment (see next page).

→ MODE, → MONITORING, → CAL.
See Chapter 5.8.3 for operating instructions

The CAL Instrument (sub-function of the Monitoring instrument)

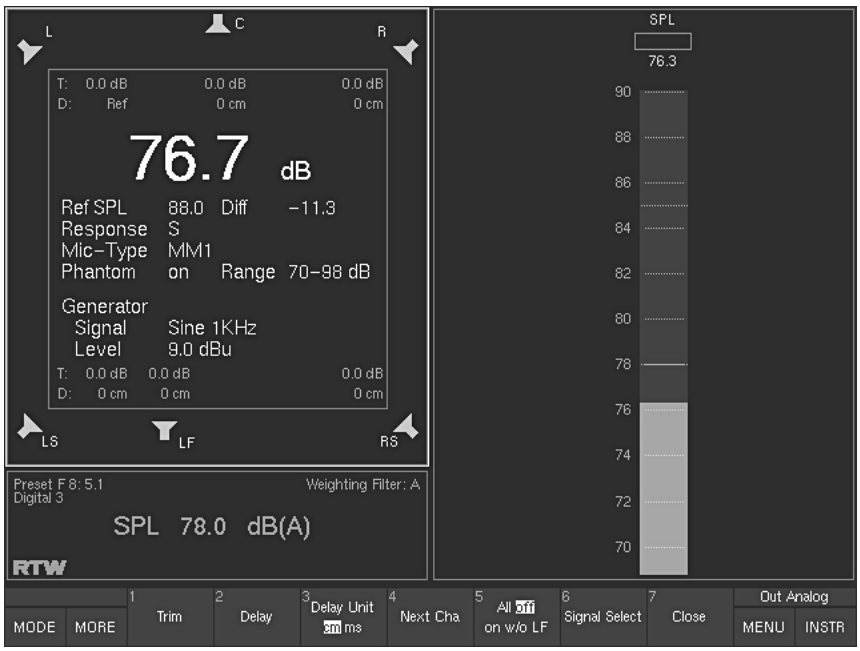


Fig. 2-11: The calibration instruments (CAL) displayed in Window 3 (highlighted with a white frame)

This instrument provides an 8-channel test signal generator and an SPL meter for the calibration of the monitoring system. The test signal generator can generate either sine wave signals or pink noise with a variety of bandwidths and levels. The values required for calibration to the various standards are preset, but you can also use variable values.
The SurroundControl's SPL meter enables you to perform the sound pressure level (SPL) measurements that are necessary to calibrate the sound monitoring system. The unit is also fitted with a calibration microphone preamplifier with settings for two different microphone types (i. e. beyerdynamic's MM-1 or Behringer's ECM 8000).

→ MODE, → MORE, → AES/EBU STATUS. See Chapter 5.9 for operating instructions

2.2.8 AES/EBU Status Monitor (AES/EBU STATUS)

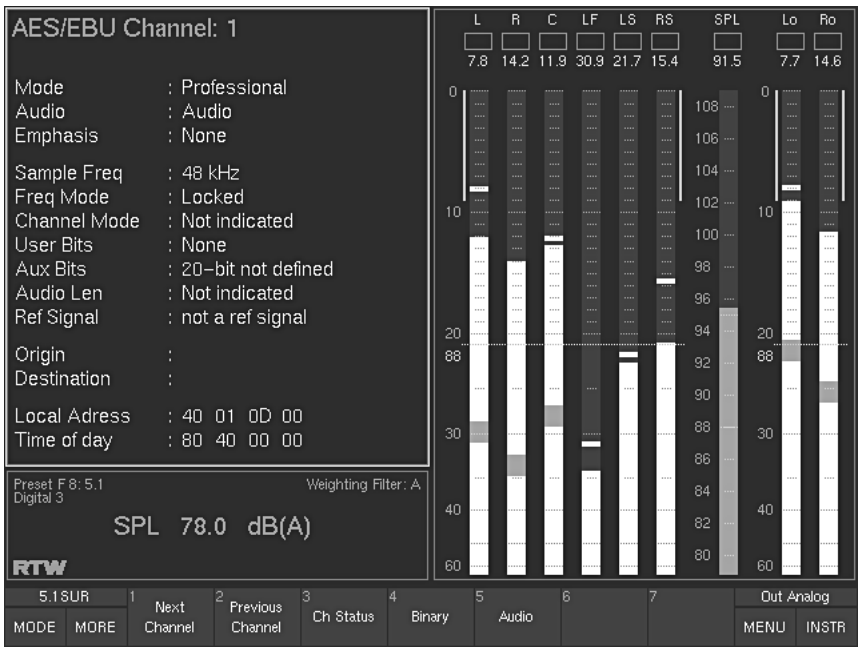


Fig. 2-12: The AES/EBU status monitor instrument (AES/EBU STATUS) displayed in Window 3 (highlighted with a white frame)

The AES/EBU Status Monitor displays the status bytes from the AES/EBU data stream as plain text. In addition to this it also displays a range of signal status information, including Confidence, Lock, Coding, Parity and Validity. Finally, the AES/EBU Status Monitor displays the audio data bits and their activity, which is useful when you need to determine the word width or identify defective bits in the data stream.

→ MODE, → MORE,
→ SDI STATUS.
See Chapter 5.10 for operating instructions

2.2.9 SDI Channel Status Monitor (SDI STATUS)

The SDI STATUS instrument is **only** available with HD/SD SDI deembedder interface installed (31900S, 31960S, 31900SD, 31960SD)!

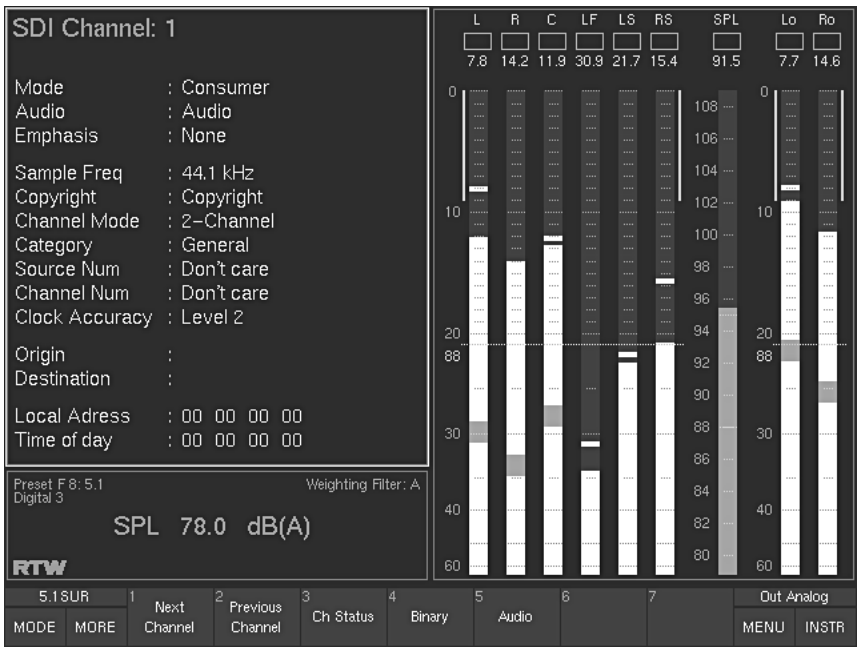


Fig. 2-13: The SDI status monitor instrument (SDI STATUS) displayed in Window 3 (highlighted with a white frame)

If the HD/SD SDI deembedder interface is installed and activated (only included in the S and SD versions), the channel status of each audio channel included in SDI signals can be displayed and monitored. It looks like the AES/EBU Status Monitor (see Chapter 2.2.8).

→ MODE, → MORE,
→ SDI INTERFACE.
See Chapter 5.11 for operating instructions

2.2.10 SDI Interface Status Monitor (SDI INTERFACE)

The SDI INTERFACE instrument is **only** available with HD/SD SDI deembedder interface installed (31900S, 31960S, 31900SD, 31960SD)!

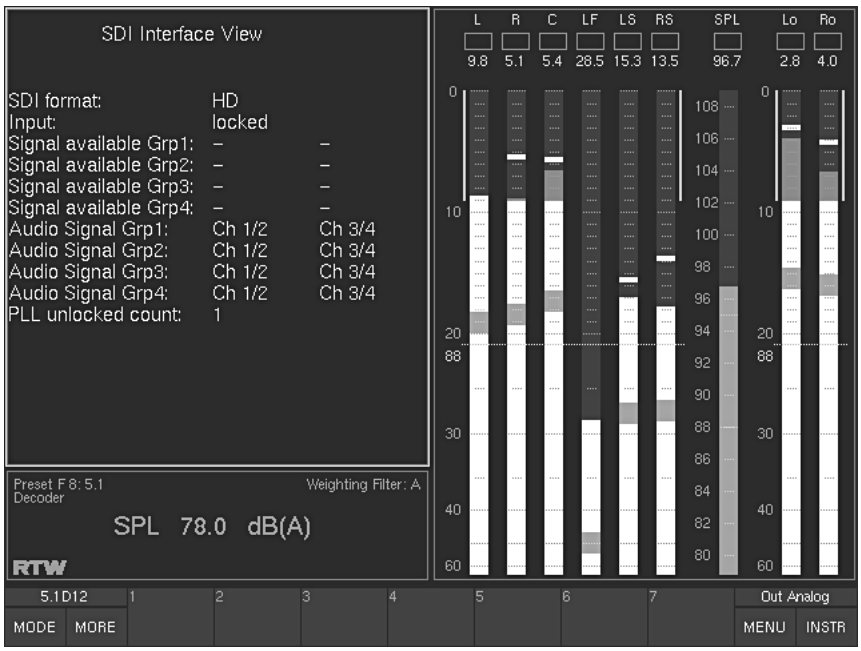


Fig. 2-14: The SDI interface monitor instrument (SDI INTERFACE) displayed in Window 3 (highlighted with a white frame)

If the HD/SD SDI deembedder interface is installed and activated (only included in the S and SD versions), the SDI Interface display shows the status of the interface and the included and available audio signals and signal groups.

→ MODE, → MORE,
→ HARDWARE STATUS.
See Chapter 5.12 for
operating instructions

2.2.11 Hardware Status Monitor (HARDWARE STATUS)

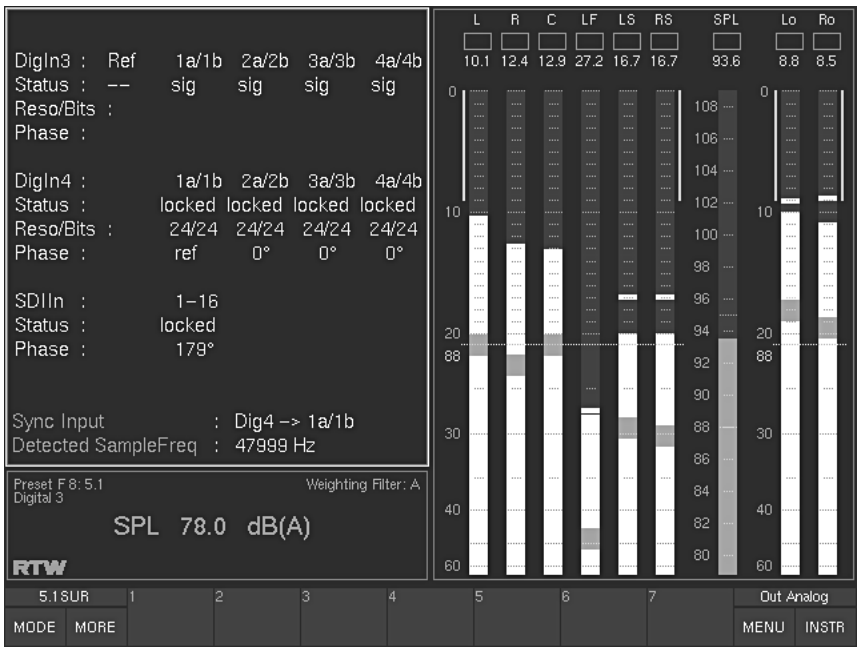


Fig. 2-15: The Hardware Status monitor instrument (HARDWARE STATUS) displayed in Window 3 (highlighted with a white frame)

The Hardware Status Monitor displayes the status of the digital inputs, the resolution and bits, the phase relationship, the sync reference and the detected sampling frequency.

→ MODE, → MORE,
→ DOLBY® META DATA.
See Chapter 5.13 for operating instructions

2.2.12 Dolby® Meta Data Monitor (DOLBY® META DATA)

The DOLBY® META DATA instrument is **only** available with Dolby® E and Dolby® AC-3 decoder installed (31900D, 31960D, 31900SD, 31960SD)!

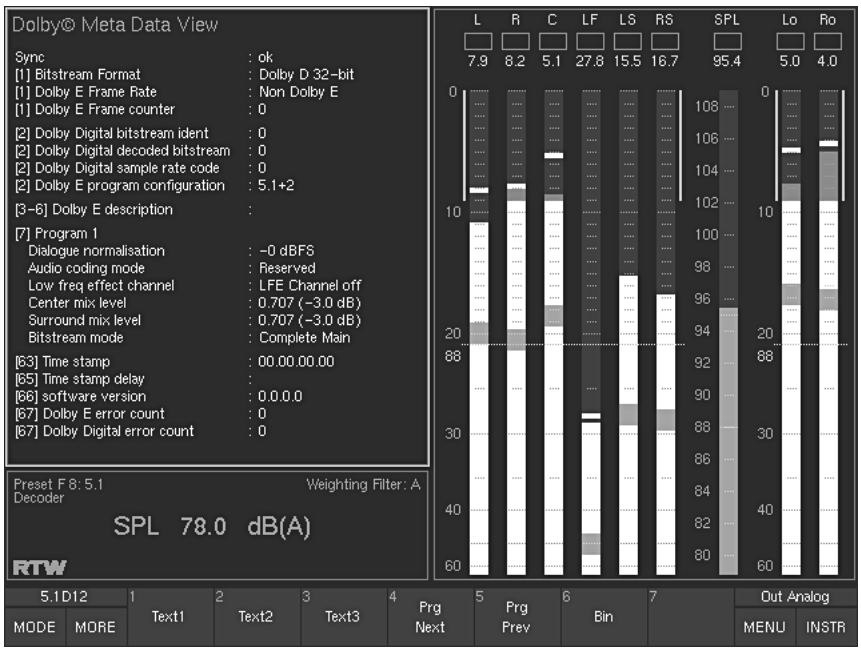


Fig. 2-16: The SDI interface monitor instrument (SDI INTERFACE) displayed in Window 3 (highlighted with a white frame)

If the Dolby® E and Dolby® AC-3 decoder option is installed and activated (only included in the D and SD versions), the meta data included in a Dolby® encoded data stream are displayed in Window 3.

→ MODE, → MORE,
→ DIALNORM.
See Chapter 5.14 for operating instructions

2.2.13 Dialnorm Meter (DIALNORM)

The DIALNORM instrument is **only** available with digital 5.1, 6.1 and 7.1 surround formats!

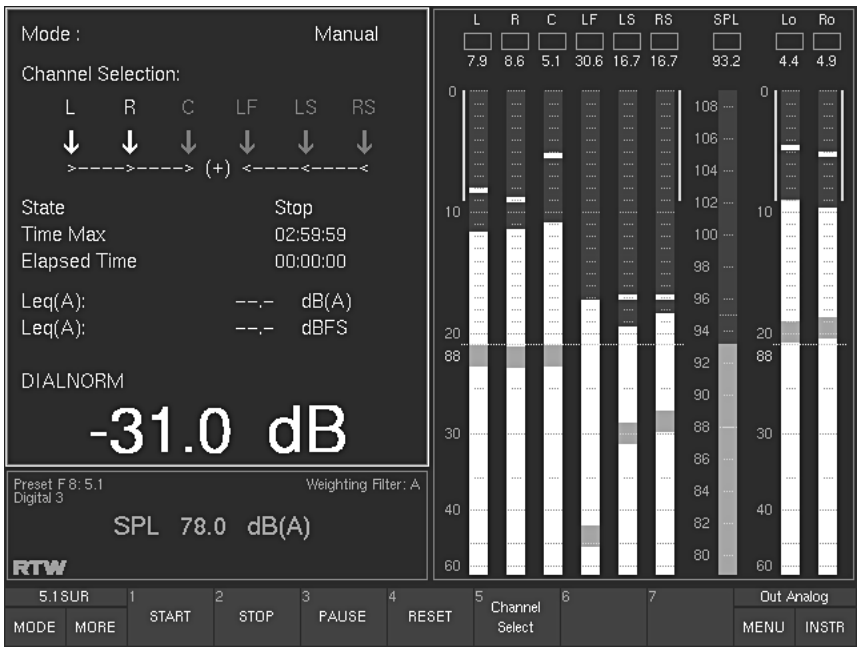


Fig. 2-17: The Dialnorm Meter instrument (DIALNORM) displayed in Window 3 (highlighted with a white frame)

The SurroundControl units can calcualte and show Dialnorm values from its digital input signals. Dialnorm is used in film sound mixing and describes the normalization of the dialog loudness level with respect to a certain reference monitoring level. With Peak Program Meter selected for the Program Meter this mode allows the measurement of the dialnorm value, the Leq(A) value referred to 0 dB FS as well as the Leq(A) value with A weighting. With ITU BS.1771 Loudness Meter selected in 5.1 surround mode for the Program Meter this mode allows the measurement of the dialnorm value, the Leq(R2LB) value referred to 0 dB FS as well as the Leq(R2LB) value with R2LB weighting.

→ MODE, → MORE, → BLITS. See Chapter 5.15 for operating instructions

2.2.14 BLITS 5.1 Surround Identification (BLITS)

The BLITS instrument is **only** available with 5.1 surround formats!

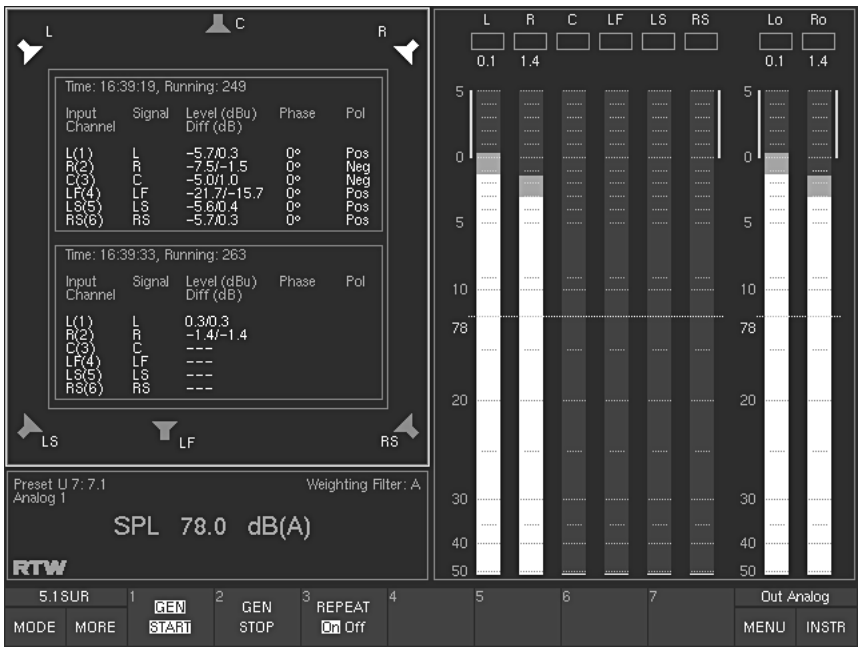


Fig. 2-18: The Dialnorm Meter instrument (DIALNORM) displayed in Window 3 (highlighted with a white frame)

To prevent unintentional channel swapping, an integrated signal generator driving the digital and analog outputs has a BLITS 5.1 Surround Identification mode that provides a signal cluster to facilitate identification of each 5.1 channel.

→ INSTR, → INFO, → CHART, → NUMERIC.
See Chapter 5.2.2.3 for operating instructions

2.3 Status Box in Window 4

These functions are **only** available with ITU BS.1771 Loudness selected for the Program Meter in Window 2!

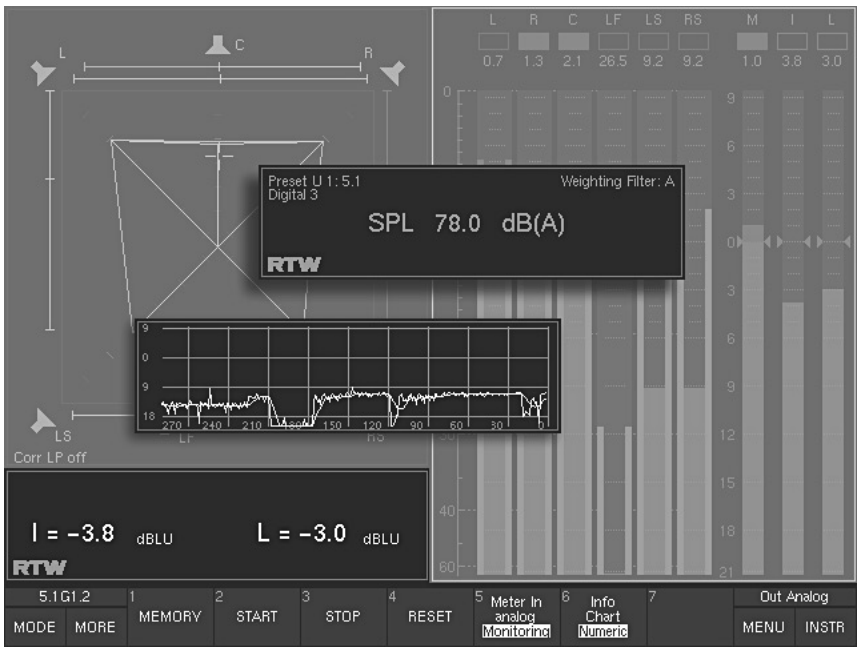


Fig. 2-19: Examples for different displays of the Status Box in Window 4

The Status Box normally shows information is used to display current status information (e. g. selected preset, weighting filter, selected input connector, SPL value) or messages. With ITU BS.1771 Loudness Meter selected for the Program Meter in Window 3 the Status Box in Window 4 also can display a chart recorder for the data logging of Long-term Loudness value readings or display the numerical values of Integrated or/and Long-term Loudness readings. Some of the instruments cover the Status Box when they are activated.

See Chapter 4 for operating instructions

2.4 Function and Monitoring Control

2.4.1 The Remote Control 30050 for the 31900 series

The Remote Control 30050 includes controls for all of the SurroundControl's monitoring functions and the metering functions. The metering functions can also be controlled with an optional computer mouse or with the function and control keys on the optional 8.4" Remote Display 30010 unit. One Remote Control 30050 is included in the standard SurroundControl 31900 series packages but it is also available as an accessory because you can connect up to three Remote Control 30050 units simultaneously to one unit (for connecting several Remote Control 30050 see Chapter 8.1).

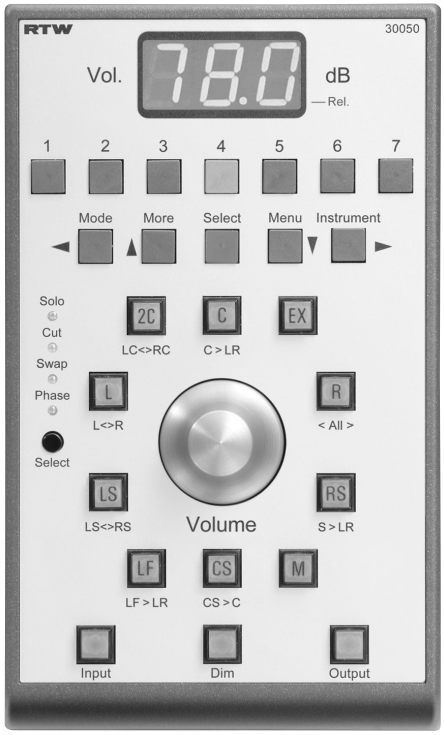


Fig. 2-20: The Remote Control 30050 for function and monitoring control of the 31900 units

2.4.2 The Control Panel of the 31960 series

The front panel of the 31960 series includes control keys for all of the SurroundControl's monitoring functions and the metering functions. The metering functions can also be controlled with an optional computer mouse or with the function and control keys on the optional 8.4" Remote Display 30010 unit. Additionally you also can connect up to two Remote Control 30050 units available as an accessory simultaneously to one 31960 unit for the control of all monitoring and metering functions (for connecting several Remote Control 30050 see Chapter 8.1).

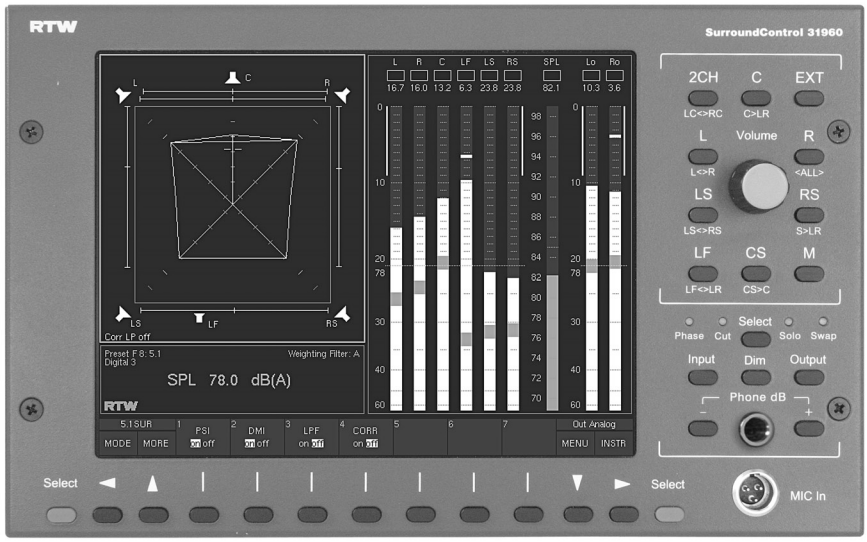


Fig. 2-21: The front panel of the 31960 series with the integrated function and monitoring control keys

3 Quick start

3.1 System Startup

Before switching the unit on, please make sure that the following connections are made according to your individual installation needs:

- Remote Control unit 30050 (required for 31900, optional for 31960)
- Analog and/or digital audio input signals
- Analog and/or digital speaker connections
- External VGA display like RTW Remote Display 30010 (required for 31900)
- Optional USB mouse
- LAN/Ethernet (if required)
- Mains voltage

See Chapter 7

Please refer to Chapter 7 - Installation for details about the configuration, all connections and pinouts.

After switching the unit on, the normal startup sequence will take about 50 seconds until the main screen is shown.

Note:
The first initial startup sequence after unpacking the unit or after a software update may take considerably more time.

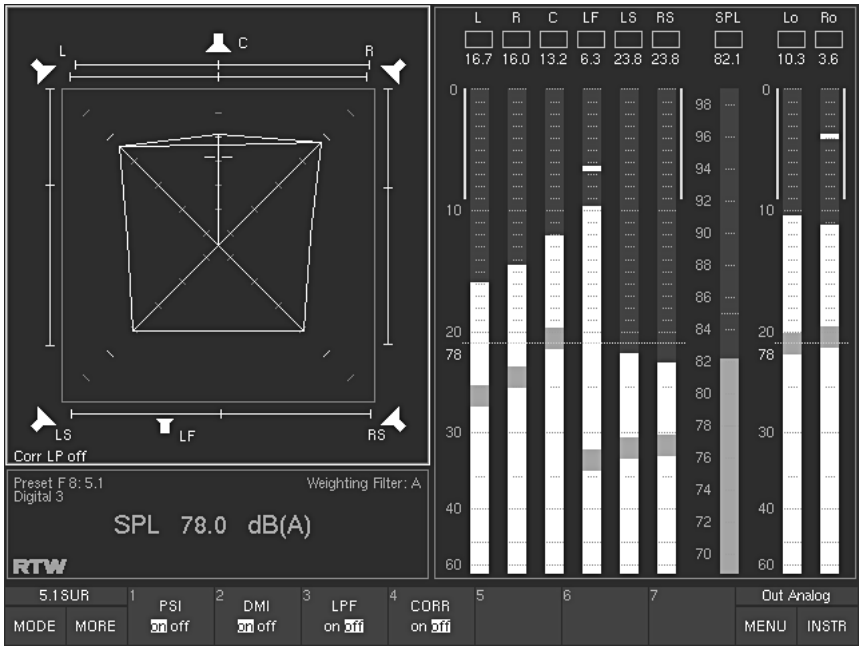


Fig. 3-1: The main screen after startup sequence with Factory Preset F8 and input Digital 3 selected

The user configurable parameters of the SurroundControl 31900 and 31960 set in the menu system consist of **global** and **local** parameters. Local parameters might be changed as soon as a new preset or Sub Preset is loaded, whereas global parameters remain unchanged until edited manually. The local parameters are hold in 7 Factory Presets and 7 User Presets. The preset loaded at startup can be configured in the menu. The SurroundControl 31900 and 31960 can as well load the last active preset used before power down.



Note:
Please refer to Chapter 6.1.1 for more information about **Local** and **Global Settings**.

See Chapter 6.1.1



Note:
Please refer to Chapters 3.5 and 6.1.2 for more information about the concept and the use of **Sub Presets** (Key Presets).

See Chapter 3.5 and E 6.1.2



Note:
Please refer to Chapters 3.4 and 3.9 for information about recalling, renaming and saving presets.

See Chapter 3.4 and 3.9



Note:
Please refer to Chapter 3.11 for information about how to define the preset loaded at power on.

See Chapter 3.11



Note:
It is also possible to define the initial setting of the volume control (SPL level) for the monitor speakers after power on. Please refer to Chapter 6.6 for information about how to define the initial SPL setting.

See Chapter 6.6

3.2 Setting clocking reference and sample rate

The reference source and the sample rate used by the unit are global parameters not being altered by loading new presets or Sub Presets.

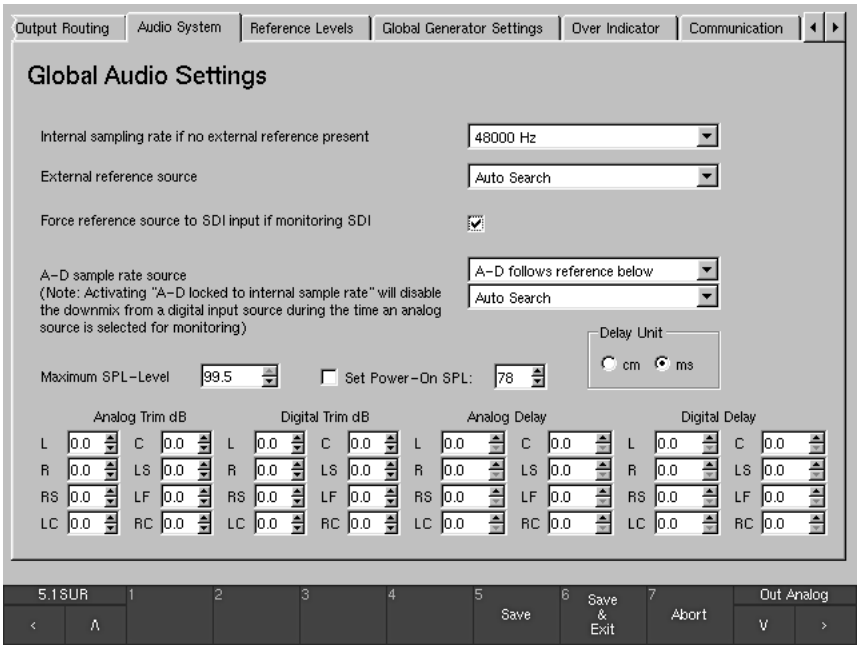


Fig. 3-2: The Audio System menu tab with the Global Audio Settings menu

To adapt these settings to your studio environment please proceed as following:

1. From normal display operation, press the **Menu** key on the Remote Control unit 30050 or the 31960 control panel or click the **MENU** button in the Toolbar (Window 1 of the screen, see Fig. 2-1). The first time the menu system is accessed after power on it will take some seconds to load.

See Fig. 2-1

2. Access the Audio System menu tab by clicking it with the mouse or using the **<** and **>** cursor keys on the Remote Control unit 30050 or the 31960 control panel. If the Audio System menu tab is not visible use the arrow buttons on the top right corner of the menu screen until you see it. After selecting the menu tab the **Global Audio Settings** menu page will be shown.

3. Use the **^** and **v** cursor keys and the red **Sel** key or use the mouse to make settings of sample rate and reference source as required in your setup.

Note:
Please refer to Chapter 6.6 for more detailed information about setting the sample rate and reference source.

See Chapter 6.6

4. Save your settings by clicking the **Save & Exit** button in the Toolbar or pressing the key labeled **6** on the Remote Control unit 30050 or the 31960 control panel. The screen shows **Save Global Settings?**

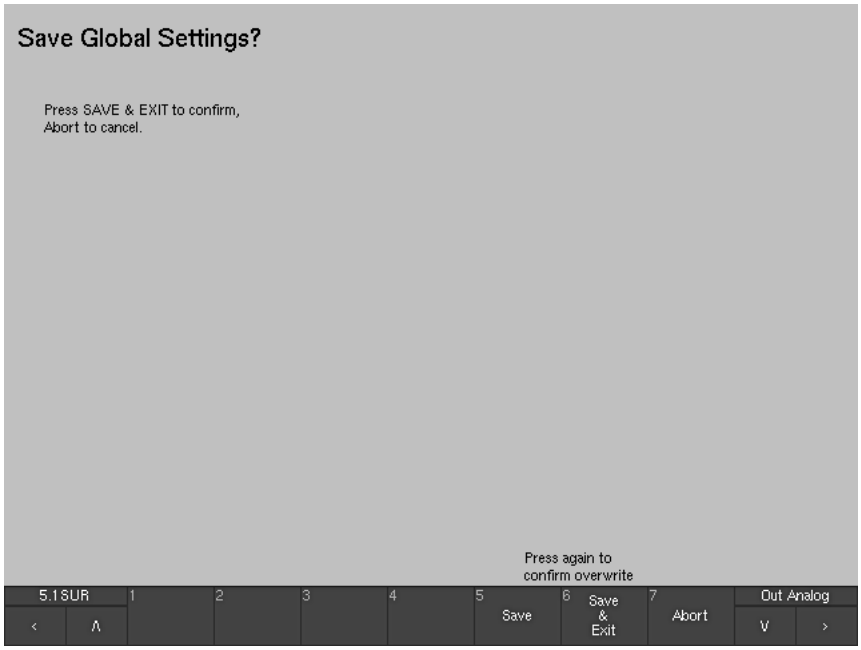


Fig. 3-3: The Save Global Settings? screen

5. Confirm saving the global settings by again clicking the **Save & Exit** button in the Toolbar or pressing the key labeled **6** on the Remote Control unit 30050 or the 31960 control panel.
   Abort any changes by clicking the **Abort** button in the Toolbar or pressing the key labeled **7** on the Remote Control unit 30050 or the 31960 control panel.

3.3 Using Presets

One of the first things you might want to do while configuring your system is finding the right preset for your application and for the audio connections you want to use.

SurroundControl 31900 and 31960 feature a comprehensive preset system reflecting a wide range of setup options. Loading a preset provides an easy and fast way to setup the local parameters of the unit. However, global parameters like the sample rate are not altered when loading a new preset; they remain unchanged until edited manually.
The local parameters are hold in 7 Factory Presets and 7 User Presets. After unpacking the unit, the User Presets named U1 to U7 hold the same content as the Factory Presets named F8 to F14, but they can be overwritten anytime to store individual user settings.

Each of the 14 presets stored in the unit contains 7 Sub Presets. Each Sub Preset can hold individual settings for, among others, the input and output routing and the default instrument displayed after loading a Sub Preset. This means that in fact the unit comes with 49 individual Sub Presets organized in 7 Factory Presets, and the same amount of Sub Presets can be stored individually in the 7 User Presets.

By selecting a factory preset you can define the channel configuration you want to use. For example, F8 is used for 5.1 surround setups, F9 can be used for 2-channel stereo signals and F10 is prepared for multichannel use.

After selecting one of the Factory Presets that reflects your channel configuration best, you can use Sub Presets to switch between the different input sources you might want to use. So, for instance, in F8 the first two Sub Presets use the input connector **Analog 1** while others use a digital input, the SDI interface (optional) or the internal Dolby® decoder (optional).

The good thing about Sub Presets is that they can be switched instantly using dedicated keys on the Remote Control unit 30050 or the 31960 control panel, so it is very easy to jump between input sources connected to the unit. Please read more about Sub Presets in Chapters 3.5 and 6.1.2.

See Chapters 3.5 and 6.1.2

Note:
For a complete list of all Factory Presets and their Sub Presets refer to Appendix A.

Note:
The SDI and decoder inputs used in some of the Sub Presets can only be accessed if your unit is supplied with the SDI and/or Dolby® options.

3.4 Recalling Factory Presets

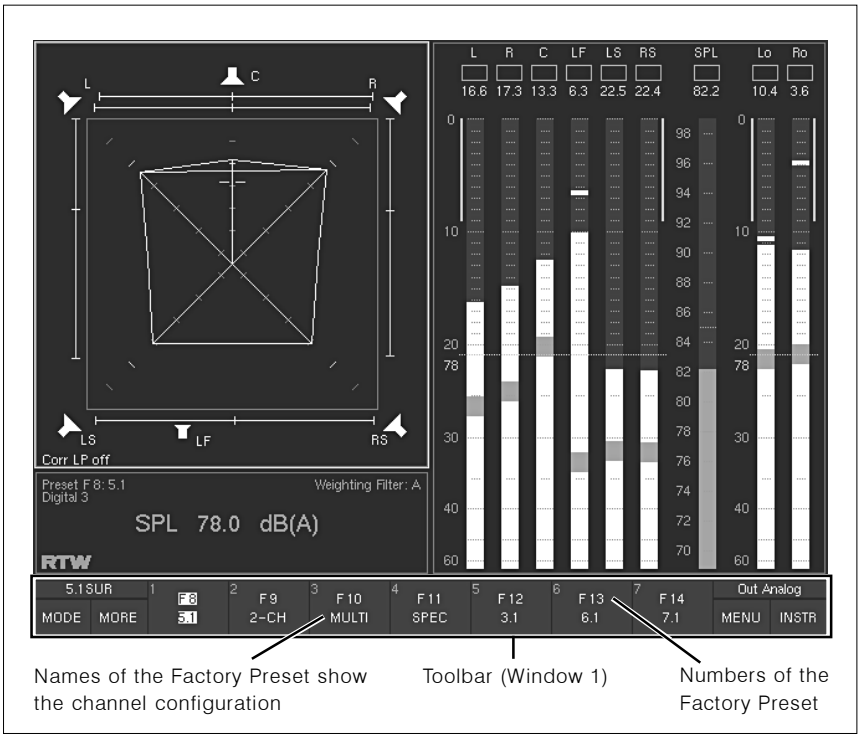


Fig. 3-4: Factory Presets displayed in the Toolbar (Window 1)

To recall a preset, proceed as following:

1. Press the **Mode** key on the Remote Control unit 30050 or the 31960 control panel or click the **MODE** button in the Toolbar (Window 1 of the screen, Fig. 2-1) repeatedly until the **MORE** button in the Toolbar turns yellow.

See Fig. 2-1

2. Press the **More** key on the Remote Control unit 30050 or the 31960 control panel or click the **MORE** button in the Toolbar (Window 1 of the screen) three times. The buttons 1 to 7 in the Toolbar show the Factory Presets F8 to F14 together with their individual names. The preset names in the second line show the channel configurations the presets are intended for.

3. Select the Factory Preset of your choice by pressing one of the numbered keys 1 to 7 on the Remote Control unit 30050 or clicking one of the numbered buttons 1 to 7 in the Toolbar. The new preset will be loaded.

Note:
For a complete list of all Factory Presets and the Sub Presets contained refer to Appendix A.

See Appendix XX

Note:
Please refer to Chapter 3.9 for details about saving individual settings in User Presets.

See Chapter 3.9

3.5 Switching Input Sources by using Sub Presets

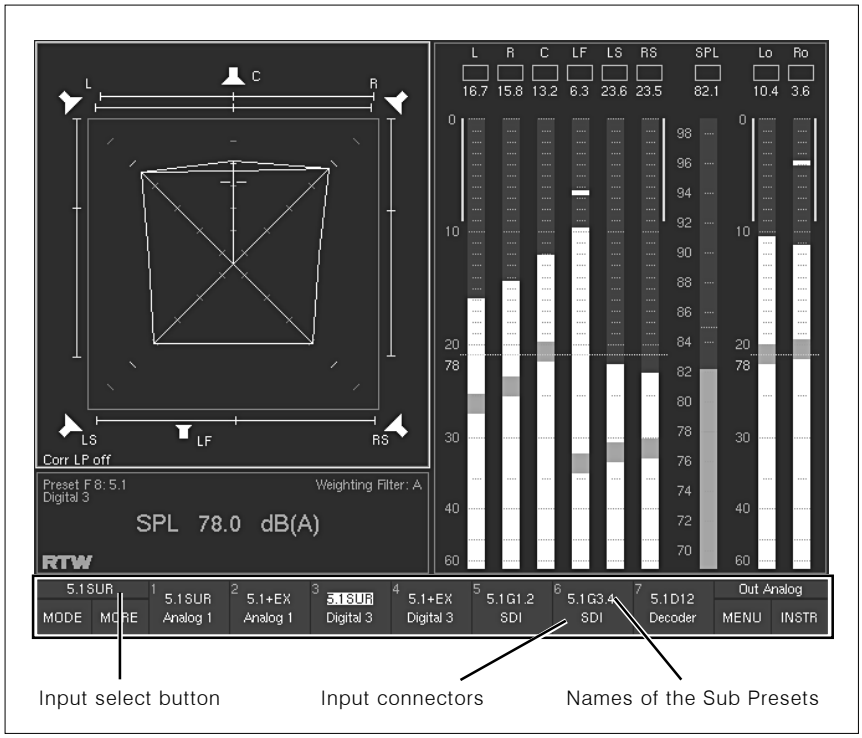


Fig. 3-5: Example: The Sub Presets for the Factory Preset F8

To switch between the (up to) 7 Sub Presets available in a Factory or User Preset, proceed as following:

1. Press the **Input** key on the Remote Control unit 30050 or the 31960 control panel or click the **Input Select** button in the Toolbar. The input select button is located above the **MODE** and the **MORE** button and always shows the currently loaded Sub Preset. Press or click the key/button once or twice so that the input key on the Remote Control unit 30050 or on the 31960 control panel lights up blue. Now the names of the 7 Sub Presets and the input connector they use are shown in the buttons 1 to 7 of the Toolbar.

2. Select the Sub Preset of your choice by pressing one of the numbered keys 1 to 7 on the Remote Control unit 30050 or the 31960 control panel or clicking one of the numbered buttons 1 to 7 in the Toolbar. The new Sub Preset will be loaded instantly. The unit will use the input signals fed to the connector defined in the Sub Preset.

See Chapter 3.10

Note:
In case the routing settings of the selected Sub Preset do not fit your connecting scheme you will have to adapt the routing setup of the preset. Please refer to Chapter 3.10 for more details about this.

3.6 Switching Instruments in Window 3

The Window 3 (the top left area of the display) can show several instrument types (display modes), e. g. Surround Sound Analyzer (SSA), Vectorscope (VSC), Correlator (CORR) or RTA. Using the Instrument Select mode the instruments can be switched easily without loading new presets or accessing the menu system. Depending on the version of your unit up to 14 instruments are provided.

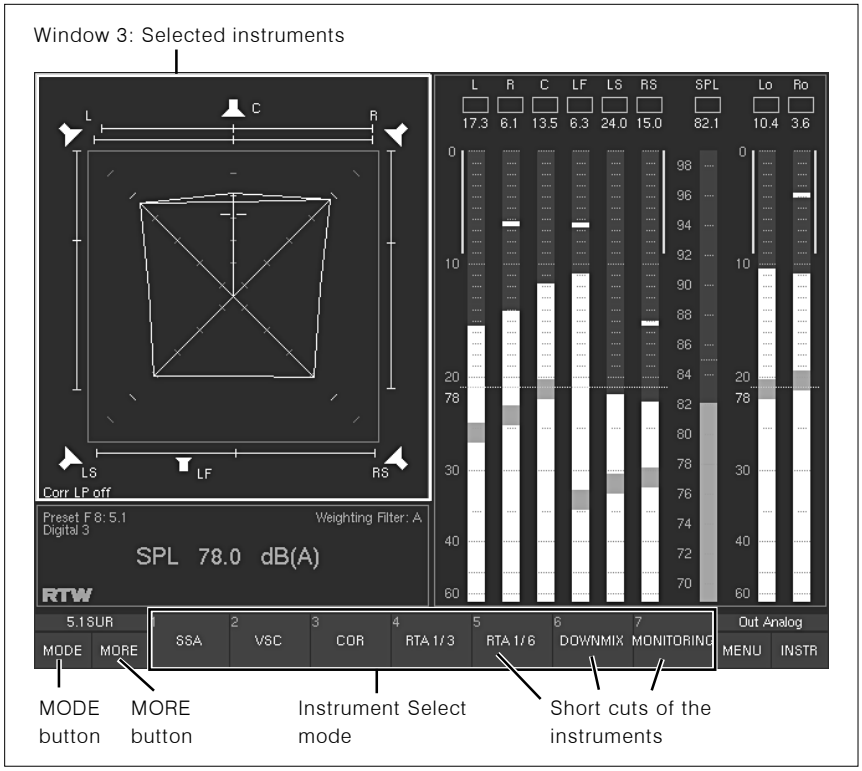


Fig. 3-6: The Surround Sound Analyzer is displayed in Window 3 and the first instrument selection level (displayed after selecting MODE) in the Toolbar

Proceed as following:

1. Press the **Mode** key/button on the Remote Control unit 30050 or the 31960 control panel or click the **MODE** button in the Toolbar (Window 1 of the screen, see Fig. 2-1). The buttons in the Toolbar numbered 1 to 7 switch into the Instrument Select mode and show the first seven available instrument types (display modes, see Fig. 3-6).

2. If you want to choose one of the other seven instruments, press or click the **MORE** key/button. The buttons numbered 1 to 7 in the Toolbar now show a second level of available instrument types (display modes, see Fig. 3-7).

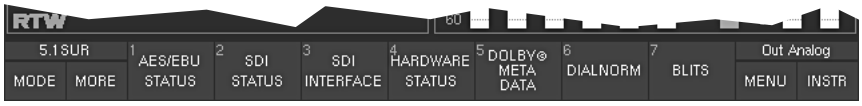


Fig. 3-7: The second Toolbar instrument level (displayed by selecting MORE)

3. Select the instrument type of your choice by pressing the related number key on the Remote Control unit 30050 or the 31960 control panel or clicking the number button in the screen Toolbar. The buttons in the Toolbar numbered 1 to 7 now switch back to the Function Select mode and show the corresponding functions of the selected instrument.

4. If you want to select another instrument type, use the **MODE** button again to change into the Instrument Select mode (as explained above) until the instrument types are shown. Make a selection as described.

Note:
The provided instruments will vary depending on the version of your unit (319n0, 319n0S, 319n0D, 319n0SD).

Note:
The instrument types available will vary depending on the channel configuration of the loaded preset.

See Chapter 3.4

Note:
Please refer to Chapter 3.4 for information about recalling presets.

3.7 Controlling Loudspeaker Monitoring

Besides controlling the metering functions of the SurroundControl 31900, the Remote Control Unit 30050 is also a fully featured surround monitoring controller with numerical readout of the volume level set.

Note:
All controls described for the Remote Control 30050 are located in a similar way on the front panel of the SurroundControl 31960 unit.

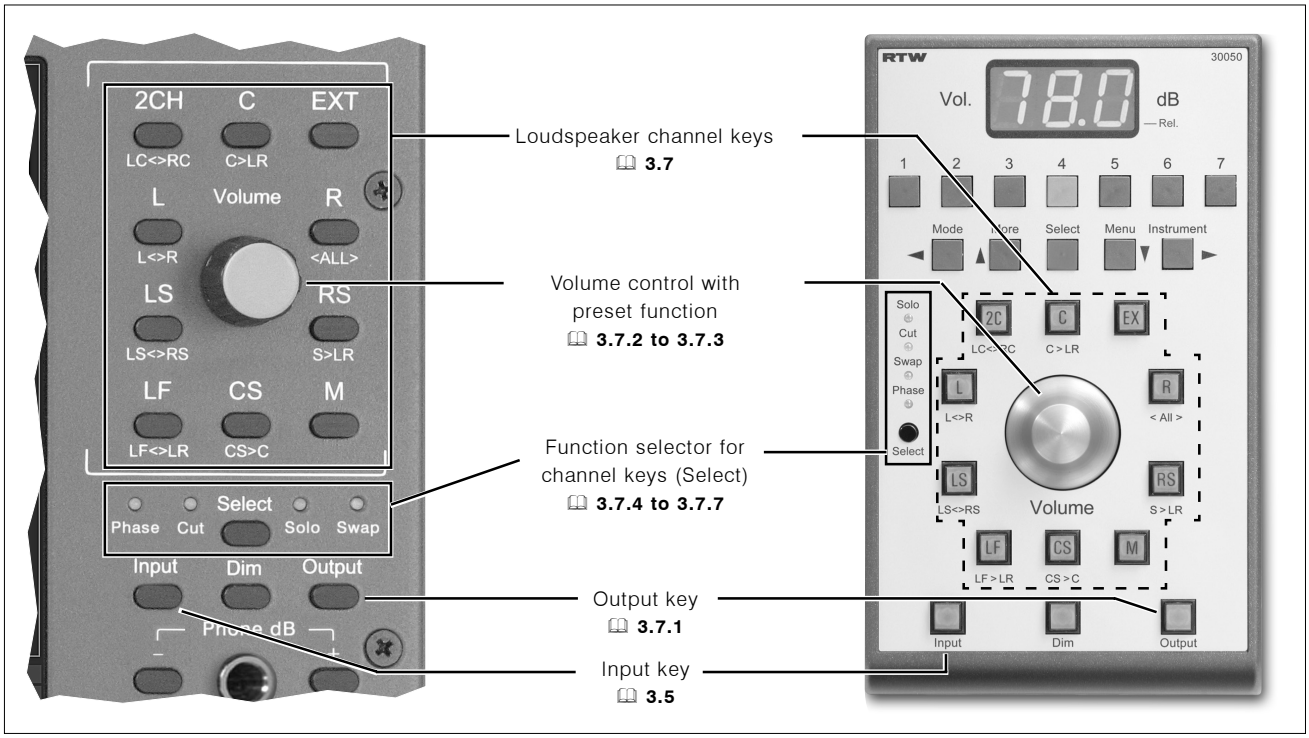


Fig. 3-8: The Remote Control 30050 (right) and the corresponding control panel of the SurroundControl 31960 series (left)

3.7.1 Switching monitoring outputs

Pressing the **Output** key on the Remote Control unit 30050 or the 31960 control panel or clicking the **Output Select** button in the top right corner of the Toolbar it is possible to toggle between two output connectors carrying the monitor signals at any time. This is a fast way to switch monitoring between two individual loudspeakers sets.
The two output connectors used when the **Output** key is active resp. inactive are defined in the menu and can be part of the local configuration stored in presets. For all Factory Presets, the **Analog Out** connector (see Chapter 7.3.13) is used when the **Output** key is not active and the **Digital 3 In**/**Out** connector (see Chapter 7.3.11) is used when the **Output** key is lit. To switch between both, press the **Output** key.

See Chapter 7.3.13
See Chapter 7.3.11

3.7.2 Controlling the volume

Turning the **Volume** dial controls the listening level of the selected monitoring outputs in steps of 0.5 dB each. Pressing the dial will switch the listening level to a preset value defined by the user (see next article about how to do this). It is also possible to set an initial listening level always set after power-on. Please refer to Chapter 6.6 for details about how to set the power-on SPL level in the **Global Audio Settings** menu page using the Audio System menu tab.

See Chapter 6.6

3.7.3 Setting the preset volume

In all channel modes except 6.1, pressing the **SC** key (placed under the volume dial, see Fig. 3-8) defines the current volume setting to be the preset level.

Proceed as following:

1. Find the preset level of your choice using the volume dial.
2. Press the **SC** key to set it.
3. After this, you can return at any time to the preset level by simply pressing the volume dial.

If you are using the 6.1 channel mode, the **SC** key is used to control the Surround Center channel of the 6.1 Setup. To set the preset volume level then, proceed as following:

1. Change to a different channel configuration.
2. Set the preset level using the **SC** key.
3. Return to 6.1 mode.
4. Now you also can return at any time from the 6.1 mode to the preset level by simply pressing the volume dial.

3.7.4 Soloing individual channels

If you want to monitor one individual channel, proceed as following:

1. Press the small black **Select** key until the **Solo** LED lights up.
2. Press the channel key you want to solo. If the Surround Sound Analyzer display is visible on the screen, the according loudspeaker symbol of all other channels will turn red.

Note:
The channel keys can be used in radio button style so that only one channel at a time is performing the selected function (Solo, Cut, Phase), cancelled by the next key pressed. Alternatively, an adding mode can be set. Please refer to Chapter 6.10.5 for details about how to change this global setting.

See Chapter 6.10.5

3.7.5 Muting individual channels

If you want to mute one individual channel, proceed as following:

1. Press the small black **Select** key until the **Cut** LED lights up.

2. Press the channel key you want to mute. If the Surround Sound Analyzer display is visible on the screen, the according loudspeaker symbol of that channel will turn red.

Note:
The channel keys can be used in radio button style so that only one channel at a time is performing the selected function (Solo, Cut, Phase), cancelled by the next key pressed. Alternatively, an adding mode can be set. Please refer to Chapter 6.10.5 for details about how to change this global setting.

See Chapter 6.10.5

3.7.6 Switching polarity of individual channels

To switch the polarity of one individual channel, proceed as following:

1. Press the small black **Select** key until the **Phase** LED lights up.

2. Press the channel key for which you want to change the polarity. If the Surround Sound Analyzer display is visible on the screen, the according loudspeaker symbol of that channel will turn to a green outline and the channel labeling is signed with ^.

Note:
The channel keys can be used in radio button style so that only one channel at a time is performing the selected function (Solo, Cut, Phase), cancelled by the next key pressed. Alternatively, an adding mode can be set. Please refer to Chapter 6.10.5 for details about how to change this global setting.

See Chapter 6.10.5

3.7.7 Swapping channels

Sometimes it is helpful to judge the surround channels of a 5.1 signal by listening to them through the front instead of the rear loudspeakers. The **Swap** function provides an easy way to switch certain channels to other loudspeakers temporarily.

Proceed as following:

1. Press the small black **Select** key until the **Swap** LED lights up. The channel keys now act as swap keys performing the swap function labeled below the channel keys of the Remote Control unit 30050 or the 31960 control panel.

2. Press the channel key performing the swap function you want to use. If the Surround Sound Analyzer display is visible on the screen, some according loudspeaker symbols of certain channels will turn red. The names of the switched channels are always labeled in brackets next to the symbols of the channels they are switched to.

3. To return to normal output routing, press the channel key again.

3.8 Menu Access

The menu system of the SurroundControl 31900 and 31960 gives access to all **Local** parameters stored in presets as well as to the **Global** settings.

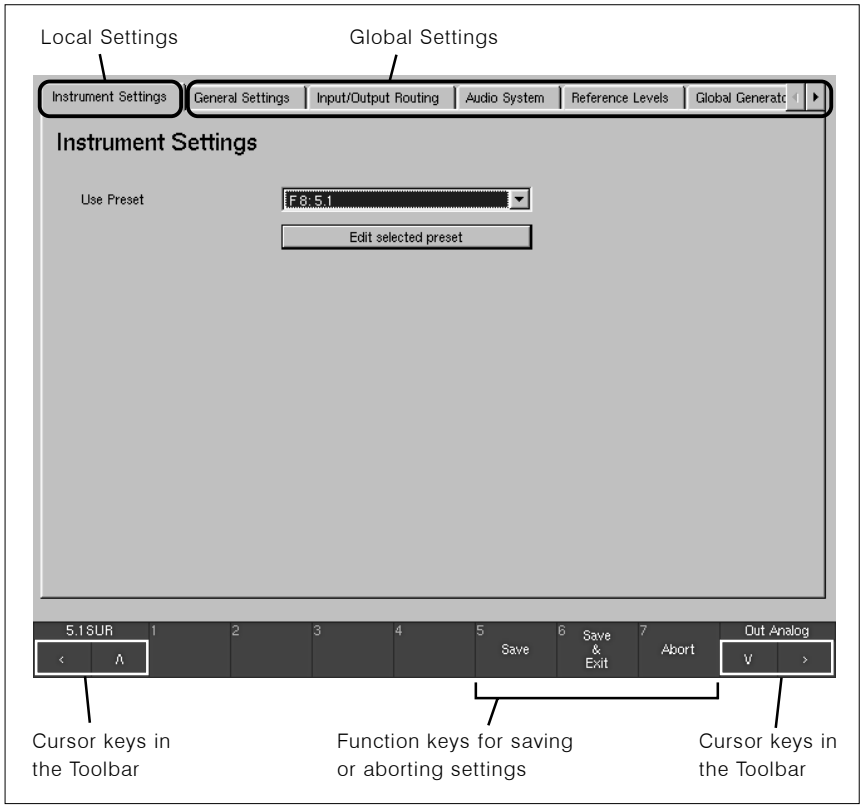


Fig. 3-9: The menu tabs for Local settings and Global settings

To enter and to use the menu, proceed as following:

1. Press the **Menu** key on the Remote Control unit 30050 or the 31960 control panel or click the **MENU** button in the Toolbar. If this is the first time you access the menu after powering on the unit, the menu software will take some seconds to load.

2. Use the mouse or the cursor keys on the Remote Control unit 30050 or the 31960 control panel to select the menu tab you want to access.

3. To change the **Local** settings of a preset, use the Instrument Settings menu tab on the left showing the **Instruments Settings** menu page.

4. Select the preset you want to modify with the Use Preset combo box.

5. Select the Edit selected preset button to change local settings.

6. All other menu tabs of the menu are used to access **Global** settings that do not change when a new preset is loaded.

7. To save the changes made and leave the menu, press the key **6** on the Remote Control unit 30050 or the 31960 control panel or click the **Save & Exit** button in the Toolbar. The unit saves the settings and returns to normal display operation.
   To leave the menu aborting all changes made, press the key **7** on the Remote Control unit 30050 or the 31960 control panel or click the **Abort** button in the Toolbar until the unit returns to normal display operation.



See Figs. 3-3 and 3-10

Note:
The saving procedure will vary slightly depending when local or global menu settings are about to be saved (see Figs. 3-3 and 3-10).



See Chapter 6

Note:
Please refer to Chapter 6 for detailed information about all menu items.

3.9 Saving Presets

See Chapter 3.8

After altering the settings of one of the presets in the menu (see Chapter 3.8), the new configuration must be saved in one of the User Presets U1 to U7 before you can use it.

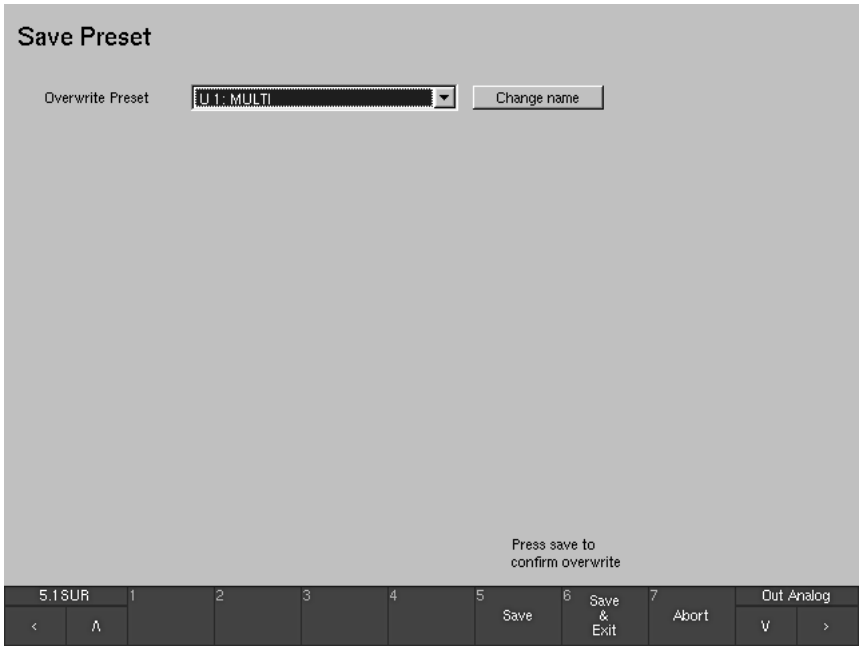


Fig. 3-10: The Save Preset screen

Proceed as following:

1. Press the key **6** on the Remote Control unit 30050 or the 31960 control panel or click the **Save & Exit** button in the Toolbar. The **Save Preset** dialog window will appear giving you the choice to select one of the 7 User Presets to be overwritten with the new settings. Select one.

2. If you want, you can change the name of the selected preset. Selecting the Change name button opens a menu page with keyboard buttons. Enter a name with up to 6 characters. Store the name and get back to the **Save Preset** dialog window with the selection of the Enter = Close button.

3. To save the changes made in the user preset selected in the Overwrite Preset combo box and leave the menu, press the key **6** on the Remote Control unit 30050 or the 31960 control panel or click the **Save & Exit** button in the Toolbar. The new settings are stored and the unit returns to normal display operation.
   To leave the menu aborting all changes made, press the key **7** on the Remote Control unit 30050 or the 31960 control panel or click the **Abort** button in the Toolbar until the unit returns to normal display operation.

3.10 Adapting the Routing

If the routing settings used in the Sub Preset of your choice don't fit your actual connecting scheme, you can use the menu to alter the routing of the Sub Preset as desired. The new routing can be saved in one of the User Presets U1 to U 7.

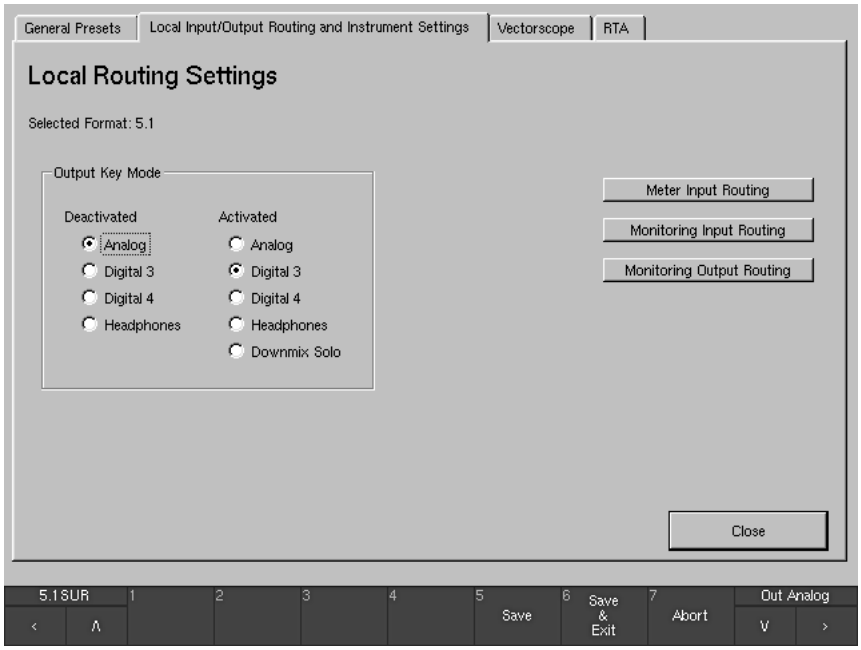


Fig. 3-11: The Local Routing Settings menu

Proceed as following:

1. Enter the menu by pressing the **Menu** key on the Remote Control unit 30050 or the 31960 control panel or clicking the **MENU** button in the Toolbar. If this is the first time you access the menu after powering on the unit, the menu software will take some seconds to load.

2. Use the mouse or the cursor keys on the Remote Control unit 30050 or the 31960 control panel to select the Instrument Settings menu tab. The **Instruments Settings** menu page is shown.

3. Select the preset that contains the Sub Preset you want to change with the Use Preset combo box.

4. Select the Edit selected preset button.

5. Select the Local Input/Output Routing and Instrument Settings menu tab. The **Local Routing Settings** menu page is shown.

6. For changing the input routing, select the Monitoring Input Routing button. Seven menu tabs labelled **Key 1** to **Key 7** appear showing the options for each Sub Preset (see Fig. 3-12 on the next page).

See Fig. 3-12



Fig. 3-12: The Key 1 to 7 Sub Preset menu tabs of the Monitoring Input Routing setting

7. Select the Sub Preset you want to change with one of the seven **Key 1** to **Key 7** menu pages.

8. Use the Source combo box to select one of the input connectors of the unit and the channel combo boxes below it (e. g. labelled with L, R, C, LF, LS, RS in 5.1 surround mode) to route each channel of that connector to the desired instrument channel.

9. Use the Close button to store the settings and to get back to the **Local Routing Settings** menu page (see Fig. 3-11).

See Fig. 3-11

10. To change the output routing, select the Monitoring Output Routing button.

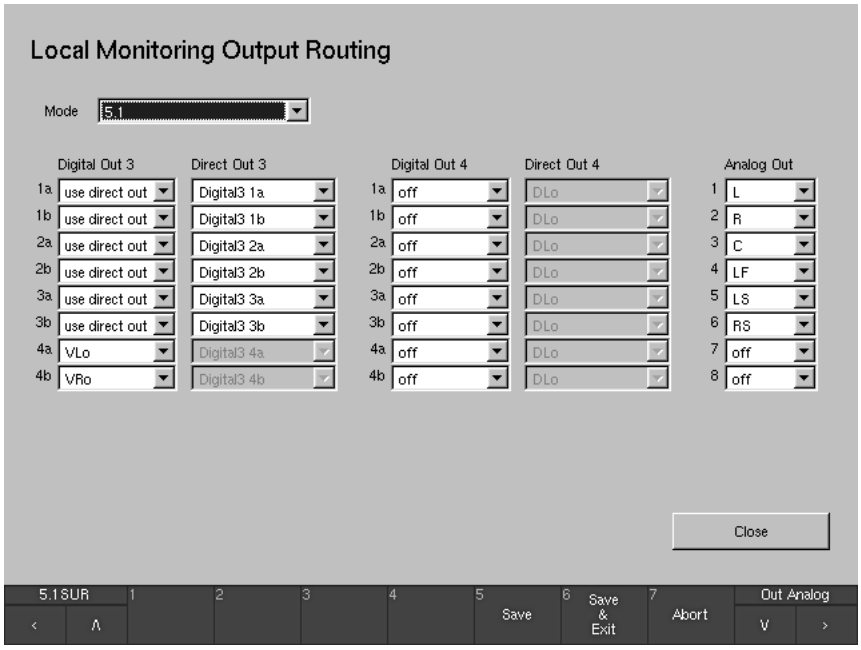


Fig. 3-13: The Local Monitoring Output Routing menu

11. Use the channel combo boxes to route each channel of the output connectors to the desired instrument channel. Similar to a router the digital outputs have the additional option to be used as direct outputs for any input signals. In this case, instead of the instrument outputs controlled by the monitoring functions of the unit, they deliver the unaltered input signals. The analog outputs are always controlled by the monitoring functions (i. e. Volume, Cut, Solo).

See Fig. 3-10

12. After you have made the desired changes, use the Close button of the menu page(s) accessed until the **Save Preset** dialog appears (see Fig. 3-10), giving you the choice to select one of the 7 User Presets to be overwritten with the new settings. Select one.

13. If you want, you can change the name of the selected preset. Selecting the Change name button opens a menu page with keyboard buttons. Enter a name with up to 6 characters. Store the name and get back to the **Save Preset** dialog window with the selection of the Enter = Close button.

14. To save the changes made in the user preset selected in the Overwrite Preset combo box and leave the menu, press the key **6** on the Remote Control unit 30050 or the 31960 control panel or click the **Save & Exit** button in the Toolbar. The new settings are stored and the unit returns to normal display operation. To leave the menu aborting all changes made, press the key **7** on the Remote Control unit 30050 or the 31960 control panel or click the **Abort** button in the Toolbar until the unit returns to normal display operation.

Note:

See Chapters 6.5.2 and 6.5.3

Refer to Chapters 6.5.2 and 6.5.3 to learn more about the input and output routing options of the menu.

See Chapter 3.7

Refer to Chapter 3.7 for details about switching between two output routings with the Output key.

3.11 Defining the Power On Preset

The SurroundControl 31900 and 31960 can be configured to load a pre-defined preset after power on or to re-use the last preset that was active before power down.

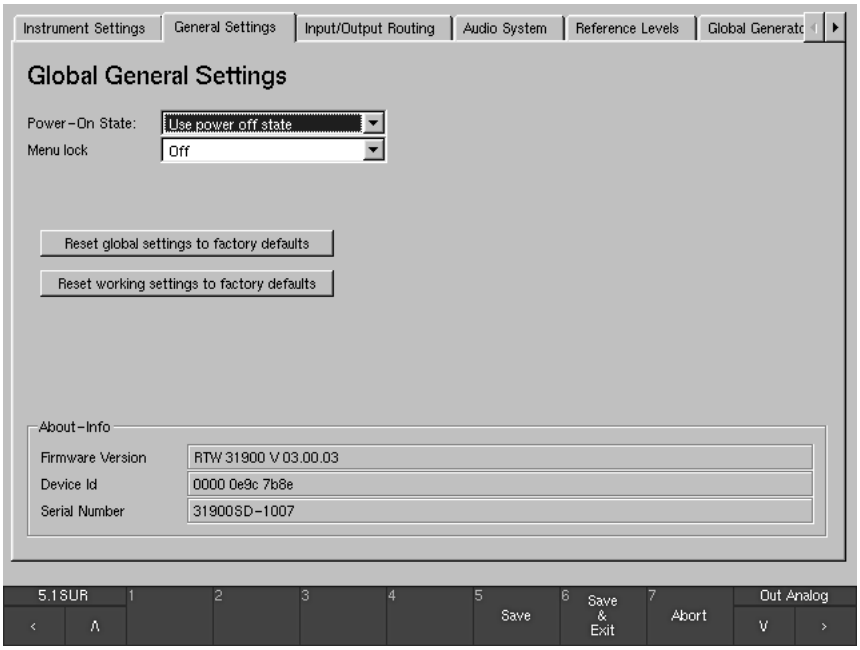


Fig. 3-14: The General Settings menu tab with the Global General Settings menu

Proceed as following:

1. Enter the menu by pressing the **Menu** key on the Remote Control unit 30050 or the 31960 control panel or clicking the **MENU** button in the Toolbar. If this is the first time you access the menu after powering on the unit, the menu software will take some seconds to load.

2. Use the mouse or the cursor keys on the Remote Control unit 30050 or the 31960 control panel to select the General Settings menu tab. The **Global General Settings** menu is shown.

3. Select the preset that you want to be loaded after power on with the Power-On State combo box. Alternatively, you can select the option Use power off state if you want the unit to come up with the last used preset.

4. To save the changes made and leave the menu, press the key **6** on the Remote Control unit 30050 or the 31960 control panel or click the **Save & Exit** button in the Toolbar. The **Save Global Settings?** dialog appears (see Fig. 3-3). Again, press the key **6** on the Remote Control unit 30050 or the 31960 control panel or click the **Save & Exit** button in the Toolbar. The new settings are stored and the unit returns to normal display operation.
   To leave the menu aborting all changes made, press the key **7** on the Remote Control unit 30050 or the 31960 control panel or click the **Abort** button in the Toolbar until the unit returns to normal display operation.

See Fig. 3-3

See Chapter 6.4

Note:
Refer to Chapter 6.4 for more details about the power on state.

3.12 Changing Scales and Reference Levels

The SurroundControl 31900 and 31960 are supporting many different reference level settings.

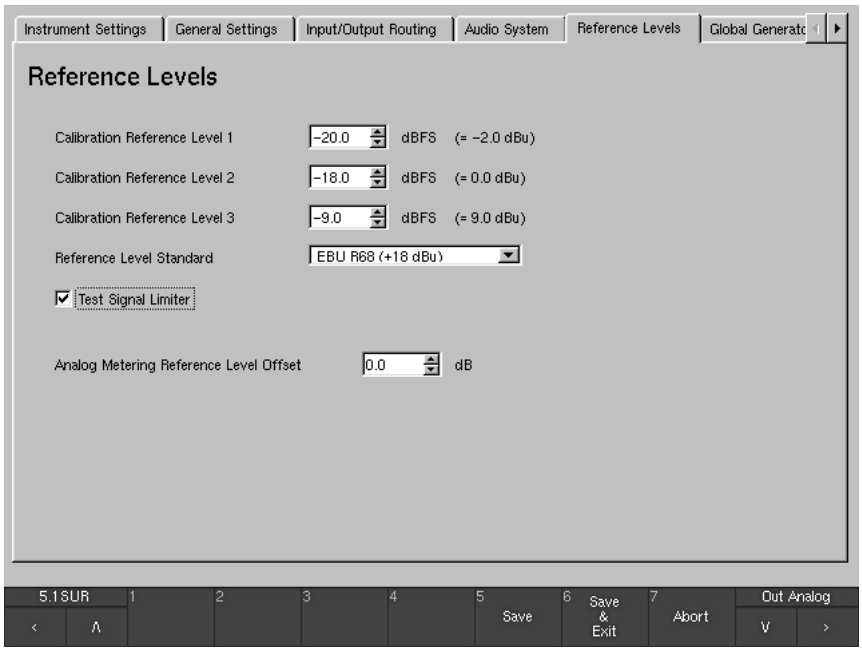


Fig. 3-15: The Reference Levels menu tab with the Reference Levels menu

To modify these global parameters, proceed as following:

1. Enter the menu by pressing the **Menu** key on the Remote Control unit 30050 or the 31960 control panel or clicking the **MENU** button in the Toolbar. If this is the first time you access the menu after powering on the unit, the menu software will take some seconds to load.

2. Use the mouse or the cursor keys on the Remote Control unit 30050 or the 31960 control panel to select the Reference Levels menu tab.

3. Make the desired changes on the **Reference Levels** menu page.

4. To save the changes made and leave the menu, press the key **6** on the Remote Control unit 30050 or the 31960 control panel or click the **Save & Exit** button in the Toolbar. The **Save Global Settings?** dialog appears (see Fig. 3-3). Again, press the key **6** on the Remote Control unit 30050 or the 31960 control panel or click the **Save & Exit** button in the Toolbar. The new settings are stored and the unit returns to normal display operation. To leave the menu aborting all changes made, press the key **7** on the Remote Control unit 30050 or the 31960 control panel or click the **Abort** button in the Toolbar until the unit returns to normal display operation.

See Fig. 3-3

Note:
Refer to Chapter 6.8 for more details about reference levels.

See Chapter 6.8

3.13 Using Loudness Display Options

The SurroundControl 31900 and 31960 are supporting ITU BS.1771 for displaying loudness information on the program meter bargraphs in various modes.

Note:
The loudness display options are only available for digital input signals in 2-channel stereo or 5.1 surround channel configurations.

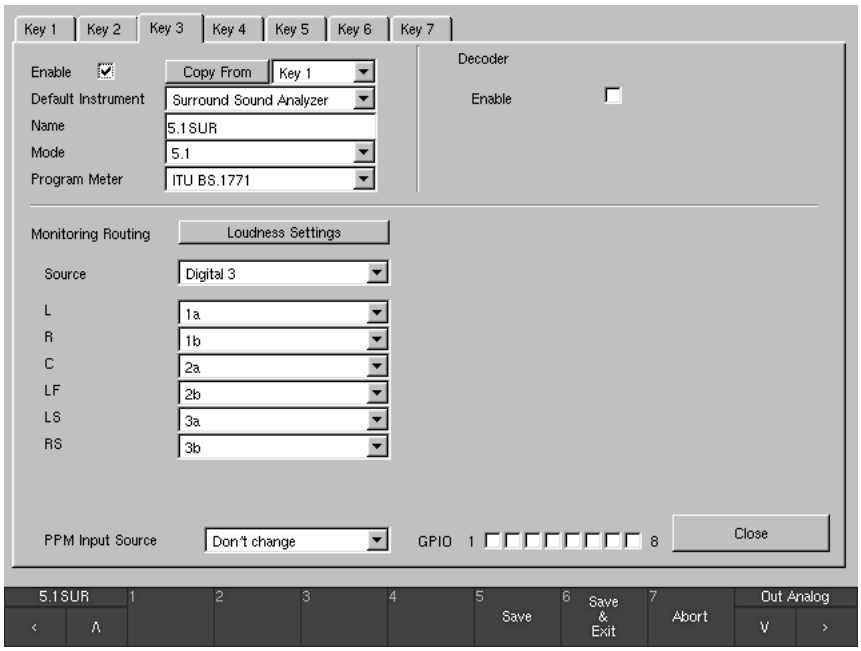


Fig. 3-16: The Key 1 to 7 Sub Preset menu tabs of the Monitoring Input Routing setting with ITU BS.1771 selected for Program Meter

To set one of the loudness options for the program meters, proceed as following:

1. Enter the menu by pressing the **Menu** key on the Remote Control unit 30050 or the 31960 control panel or clicking the **MENU** button in the Toolbar. If this is the first time you access the menu after powering on the unit, the menu software will take some seconds to load.

2. Use the mouse or the cursor keys on the Remote Control unit 30050 or the 31960 control panel to select the Instrument Settings menu tab.

3. Using the Use Preset combo box select the preset that contains the Sub Preset for which you want to activate the loudness option.

4. Select the Edit selected preset button.

5. Select the Local Input/Output Routing and Instrument Settings menu tab. The **Local Routing Settings** menu page is shown.

6. Select the Monitoring Input Routing button.

7. Select the Sub Preset you want to change with one of the seven **Key 1** to **Key 7** menu tabs.

8. Use the Program Meter combo box to switch from PPM to ITU BS.1771 mode.

9. Use the Loudness Settings button to get to the **ITU BS.1771 Loudness Settings** menu page and to configure the available loudness options.

10. After you have made the desired changes, use the Close button of the menu page(s) accessed until the **Save Preset** dialog appears (see Fig. 3-10), giving you the choice to select one of the 7 User Presets to be overwritten with the new settings. Select one.

11. If you want, you can change the name of the selected preset. Selecting the Change name button opens a menu page with keyboard buttons. Enter a name with 6 characters. Store the name and get back to the **Save Preset** dialog window with the selection of the Enter = Close button.

12. To save the changes made in the user preset selected in the Overwrite Preset combo box and leave the menu, press the key **6** on the Remote Control unit 30050 or the 31960 control panel or click the **Save & Exit** button in the Toolbar. The new settings are stored and the unit returns to normal display operation.
    To leave the menu aborting all changes made, press the key **7** on the Remote Control unit 30050 or the 31960 control panel or click the **Abort** button in the Toolbar until the unit returns to normal display operation.



Note:
Please refer to Chapters 6.5.2.9 to 6.5.2.11 and 5.2.2 for more information about the loudness options.

See Chapters 6.5.2.9 to 6.5.2.11 and 5.2.2

4 Common Operation

The Remote Control 30050 (31900 series) and the control panel of the 31960 series are the main control units for all the monitoring and metering functions of the SurroundControl units as described in the following chapters.

4.1 General

The metering functions (instrument functions) and the menu items of the SurroundControl units generally can be operated in three different ways: With the Remote Control 30050 unit (31900 series) resp. the control panel (31960 series), with an optional computer mouse using the controls displayed in the Toolbar on the screen (Window 1), or with the control keys on the optional Remote Display 30010 unit. The several display modes with the functions of the instruments are described in Chapter 5. The menu items can be found in Chapter 6.

Besides controlling the metering functions the Remote Control 30050 for the 31900 series and the control panel of the 31960 series are fully featured monitoring controller units with loudspeaker channel keys, several functions for the channel keys like Solo, Cut, Swap and Phase reverse, numerical readout of the volume level set, input and output selection, and DIM or MUTE function. Up to three Remote Control 30050 can be connected to the 31900 series and up to two to the 31960 series.

The SurroundControl units externally can be controlled by using the GP IO connector. Depending on the control signals the metering and monitoring functions one-to-one can be controlled or defined actions can be initialized. But the SurroundControl units also can output control signals for activating alarm indicators or for controlling external units. See Chapters 4.4, 6.5.2, 6.12 and 7.3.16 for details.

Also see Chapters 4.4, 6.5.2, 6.12 and 7.3.16

4.2 Operating Options

SurroundControl 31900 series

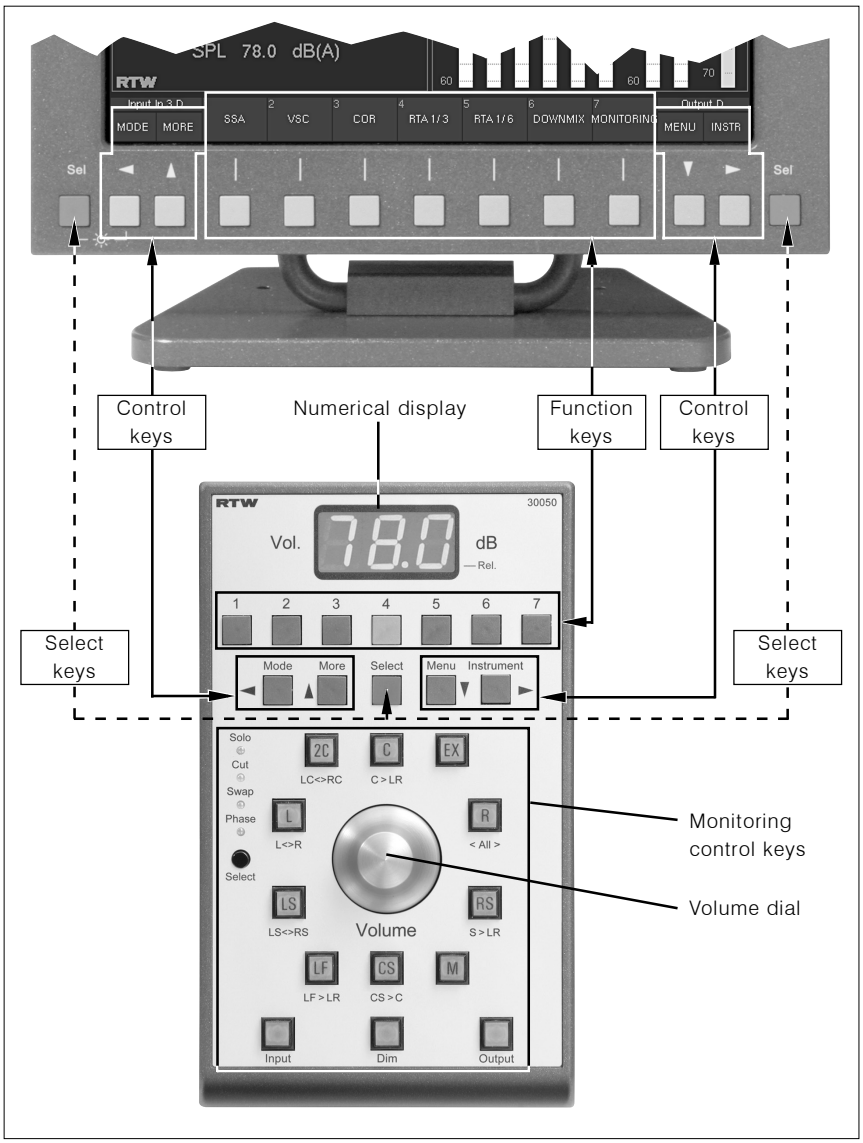


Fig. 4-1: The Remote Control 30050 with the controls of the 31900 system

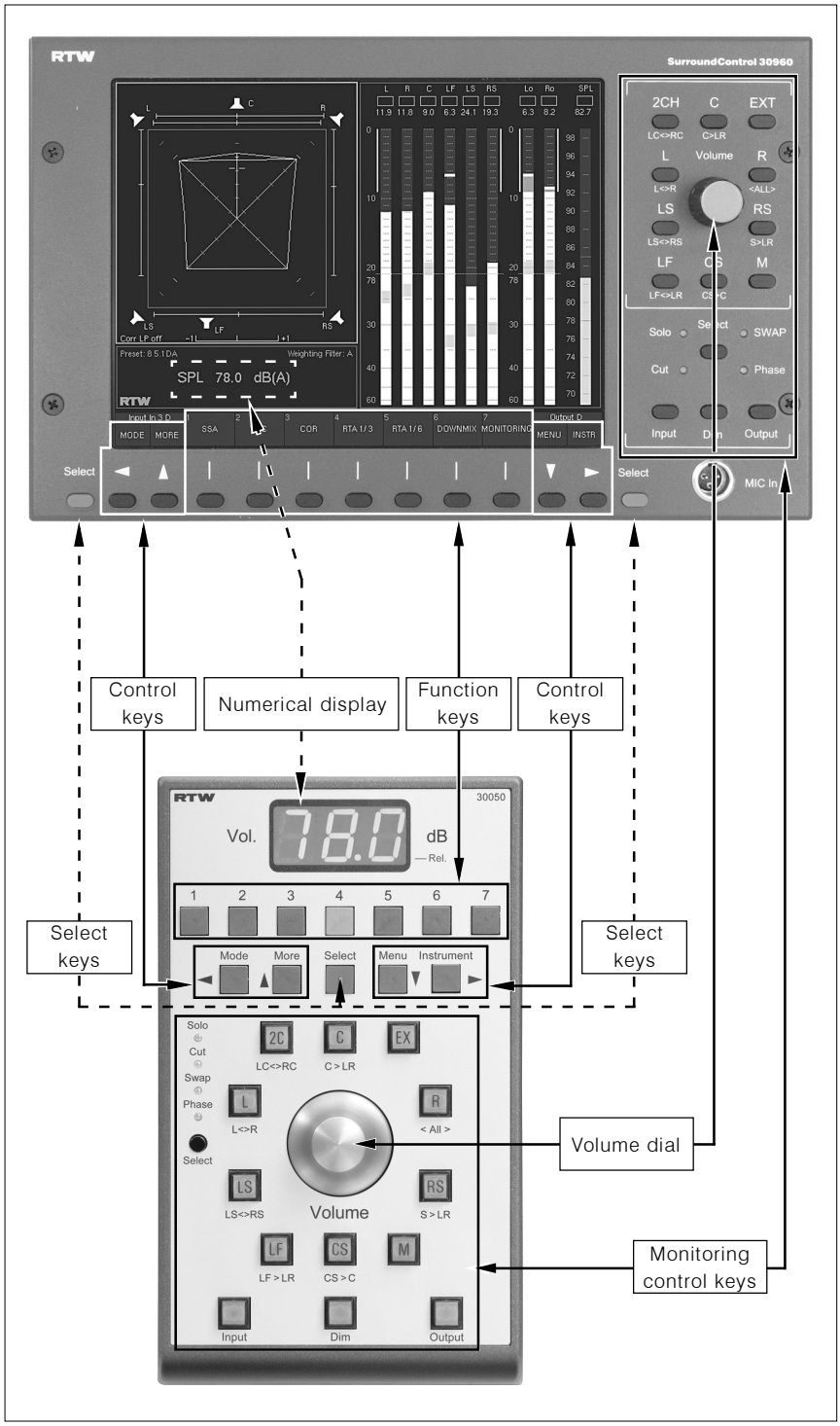


Fig. 4-2: The corresponding controls of the 31960 series

Function keys see Figs. 4-1 and 4-2

The Remote Control 30050 (31900 series, see Fig. 4-1) and the control panel of the 31960 series (see Fig. 4-2, also the Remote Display 30010) have a total of 7 function keys for the selection of a display mode, a preset or the instruments functions. On the Remote Control 30050 these keys are numbered. These numbers correspond to the buttons of the Toolbar in Window 1 of the display (see Fig. 4-1).

Control keys see Figs. 4-1 and 4-2

Another two pairs of control keys are located below the function keys on the Remote Control 30050 resp. to the left and right of the function keys on the control panel of the 31960 series (also in the same way on the Remote Display 30010):

→ MODE
- **MODE**: Switches between Function Select and Instrument Select modes.

→ MORE
- **MORE**: Moves down to the next Toolbar level.

→ MENU
- **MENU**: Opens the configuration menu pages in which you can view and adjust settings.

→ INSTR(UMENT)
- **INSTR(UMENT)**: Stands for „Instrument“ and switches the focus between Window 2 and Window 3.

In the configuration menus these four keys function as cursor keys.

Select keys see Figs. 4-1 and 4-2
→ Sel(ect)

The Remote Control 30050 has one Select key between the two pairs of control keys. The control panel of the 31960 series (also the Remote Display 30010) has two Select keys which are located outside on the left and outside on the right. These keys are used to confirm selections in the menus.

4.3 The Function and Control Keys in Detail

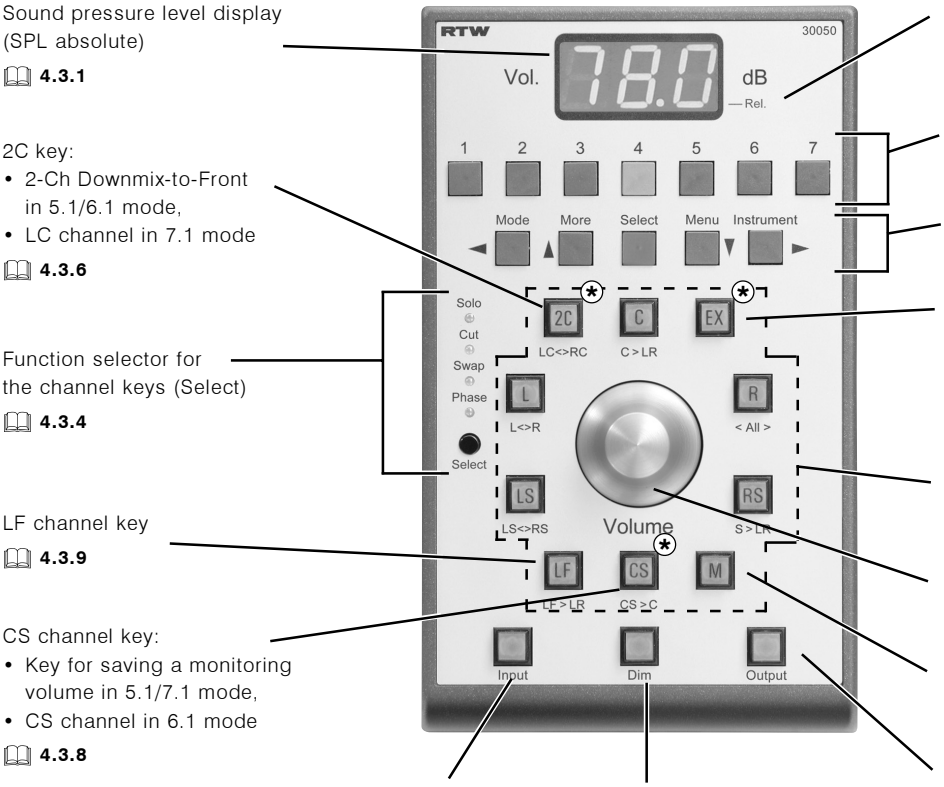


Fig. 4-3: The controls of the Remote Control 30050 for 31900 series, the same functions are available on the control panel of the 31960 series

4.3.1 The Monitoring Sound Pressure Level Display (SPL)

(See Figs. 4-1 to 4-3)

Listening Level:
→ INSTR (until Window 3 is highlighted)
→ MODE
→ MONITORING
→ Listening Level (until abs or rel is selected)

There are two different modes for displaying the monitoring volume (Listening Level) in the 3-digit 7-segment display resp. in the Status Box in Window 4:

- SPL Absolute: Displays the set equivalent listening sound pressure level in dB SPL(A). This is the sound pressure you would get if you applied a noise signal with a reference level to the input (e. g. –18 dB FS RMS).
- SPL Relative: Displays the attenuation or gain relative to the reference sound pressure level in dB. A display of 0 dB corresponds to your preset reference sound pressure level.

See Chapter 5.8

You can select the display mode with the function keys of the Monitoring instrument (see Chapter 5.8) displayed in Window 3. There is also displayed, if the absolute or the relative listening level is selected.

To switch between absolute and relative mode please proceed as following:

1. Press the **INSTR** button/key on the right until Window 3 gets the white frame.

2. Press the **MODE** button/key on the left to switch from Function Select mode to Instrument Select mode.

3. Press button/key 7 labelled **MONITORING**. The Monitoring instrument is displayed in Window 3 and the Toolbar switches to the Function Select mode for the Monitoring instrument.

4. Press button/key 6 labelled **Listening Level** until you have selected the option you prefer: absolute (abs) or relative (rel). The selected option is highlighted on the button in the Toolbar and mainly displayed in the Monitoring instrument.

5. Turn the volume control and adjust the listening level.



Note:
You can calibrate the connected monitoring system with the SurroundControl's integrated test signal generator and SPL Meter (see Chapters 5.8.3 to 5.8.5). You also need a calibration microphone which is available as an optional accessory.

See Chapters 5.8.3 to 5.8.5



Additionally on the Remote Control 30050 the decimal point of the rightmost digit on in the three digit 7-segment display lights up when SPL Relative mode is active. When this decimal point is off this indicates that the display is in SPL Absolute mode.
In SPL Relative mode both positive and negative values are possible and the first digit of the three digit 7-segment display is used for the sign. When values greater than ±9.9 dB are displayed the scale switches automatically and the digit on the right displays the 1 dB values instead of the 1/10 dB values.

4.3.2 The Function Keys

(See Figs. 4-1 to 4-3)

The functions assigned to function keys 1 to 7 change depending on the current instrument and operating mode. The currently active functions are always displayed in the Toolbar on the connected monitor (Remote Display 30010 or a standard VGA monitor). See Chapter 5 for detailed descriptions of the functions available in the individual instruments and display modes.

See Chapters 4.2 and 5

4.3.3 The Control Keys and the Select Key

(See Figs. 4-1 to 4-3)

See Chapters 4.2 and 5

→ MODE

- **MODE**: Switches between Function Select (select functions) and Instrument Select (select instruments) modes. The default mode is Function Select, which is also activated automatically as soon as you select an instrument.

→ MORE

- **MORE**: Displays the next Toolbar function level if additional functions are available. When you are on the last available level selecting **MORE** returns you to the first level. The text in the Toolbar buttons also changes to grey when no more levels are available.

→ Sel(ect)

- **Sel(ect)**: Used to terminate and confirm your inputs in the menus.

→ MENU

- **MENU**: Opens the menu pages for configuration of the system settings.

→ INSTR(UMENT)

- **INSTR(UMENT)**: Switches the focus between Window 2 (Program Meter) and Window 3 (current instrument) – see Chapter 2 for details. The function keys always control the instrument that currently has the focus, which is indicated by the highlighted frame around the instrument.

In the configuration menus the control keys on the left and right of the Select key (in the middle) function as cursor keys.

4.3.4 Function Selector for the Channel Keys

(See Figs. 4-1 to 4-3)

The black Select button, on the Remote Control 30050 left hand sided and on the control panel of the 31960 series right handed in the middle, sets the current function of the channel keys, which is indicated by a yellow LED:

- Solo: Mutes all channels except the selected channel.
- Cut: Mutes the selected channel.
- Swap: Swaps channels as indicated by the labels on the panel beneath the keys (see Fig. 4-4)
- Phase: Rotates the phase of the selected channel by 180°. The corresponding loudspeaker symbol of the display changes to a lined symbol, the sign ^ is added to the channel labelling.

These functions apply for keys with channel allocations, which correspond to the surround format you are currently using.

See Chapters 4.3.5 to 4.3.10

Note:
Depending on the surround format selected the 2C, EX and SC keys also can proceed as channel keys (see Chapters 4.3.5 to 4.3.10).

Swap Functions (labels beneath the keys on the panel):

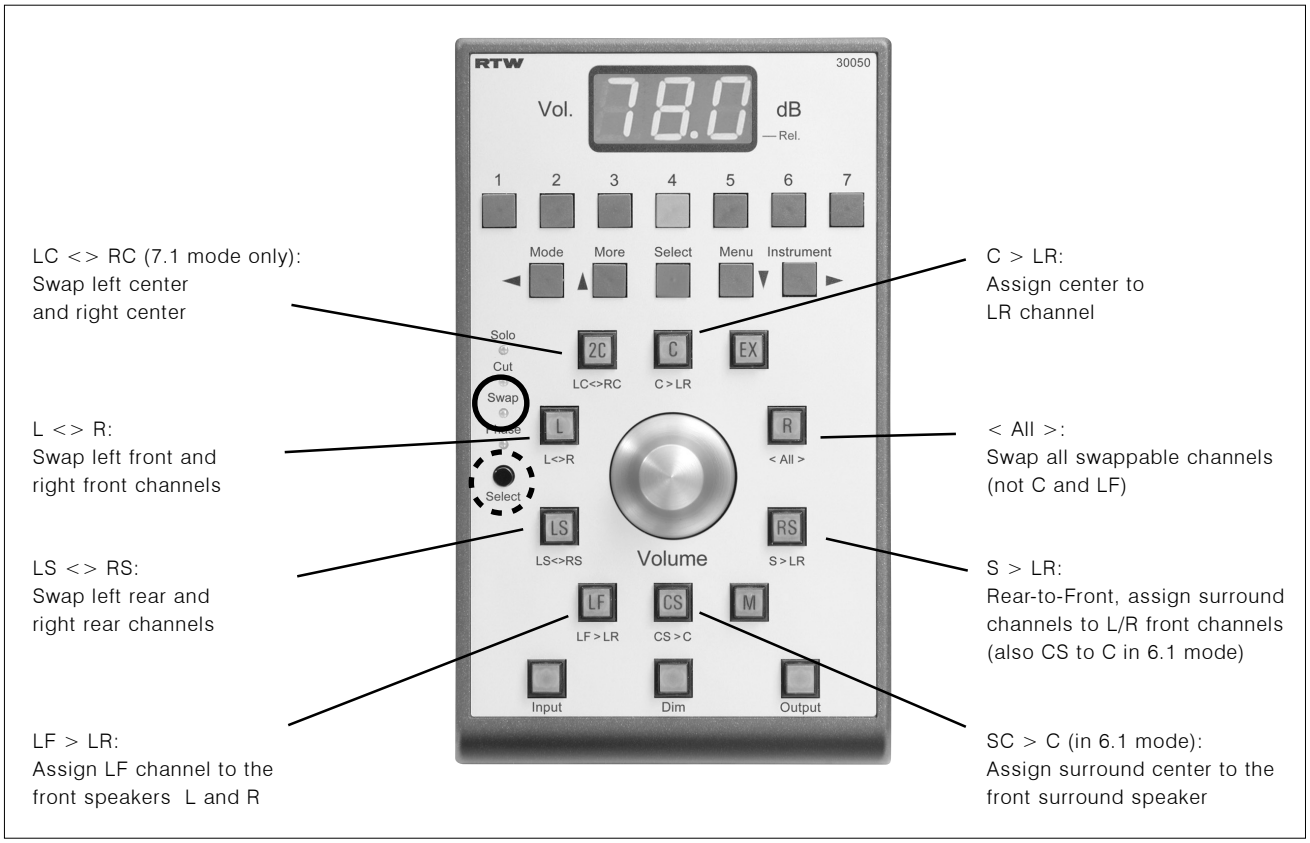


Fig. 4-4: Remote Control 30050 key assignments in Swap mode (31900 series), the same functions are available on the control panel of the 31960 series

4.3.5 The Channel Keys

(See Figs. 4-1 to 4-4)

The channel keys control the channel functions of the loudspeaker outputs. The functions that can be performed by these keys (Solo, Cut, Swap, Phase) are set with the black Select button (see 4.3.4). Some of the channel keys can have different functions in some surround formats (see Chapters 4.3.6 to 4.3.10).

See Chapter 4.3.4

See Chapters 4.3.5 to 4.3.10

4.3.6 The 2C Key

(See Figs. 4-1 to 4-4)

This key performs different functions depending on the current mode:

- 3.1/5.1/6.1 mode: Irrespective of the channel key function set with the Select button (see Chapter 4.3.4) pressing this key in these modes switches the internal Lo/Ro (VOL) (2-Ch Downmix) to the L and R front channels, and all other channels including LF are muted. In these modes the 2C key has a toggle function and is linked to the EX key (see Chapter 4.3.7).

  In the Key Settings menu (see Chapter 6.12.3) you can configure the Downmix Meter (see Chapter 5.7) or the Surround Sound Analyzer (SSA) instrument to activate automatically when you switch to Lo/Ro Monitoring.

See Chapter 6.12.3 and 5.7

2C key cap can be changed with LC key cap included in standard package.

- 7.1 mode: In this mode this key is assigned to the Left Center (LC) channel. It enables you to apply the functions selected with the black Select button (see Chapter 4.3.4.) to the LC channel.

To set the instrument for the Lo/Ro monitoring when switching the 2C key please proceed as following:

1. Press the **MENU** button/key. The last used menu page is opened.
2. Use the **<** or **>** button/key to select the **Key Settings** menu tab. The **Key Settings** menu page is displayed.
3. Select the instrument you prefer with activating the check box in the **Display Mode for Downmix Monitoring** frame.
4. Press the **Save & Exit** button/key (6) to store your selection.
5. Press the **2C** key on the Remote Control 30050 (31900 series) resp. on the control panel of the 31960 series. The downmix signal is switched to the front loudspeakers and your selected instrument is now displayed in Window 3.

4.3.7 The EX Key

(See Figs. 4-1 to 4-4)

This key performs different functions depending on the current mode:

- 3.1/5.1 mode: Irrespective of the channel key function set with the Select button (see Chapter 4.3.4) pressing this key in these modes switches the external Lext/Rext (2-Ch Downmix) to the L and R front channels, and all other channels including LF are muted. In these modes the EX key has a toggle function and is linked to the 2C key (see Chapter 4.3.6).

See Chapter 6.12.2 and 5.4

In the Key Settings menu (see Chapter 6.12.2) you can configure the Vectorscope (settings see Chapter 5.4) or the Surround Sound Analyzer instrument to activate automatically when you switch to Lext/Rext Monitoring.

EX key cap can be changed with RC key cap included in standard package.

- 7.1 mode: In this mode this key is assigned to the Right Center (RC) channel. It enables you to assign the functions selected with the black Select button (see Chapter 4.3.4) to the RC channel.

To set the instrument for the Lext/Rext monitoring when switching the EX key please proceed as following:

1. Press the **MENU** button/key. The last used menu page is opened.
2. Use the **<** or **>** button/key to select the **Key Settings** menu tab. The **Key Settings** menu page is displayed.
3. Select the instrument you prefer with activating the check box in the **Display Mode for External Monitoring** frame.
4. Press the **Save & Exit** button/key (6) to store your selection.
5. Press the **EX** key on the Remote Control 30050 (31900 series) resp. on the control panel of the 31960 series. The external signal is switched to the front loudspeakers and your selected instrument is now displayed in Window 3.

4.3.8 The CS Channel Key

(See Figs. 4-1 to 4-4)

This key performs different functions depending on the current mode:

Setting preset level:
→ turn volume control to the level of your choice
→ CS key
See Chapter 3.7.3 

- 3.1/5.1/7.1 mode: Pressing the CS key in these modes stores the value of the current reference sound pressure level (SPL) setting as a preset (see Chapter 3.7.3). The value can then be displayed and activated by pressing the Volume control (see Chapter 4.3.11). The preset also remains stored when the SurroundControl is switched off. This does not have an effect on the calibration of the monitoring system. This function is simply provided as a useful feature that allows you to return quickly to a stored volume level.
- 6.1 mode: In this mode the CS key is assigned to the Surround Center channel (CS). It enables you to apply the functions selected with the black Select button (see Chapter 4.3.4.) to the SC channel.

4.3.9 The LF Channel Key

(See Figs. 4-1 to 4-4)

This key enables you to apply the functions selected with the black Select button (see Chapter 4.3.4.) to the subwoofer (LF) channel.

4.3.10 The Mono Key

(See Figs. 4-1 to 4-4)

Mono Mode:
→ INSTR (until Window 3 is highlighted)
→ MODE
→ MONITORING
→ Mono Mode
→ button/key 1 to 5 (select your preferred channel)
→ Close

This key switches the mono signal to the channel(s) selected with the Mono Mode function in the Monitoring instrument (see Chapter 5.8.2). The function selected in the Toolbar remains activated until you select the **Close** button/key. This enables you to check the effects of different settings. Window 4 (Status Box) then additionally displays the message „Mono active“.

To select the Mono mode please proceed as following:

1. Press the **INSTR** button/key until Window 3 gets the white frame.
2. Press the **MODE** button/key on the left to switch from Function Select mode to Instrument Select mode.
3. Press button/key 7 labelled **MONITORING**. The Monitoring instrument is displayed in Window 3 and the Toolbar switches to the Function Select mode for the Monitoring instrument.
4. Press button/key 1 labelled **Mono Mode**. Now you can select the channels or channel groups to which the mono signal should be switched.
5. When you have found your preferred channel or channel group, press the **Close** button/key to get back to the functions of the Monitoring instrument.
6. Press the **M** key on the Remote Control 30050 (31900 series) resp. on the control panel of the 31960 series. The mono signal is switched to the selected channel or channel group.

4.3.11 The Volume control

(See Figs. 4-1 to 4-4)

Vol Sens:
→ INSTR (until Window 3 is highlighted)
→ MODE
→ MONITORING
→ Vol Sens (until L, M or H is selected)

This control adjusts the listening volume. You can set the sensitivity of the volume control (Vol Sens) in the Monitoring instrument spreading the level range that can be passed through by one turn of the volume control.

The volume control is also used in the CAL instrument for setting trim and delay values for individual channels, by holding down the Trim or Delay button/key and simultaneously turning the volume control (see Chapters 5.8.3 and 4.3.14) and in Multi-Channel modes for selecting one of the Listening Groups (see Chapter 4.3.15).

See Chapters 5.8.3, 4.3.14 and 4.3.15

Setting preset level:
→ In 3.1/5.1/7.1 surround modes turn volume control to the level of your choice
→ CS key

In all modes pressing the Volume control retrieves and sets the preset value stored with the CS channel key (see Chapter 4.3.8). The Downmix-Direct-Out signals DLo, DRo and DMo are not affected by the volume control setting.

When the **Adding Mode, push volume knob for global reset** check box is activated on the **Key Settings** menu (see Chapter 6.12.5) all channels can be set back to the basic position by pressing the volume control.

To select the sensitivity of the volume control please proceed as following:

1. Press the **INSTR** button/key on the right until Window 3 gets the white frame.

2. Press the **MODE** button/key on the left to switch from Function Select mode to Instrument Select mode.

3. Press button/key 7 labelled **MONITORING**. The Monitoring instrument is displayed in Window 3 and the Toolbar switches to the Function Select mode for the Monitoring instrument.

4. Press button/key 5 labelled **Vol Sens** until you have selected the sensitivity option you prefer: low (L) for a small volume level range that can be passed through with one turn, middle (M) for a middle range or high (H) for a large range. The selected option is highlighted on the button in the Toolbar.

5. Now you can use the volume control with the selected sensitivity.

4.3.12 The Input Key (input switcher)

(See Figs. 4-1 to 4-4)

This key selects the input for the Monitoring Controller. Pressing the key activates the display of the 7 Sub Presets corresponding to the selected Preset as input sources on the buttons of the Toolbar (Window 1). With the corresponding buttons/keys (1 to 7) the input source can be selected (see Chapter 3.5). Pressing the Input key again switches back to the used instrument now with the selected input source.

See Chapter 3.5

4.3.13 The Dim Key

(See Figs. 4-1 to 4-4)

DIM Level:
→ INSTR (until Window 3 is highlighted)
→ MODE
→ MONITORING
→ DIM Level
→ Mute (until on or off is selected)
→ Moment (until on or off is selected)
See Chapter 5.8.2

This key activates dimming (level attenuation), using the value set with the **DIM Level** function in the Monitoring instrument (see Chapter 5.8.2). Setting this value to minus infinity is equivalent to a Mute All function.

You can configure the behaviour of this key with the Monitoring instrument. The available options are Mute and Moment, which have the following functions:

- Mute off: Pressing the **Dim** key on the Remote Control 30050 (31900 series) resp. the control panel of the 31960 series activates dimming with the configured attenuation level value. Window 4 then displays: Monitor dimmed.
- Mute on: Pressing the **Dim** key on the Remote Control 30050 (31900 series) resp. the control panel of the 31960 series mutes the output signal. Window 4 then displays: Monitor muted.
- Moment on: The Dim/Mute function only remains active as long as you press the Dim key on the Remote Control 30050 (31900 series) resp. the control panel of the 31960 series.
- Moment off: Pressing the **Dim** key on the Remote Control 30050 (31900 series) resp. the control panel of the 31960 series switches the Dim/Mute function on or off. On the Remote Control 30050 the current status is then indicated by the key light.

To define the preset for the DIM key please proceed as following:

1. Press the **INSTR** button/key on the right until Window 3 gets the white frame.

2. Press the **MODE** button/key on the left to switch from Function Select mode to Instrument Select mode.

3. Press button/key 7 labelled **MONITORING**. The Monitoring instrument is displayed in Window 3 and the Toolbar switches to the Function Select mode for the Monitoring instrument.

4. Press button/key 2 labelled **DIM Level**. The Toolbar switches to the functions for the DIM level setting.

5. Press button/key 5 labelled **Mute** until you have selected the option you prefer. The selected option is highlighted on the button in the Toolbar.

6. Press button/key 6 labelled **Moment** until you have selected the option you prefer. The selected option is highlighted on the button in the Toolbar.

7. Press **Close** to get back to functions of the Monitoring instrument. The **Dim** key now is preset with your individual needs.

4.3.14 The Output Key (output switcher)

(See Figs. 4-1 to 4-4)

This key switches the output signals to the analog or digital outputs (see also Chapters 5.n.n and 5.n.n).

Output Key Mode:
→ MENU
→ Edit selected preset
→ Local Input/Output Routing and Instrument Settings
→ check box in **deactivated** column with your preferred main output
→ check box in **activated** column with your preferred alternative output
→ Save & Exit
→ Select User Preset to overwrite
→ Save & Exit
See Chapter 6.5 and 6.5.3

The **Output Key Mode** is set in the Input/Output Routing menu (Global Routing Settings, see Chapters 6.5) as well as in the Local Input/Output Routing and Instrument Settings menu with the Local Routing Settings. Here you can select the outputs for the deactivated and for the activated (pressed and lightened) status of the Output key. Between these outputs you then can swap, the output signals are sent to the active output, the other outputs are muted. This function is used when you have two monitoring systems.

Example:
The main monitoring system is connected to the Digital 3 In/Out connector (display in the Toolbar is Out Digital 3) and an alternative „home system" is connected directly to the analog outputs via an amplifier (display in the Toolbar is Out Analog).

If you select Downmix-Solo for the activated status of the Output key and when you then press the Output key the signals Lo/Ro are connected to the preselected outputs and all other outputs are muted.

Example:
You want to listen to the 2-Ch Downmix on separate loudspeakers in a near-field set. The Toolbar then displays Out Downmix.

In Multi-Channel mode the Output key features another function. When pressing and holding the Output key in these modes the available Listening Groups are displayed in one or two levels in the Toolbar in Window 1 and can be selected. How to proceed see beneath.

To define the outputs for the Output key please proceed as following:

1. Press the **MENU** button/key and enter the menu system.

2. Use the ^ or v button/keys to select the **Edit selected preset** button. The **General Preset Settings** menu page is displayed.

3. Use the **<** or **>** button/key to select the **Local Input/Output Routing and Instruments Settings** menu tab. The **Local Routing Settings** menu page is displayed.

4. Select one of the check boxes of the **Deactivated** column in the **Output Key Mode** frame that meets your configuration and should be the main monitoring set.

5. Select one of the check boxes of the **Activated** column in the **Output Key Mode** frame. This should be the alternative set or the Downmix Solo option.

6. If you have selected the Downmix Solo option, use the ^ or v button/keys to select the **Monitoring Output Routing** button. The **Local Monitoring Output Routing** menu page is displayed.

7. Use the cursor and the **Select** buttons/keys to assign the Downmix signals to the outputs.

8. Press **Save & Exit** to get to the **Save Preset** menu page. Use the cursor and the **Select** buttons/keys to select a User Preset.

9. Pressing **Save & Exit** again turns you back to normal operation.

To select another Listening Group in Multi-Channel mode please proceed as following:

1. Assumed that you are working in Multi-Channel mode and that you have selected the channel groups and the channels you need using the **Monitoring Input Routing** menu. There the number of available **Listening Groups** is defined.

2. In normal operation mode press and hold the **Output** key on the Remote Control 30050 (31900 series) resp. the control panel of the 31960 series. The available Listening Groups (up to eight) are dipslayed in one or two function levels of the Toolbar in Window 1. The number depends on the routing selection.

3. Additionally to the holded **Output** key press the button/key **Listen 1** to **Listen 7** (if available) of the respective Listening Group you want to hear, or click the button of the Toolbar with the mouse. To select Listening Group 8 (if available), press button/key **MODE** to display and select the button/key labelled **Listen 8**.

4. Alternatively you can turn the Volume control to the Listening Group you want to hear while holding the **Output** key.

5. The green loudspeaker symbols at the top of the peakmeter bargraphs change their position to the selected Listening Group (which can be a single channel with one symbol or a 2-Channel Stereo pair with two symbols).

6. When you then loose the **Output** key, the functions of the Peak Program Meter are displayed in the Toolbar in Window 1 and the Program Meter in Window 2 gets the focus (white frame).

7. If you need the functions of the current instrument displayed in Window 3, press the **INSTR** button/key to set the focus to it.

4.4 External control via GP IO connector

The SurroundControl units externally can be controlled by using external keys, switchers, or control signals with the GP IO connector. The pin assignment is shown in Chapter 7.3.16.

See Chapter 7.3.16

4.4.1 GP IO inputs

All the 16 GP IO inputs are active low. With the **Preset Recall Mode** of the **Key Settings** menu (see Chapter 6.13) you can define, if the GP IO inputs function as normal function control inputs or if the GP IO inputs can be used to activate the User Presets with external keys or switchers or with a control signal from an external application.

See Chapter 6.16

Factory setting, all the functions of the buttons and keys of the Toolbar and of the Remote Control 30050 (31900 series) resp. the control panel of the 31960 series can be controlled one-to-one via keys or switchers connected to the corresponding inputs of the GP IO connector. The **Preset Recall Mode** is set to Off.

If you want to use the GP IO inputs for the external activation of a User Preset, please proceed as following:

1. Disconnect the unit from the power supply.
2. Use a counter plug to connect external keys, switchers, or control signals to the GP IO connector of the units. Connect one pin of an external key, switcher, or control signal wire to the pin corresponding to the function key input (pins 1 to 7) you want to switch. Connect the other pin to pin 25 for common potential.
3. When all keys, switchers or external application control signals are supplied, connect the counter plug to the GP IO connector of the unit.
4. Connect the unit to the power supply and start the system.

Menu selections for external recall of presets:
→ MENU
→ Key Settings
→ GPI only in **Preset Recall Mode** section
→ Save & Exit
→ Save & Exit

5. Press the **MENU** button/key. The menu system is initialized.
6. Use the **<** or **>** button/key to select the **Key Settings** menu tab. The **Key Settings** menu page is displayed.
7. Use **^** or **v** button/key to set the focus to the GPI only option of the **Preset Recall Mode** section. Enter the selection by pressing the red **Sel** (SELECT) key.
8. Click the **Save & Exit** button/key to store the changes and leave the menu. The **Save Global Settings?** dialog is displayed.
9. Click the **Save & Exit** button/key again. Now the changes are finally stored, the unit turns back to normal operation.
10. Now you can select another User Preset with the external keys or switchers or other applications automatically can set different User Presets.

4.4.2 GP IO outputs

But the SurroundControl units also can serve control signals for activating alarm indicators or for the control of external units resp. applications. On the menu pages of the Sub Presets (Key 1 to Key 7 including the signal source) can be defined which one or which combination of GP IO outputs are activated when pressing the corresponding button/key in the Toolbar.

Example:
You have to monitor a Dolby® encoded audio signal of a video/audio data stream. In order of the delays when decoding the audio data, often it is necessary to match audio and video delays, so that video and audio is synchronized again. When you select the Sub Preset with the settings for the Dolby® signal source on the SurroundControl units, you activate the according GP IO outputs. These immediately start your external applications and units controlling the delay for the synchronization of the video and audio signals.

The state of the 8 GP IO outputs can be active low or active high, the output signal timing can be permanent or of a short time span. The assignment of a combination of different outputs to one key is possible. For example, it is possible to use two outputs to get four switching states.

If you want to use the GP IO outputs for the activation of external applications or system units, please proceed as following:

1. Determine the GP IO outputs to be used as Key Presets or for alarm function.

2. Disconnect the unit from the power supply.

3. Use a counter plug to connect the GP IO connector of the units to the external applications to be controlled or to receive the alarm signal. Connect one lead of the transmitting cable to your application with the pin on the counter plug corresponding to the GP IO output you want to use. Connect the other lead to pin 25 for common potential.

4. Correspondingly connect the cable to your application and units.

5. When all determined connections are wired, connect the counter plug to the GP IO connector of the SurroundControl unit.

6. Connect the unit to the power supply and start the system.

7. Press the **MENU** button/key. The menu system is initialized.

8. Use the **<** or **>** button/key to select the **GPIO Configuration** menu tab. The **Global GPIO Settings** menu page is displayed.

9. Use **^** or **v** button/key to set the focus to the **Function** combo boxes of the **Outputs** you have to change. Enter the selection by pressing the red **Sel** (SELECT) key.

10. Use **^** or **v** button/key to set the focus on the function option you need (Key Preset or Alarm). Enter the selection by pressing the red **Sel** (SELECT) key.

Menu selections for setting the GP IO output functions:
→ MENU
→ GPIO Configuration menu tab
→ Key Preset or Alarm in combo boxes of **Function** column
→ select option in combo boxes of **Output Signal Timing** column
→ select option in combo boxes of **Output Logic** column
→ Alarm Configuration menu tab
→ on in **Alarms General Settings** frame
→ Select ohter options
→ Select option in Output combo boxes in **Alarm-Event Type Selection** section
→ Instrument Settings menu tab
→ Edit Selected Preset
→ Local Input/Output Routing and Instrment Settings menu tab
→ Monitoring Input Routing
→ Key 1 to Key 7 menu tabs
→ GPIO 1 ... 8 section
→ Select check boxes for determined outputs
→ Save & Exit
→ Select User Preset
→ Change name (if wanted)
→ Save & Exit

11. Repeat steps 7 and 8 for all the output fucntions you have to change.

12. Use ^ or v buttons/keys to select the **Output Signal Timing** combo boxes and the **Output Logic** combo boxes. Proceed as described in steps 7 to 9.

13. If you have assigned the alarm function to outputs, use < or > key to select the **Alarm Configuration** menu tab. The **Global Alarm Setting** menu page is displayed.

14. Use ^ or v buttons/keys to set the focus to the on checkbox of the **Alarm General Settings** frame. Enter the selection by pressing the red **Sel** (SELECT) key.

15. Use ^ or v buttons/keys and the red **Sel** (SELECT) key to select all the other options you need.

16. In the **Alarm-Event Type Selection** section there are only the **Output** combo boxes available, which have been assigned with the alarm function as described before (steps 7 to 8).

17. Use ^ or v key to set the focus to one of the combo boxes. Enter the selection by pressing the red **Sel** (SELECT) key.

18. Use ^ or v key to select the option you need. Enter the selection by pressing the red **Sel** (SELECT) key.

19. Use < or > key to select the **Instrument Settings** menu tab. The **Instrument Settings** menu page is displayed.

20. Use ^ or v key to set the focus to the **Edit selected preset** button. Enter the selection by pressing the red **Sel** (SELECT) key.

21. Use < or > key to select the **Local Input/Output Routing and Instrument Settings** menu tab. The **Local Routing Settings** menu page is displayed.

22. Use ^ or v key to set the focus to the **Monitoring Input Routing** button. Enter the selection by pressing the red **Sel** (SELECT) key.

23. On the **Key 1** to **Key 7** menu pages use the ^ or v button/key to set the focus to the checkboxes labelled **GPIO 1 . 8**. Select one or more depending on your definition of the output switching state for this key. The check boxes of the outputs set to the alarm functions are greyed and cannot be selected.

24. Click the **Safe & Exit** button or press the corresponding key to store the changes and leave the menu. The **Save Preset** menu page is displayed.

25. Press the red **Sel** (SELECT) key, if you want to select another User Preset as the displayed one. Use the ^ or v button/key to set the menu focus to the one you prefer and press the red **Sel** (SELECT) key.

26. If you want you can change the name of the preset. The button **Change name** opens a keyboard to enter the name you prefer.

27. Click the **Safe & Exit** button or press the corresponding key again. Now the changes are finally stored, the unit turns back to normal operation.

5 Instruments (Display Modes)

5.1 Controlling the instruments

The instruments and their functions can be operated in three different ways: With the keys of the Remote Control 30050 unit (31900 series) resp. the control panel of the 31960 series, with an optional computer mouse using the controls displayed in the Toolbar on the screen (Window 1), or with the control keys on the optional Remote Display 30010.

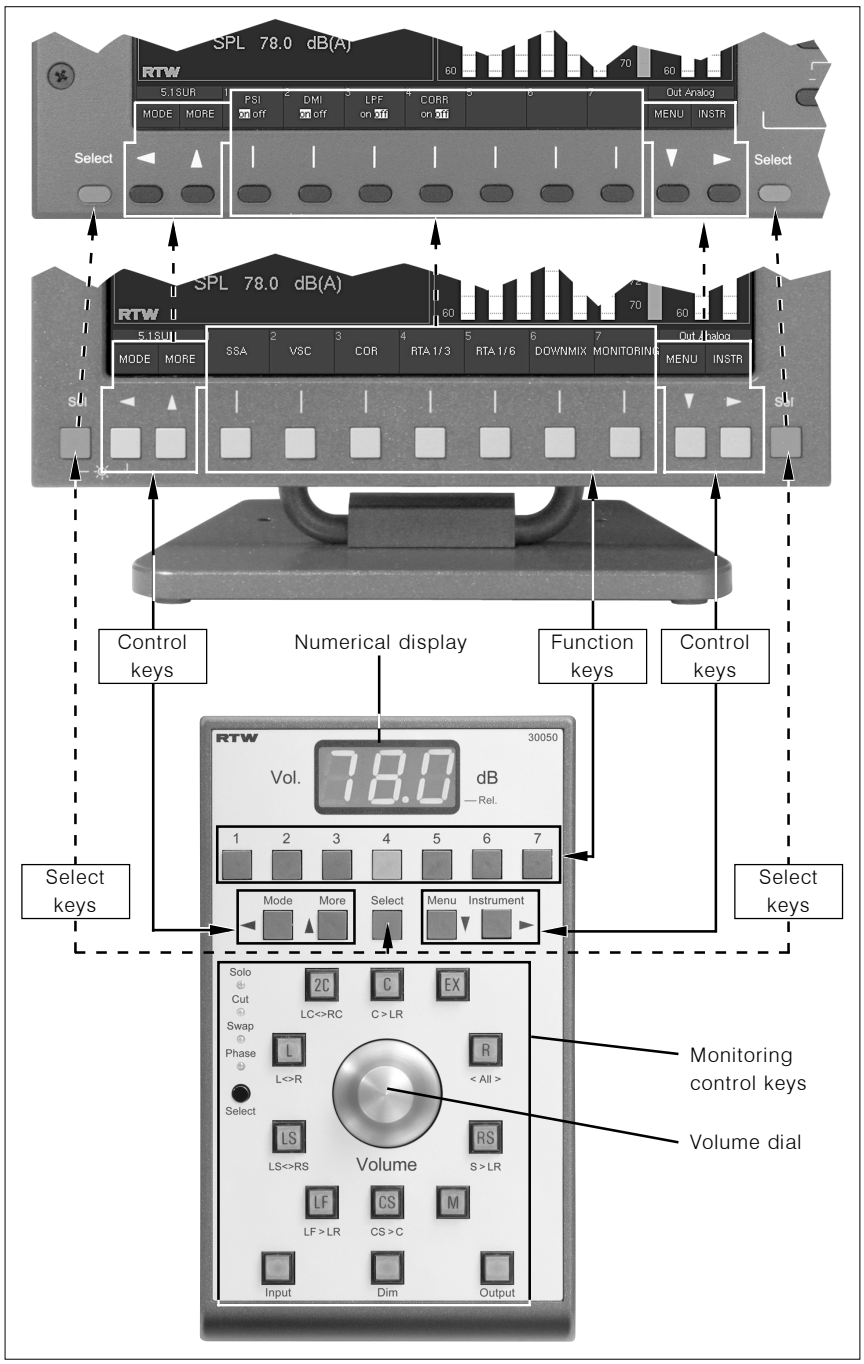


Fig. 5-1: Control panel of the 31960 series, Remote Display 30010 and key layout of the Remote Control 30050 (31900 series) from top to bottom, and examples of the Toolbar as displayed on the screen.

5.1.1 The Control Keys and the Toolbar



The Remote Control 30050 (31900 series) resp. the control panel of the 31960 series and the Remote Display 30010 have a total of 11 keys for operating the SurroundControl systems. On-screen buttons providing the same control functions for access with an optional mouse are displayed in the Toolbar in Window 1 of the display.

Function keys see Fig. 5-1 



The functions assigned to function keys 1 to 7 change depending on the current system mode. The functions that are currently active are displayed in the Toolbar. These keys can function as either pushbuttons or switches, and they can also be used to adjust settings with up to three options for some instruments. The current option is highlighted (see illustration on the left) and you can switch between the available options by pressing the key or clicking the corresponding button repeatedly.

Two pairs of control keys are located below the function keys on the Remote Control 30050 (31900 series) and to the left and right of the function keys on the control panel of the 31960 series and on the Remote Display 30010:

→ MODE
- **MODE**: Switches between Function Select and Instrument Select modes.

→ MORE
- **MORE**: Moves down to the next Toolbar level. When you are on the last available level selecting MORE returns you to the first level. The text in the Toolbar buttons changes to grey when only one level is available.

→ MENU
- **MENU**: Opens the configuration menu pages in which you can view and adjust settings.

→ INSTR(UMENT)
- **INSTR**: Stands for „Instrument“ and switches the focus between Window 2 and Window 3.

In the configuration menus these four keys are used as cursor keys.

Select keys see Fig. 5-1 
→ SEL(ECT)

The Remote Control 30050 (31900 series) has one Select key, the control panel of the 31960 series and the Remote Display 30010 have two Select keys. These keys are used to confirm selections in the menus. When you are using the optional mouse the left mouse key is used to confirm selections.

The buttons displayed in the Toolbar are numbered. These numbers correspond to the numbers above the function keys on the Remote Control 30050 unit (see Fig. 5-1).
In addition to pushbuttons and switch function buttons the Toolbar also includes displays for the current input and output status (see Fig. 5-2). When pressing the input key on the Remote Control 30050 (31900 series) resp. on the control panel of the 31960 series (see Fig. 5-1) or when clicking the Toolbar input button with the optional mouse the numbered keys display the Sub Presets (see Chapters 3.5 and 4.3.12) with the available input sources for the current selected preset. Pressing the output key or clicking the Toolbar output button changes the current output as defined for the Output Key Mode in the Input/Output Routing menus as described in Chapters 4.3.14 and 6.5 (first paragraph).

See Chapters 3.5 and 4.3.12 

See Chapters 4.3.14 and 6.5 

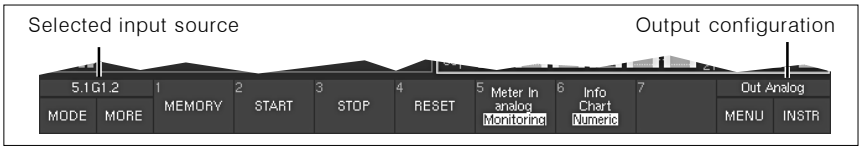


Fig. 5-2: The Toolbar buttons for the input sources and the output configuration

5.1.2 Toolbar Modes: Function Select and Instrument Select

→ MODE

The Toolbar has two different modes which can be selected with the MODE key:

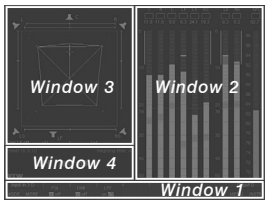
- Function Select: Mode for operating the instruments
- Instrument Select: Mode for selecting an instrument or a preset

See Chapters 3.6

The default mode is Function Select. How to proceed is described in Chapter 3.6.

- **Function Select**

→ INSTR



When **Function Select** mode is active you can operate the active instrument, which is identified by a highlighted frame around the instrument window. You can switch the focus between Window 2 and Window 3 by pressing the **INSTR** key or clicking in the window with the left mouse key. Window 1 (Toolbar) and Window 4 (Status Box) can never be given the focus (made active) because this mode is not relevant for them.

→ (Button/key 1 – 7)

→ MORE → (other functions)

The available functions for the active instrument are shown as buttons in the Toolbar in Window 1. If more than 7 functions are available the additional functions can be displayed by selecting **MORE**.

- **Instrument Select**

→ MODE → (Instruments)

→ MODE → MORE
→ (other instruments)

In this mode there are two Toolbar levels for selecting the available instruments and two additional levels with 7 Factory Presets and 7 User Presets. To display an instrument in Window 3 and activate it just press the corresponding function key or optional click on its Toolbar button with the mouse. When you select a new instrument the current settings of the instrument you were using are stored automatically and restored when you return to the instrument again later. The new selected instrument turns to the Function Select mode.

Example:

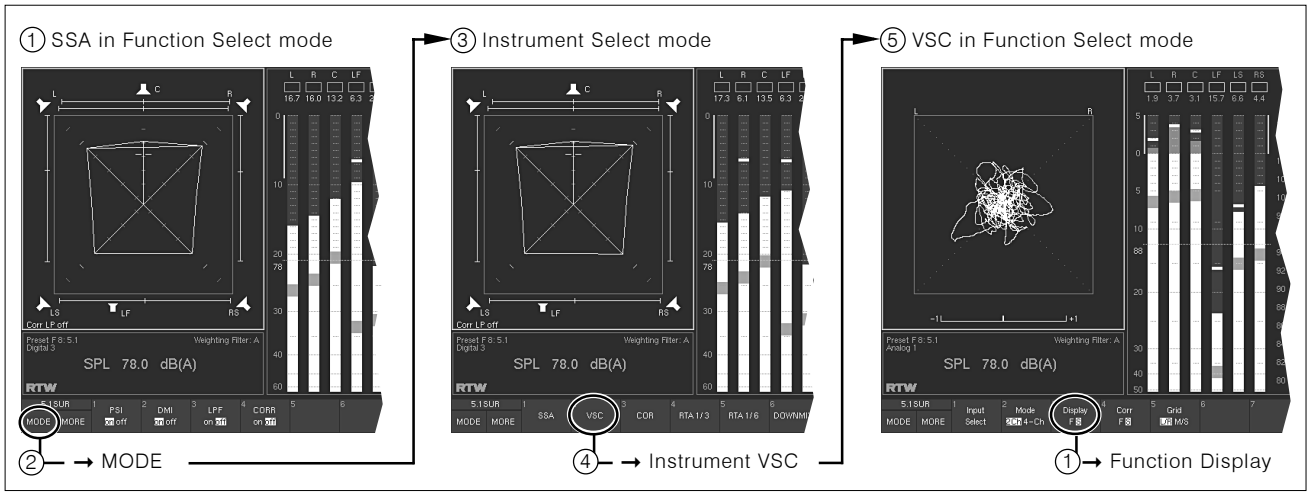


Fig. 5-3: Changing between Function Select and Instrument Select mode when selecting another instrument. Example with the instruments SSA and VSC

→ INSTR
Focus on Window 2 (white frame)



5.2 The Program Meter Instrument

The Program Meter instrument is always displayed in Window 2. To select it assign the focus to it (indicated by a highlighted frame around the window) by pressing the **INSTR** key. When the focus is on this window the Program Meter functions are displayed in the Toolbar. (The functions are available simultaneously with all other instruments except the RTA 1/6 instrument, which covers Window 2 and thus hides the peakmeter.) Pressing the **INSTR** key again returns the focus to Window 3 and displays the functions of the instrument displayed there in the Toolbar (Window 1).

The Program Meter can have two different modes:

See Chapter 5.2.1
- Peak Program Meter mode (PPM), see Chapter 5.2.1,

See Chapter 5.2.2
- ITU BS.1771 Loudness Meter mode, see Chapter 5.2.2.

5.2.1 The Peak Program Meter (PPM)

The peakmeter display in the selected and displayed mode consists of up to four peak-meter groups (Channel Groups). Each group can have different domains, standards and settings. By the use of the Position combo boxes in the Peakmeter Settings menus (see Chapter 6.5.2.6) the displays of the groups can be turned on and off and their order can be selected as required. The widths of the display bars are adjusted automatically by the software. The bargraphs of every group have a numerical display and can contain Peak Hold spots and additional Loudness indicators that are shown as a spot inside each bargraph.

See Chapter 6.5.2.6

The SPL Bargraph is available in the surround and stereo modes of the PPM instrument. It shows the combined SPL level of all channels shown in the PPM display.

- **Surround modes**

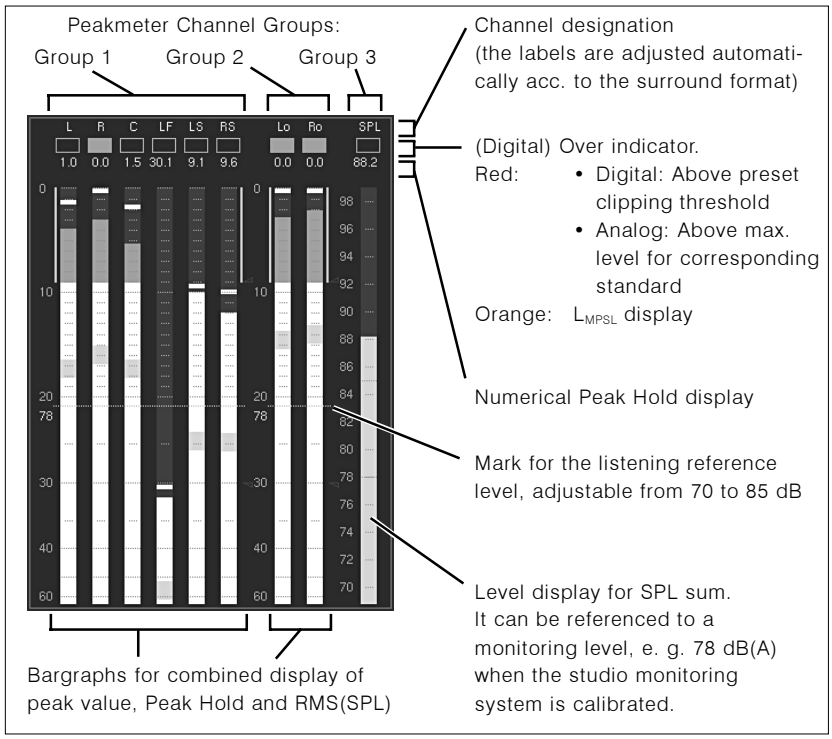


Fig. 5-4: Display elements of the Program Meter instrument in PPM mode with 5.1 surround format selected

- **Multi-Channel modes**

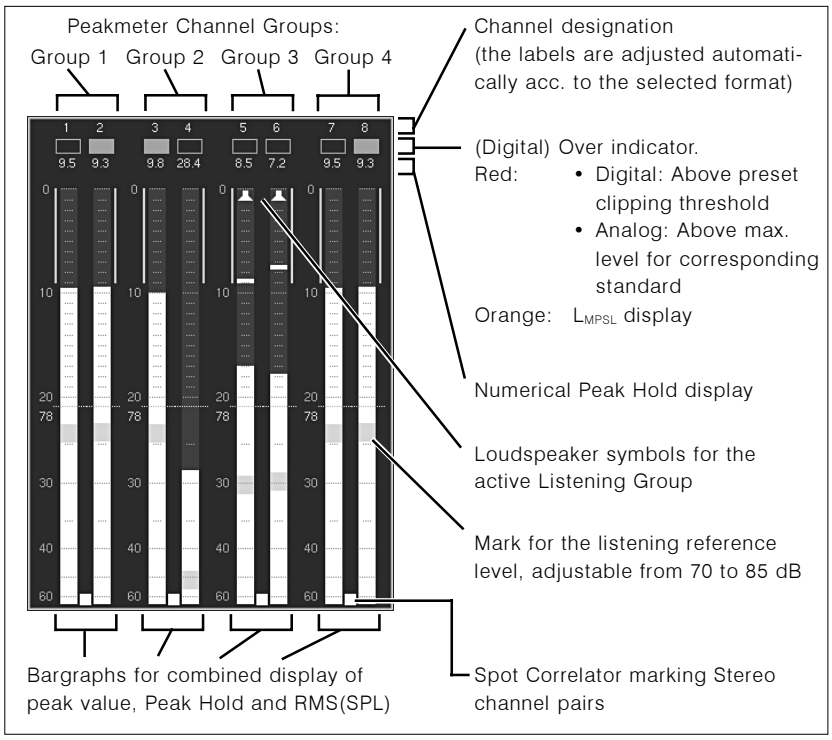


Fig. 5-5: Display elements of the Program Meter instrument in PPM mode with Multi-Channel format selected

- **2-Channel Stereo mode**

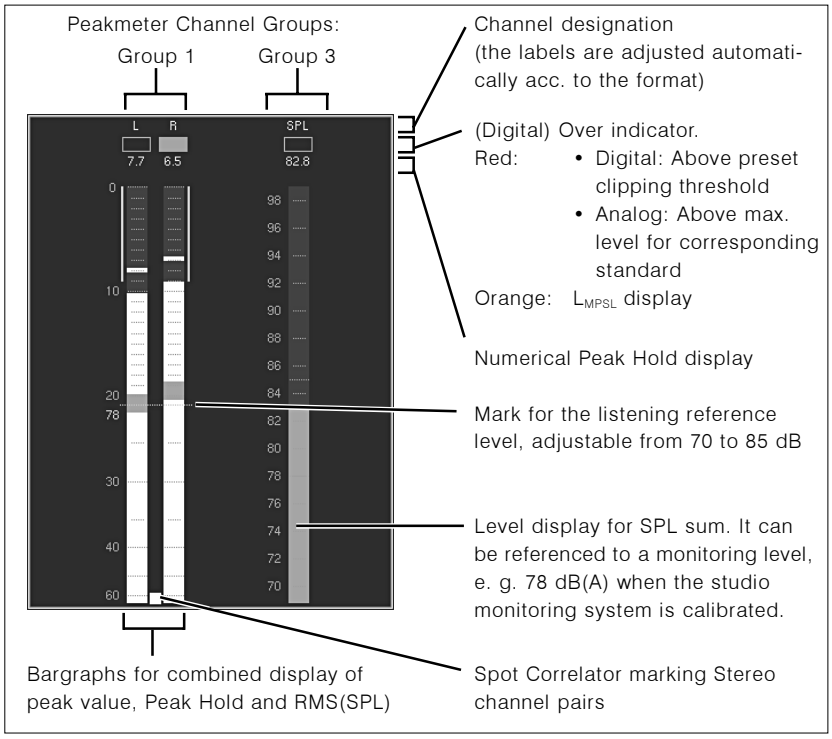


Fig. 5-6: Display elements of the Program Meter instrument in PPM mode with 2-Channel Stereo format selected

5.2.1.1 Changing the parameters of the Peak Program Meter

Many parameters of the PPM bargraphs, the peak hold function and the loudness indicators can be changed in the Channel Group menus for the several Peakmeter Settings.

To access these menus from normal display operation please proceed as following:

1. Press the **MENU** button/key, the unit changes to menu mode.

2. Use ^ or v button/key to set the menu focus on the Edit selected preset button and enter this selection by pressing the red **Sel** (SELECT) key.

3. Use < or > button/key to select the Local Input/Output Routing and Instrument Settings menu tab. The **Local Routing Settings** menu is shown.

4. Use ^ or v button/key to set the menu focus on the Monitoring Input Routing button and enter this selection by pressing the red **Sel** (SELECT) key.

5. Use ^ or v button/key to set the menu focus on the Peakmeter Settings button for the **Monitoring Routing** section (or another Peakmeter Settings button for the peakmeter bargraphs you want to change). Enter this selection by pressing the red **Sel** (SELECT) key.

6. On the **Peakmeter Settings** menu page use ^ or v button/key to set the menu focus on the Channel Group 1 button. Enter this selection by pressing the red **Sel** (SELECT) key.

7. On the **Peakmeter – Channel Group 1** menu page you now can select the combo boxes, list boxes, check boxes and buttons by using the ^ and v buttons/keys to make the appropriate changes like measuring standards, scales, color setups and others. Enter the selections by pressing the red **Sel** (SELECT) key.

8. Use ^ or v button/key to set the menu focus on the Close button. Enter this selection by pressing the red **Sel** (SELECT) key to get back to the previous menu page.

9. On the **Peakmeter Settings** menu page use ^ or v button/key to set the menu focus on one of the other Channel Group buttons. Enter this selection by pressing the red **Sel** (SELECT) key.

10. On the selected **Channel Group** menu page you now can make the changes as described in step 7. Enter the selections by pressing the red **Sel** (SELECT) key.

11. Repeat steps 8 to 10 until you have entered all the Channel Groups where you want to change parameters.

12. Click the **Safe & Exit** button or press the corresponding key to store the changes and leave the menu. The **Save Preset** menu page is displayed.

13. Press the red **Sel** (SELECT) key, if you want to select another User Preset as the displayed one. Use the ^ or v button/key to set the menu focus to the one you prefer and press the red **Sel** (SELECT) key.

14. If you want you can change the name of the preset. The button Change name opens a keyboard to enter the name you prefer.

15. Click the **Safe & Exit** button or press the corresponding key again. Now the changes are finally stored, the unit turns back to normal operation.

5.2.1.2 The functions of the Peak Program Meter

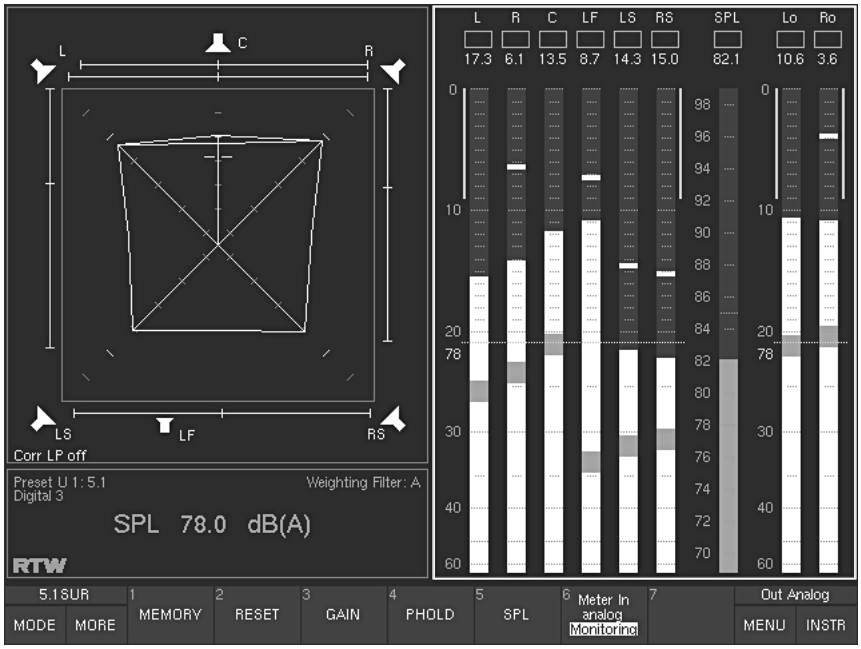


Fig. 5-7: The functions of the PPM instrument displayed in the Toolbar

The functions of the Program Meter instrument in PPM mode can be selected by clicking the numbered buttons in the Toolbar or by pressing the corresponding keys on the Remote Control 30050 (31900 series), the control panel of the 31960 series or on the Remote Display 30010.

- **Memory**
  (Button/Key 1, see Fig. 5-7)
  Depending on the preset this function activates the numerical display of the longterm memory for maximum level, volume level or digital errors.

- **Reset**
  (Button/key 2, see Fig. 5-7)
  This function deletes the longterm memory, the peak hold memory and the stored digital errors.

- **Gain**
  (Button/key 3, see Fig. 5-7)
  This function activates the measurement range expansion and simultaneously switches the peak meter scale. The following gain increases are applied in accordance with the scale standards:

Mode/Standard	Gain
Digital scales	40 dB
DIN	20 dB
Nordic	40 dB
British IIa + IIb	40 dB
VU	20 dB
Zoom20	20 dB
+24 dBu	20 dB
+20 dBr	20 dB

  For digital input signals the reference point on scales DIN+5, DIN+10, Nordic, British IIa, British IIb, Zoom20 and Zoom2 corresponds to the set headroom value. Factory default: –9 dB FS.

- **PHold**
  (Button/key 4, see Fig. 5-7)
  This function activates or deactivates the PPM's peak hold display. The function has no effect on the numerical display.

- **SPL**
  (Button/key 5, see Fig. 5-7)
  This function activates or deactivates the volume level displays of the individual channels.

- **Meter In analog/Monitoring**
  (Button/key 6, see Fig. 5-7)
  This function changes the source of the Program Meter without affecting the monitoring. The Program Meter can either follow the Monitoring or use the input selected on the **Meter Input Routing** menu page (see Chapter 6.5.1). Available selections are Meter In analog (connector description see Chapter 7.3.8) or Digital 3 (connector description see Chapter 7.3.11).

See Chapters 6.5.1, 7.3.8 and 7.3.11

The ITU BS.1771 Loudness Meter instrument is **only** available in digital 5.1 Surround and 2-Channel Stereo mode!

5.2.2 The ITU BS.1771 Loudness Meter

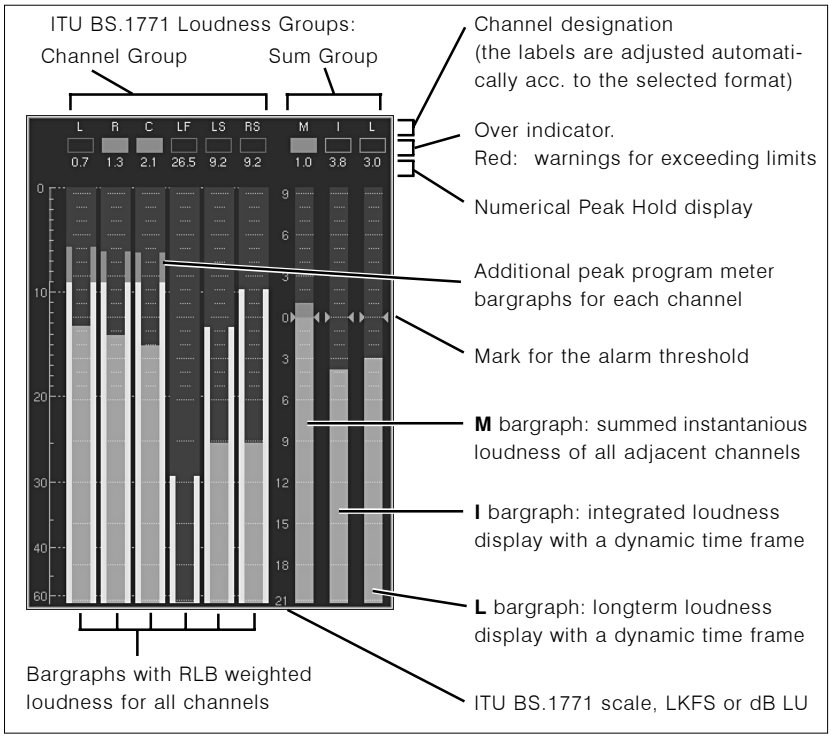


Fig. 5-8: Display elements of the Program Meter instrument in ITU BS.1771 Loudness mode with 5.1 surround format selected

Depending on the selected channel mode the ITU BS.1771 Loudness Meter mode of the Program Meter generates up to 9 bargraphs, devided into two channel groups:

- The bargraphs of the Channel Group read the current loudness of the input channels according to their associated channel label. These values are weighted according to ITU BS.1771 standard.
- In the Sum Group the bargraph labeled **M** represents the summation of all input channels in the display. The summation matrix can be changed by the use of the Channel Weighting ITU BS.1771 Format 5.1 menu option (see Chapter 6.5.2.11). The bargraph labeled **I** reads the loudness value of an adjustable dynamic time frame. The bargraph labeled **L** shows the loudness value of a longterm reading. All measurements are weighted with the RLB filter as described in ITU BS.1770 standard.

See Chapter 6.5.2.11

The ITU BS.1771 loudness bargraphs can be used with 5.1 Surround and 2-Channel Stereo modes (see Chapter 6.5.2.3). The widths of the display bars are adjusted automatically by the software. The bargraphs of the loudness groups have a numerical display and an over indicator. Normally the bargraphs of the Loudness Channel Group are shown in combination with smaller PPM bargraphs in the outer sections. But these additional bargraphs can also be switched off.

See Chapter 6.5.2.3

5.2.2.1 Background – the ITU BS.1771 Loudness Measurement Function

A reliable and standardised method for evaluating program loudness is essential for all audio and video work – for example to make it possible to normalize the sound in production to prevent unpleasant jumps in volume on switching between different program sections in radio and TV broadcasts.

The SurroundControl units all have an integrated loudness measurement function conforming to the ITU BS.1771 recommendations for stereo and 5.1 surround sound signals, which can be displayed as an alternative to or in combination with the standard PPM peak program meter bargraph display. Presets enable the user to switch between the two modes at any time. Switching from PPM mode to the ITU BS.1771 mode activates the ITU loudness display scale, which uses LKFS or dB LU (dB Loudness Units) and has a range from –21 to +9 . Depending on the channel mode the display has either two or six bars for the sum loudness of the stereo or 5.1 surround channels in one group, plus three additional bargraphs as defined in the Sum Group of the the ITU BS.1771 Loudness Settings menu.

- **Momentary “M”:**
  The M bargraph display shows the momentary sum loudness for all the connected channels for a preset period, using the ITU BS.1770 RLB filter. In 5.1 surround mode you can also define weighting factors for the individual channels for the sum calculation. The dynamic range of this bar scale is the same as those of the individual channels.

- **Integrated “I”:**
  The I bargraph display shows the mean momentary value for an ongoing time window (e. g. for the last 20 s). This integrated display with a dynamic time window is not falsified by pauses in the signal because signals below a user-adjustable threshold do not influence the display. Depending on the time setting, this bar display may appear rather slow or even static. Using the Numeric option of the function button/key 6 (see beneath) it is also possible to display the integrated loudness value numerically in the Status Box in Window 4 of the screen. When using the Chart option the Status Box shows a graphical display of the curve progression of the values (white line).

- **Longterm “L”:**
  The L bargraph display shows in a dynamic time window the loudness value of a longterm reading up to more than 7 days. This display is not falsified by pauses in the signal because signals below a user-adjustable threshold do not influence the display. This bargraph display may appear rather static. Using the Numeric option of the function button/key 6 (see beneath) it is also possible to display the longterm loudness value numerically in the Status Box in Window 4 of the screen. When using the Chart option the Status Box shows a graphical display of the curve progression of the values (green line).

5.2.2.2 Changing the parameters of the ITU BS. 1771 Loudness Meter

See Chapter 6.5.2.9

Many parameters of the ITU BS.1771 Loudness bargraphs can be changed in the **Channel Group** menus of the **Loudness Settings** menu (see Chapter 6.5.2.9).

To access these menus from normal display operation please proceed as following:

1. Press the **MENU** button/key, the unit changes to menu mode.

2. Use ^ or v button/key to set the menu focus on the Edit selected preset button and enter this selection by pressing the red **Sel** (SELECT) key.

3. Use < or > button/key to select the Local Input/Output Routing and Instrument Settings menu tab. The **Local Routing Settings** menu is shown.

4. Use ^ or v button/key to set the menu focus on the Monitoring Input Routing button and enter this selection by pressing the red **Sel** (SELECT) key.

5. Use ^ or v button/key to set the menu focus on the Program Meter combo box. Enter this selection by pressing the red **Sel** (SELECT) key.

6. Use ^ or v button/key to set the menu focus on ITU BS.1771. Enter this selection by pressing the red **Sel** (SELECT) key.

7. Use ^ or v button/key to set the menu focus on the Loudness Settings button of the **Monitoring Routing** section. Enter this selection by pressing the red **Sel** (SELECT) key.

8. On the **ITU BS.1771 Loudness Settings** menu page use ^ or v button/key to set the menu focus on the Channel Group button. Enter this selection by pressing the red **Sel** (SELECT) key.

9. On the **Channel Group** menu page you now can select the combo boxes, list boxes, check boxes and buttons by using the ^ and v buttons/keys to make the appropriate changes like measuring standards, scales, color setups and others for the individual channels. Enter the selections by pressing the red **Sel** (SELECT) key.

10. Use ^ or v button/key to set the menu focus on the Close button. Enter this selection by pressing the red **Sel** (SELECT) key to get back to the previous menu page.

11. On the **ITU BS.1771 Loudness Settings** menu page use ^ or v button/key to set the menu focus on the Sum Group button. Enter this selection by pressing the red **Sel** (SELECT) key.

12. On the **Sum Group** menu page you now can select the combo boxes, list boxes, check boxes and buttons by using the ^ and v buttons/keys to make the appropriate changes for the three additional bargraphs **M**, **I** and **L**. Here you can define the thresholds and time periods, colors and channel weighting for the summed loudness values. Enter the selections by pressing the red **Sel** (SELECT) key.

13. Click the **Safe & Exit** button or press the corresponding key to store the changes and leave the menu. The **Save Preset** menu page is displayed.

14. Press the red Sel (SELECT) key, if you want to select another User Preset as the displayed one. Use the ^ or v button/key to set the menu focus to the one you prefer and press the red **Sel** (SELECT) key.

15. If you want you can change the name of the preset. The button Change name opens a keyboard to enter the name you prefer.

16. Click the **Safe & Exit** button or press the corresponding key again. Now the changes are finally stored, the unit turns back to normal operation.

5.2.2.3 The functions of the ITU BS.1771 Loudness Meter

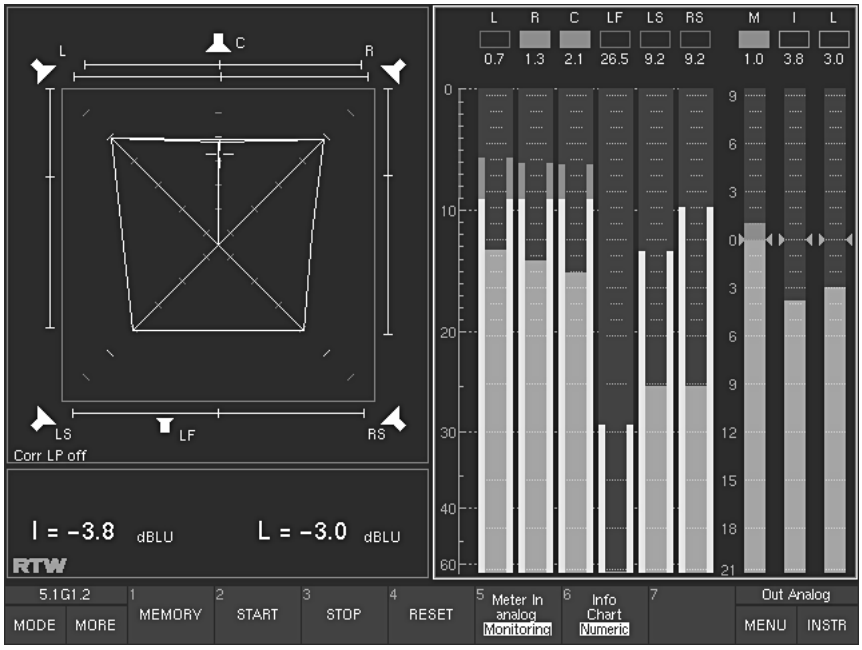


Fig. 5-9: The functions of the ITU BS.1771 Loudness Meter displayed in the Toolbar

The functions of the Program Meter instrument in ITU BS.1771 Loudness mode can be selected by clicking the numbered buttons in the Toolbar or by pressing the corresponding keys on the Remote Control 30050 (31900 series), the control panel of the 31960 series or on the Remote Display 30010.

- **Memory**
  (Button/Key 1, see Fig. 5-9)
  Pressing and holding this button/key activates the display of the longterm memory for maximum loudness level. The numerical display of the loudness level and the digital error indicators above the bargraphs is running on.

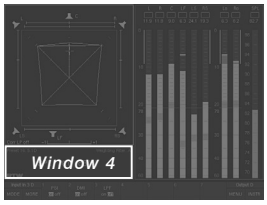
- **Start**
  (Button/key 2, see Fig. 5-9)
  With this function a new cycle of integrated and longterm loudness measurement can be started, or a stopped one can be continued.

- **Stop**
  (Button/key 3, see Fig. 5-9)
  This function stops the current running measurements of the integrated and the longterm bargraphs and holds the last values.

- **Reset**
  (Button/key 4, see Fig. 5-9)
  This function zeros the holded values and the stored digital errors of the integrated and the longterm bargraphs and deletes it from the display.

- **Meter In analog/Monitoring**
  (Button/key 5, see Fig. 5-9)
  This function switches between the analog signal source of the **Meter In analog** connector described in Chapter 7.3.8 (Meter In analog) or the signal being used for monitoring (the selected input of the other input connectors) to be shown on the peakmeter displays.

See Chapter 2.3

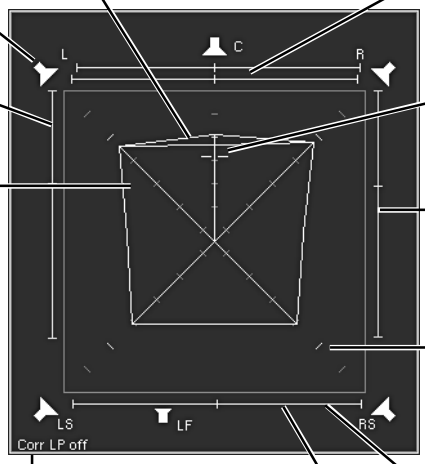


- **Info/Chart/Numeric**
  (Button/key 6, see Fig. 5-9)

  Repeatedly pressing this button/key switches between the display options for the Status Box in Window 4 (see Chapter 2.3):
  - Info: The Status Box shows informations on the selected preset, the selected input, the selected weighting filter, the current SPL value, and other relevant information.
  - Chart: The Status Box shows a dynamic time section of the chart recorder displaying the loudness values of the integrated (white line) and the longterm (green line) reading.
  - Numeric: The Status Box numerically shows the loudness values of the integrated and the longterm reading. If these values exceed the selected thresholds, they are displayed red-colored.

→ INSTR Focus on Window 3 (white frame) → MODE → SSA

5.3 The SSA Instrument



Speaker symbols indicate channel status (in CAL mode):
- green: Speaker active
- red: Speaker off

Moving bar indicator (PSI - Phantom Source Indicator) shows position and width of the phantom sound source between the L and LS channels

Total Program Volume (TVI - Total Volume Indicator). The aera enclosed by the lines is a measure for the total volume level, the spreading across the four quadrants is an image of the balance of the sound characteristics. The correlation level **r** is shown by the shape of the lines (and additional by the color of the PSIs):
- a distinctive roof: **r** from +1 to +0.25 (PSI: green),
- a straight line: **r** from +0.25 to –0.25 (PSI: yellow),
- a funnel: **r** from –0.25 to –1 (PSI: red).

Center channel level indicator (yellow line)

Switchable low pass filter for the LS-RS correlation (phase) meter

Correlation meter can be displayed next to or instead of the PSIs

Moving bar indicators (PSI - Phantom Source Indicator) show position and width of the phantom sound sources between the L - C and C - R channels and between the L and R channels

Position of the dominant sound event, the subjective sensed acoustic focal point (DMI - Dominance Vector)

Moving bar indicator (PSI - Phantom Source Indicator) shows position and width of the phantom sound source between the R and RS channels

Scaled coordinate system for the sound pressure level with marker (red) for the reference monitoring sound pressure level selected in the program meter section and to which the studio monitoring system can be calibrated.

Moving bar indicator (PSI - Phantom Source Indicator) shows position and width of the phantom sound source between the LS and RS channels

- In 6.1 mode an additional speaker symbol is displayed in the middle at the bottom.
- Im 7.1 mode two additional speaker symbols are displayed to the left and right of the C symbol at the top. Their levels are mixed with those of the center channel – there is only one combined center indicator. The selected channel functions are displayed for all speakers as described above.
- In 2-Channel Stereo mode the SSA looks slightly different. Only L/R loudspeakers, bars and their total volume (triangle) are displayed.

Fig. 5-10: The Surround Sound Analyzer (SSA) instrument in 5.1 surround mode

The SSA instrument is **not** available in Multi-Channel modes!



(The SSA instrument is always displayed in Window 3. To select it assign the focus to it (indicated by a highlighted frame around the window) by pressing the **INSTR** key. When the focus is on this window the SSA functions are displayed in the Toolbar (Window 1).

SSA is the acronym for **Surround Sound Analyzer** which is a powerful tool for visualizing serveral aspects of surround signals in parallel, e. g. the balance between front and surround channels and between L-C-R channels, display of either phantom sound sources or correlators or both, total volume indication, dominant sound events, phase relationships and many others. The dynamic behaviour of all display elements corresponds to the subjective listening impression, enabling you to see the balance of your surround programme intuitively and at a glance.
In 2-Channel Stereo mode the SSA instrument is available in a reduced version, then it is called Stereo Sound Analyzer.

5.3.1 What is monitored in the SSA instrument?

With the Surround Sound Analyzer surround format signals can be displayed as:

- Balance between front and surround channels
- Balance of the front L-C-R channels
- Display of front, side and rear phantom sound sources or correlation of main channel pairs instead or in combination
- Display of dominant sound events, with memory
- Adjustable coordinate system (SPL or loudness)
- Total sound volume indicator for the surround programme
- Low pass filter for low frequencies

The Surround Sound Analyzer gives you an accurately-scaled visual representation of the relative volume relationships within the overall surround sound. The interactions of sound levels (loudness or sound pressure), phase correlation and level differences between all five channels contributing to the overall sound are converted into an immediately comprehensible visual image. In addition to this, the visual display of the Surround Sound Analyzer has been designed to ensure that the dynamic behavior of the displays corresponds to the subjective acoustic impression, making it possible to understand the balance of your surround programme immediately, at a single glance. The Surround Sound Analyzer display is based on the loudness (ITU BS.1771 RLB or other weighting filters). It equates to the listening sound pressure level, when the SurroundControl units and the studio monitoring system are properly calibrated. The axes of the 45° rotated coordinate system use dB loudness, dB SPL, LKFS or dB LU scales, with a reference mark that is also shown in the loudness and SPL displays in the Peak Program Meter and in the ITU BS.1771 Loudness Meter.

Graphical display of overall loudness
Multi-channel display devices often show the relationships between the individual sound levels that make up a surround signal with circular or pie-slice graphics. Despite the great popularity of round shapes we have chosen to use a combination of a polygon and bar graphs in the Surround Sound Analyzer, because this makes it possible to display more parameters simultaneously and with greater clarity. The polygon is generated by combining the displayed level values on the scales of the 45° coordinate system. When all channels are set to the same level with a white noise signal the result is a square, the area of which is a measure of the total sound volume. The distribution of the four quadrants shows the volume distribution in the surround system. In addition to this the display also takes into account the phase correlation and the position of possible phantom sound sources.

The critical center channel
The balance between the center channel and the L and R channels is a critical factor in all types of surround sound productions. We have thus allocated a separate pair of display bars to this parameter to show clearly the volume differences between the center and the L and R channels. Another indicator makes it possible to identify the base width of the center sound source, which can be useful when there is crosstalk into the L or R channels.

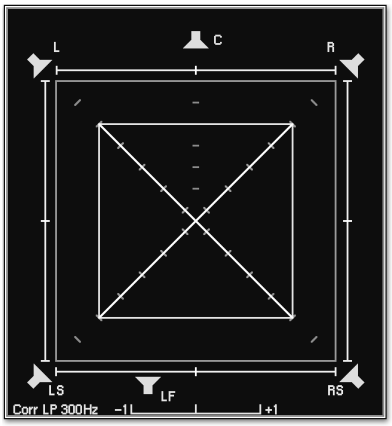
Phase meter for low frequencies

The „enveloping effect“ of the surround channels can be evaluated with the help of a additional correlation display that shows the phase correlation of the LS and RS surround channels at low frequencies when the low pass filter is activated. Ideally, the low-frequency signals (e. g. reverberation) should be decorrelated as much as possible. The SurroundControl units also feature an additional 10-fold phase correlation display that enables you to check the correlation of all possible channel pairs.

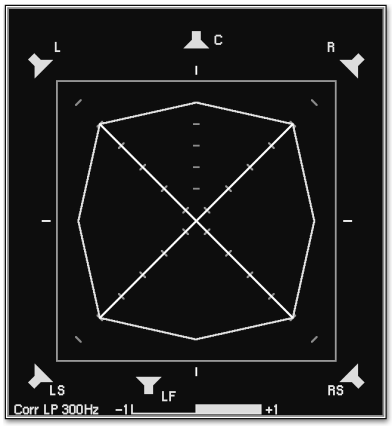
Loudness-based level control

Loudness-based level control has been recommended for some time now for optimal adjustment of the volumes of several individual programmes. The SurroundControl units support loudness-based level control on the basis of a defined reference sound pressure level. To use this feature, the studio’s monitoring system must first be calibrated against a reference listening sound pressure level (e. g. 85 dB(A)) with a sound level meter. Loudness-based level control provides much more accurate and realistic monitoring of the balance between dialog, effects and music.

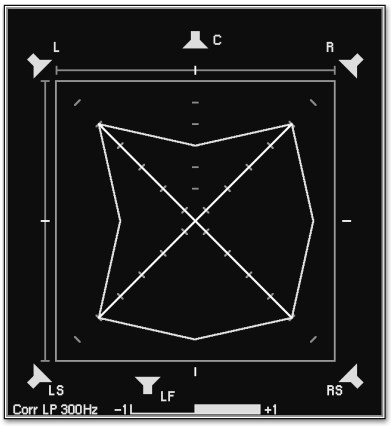
Examples of the Surround Sound Analyzer's displays



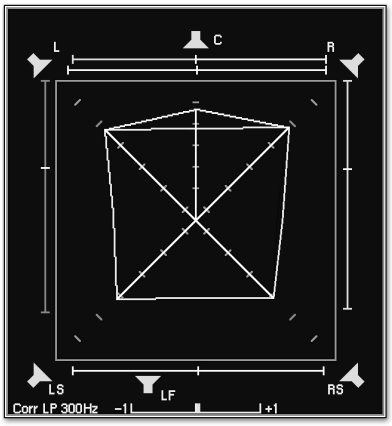
1. Incoherent noise with same levels in the channels L, R, LS and RS, set to the reference monitoring sound pressure level. In each case the correlation is r = 0, phantom sound sources are not locatable.



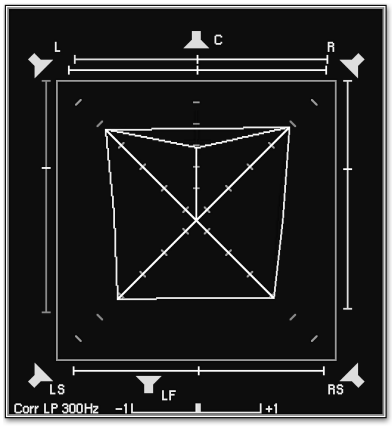
2. Identical sine wave signal with same level in the channels L, R, LS, RS. The correlation is r = +1 (outward broken TVI lines), the phantom sound sources (PSI) are in the middle, similar to a mono signal.



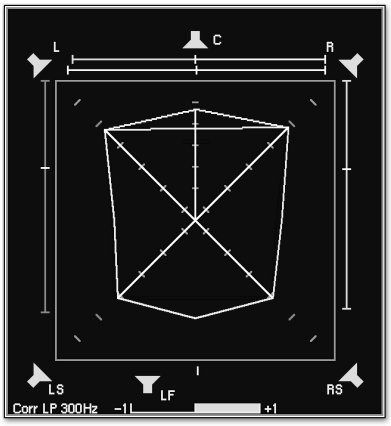
3. Same as on the left but with the phase of the left channel rotated through 180°. In the channel pairs L - R and L - LS each the correlation is r = –1, there are no phantom sound sources locatable.



4. Surround signal with some Center presence (roof). A support microphone would be too dominant. A dialog in relation to music would be too quiet. The width of the PSI lines of the C channel is a sign of coherent signal parts in L and/or R (crosstalk).



5. Surround signal with a low level Center presence (funnel). When recording music, the intermixture of a support microphone may enhance the perceptibility of the C channel in relation to the channel L and R.



6. The widely outward broken TVI line between LS and RS, no spreading of the PSI line and the correlation level r = +1 in the lower phase meter indicate that an identical mono signal is applied in both surround channels.

Fig. 5-11: Examples of displays in the Surround Sound Analyzer instrument (SSA), also see: www.rtw.de/english/special/index.html

5.3.2 The functions of the SSA instrument

5.3.2.1 Surround Sound Analyzer functions in Surround modes

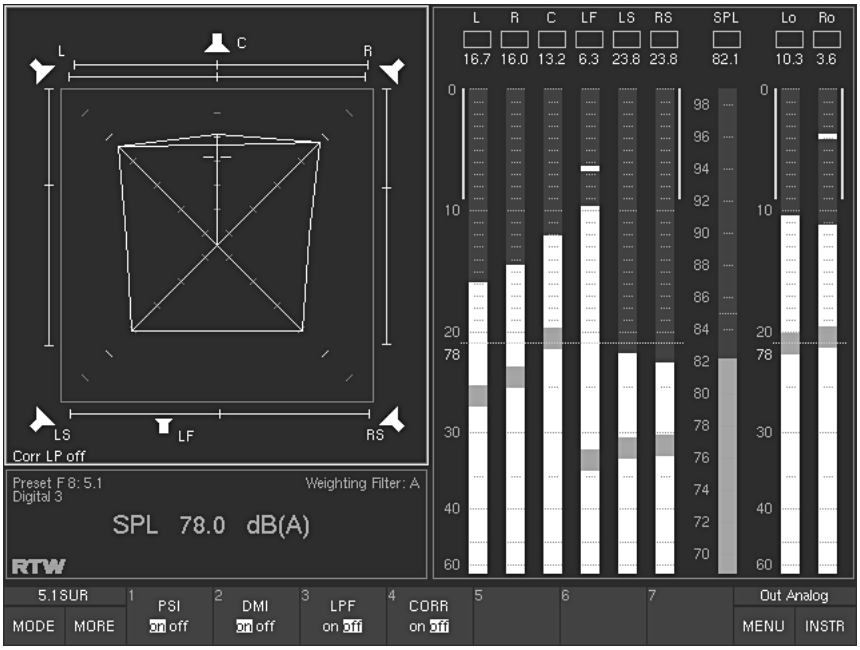


Fig. 5-12: The Surround Sound Analyzer (SSA) instrument in 5.1 surround mode

- **PSI**
  (Button/key 1, see Fig. 5-12)
  The PSI function (Phantom Source Indicator) activates or deactivates the indicators for phantom sound sources. They are displayed instead or in combination with the phase meters (see CORR below).

- **DMI**
  (Button/key 2, see Fig. 5-12)
  The DMI (Dominance Indicator) activates or deactivates the dominance indicator in the surround sound field (white cross).

- **LPF**
  (Button/key 3, see Fig. 5-12)
  The LPF (Low Pass Filter) function activates or deactivates the low pass filter function (300Hz) of the Surround Correlator for LS and RS channels. The current status is shown on the lower left in the SSA window.

- **CORR**
  (Button/key 4, see Fig. 5-12)
  The CORR function (Correlator) activates or deactivates the phase meters of the main channel pairs of the surround field. They are displayed instead or in combination with the phantom source indicators (see PSI above).

5.3.2.2 Stereo Sound Analyzer functions in 2-Channel Stereo mode

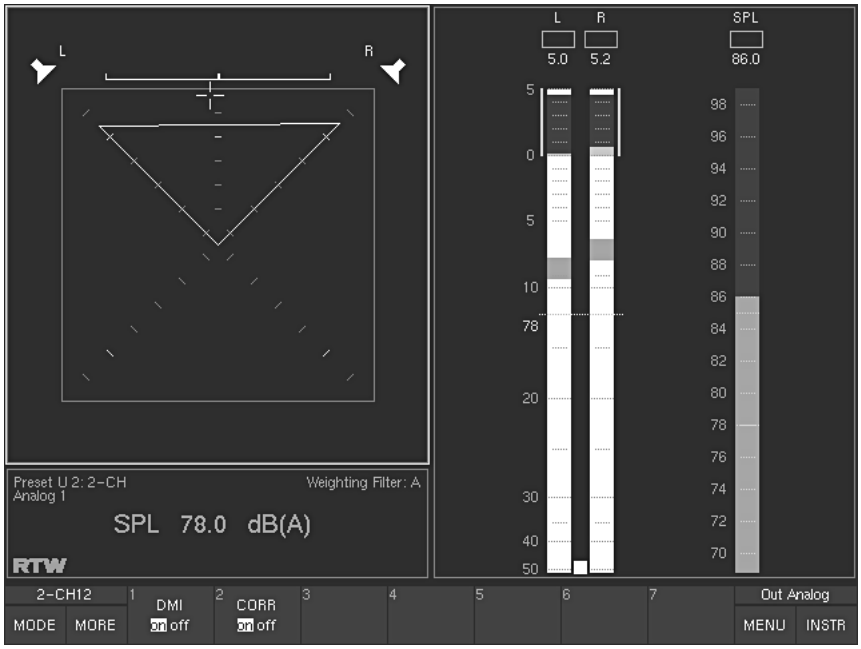


Fig. 5-13: The Stereo Sound Analyzer (SSA) instrument in 2-Channel Stereo mode

- **DMI**
  (Button/key 1)
  The DMI (Dominance Indicator) activates or deactivates the dominance indicator in the surround sound field (white cross).

- **CORR**
  (Button/key 2)
  The CORR function (Correlator) activates or deactivates the phase meters of the main channel pairs of the surround field.

→ INSTR Focus on Window 3 (white frame) → MODE → VSC

5.4 The VSC Instrument

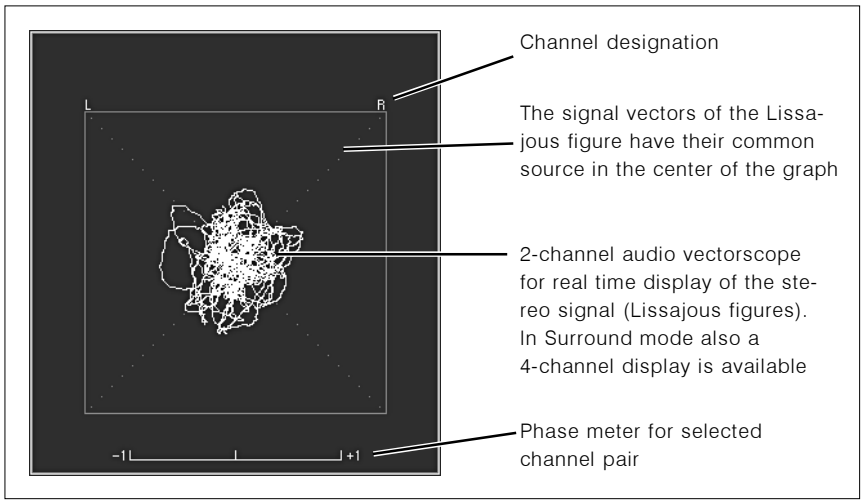


Fig. 5-14: The Audio Vectorscope instrument (VSC)



The VSC instrument is always displayed in Window 3. To select it assign the focus to it (indicated by a highlighted frame around the window) by pressing the **INSTR** key. When the focus is on this window the VSC functions are displayed in the Toolbar (Window 1).

The **Audio Vectorscope** (Lissajous display) is a 2-channel display mode available in the surround modes and for the Stereo channel pairs of the Multi-Channel and 2-Channel Stereo modes. It shows the phase relationship between one selectable channel pair at a time. This display mode also features a phase meter for the two channels selected. In Surround modes the VSC instrument can be switched to a four channel display devided into two sections: the upper one showing the L/R channels and the lower one the LS/RS channels including the corresponding phase meters. The Vectorscope display is not available in the 2-channel, 4-channel, 6-channel and 8-channel modes.

5.4.1 Changing the parameters of the Vectorscope

It is possible to customize some of the display elements shown in the vectorscope. To access the respective menu from normal display operation please proceed as following:

1. Press the **MENU** button/key, the unit changes to menu mode.

2. Use ^ or v button/key to set the menu focus on the Edit selected preset button and enter this selection by pressing the red **Sel** (SELECT) key.

3. Use < or > button/key to select the Vectorscope menu tab. The **Vectorscope Settings** menu is shown.

4. Use ^ or v button/key to set the menu focus on the buttons and combo boxes of the options you want to change. Enter the selection by pressing the red **Sel** (SELECT) key.

5. Use the ^ and v buttons/keys to make the appropriate changes for color setup, grid or AGP. Enter the selections by pressing the red **Sel** (SELECT) key. On the color selection menu pages use the Close button to get back to the **Vectorscope Settings** menu page.

6. Click the **Safe & Exit** button or press the corresponding key to store the changes and leave the menu. The **Save Preset** menu page is displayed.

7. Press the red **Sel** (SELECT) key, if you want to select another User Preset as the displayed one. Use the ^ or v button/key to set the menu focus to the one you prefer and press the red **Sel** (SELECT) key.

8. If you want you can change the name of the preset. The button Change name opens a keyboard to enter the name you prefer.

9. Click the **Safe & Exit** button or press the corresponding key again. Now the changes are finally stored, the unit turns back to normal operation.

5.4.2 The functions of the VSC instrument

Depending on the selected mode different functions placed on different keys are available.

5.4.2.1 Vectorscope functions in Surround modes

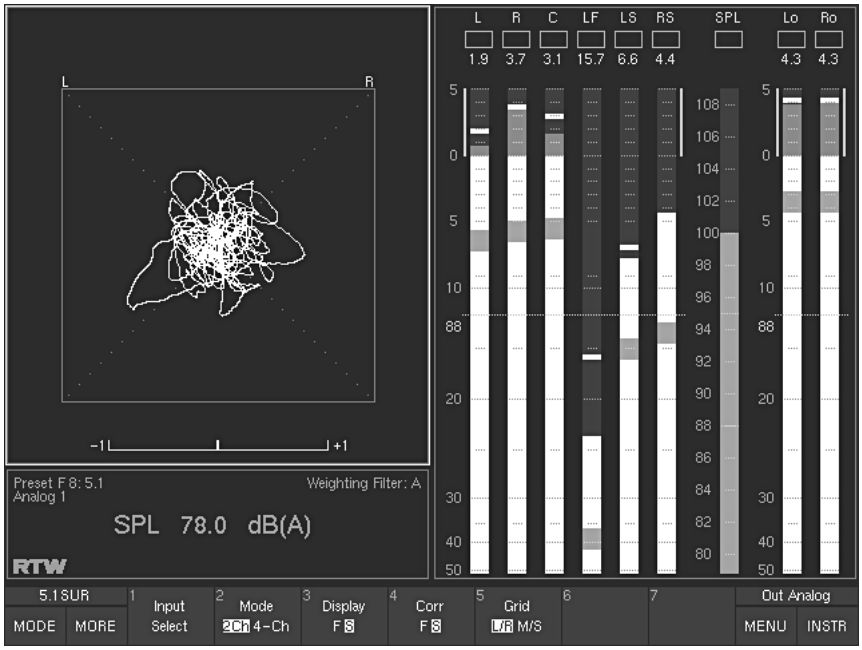


Fig. 5-15: The Audio Vectorscope instrument (VSC) in 5.1 Surround mode

- **Input Select**
  (Button/key 1, see Fig. 5-15)
  Selecting this function displays an additional menu for selecting the channel pairs as inputs for the two-channel stereo vectorscope.

  Depending on the selected surround mode the number of buttons/keys with the different channel combinations varies. If there are more than 7 channel pairs, press the **MORE** button/key for a second level with the other channel pairs. When you have made a selection the Toolbar display will automatically switch back to the level with the functions of the VSC instrument.

  - **3.1 Surround mode:**
    - L – R (Button/key 1)
    - L – C (Button/key 2)
    - C – R (Button/key 3)

- **5.1 Surround mode:**
  - L – R (Button/key 1)
  - LS – RS (Button/key 2)
  - L – C (Button/key 3)
  - C – R (Button/key 4)
  - L – LS (Button/key 5)
  - R – RS (Button/key 6)
  - Lo – Ro resp. Lext – Rext (Button/key 7)

- **6.1 Surround mode:**
  - L – R (Button/key 1)
  - LS – RS (Button/key 2)
  - L – C (Button/key 3)
  - C – R (Button/key 4)
  - L – LS (Button/key 5)
  - C – CS (Button/key 6)
  - R – RS (Button/key 7)

  Press **MORE** button/key to display the next function level:
  - LS – CS (Button/key 1)
  - CS – RS (Button/key 2)
  - Lo – Ro resp. Lext – Rext (Button/key 3)

- **7.1 Surround mode:**
  - L – R (Button/key 1)
  - LS – RS (Button/key 2)
  - L – C (Button/key 3)
  - C – R (Button/key 4)
  - L – LS (Button/key 5)
  - R – RS (Button/key 6)
  - LC – C (Button/key 7)

  Press **MORE** button/key to display the next function level:
  - C – RC (Button/key 1)



Note:
If you have selected the 4-channel option (**4 Ch**) of the Mode button/key available in Surround modes (see below), the Input Select button/key is greyed and has no function.

- **Mode 2Ch/4Ch**
  (Button/key 2, see Fig. 5-15)
  The **Mode** function switches the vectorscope display between 2- and 4-channel mode (2Ch/4Ch).
  In 4-channel mode channels L and R are represented in the upper half of the display, channels LS and RS in the lower half. The channel pairs L – R and LS – RS each have a correlation indicator. The **Input Select** button/key is greyed and has no function.

- **Display**
  (Button/key 3, see Fig. 5-15)
  This function switches the display speed of the vectorscope between fast (F) and slow (S).

- **Corr**
  (Button/key 4, see Fig. 5-15)
  This function switches the display speed of the correlator between fast (F) and slow (S).

- **Grid**
  (Button/key 5, see Fig. 5-15)
  This function switches the vectorscope grid between L/R (left/right) and M/S (middle/side).

5.4.2.2 Vectorscope functions in Multi-Channel modes

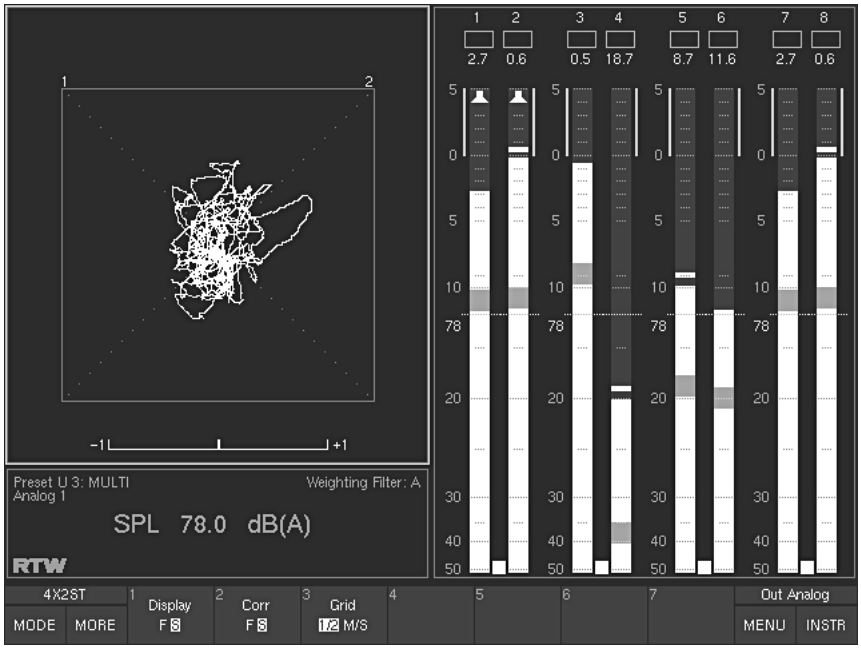


Fig. 5-16: The Audio Vectorscope instrument (VSC) in Multi-Channel mode

In Multi-Channel modes the VSC input always follows the selected Listening Group, if it is a Stereo channel pair (bargraph pair with spot correlator) which is marked with green loudspeaker symbols (see Fig. 5-16) in the PPM.

Note:
If you want to select another Listening Group, please press and hold the **Output** key on the Remote Control 30050 (31900 series) resp. on the control panel of the 31960 series. Then the key labelling of the Toolbar changes and shows the available Listening Groups. Select the one you want to use by either turning the volume control or pressing the associated **Listen** button/key and release the **Output** key. Maybe you have to press the **INSTR** button/key to go back to the VSC instrument and its functions (see Chapter 4.3.14 for a detailed description how to proceed).

See Chapter 4.3.14

- **Display**
  (Button/key 1, see Fig. 5-16)
  This function switches the display speed of the vectorscope between fast (F) and slow (S).

- **Corr**
  (Button/key 2, see Fig. 5-16)
  This function switches the display speed of the correlator between fast (F) and slow (S).

- **Grid**
  (Button/key 3, see Fig. 5-16)
  This function switches the vectorscope grid between L/R (left/right) and M/S (middle/side).

5.4.2.3 Vectorscope functions in 2-Channel Stereo mode

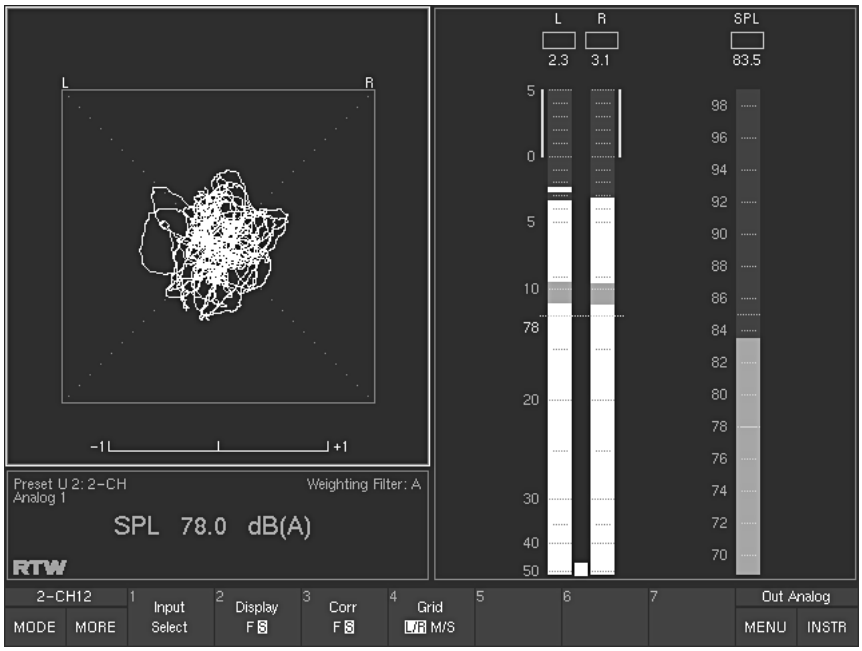


Fig. 5-17: The Audio Vectorscope instrument (VSC) in 2-Channel Stereo mode

- **Input Select**
  (Button/key 1, see Fig. 5-17)
  Selecting this function displays an additional menu for selecting the channel pair as input for the two-channel stereo vectorscope.

  - **2-Channel Stereo mode:**
    - L – R

- **Display**
  (Button/key 2, see Fig. 5-17)
  This function switches the display speed of the vectorscope between fast (F) and slow (S).

- **Corr**
  (Button/key 3, see Fig. 5-17)
  This function switches the display speed of the correlator between fast (F) and slow (S).

- **Grid**
  (Button/key 4, see Fig. 5-17)
  This function switches the vectorscope grid between L/R (left/right) and M/S (middle/side).

→ INSTR Focus on Window 3 (white frame) → MODE → CORR

5.5 The CORR Instrument

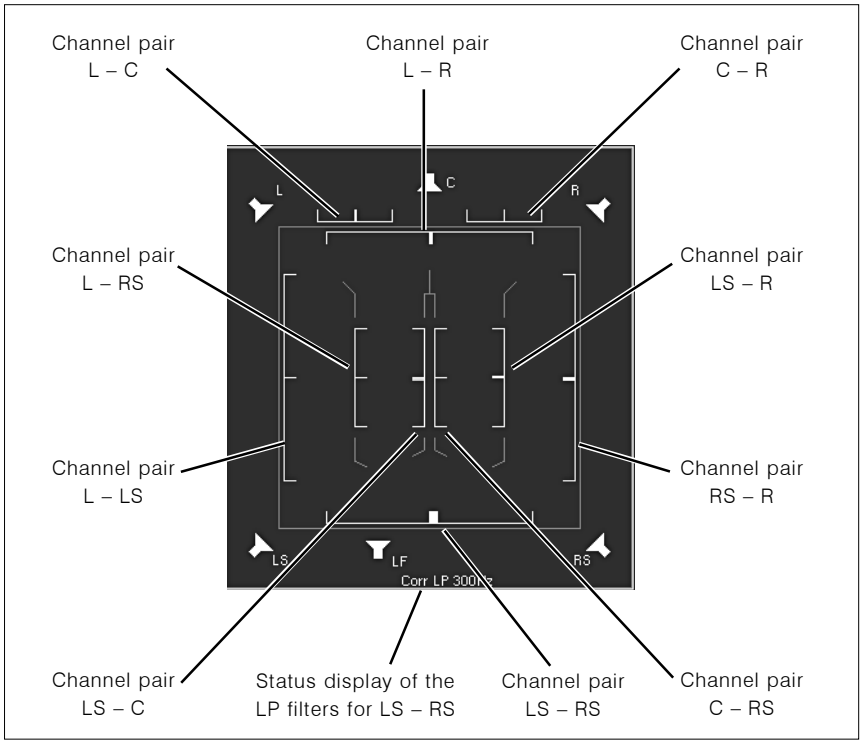


Fig. 5-18: The Correlator instrument (CORR) as multi-fold correlator in 5.1 surround mode



The CORR instrument is always displayed in Window 3. To select it assign the focus to it (indicated by a highlighted frame around the window) by pressing the **INSTR** key. When the focus is on this window the CORR functions are displayed in the Toolbar (Window 1).

- **Surround modes**

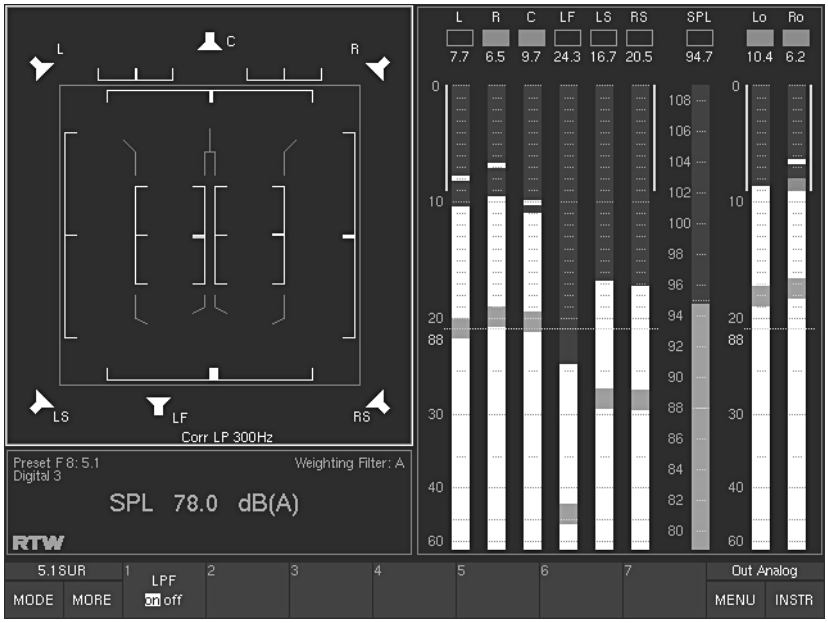


Fig. 5-19: The screen display with CORR instrument in 5.1 surround mode selected

With 5.1, 6.1 and 7.1 surround modes selected the CORR instrument shows a multi-fold correlator display and features 10 phase meters for all possible channel pairs graphically placed in the speaker setup of the respective surround mode. A low pass filter (300 Hz) can be activated and is represented in the LS/RS phase meter.
In 6.1 surround mode the system does not yet have a separate display for the surround center channel.
In 7.1 surround mode the levels of the additional front channels are mixed with those of the front center channel. There is only one common front center indicator. Example see Fig. 5-19 above.

- **Multi-Channel modes**

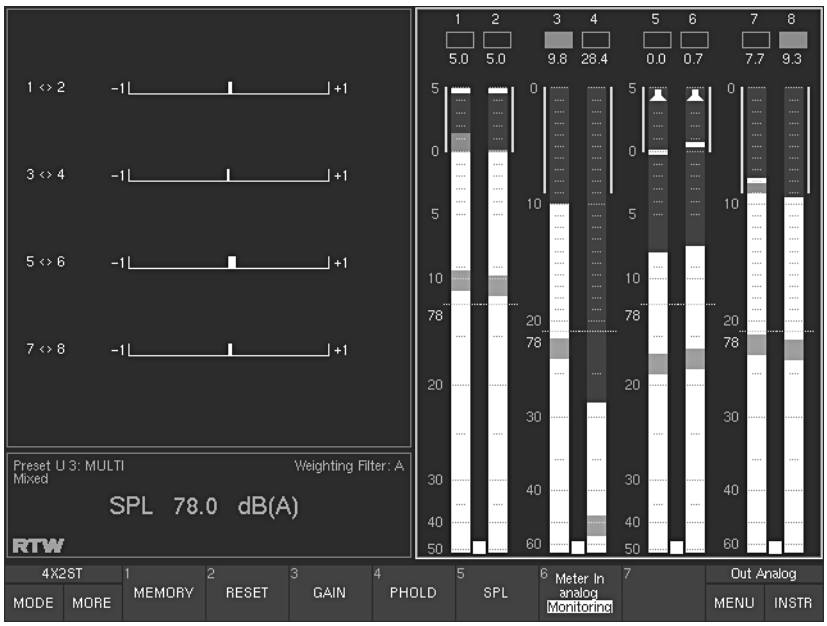


Fig. 5-20: The screen display with CORR instrument in Multi-Channel mode selected

In Multi-Channel modes the CORR instrument only displays the phase meters (up to four) of 2-Channel Stereo pairs marked in the Peak Program Meter with a spot correlator between the bargraphs.

- **2 Channel Stereo mode**
  The CORR instrument is not available. The phase meter is integrated in the Audio Vectorscope (VSC instrument, see Chapter 5.4).

See Chapter 5.4

5.5.1 The Functions of the CORR instrument

Functions are only available with 5.1, 6.1 and 7.1 surround modes

- **LPF**
  (Button/key 1, see Fig. 5-19)
  The LPF (Low Pass Filter) function which is only available in Surrond mode activates (on) or deactivates (off) the low pass filter (300 Hz) of the surround correlator. The current status is shown at the bottom left of the SSA window.

→ INSTR Focus on Window 3 (white frame) → MODE → RTA 1/3 or RTA 1/6

5.6 The RTA 1/3 and RTA 1/6 Instruments

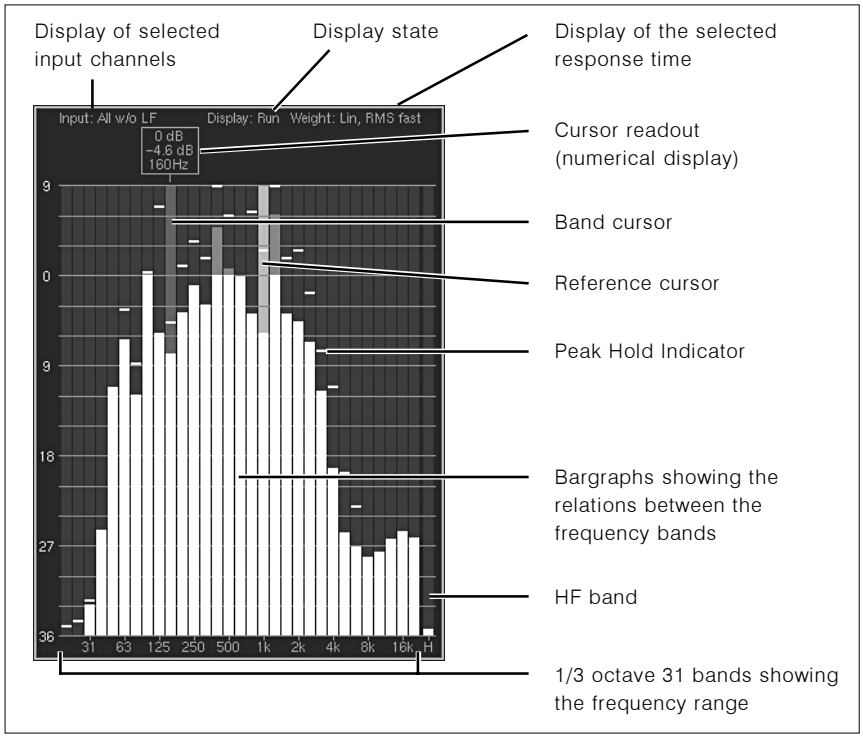


Fig. 5-21: The RTA 1/3 instrument as an example for the elements of the Real Time Analyzer instruments



The RTA instruments are always displayed in Window 3. To select them assign the focus to them (indicated by a highlighted frame around the window) by pressing the **INSTR** key. When the focus is on this window the RTA functions are displayed in the Toolbar (Window 1).

The **Real Time Analyzer** instruments display the spectral distribution of individual channels or channel groups.

- RMS integration time pursuant to IEC651
- RMS peak: Rise time 10 ms, fallback time same as a peakmeter
- Additional HF range for signal components above 20 kHz
- Display Hold function for easy evaluation
- Band Cursor with cursor readout to make the values more easily readable
- Reference Cursor function shows the difference between the current band and the reference band

When the RTA 1/3 instrument (31 bands) is activated it covers the Status Box (Window 4). The activated RTA 1/6 (61 bands) is the only instrument that covers also the Program Meter in Window 2.

5.6.1 Changing the parameters of the RTA

It is possible to customize some of the display elements shown in the RTA. To access the respective menu from normal display operation please proceed as following:

1. Press the **MENU** button/key, the unit changes to menu mode.

2. Use ^ or v button/key to set the menu focus on the Edit selected preset button and enter this selection by pressing the red **Sel** (SELECT) key.

3. Use < or > button/key to select the RTA menu tab. The **RTA Settings** menu is shown.

4. Use ^ or v button/key to set the menu focus on the check box, combo boxes and buttons of the options you want to change. Enter the selection by pressing the red **Sel** (SELECT) key.

5. Use the ^ and v buttons/keys to make the appropriate selections. Enter the selections by pressing the red **Sel** (SELECT) key. If you entered one of the buttons to change a color use the Close button on the color selection menu pages to get back to the **RTA Settings** menu page.

6. Click the **Safe & Exit** button or press the corresponding key to store the changes and leave the menu. The **Save Preset** menu page is displayed.

7. Press the red **Sel** (SELECT) key, if you want to select another User Preset as the displayed one. Use the ^ or v button/key to set the menu focus to the one you prefer and press the red **Sel** (SELECT) key.

8. If you want you can change the name of the preset. The button Change name opens a keyboard to enter the name you prefer.

9. Click the **Safe & Exit** button or press the corresponding key again. Now the changes are finally stored, the unit turns back to normal operation.

5.6.2. The functions of the RTA instruments

The functions and controls of the RTA 1/3 are identical to those of the RTA 1/6, only the input selection differs as desribed in the paragraphs below.

5.6.2.1 RTA functions in Surround modes

First function level:

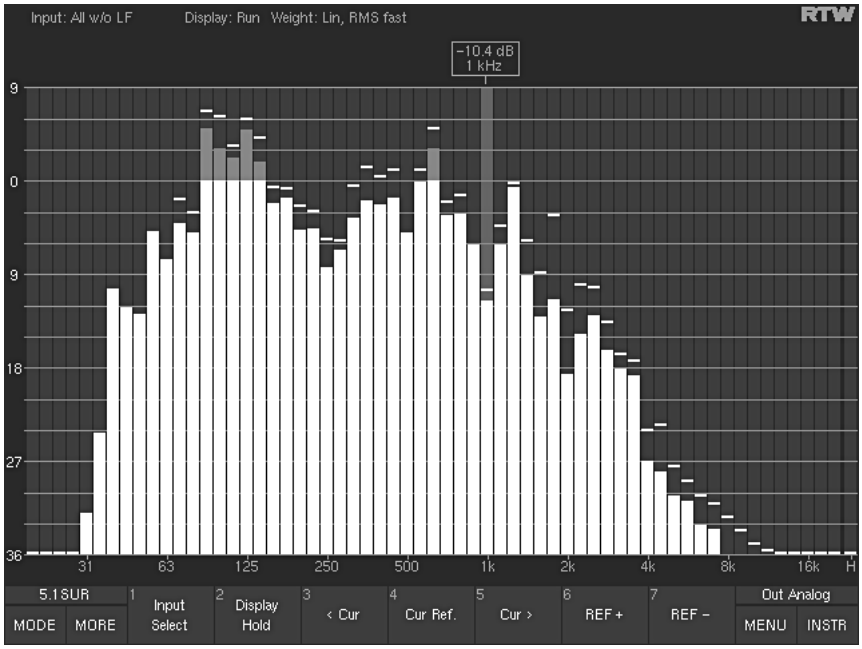


Fig. 5-22: First Toolbar function level of the RTA instruments in 5.1 Surround mode. Select MORE to display additional functions (level 2) (Example: RTA 1/6)

- **Input Select**
  (First level, button/key 1, see Fig. 5-22)
  This function displays an additional Toolbar level where you can select the input signal sources:

  - All w/o LF: All channels mixed, without LF, if selected in **RTA Settings** menu. Otherwise All is displayed here on the button and all channels including LF will be mixed and displayed in the RTA. (Button/key 1)
  - Single: Opens an additional level for selection of a single channel. When you then select a channel the Toolbar will switch back directly to the Function Select mode of the RTA. When you do not make a selection here but press the **Close** button you will get back to the previous level. (Button/key 2)
  - Front: Sum of the front channels (Button/key 3)
  - Rear: Sum of the surround channels (Button/key 4)

- L/R: Sum of L + R (Button/key 5)
- Close: Closes this level, if you want to go back without a selection (Button/key 6)

See Chapter 5.8.3

Note:
If the RTA 1/6 was activated from the CAL instrument (see Chapter 5.8.3), this button/key is labelled **Meter**. If you then press this button/key, the display turns back to the CAL instrument.

- **Display Hold**
  (First level, button/key 2, see Fig. 5-22)
  Selecting this function freezes the RTA display. A cursor readout is possible, but the buttons/keys **Ref+** and **Ref–** are disabled. This button/key has toggle function – select again to turn off **Display Hold**.

- **< Cur and Cur >**
  (First level, button/key 3 and button/key 5, see Fig. 5-22)
  These functions move the cursor to the previous or next frequency band in the RTA. You can also move the cursor to the left and right by clicking and dragging with the optional mouse.

- **Cur Ref**
  (First level, button/key 4, see Fig. 5-22)
  Selecting this function sets the current level of the selected frequency band as the reference value. If you then set the cursor on another band the difference between this band and the reference value is shown in the cursor readout.

- **Ref + and Ref –**
  (First level, button/key 6 and button/key 7, see Fig. 5-22)
  These functions enable you to shift the display's reference point for a clearer readout in the window. The RTA's level display is always relative.

→ MORE

Second function level (select MORE to activate):

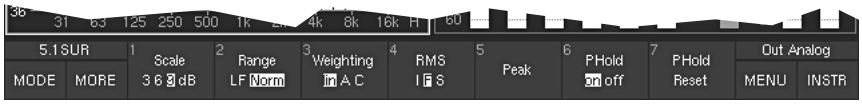


Fig. 5-23: Second Toolbar function level of the RTA instruments (displayed after selecting MORE) in Surround modes

- **Scale**
  (Second level, button/key 1, see Fig. 5-23)
  This function switches the display scale between 3, 6 and 9 dB divisions.

- **Range**
  (Second level, button/key 2, see Fig. 5-23)
  This function switches the frequency range of the RTA display between LF (5 Hz – 5 kHz) and Norm (20 Hz – 20 kHz).

- **Weighting**
  (Second level, button/key 3, see Fig. 5-23)
  This function allows you to select weighting filter A or C. Selecting lin (linear) deactivates the weighting filters.

- **RMS**
  (Second level, button/key 4, see Fig. 5-23)
  This function (toggle function linked to button/key 5 – **Peak**) changes the integration time of the RTA display's RMS detector, as follows:
  - I: Impulse
  - S: Slow
  - F: Fast (corresponds to IEC standard)

- **Peak**
  (Second level, button/key 5, see Fig. 5-23)
  This function (toggle function linked to button/key 4 – **RMS**) switches the display between peak integration with 10 ms and RMS integration.

- **PHold**
  (Second level, button/key 6, see Fig. 5-23)
  This function switches the peak hold display on or off.

- **PHold Reset**
  (Second level, button/key 7, see Fig. 5-23)
  This function clears the longterm memory, the peak hold memory and any stored digital errors.

5.6.2.2 RTA functions in Multi-Channel modes

In Multi-Channel modes the RTA inputs always follow the selected Listening Group which is marked with green loudspeaker symbols (see Fig. 5-24) in the Peak Program Meter.

Note:
If you want to select another Listening Group, please press and hold the **Output** key on the Remote Control 30050 (31900 series) resp. on the control panel of the 31960 series. Then the key labelling of the Toolbar changes and shows the available listening Groups. Select the one you want to use and loose the **Output** key. Maybe you have to press the **INSTR** button/key to go back to the VSC instrument and its functions (see Chapter 4.3.14 for a detailed description how to proceed).

See Chapter 4.3.14

The available functions are placed on other buttons/keys than in Surround or 2-Channel Stereo modes.

Note:
If the RTA 1/6 is called from the CAL instrument, then the positions of the functions are the same as described for the Surround or 2-Channel Stereo modes (see Chapters 5.6.2.1 or 5.6.2.3).

See Chapter 5.6.2.1 or 5.6.2.3

First function level:

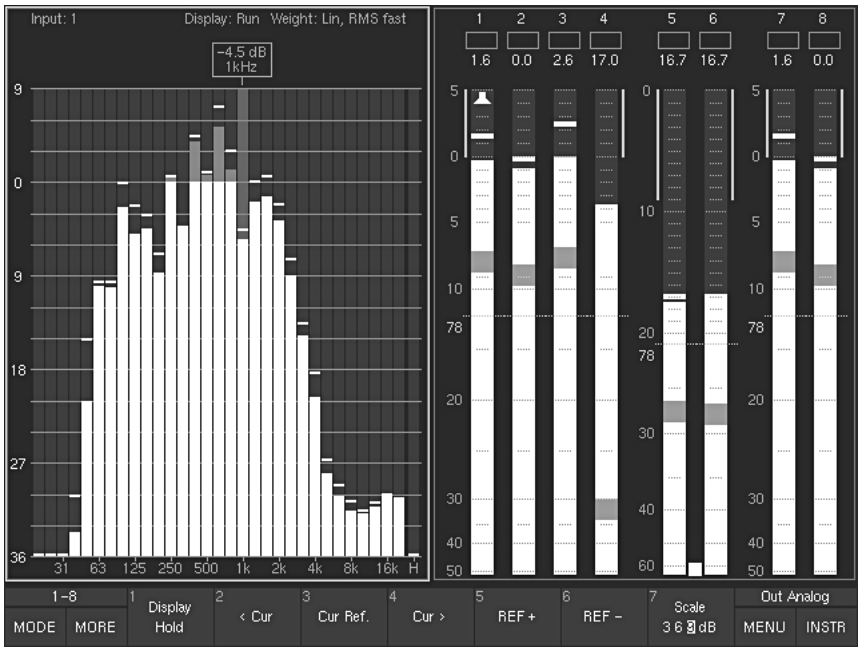


Fig. 5-24: First Toolbar function level of the RTA instruments in Multi-Channel mode. Select MORE to display additional functions (level 2)

- **Display Hold**
  (First level, button/key 1, see Fig. 5-24)
  Selecting this function freezes the RTA display. A cursor readout is possible, but the buttons/keys **Ref+** and **Ref–** are disabled. This button/key has toggle function – select again to turn off **Display Hold**.

- **< Cur and Cur >**
  (First level, button/key 2 and button/key 4, see Fig. 5-24)
  These functions move the cursor to the previous or next frequency band in the RTA. You can also move the cursor to the left and right by clicking and dragging with the optional mouse.

- **Cur Ref**
  (First level, button/key 3, see Fig. 5-24)
  Selecting this function sets the current level of the selected frequency band as the reference value. If you then set the cursor on another band the difference between this band and the reference value is shown in the cursor readout.

- **Ref + and Ref –**
  (First level, button/key 5 and button/key 6, see Fig. 5-24)
  These functions enable you to shift the display's reference point for a clearer readout in the window. The RTA's level display is always relative.

- **Scale**
  (First level, button/key 7, see Fig. 5-24)
  This function switches the display scale between 3, 6 and 9 dB divisions.

→ MORE

Second function level (select MORE to activate):



Fig. 5-25: Second Toolbar function level of the RTA instruments (displayed after selecting MORE) in Multi-Channel mode

- **Range**
  (Second level, button/key 1, see Fig. 5-25)
  This function switches the frequency range of the RTA display between LF (5 Hz – 5 kHz) and Norm (20 Hz – 20 kHz).

- **Weighting**
  (Second level, button/key 2, see Fig. 5-25)
  This function allows you to select weighting filter A or C. Selecting lin (linear) deactivates the weighting filters.

- **RMS**
  (Second level, button/key 3, see Fig. 5-25)
  This function (toggle function linked to button/key 5 – **Peak**) changes the integration time of the RTA display's RMS detector, as follows:
  - I: Impulse
  - S: Slow
  - F: Fast (corresponds to IEC standard)

- **Peak**
  (Second level, button/key 4, see Fig. 5-25)
  This function (toggle function linked to button/key 4 – **RMS**) switches the display between peak integration with 10 ms and RMS integration.

- **PHold**
  (Second level, button/key 5, see Fig. 5-25)
  This function switches the peak hold display on or off.

- **PHold Reset**
  (Second level, button/key 6, see Fig. 5-25)
  This function clears the longterm memory, the peak hold memory and any stored digital errors.

5.6.2.3 RTA functions in 2-Channel Stereo mode

First function level:

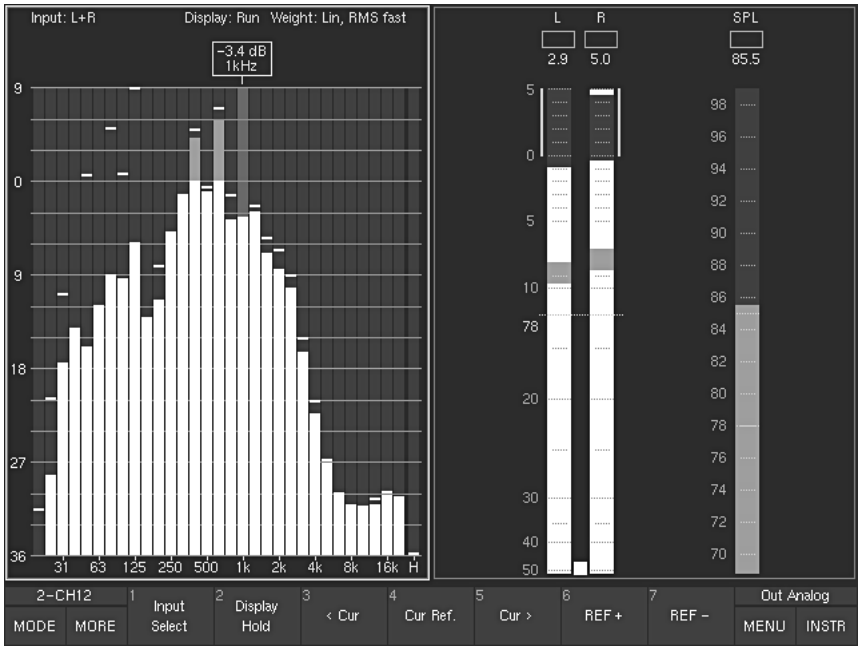


Fig. 5-26: First Toolbar function level of the RTA instruments in 2-Channel Stereo mode. Select MORE to display additional functions (level 2)

- **Input Select**
  (First level, button/key 1, see Fig. 5-26)
  This function displays an additional Toolbar level where you can select the input signal sources. When you then select a channel the Toolbar will switch back directly to the Function Select mode of the RTA. When you do not make a selection here but press the **Close** button you will get back to the previous level.

  - L: Left channel L
  - R: Right channel R
  - L+R: Sum of L + R
  - Close: Closes this level, if you want to go back without a selection

See Chapter 5.8.3

Note:
If the RTA 1/6 was activated from the CAL instrument (see Chapter 5.8.3), this button/key is labelled **Meter**. When you then press this button/key the display turns back to the CAL instrument.

- **Display Hold**
  (First level, button/key 2, see Fig. 5-26)
  Selecting this function freezes the RTA display. A cursor readout is possible but the buttons/keys **Ref+** and **Ref–** are disabled. This button/key has toggle function – select again to turn off **Display Hold**.

- **< Cur and Cur >**
  (First level, button/key 3 and button/key 5, see Fig. 5-26)
  These functions move the cursor to the previous or next frequency band in the RTA. You can also move the cursor to the left and right by clicking and dragging with the optional mouse.

- **Cur Ref**
  (First level, button/key 4, see Fig. 5-26)
  Selecting this function sets the current level of the selected frequency band as the reference value. If you then set the cursor on another band the difference between this band and the reference value is shown in the cursor readout.

- **Ref + and Ref –**
  (First level, button/key 6 and button/key 7, see Fig. 5-26)
  These functions enable you to shift the display's reference point for a clearer readout in the window. The RTA's level display is always relative.

→ MORE

Second function level (select MORE to activate):

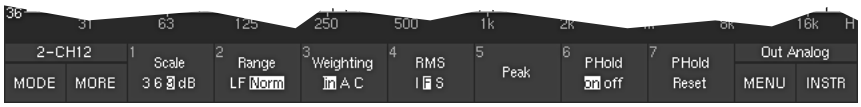


Fig. 5-27: Second Toolbar function level of the RTA instruments (displayed after selecting MORE) in 2-Channel Stereo mode

- **Scale**
  (Second level, button/key 1, see Fig. 5-27)
  This function switches the display scale between 3, 6 and 9 dB divisions.

- **Range**
  (Second level, button/key 2, see Fig. 5-27)
  This function switches the frequency range of the RTA display between LF (5 Hz – 5 kHz) and Norm (20 Hz – 20 kHz).

- **Weighting**
  (Second level, button/key 3, see Fig. 5-27)
  This function allows you to select weighting filter A or C. Selecting lin (linear) deactivates the weighting filters.

- **RMS**
  (Second level, button/key 4, see Fig. 5-27)
  This function (toggle function linked to button/key 5 – **Peak**) changes the integration time of the RTA display's RMS detector, as follows:
  - I: Impulse
  - S: Slow
  - F: Fast (corresponds to IEC standard)

- **Peak**
  (Second level, button/key 5, see Fig. 5-27)
  This function (toggle function linked to button/key 4 – **RMS**) switches the display between peak integration with 10 ms and RMS integration.

- **PHold**
  (Second level, button/key 6, see Fig. 5-27)
  This function switches the peak hold display on or off.

- **PHold Reset**
  (Second level, button/key 7, see Fig. 5-27)
  This function clears the long-term memory, the peak hold memory and any stored digital errors.

→ INSTR Focus on Window 3 (white frame) → MODE → DOWNMIX

5.7 The DOWNMIX Instrument

The Downmix instrument is **only** available in Surround mode!

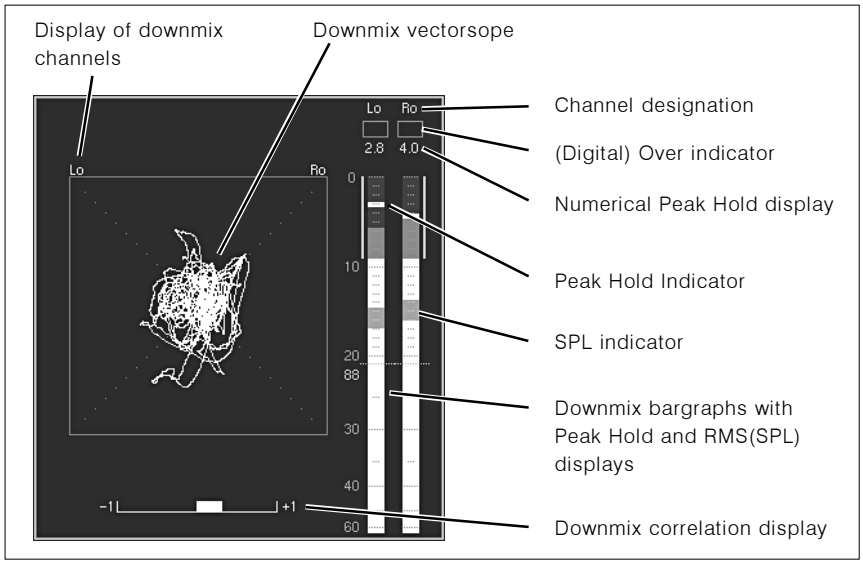


Fig. 5-28: The 2-Channel Downmix Meter instrument (DOWNMIX)



The DOWNMIX instrument is always displayed in Window 3. To select it assign the focus to it (indicated by a highlighted frame around the window) by pressing the **INSTR** key. When the focus is on this window the DOWNMIX functions are displayed in the Toolbar (Window 1).

The **(Two-Channel) Downmix Meter** instrument displays the levels and the correlation of the internally-generated two-channel downmix signal. It either can be metered and switched to the front loudspeakers or directly given out via the output connectors and then be monitored with the Downmix Meters. The instrument also features an audio vectorscope function.

5.7.1 Background – the Downmix Matrix

The Downmix Matrix

A stereo-compatible 2-channel signal is downmixed from the surround channels using adjustable factors. In 5.1 format the surround channels LS and RS are output to the left and right channels, and the Center channel is mixed into both channels with the same level on each side. It is advisable to apply an attenuation of 3 dB for the Center channel.

The SurroundControl units make the 2-channel signal available as Downmix Direct Out (designations: DLo, DRo, DMo) and Downmix Volume Out (VLo, VRo). The Direct Out signal is generated independently of all the channel functions and can be used for recording or as a parallel signal for transmission as a stereo broadcast. The Volume signal is used for monitoring and is thus routed via the Monitoring Controller. You can switch this signal to the L/R channels of the main monitoring system with the **2C** key (see Chapter 4.3.6) on the Remote Control 30050 (31900 series) resp. the control panel of the 31960 series. All other channels are then muted. Alternatively, you can switch the signal to your own outputs with the **Output** key, for example when you want to monitor it on your own loudspeaker system. The necessary settings are made in the **Input**/**Output Routing** menus (see Chapters 6.3.2 and 6.5).

See Chapter 4.3.6

See Chapter 6.3.2 and 6.5

Downmix in 6.1 and 7.1 Surround Format

The total number of input and output channels is limited to 8 per domain or group. Because of this there are a number of points you need to observe in connection with the downmix for 6.1 and 7.1 formats (see the section below for details).

The Lext/Rext Channels

There are a number of points you need to observe when using the additional external channels, depending on the surround format. Since you have eight channels per domain 5.1 format is not a problem: the unit is able to manage the six surround channels and the two additional channels internally as a group. However, since the 6.1 and 7.1 formats require seven and eight inputs, respectively, it is not possible to configure the external channels in the same channel group. This is particularly important for the outputs, where the additional channels must be placed in the other domain (when using analog signals) or in the other connector (when using digital signals). This can be configured in the **Monitoring Output Routing** settings (see Chapter 6.5.3).

See Chapter 6.5.3

Example: 7.1 output analog; if you wish to use Lext/Rext (and possibly also Lo/Ro, see below) you must configure them in the digital domain.

The Lo/Ro Channels

When the surround signal is mixed to form a stereo-compatible two-channel mix the internal channels Lo/Ro are generated in the internal downmix matrix. These channels can be displayed in a separate instrument (the Downmix Meter) in the left instrument window, which is Window 3 (level, SPL, correlation and audio vectorscope). You can also display the levels of channels Lo/Ro in the peakmeters. When the downmix matrix is activated these channels can be routed to the outputs as DLo/DRo (Direct Out) and they are independent of the volume control on the Remote Control 30050 (31900

series) resp. the control panel of the 31960 series. In addition to these channels you also have the channels VLo/VRo (VOL), which are controlled by the volume control and can also be routed to the outputs for monitoring. The VLo/VRo channels also have a Solo function, which can switch the VLo/VRo signals either to separate outputs or to the front loudspeakers L and R, which then mutes all other channels. In practice this means you can monitor the 2-channel downmix either on the main monitors or on a second speaker set, for example on nearfield monitor speakers.

Routing configuration

The routing settings described above can be configured with the buttons Meter Input Routing (see Chapter 6.5.1), Monitoring Input Routing (see Chapter 6.5.2) and Monitoring Output Routing (see Chapter 6.5.3) in the **Input/Output Routing** menus (see Chapters 6.3.2 and 6.5). All routing settings can be configured independently for the surround formats .

See Chapter 6.5.1
See Chapter 6.5.2/6.5.3
See Chapter 6.3.2 and 6.5

5.7.2 Changing the parameters of the Downmix Meter

Many parameters of the DOWNMIX instrument can be changed in the Downmix Routing section of the Monitoring Input Routing menus (see Chapter 6.5.2.9).

See Chapter 6.5.2.9

To access these menus from normal display operation please proceed as following:

1. Press the **MENU** button/key, the unit changes to menu mode.

2. Use ^ or v button/key to set the menu focus on the Edit selected preset button and enter this selection by pressing the red **Sel** (SELECT) key.

3. Use < or > button/key to select the Local Input/Output Routing and Instrument Settings menu tab. The **Local Routing Settings** menu is shown.

4. Use ^ or v button/key to set the menu focus on the Monitoring Input Routing button and enter this selection by pressing the red **Sel** (SELECT) key.

5. Use ^ or v button/key to set the menu focus on the Source combo box of the **Downmix Routing** section and enter this selection by pressing the red **Sel** (SELECT) key.

6. Use ^ or v button/key to set the focus on the input source you want to use for the Downmix. Enter this selection by pressing the red **Sel** (SELECT) key.

7. Use ^ or v button/key to set the menu focus on the Downmix and Peakmeter Settings button. By pressing this selection with the red **Sel** (SELECT) key you enter the **Two Channel Downmix** Settings menu.

8. Use ^ or v button/key to set the menu focus on one of the list boxes of the **Downmix Parameter** frame or the buttons and combo boxes of the **Downmix Vectorscope** frame. Enter the selections by pressing the red **Sel** (SELECT) key.

9. Use ^ or v button/key to select the parameter you need. Enter the selections by pressing the red **Sel** (SELECT) key. On the **Choose a Color** menu page use the Close button to turn back to the **Two Channel Downmix Settings** menu.

10. Back on the **Two Channel Downmix Settings** menu page use ^ or v button/key to set the menu focus on the Channel Group button, if you want to change the parameters for the downmix peakmeter. Enter this selection by pressing the red **Sel** (SELECT) key.

11. On the **Channel Group** menu page you now can select the combo boxes, list boxes, check boxes and buttons by using the ^ and v buttons/keys to make the appropriate changes like measuring standards, scales, color setups and others for the individual channels. Enter the selections by pressing the red **Sel** (SELECT) key.

12. Click the **Safe & Exit** button or press the corresponding key to store the changes and leave the menu. The **Save Preset** menu page is displayed.

13. Press the red **Sel** (SELECT) key, if you want to select another User Preset as the displayed one. Use the ^ or v button/key to set the menu focus to the one you prefer and press the red **Sel** (SELECT) key.

14. If you want you can change the name of the preset. The button Change name opens a keyboard to enter the name you prefer.

15. Click the **Safe & Exit** button or press the corresponding key again. Now the changes are finally stored, the unit turns back to normal operation.

5.7.3 The functions of the DOWNMIX instrument

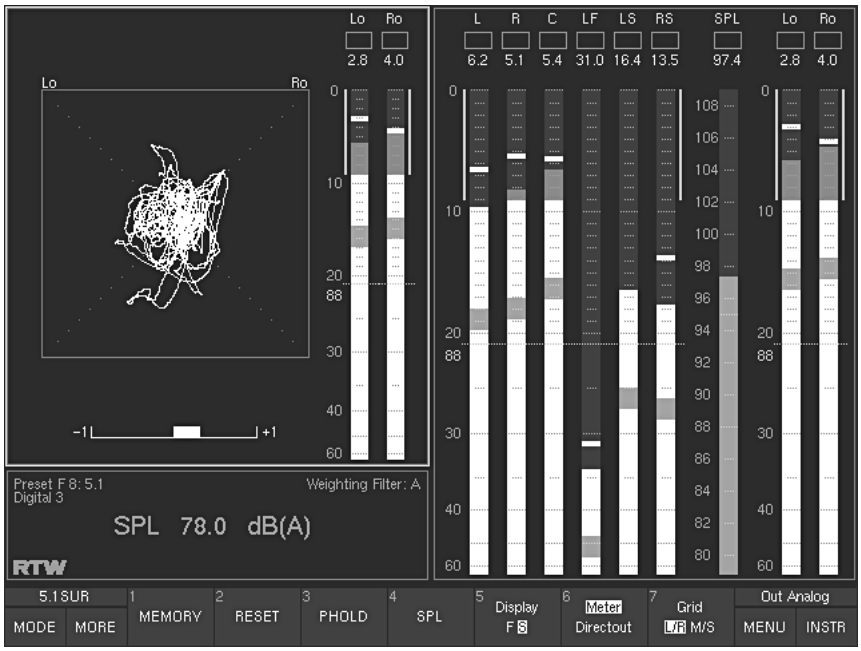


Fig. 5-29: The screen display with DOWNMIX instrument selected

Note:
The functions described below all apply only to the Downmix Meter in Window 3 (highlighted frame). None of these functions have any effect on the Peak Program Meter displayed in Window 2. Please check that the highlighted frame is on Window 3 before you use a function of the Downmix instrument. Maybe you have to press the **INSTR** button/key to set the highlighted frame to Window 3.

- **MEMORY**
  (Button/key 1, see Fig. 3-13)
  Depending on the current setting this function activates the numerical display of the long-term memory for maximum level, volume level, most negative correlation or digital errors.

- **RESET**
  (Button/key 2, see Fig. 5-29)
  This function deletes the longterm memory, the peak hold memory and any stored digital errors.

- **PHOLD**
  (Button/key 3, see Fig. 5-29)
  This function switches the peak hold display on or off.

- **SPL**
  (Button/key 4, see Fig. 5-29)
  This function activates or deactivates the volume (sound pressure level) display.

- **Display**
  (Button/key 5, see Fig. 5-29)
  This function switches the display speed of the vectorscope between fast (F) and slow (S).

- **Meter/Directout**
  (Button/key 6, see Fig. 5-29)
  With this function the source for the display of the downmix signals can be selected:
  - Meter: The signal source can be the analog or digital domain and the internal generated downmix signals are displayed. These signals cannot be routed to the outputs.
  - Directout: The values of the internal generated downmix signals present on the digital output (see Fig. 7-4) are displayed.

See Fig. 7-4

- **Grid**
  (Button/key 7, see Fig. 5-29)
  This function switches the vectorscope grid between L/R (left/right) and M/S (middle/side).

→ INSTR Focus on Window 3 (white frame)
→ MODE
→ MONITORING

5.8 The MONITORING Instrument

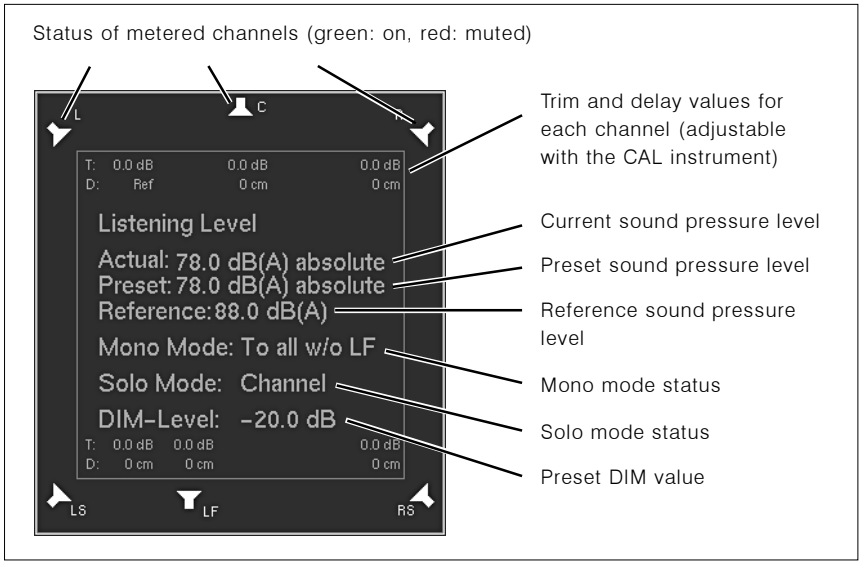


Fig. 5-30: The Monitoring Instrument (MONITORING)



The MONITORING instrument is always displayed in Window 3. To select it assign the focus to it (indicated by a highlighted frame around the window) by pressing the **INSTR** key. When the focus is on this window the MONITORING functions are displayed in the Toolbar (Window 1).

This instrument is used to manage the functions configuration settings of the **Monitoring Controller**.
When the MONITORING instrument is activated a window is displayed showing symbols for the loudspeakers and the values of the level trim offset, the delay, the listening level setting, the reference level, the dimming level and the selected mode for the generation of the mono signal.

The **Monitoring Controller** consists of an 8-channel level control and an internal routing matrix for executing the various functions like Solo, Cut, Channel Swap and Phase Reverse for each channel.

- Supports surround formats 3.1, 5.1, 6.1 and 7.1
- 8-channel digital volume control with preset function
- Calibrated volume display
- Channel functions:
  - Solo
  - Cut
  - Channel Swap (individual channels and all channels)
  - Rear-to-Front
  - Phase Reverse
  - Mono (several modes)
  - Level Trim for every surround monitoring output, analog and digital
  - adjustable Delay for every surround monitoring output, analog and digital

- Downmix outputs DLo/DRo (Direct Downmix Out, independent of volume controls) and VLo/VRo VOL for listening via volume controls
- DIM key with adjustable dimming (attenuation)

Note:
For the control of these options the use of the Remote Control 30050 (31900 series) resp. the control panel on the right of the 31960 series is required. See Chapter 4 for a detailed description.

See Chapters 4 and 6

The CAL Instrument as an important sub-function of the Monitoring instrument provides an 8-channel test signal generator and an SPL meter for calibration of the monitoring system. The test signal generator can generate either sine wave signals or pink noise with a variety of bandwidths and levels. The values required for calibration to the various standards are preset, but you can also use variable values.
The SurroundControl units' SPL meter enables you to perform the sound pressure level (SPL) measurements that are necessary to calibrate the sound monitoring system. The units are also fitted with a calibration microphone preamplifier with settings for two different microphone types (i. e. beyerdynamic's MM-1 or Behringer's ECM 8000).

The main options are also available with Multi-Channel and 2-Channel Stereo modes.

5.8.1 Changing parameters

The multifaceted options for controlling the functions of the Monitoring instrument can be found on the different menu pages. Please refer to the detailed descriptions in this Chapter beneath and in Chapters 4 and 6.

See Chapters 4 and 6

5.8.2 The functions of the MONITORING instrument

First function level:

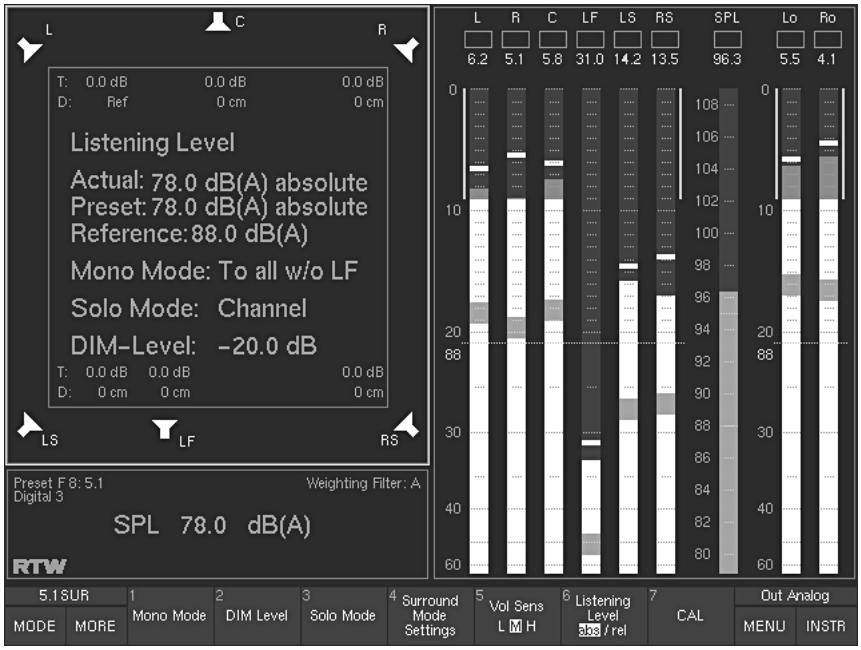
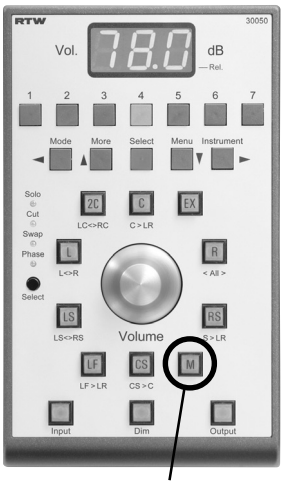


Fig. 5-31: First Toolbar function level of the MONITORING instrument. Select MORE to display additional functions (level 2)



M key on the Remote Control 30050
M key also see Figs. 4-2 and 4-3

- **Mono Mode**
  (First level, button/key 1, see Fig. 5-31)
  This function enables you to select which loudspeaker you want to send the mono signal to when you press the **M** key on the Remote Control 30050 unit (31900 series, see illustration on the left and Fig. 4-3 in Chapter 4) resp. the control panel of the 31960 series (see Figs. 4-2 and 4-3 in Chapter 4). Selecting this function opens a new function level in the Toolbar with the following button/key assignments:

  - Center (only with Surround modes) (Button/key 1)
  - L (Button/key 2)
  - R (Button/key 3)
  - L + R (Button/key 4)
  - All resp. All w/o LF (only with Surround modes) (Button/key 5)
  - Close (return to previous level) (Button/key 6)

  The selection is activated immediately. After you make your selection the Toolbar remains displayed to allow you to compare the effects of different settings. You must select button/key **6 Close** to switch back to the previous function level.



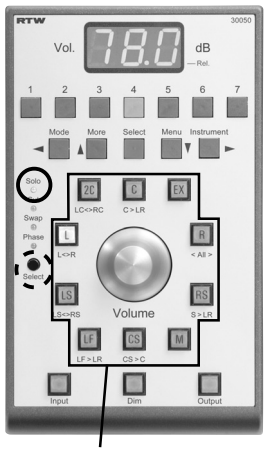
DIM key on the Remote Control 30050
DIM key also see Figs. 4-2 and 4-3 and Chapter 4.3.13

- **DIM Level**
  (First level, button/key 2, see Fig. 5-31)
  This function is used to set the amount of dimming (level attenuation) applied when you press the **DIM** key on the Remote Control 30050 unit (31900 series, see illustration on the left and Fig. 4-3 in Chapter 4, description in Chapter 4.3.13) resp. the control panel of the 31960 series (see Figs. 4-2 and 4-3 in Chapter 4) or by an external control signal. Selecting this function opens an additional function level in the Toolbar with the following button/key assignments:

  - +10 dB (Button/key 1)
  - +1 dB (Button/key 2)
  - –1 dB (Button/key 3)
  - –10 dB (Button/key 4)

  Pressing button/key 1 through 4 increases or decreases the setting by the corresponding value. The result is displayed in Window 3. Activating the Mute function (button/key 5) switches the display off.

  - Mute: Defines the function of the **DIM** key on the Remote Control 30050 unit (31900 series) resp. the control panel of the 31960 series: (Button/key 5)
    - On: The **DIM** key controls the Mute function. When it is pressed the Monitoring Controller's output signal is muted.
    - Off: When the **DIM** key is pressed the Monitoring Controller's output signal is dimmed with defined values
  - Moment: Defines the switching behaviour of the **DIM** key on the Remote Control 30050 (31900 series) resp. the control panel of the 31960 series: (Button/key 6)
    - On: The **DIM** function remains active only while the **DIM** key is pressed and holded.
    - Off: Pressing the **DIM** key switches the **DIM** function on or off. On the Remote Control 30050 the current status is indicated by the light in the key.
  - Close: Returns you to the previous Toolbar function level. (Button/key 7)



Channel keys on the Remote Control 30050: L is solo
Also see Figs. 4-2 and 4-3

- **Solo Mode**
  (First level, button/key 3, see Fig. 5-31)
  This function enables you to select the loudspeaker you want to send the solo signal to when you press the one of the channel keys on the Remote Control 30050 unit (31900 series, see illustration on the left and Fig. 4-3 in Chapter 4) resp. the control panel of the 31960 series (see Figs. 4-2 and 4-3 in Chapter 4). Selecting this function opens an additional function level in the Toolbar with the following button/key assignments:

  - Channel: the channel can be listened "solo in place", the selected solo signal is sent to the corresponding loudspeaker (Button/key 1)
  - L: the selected solo signal is always sent to the left loudspeaker (Button/key 2)
  - R: the selected solo signal is always sent to the right loudspeaker (Button/key 3)
  - L + R: the selected solo signal is always sent to the left and right loudspeakers (Button/key 4)
  - Center: the selected solo signal is always sent to the center loudspeaker (Button/key 5)
  - Close: return to previous level (Button/key 6)

  Note:
  When one of the options with preassigned loudspeakers for the solo signal is selected, the Status Box in Window 4 additionally notifies the selected Solo mode.

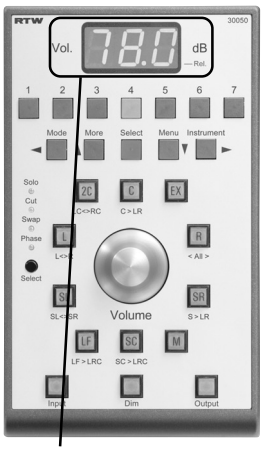
  The selection is activated immediately. After you make your selection the Toolbar remains displayed to allow you to compare the effects of different settings. You must select button/key **6 Close** to switch back to the previous function level.

- **Surround Mode Settings**
  (First level, button/key 4, see Fig. 5-31)
  Selecting this function opens an additional function level in the Toolbar with the following button/key assignments:

  - LF Boost: This function boosts the output level of the LF channel by 10 dB (SMPTE Rec). This does not have any effect on the peakmeter displays. (Button/key 1)
  - Sur –3 dB: This function reduces the level of the surround channels by 3 dB (SMPTE recommendation for Mono Surround). (Button/key 2)
  - Close: Returns you to the previous Toolbar function level. (Button/key 3)

  The selection is activated immediately. After you make your selection the Toolbar remains displayed to allow you to compare the effects of different settings. You must select button/key **3 Close** to switch back to the previous function level.

See Chapter 4.3.11



Display on the Remote Control 30050
Also see Figs. 4-2 and 4-3 and Chapter 4.3.1

- **Vol Sens**
  (First level, button/key 5, see Fig. 5-31)
  This function adjusts the sensitivity of the volume control on the Remote Control 30050 unit (31900 series) resp. the control panel of the 31960 series (also see Chapter 4.3.11):
  - L: Low
  - M: Medium
  - H: High

- **Listening Level**
  (First level, button/key 6, see Fig. 5-31)
  This function switches the listening level displayed on the Remote Control 30050 unit (31900 series), in the Status Box in Window 4 and in the MONITORING instruments display in Window 3 between absolute and relative (in relation to the set reference value). On the Remote Control 30050 display the current mode is indicated by the decimal point of the rightmost digit (see illustration on the left and Fig. 4-2 in Chapter 4, detailed description in Chapter 4.3.1). On the Status Box in Window 4 the absolute value is displayed with dB(A) (if this is the reference), the relative value with dB only. Then also negative values can be displayed.

- **CAL**
  (First level, button/key 7, see Fig. 5-31, not available in 2-Channel Stereo mode)
  This function activates the CAL instrument for calibration of the monitoring functions (see Chapter 5.8.3 for a detailed description).

Detailed description in Chapter 5.8.3

→ MORE

Second function level (select MORE to activate):

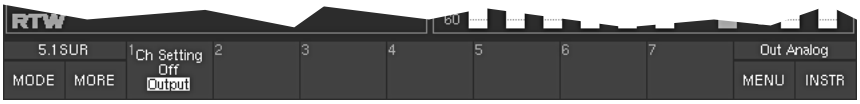


Fig. 5-32: Second Toolbar function level of the MONITORING instrument (displayed after selecting MORE)

- **Ch Setting**
  (Second level, button/key 1, see Fig. 5-32, in 2-Channel Stereo mode on first level, button/key 7))
  This function sets the display mode for the trim and delay values:
  - Off: No display
  - Output: Shows the values set for the outputs

→ INSTR Focus on Window 3 (white frame) → MODE
→ MONITORING
→ CAL

5.8.3 The functions of the CAL Instrument

The signal form and level are selected with the function keys. Switching the test signal to the desired outputs is easiest with the channel keys on the Remote Control 30050 unit (31900 series) resp. the corresponding keys on the control panel of the 31960 series. When you activate the CAL instrument all loudspeakers are automatically muted (indicated by red speaker symbols in Window 3). The default test signal is pink noise with a bandwidth of 20 Hz – 20 kHz and a level of –18 dB FS RMS. The SPL meter is displayed in Window 2 and the calibration microphone input is active.

First function level:

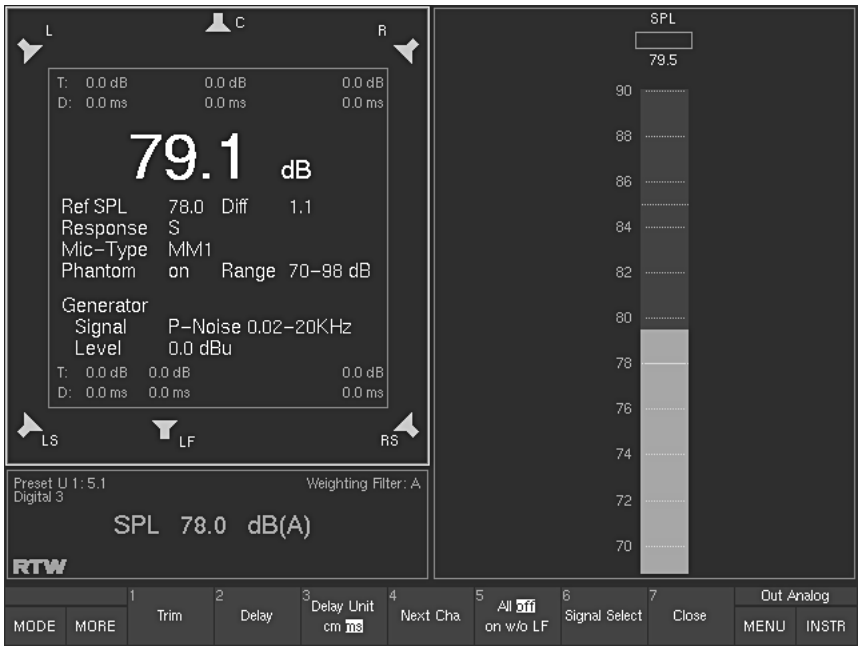
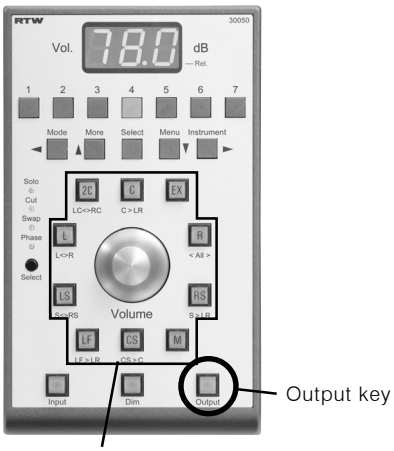


Fig. 5-33: First Toolbar function level of the CAL instrument. Select MORE to display additional functions (level 2)

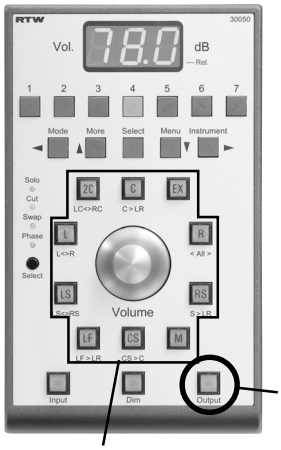


Output key

Channel keys and volume control on the Remote Control 30050
Also see Figs. 4-2 and 4-3

See Chapters 4.3.14 and 6.6 and Fig. 5-2

- **Trim**
  (First level, button/key 1, see Fig. 5-33)
  The **Trim** function allows you to adjust the levels of individual speaker channels to accommodate the acoustic properties of the listening room. To select the channel or channels for which you want to adjust the trim values press the corresponding keys on the Remote Control 30050 unit (31900 series, see illustration on the left and Fig. 4-3 in Chapter 4) resp. the control panel of the 31960 series (see Figs. 4-2 and 4-3 in Chapter 4). You can then adjust the trim value for the selected channel(s) by holding down the **Trim** key (button/key 1) and simultaneously turning the Volume control on the Remote Control 30050 (31900 series) resp. on the control panel of the 31960 series. Trim values also can be set on the Audio System menu tab (see Chapter 6.6).
  You can set different trim values for the analog and digital outputs. The output is selected with the Output key (see Chapter 4.3.14) on the Remote Control 30050 unit (31900 series) resp. the control panel of the 31960 series or by clicking the corresponding button in the Toolbar (see Fig. 5-2 in Chapter 5.1.1) with the optional mouse.



Output key

Channel keys and volume control on the Remote Control 30050
Also see Figs. 4-2 and 4-3

See Chapters 4.3.14 and 6.6 and Fig. 5-2

- **Delay**

  (First level, button/key 2, see Fig. 5-33)

  The **Delay** function allows you to adjust the delay applied to the individual loudspeaker channels to accommodate the acoustic properties of the listening room.

  When you select **cm** as the units for setting the delay (see **Delay Unit** below) the left front speaker (L) is used as the reference point. Loudspeaker positioning according to the ITU standard is assumed as the basis. Deviations from this ideal circle can be set for all loudspeaker positions as positive (larger) and negative (smaller) distance values in cm.

  When you select **ms** as the units for setting the delay (see **Delay Unit** below) you can set individual time delay values for all speaker channels. To select one or more channels to adjust press the corresponding keys on the Remote Control 30050 unit (31900 series, see illustration on the left and Fig. 4-3 in Chapter 4) resp. the control panel of the 31960 series (see Figs. 4-2 and 4-3 in Chapter 4). You can then adjust the delay value for the selected channel(s) by holding down the **Delay** key (button/key 2) and simultaneously turning the Volume control on the Remote Control 30050 unit (31900 series) resp. the control panel of the 31960 series or by setting them on the Audio System menu tab (see Chapter 6.6).

  You can set different delay values for the analog and digital outputs. The output is selected with the **Output** key (see Chapter 4.3.14) on the Remote Control 30050 unit (31900 series) resp. the control panel of the 31960 series or by clicking the corresponding button in the Toolbar (see Fig. 5-2 in Chapter 5.1.1) with the optional mouse.

- **Delay Unit**

  (First level, button/key 3, see Fig. 5-33)

  This function sets the units for the delay setting:

  - cm: Deviation of the loudspeaker's position from the ITU ideal position in cm
  - ms: Allows you to set the desired delay individually for each channel

You can enter both negative and positive values for the distance delay:

- Entering positive values delays the selected channel and moves it back acoustically.
- Entering negative values leaves the selected channel unchanged and applies the select delay value to all the other channels (compare with the displayed values in the Audio System menu tab, description see Chapter 6.6). This delays all channels except the selected channel, thus moving the selected channel forward acoustically.

  Caution! This can cause synchronisation problems with sound that is synced to the picture!

Important! Always allow for the standard delays applied to the signal by the SurroundControl units according to the selected mode and sampling frequency, as shown in the table!

Delay	Digital to Digital	Digital to Analog	Analog to Digital	Analog to Analog
	Delay in Frames:			
	9	54	73	118
Sampling Frequency	**Delay in ms**			
44.1 kHz	0.2043	1.2258	1.6571	2.6786
48 kHz	0.1872	1.1232	1.5184	2.4544
96 kHz	0.0936	0.5616	0.7592	1.2272

- **Next Cha**
  (First level, button/key 4, see Fig. 5-33)
  This function switches the test signal to the next channel (all other channels are muted). If no channel is currently active the sequence begins with channel L. Switching is performed clockwise.

- **All**
  (First level, button/key 5, see Fig. 5-33)
  This function selects the test signal configuration for all speakers as follows:
  - Off: Switches the test signal off
  - On: Switches the test signal to all outputs including LF
  - w/o LF: Switches the test signal to all outputs except LF

- **Signal Select**
  (First level, button/key 6, see Fig. 5-33)

Detailed description in Chapter 5.8.4

This function opens a new Toolbar function level with the functions of the test signal generator. See Chapter 5.8.4 for a detailed description.

- **Close**
  (First level, button/key 7, see Fig. 5-33)
  This function closes the CAL instrument and returns you to the MONITORING instrument, resetting the loudspeaker channels to their normal mode and switching off the test signal generator.

→ MORE

Second function level (select More to activate):

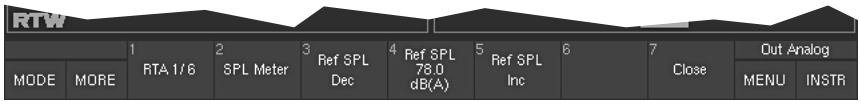


Fig. 5-34: Second Toolbar function level of the CAL instrument (displayed after selecting MORE)

- **RTA 1/6**
  (Second level, button/key 1, see Fig. 5-34)

See Chapter 5.6

This function opens the RTA 1/6 instrument (its input is automatically assigned to the calibration microphone input in this mode) so that you can view the spectrum of the signal input by the microphone. You can use all the functions of the RTA 1/6 instrument (see Chapter 5.6). Selecting the Meter button/key in the Toolbar of the RTA 1/6 instrument takes you back to the first function level of the CAL instrument. Selecting the button/key MORE displays the second level functions again.

- **SPL Meter**
  (Second level, button/key 2, see Fig. 5-34)

Detailed description in Chapter 5.8.5

This function opens an additional function level with controls for the SPL Meter functions. See Chapter 5.8.5 for a detailed description.

- **Ref SPL Dec**
  (Second level, button/key 3, see Fig. 5-34)
  This function (Decrement) reduces the current SPL reference value (**Ref SPL**, see below) in 1 dB steps.

- **Ref SPL**
  (Second level, button/key 4, see Fig. 5-34)
  This function displays the SPL reference value for the test signal generator set with button/key 3 **Ref SPL Dec** (see before) and button/key 5 **Ref SPL Inc** (see below) in a range from 68 to 88 dB(A).

- **Ref SPL Inc**
  (Second level, button/key 5, see Fig. 5-34)
  This function (Increment) increases the current SPL reference value (**Ref SPL**, see before) in 1 dB steps.

- **Close**
  (Second level, button/key 7, see Fig. 5-34)
  This function closes the CAL instrument and returns you to the MONITORING instrument, resetting the loudspeaker channels to their normal mode and switching off the test signal generator.

→ INSTR Focus on Window 3 (white frame) → MODE
→ MONITORING
→ CAL → Signal Select

5.8.4 The CAL Instrument's Signal Select functions (Monitoring)

Selecting **Signal Select** (button/key 6 in the CAL instrument, see Fig. 5-33 in Chapter 5.8.3) opens a new function level containing the controls for the functions of the test signal generator:

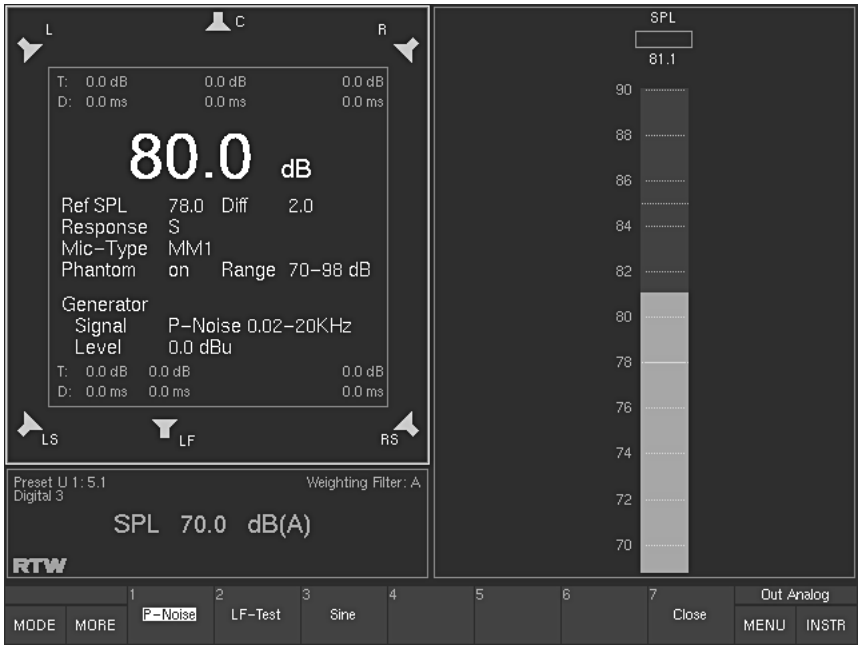


Fig. 5-35: Screen display after selecting the Signal Select function of the CAL instrument

The test signal generator can produce three different signal types:

See Chapter 5.8.4.1
- P-Noise: Generates a pink noise test signal (see Chapter 5.8.4.1).

See Chapter 5.8.4.2
- LF-Test: The LF-Test function is used for a listening check of the balance between the subwoofer and the other speakers in accordance with the SSF proposal (see Chapter 5.8.4.2).

See Chapter 5.8.4.3
- Sine: The Sine function generates a sine wave signal with an adjustable frequency and level (see Chapter 5.8.4.3).

The current selected signal is highlighted on the buttons/keys of the Toolbar.

Selecting one of these functions automatically displays a new function level with the settings for the selected signal type. The level value is a common parameter that is applied for all test signal types, irrespective of which of the three buttons/keys you select to set it.

Buttons/keys 1 to 4 in the respective settings levels (see Figs. 5-36, 5-37 and 5-39) thus have the same labels and functions for all three test signal types:

- **Level**
  (Button/key 1 – toggle function linked to **Level Var**)
  This function features the dBu converted values (see Figs. 5-36, 5-37 and 5-39) of the reference levels of the analog inputs and outputs and the calibration levels of the test signal generator which can be adjusted in the **Reference Levels** menu (see Chapter 6.7).

See Chapter 6.7

  The Factory settings for the Calibration Reference Levels adjusted in dB FS are:
  - –20 dB FS RMS
  - –18 dB FS RMS: EBU adjustment level (–3 dBu)
  - –9 dB FS RMS: Maximum allowed signal level pursuant to EBU, 0 dB on the peak meter (LMPSL) (+6 dBu)

  The resulting dBu values depend on the selected Reference Level Standard which is also adjusted in the **Reference Levels** menu, so the button/key 1 can display different values:

- **Dec** (Decrement)
  (Button/key 2)
  This function reduces the variable output signal level (**Level var**, see below) in 1 dB steps.

- **Level var**
  (Button/key 3 – toggle function linked to **Level**)
  This function selects the variable output signal level set with the buttons/keys 3 (**Dec**) and 4 (Inc). Preset is the dBu value of Calibration Reference Level 2 (see **Level** above and Chapter 6.7).

- **Inc** (Increment)
  (Button/key 4)
  This function increases the variable output level (**Level Var**) in 1 dB steps.

5.8.4.1 P-Noise

(Button/key 1, see Fig. 5-35)



Fig. 5-36: Screen display of the function level of the P-Noise test signal

Pressing the P-Noise button/key opens a new level with the following functions for setting the signal parameters:

- Level (button/key 1, see description above)
- Dec (button/key 2, see description above)
- Level var (button/key 3, see description above)
- Inc (button/key 4, see description above)

- **0.2-20K/0.02-20K (Bandwidth)**
  (Button/key 5, see Fig. 5-36)
  This function sets the bandwidth of the pink noise signal:
  0.2 kHz – 20 kHz or 20 Hz – 20 kHz.

- **Cor/Incor**
  (Button/key 6, see Fig. 5-36)
  This function switches all channels between coherent and incoherent noise.

- **Close**
  (Button/key 7, see Fig. 5-36)
  This function stores your settings and closes the current function level. The test signal generator remains active and the test signal remains on.

5.8.4.2 LF-Test

(Button/key 2, see Fig. 5-35)

Pressing the LF-Test button/key opens a new level with the functions for setting the LF test signal parameters

When you perform the test by selecting the corresponding function (see below) a low-frequency signal (second level, see Fig. 5-38) is output to the LF channel and all other speakers are muted. When you select the same function again the noise signal with the bandwidth shown in the bottom row is output to the speakers set with the **Output** function (see below). Switching back and forth between the two allows you to check the balance of the crossover frequencies and the best position for the subwoofer.

First function level:

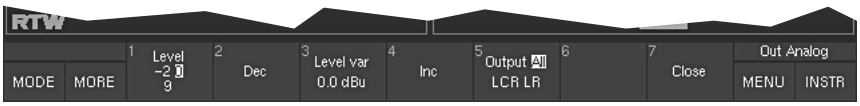


Fig. 5-37: Screen display of the first function level of the LF-Test signal. Select MORE to display additional functions (level 2)

- Level (button/key 1 – first level, see above)
- Dec (button/key 2 – first level, see above)
- Level var (button/key 3 – first level, see above)
- Inc (button/key 4 – first level, see above)

- **Output**
  (First level, button/key 5, see Fig. 5-37)
  This function selects the channels to which the surround test signal will be output:

  - All: All channels (except subwoofer)
  - LCR: Front channels L, R, C only
  - LR: Channels L and R only

- **Close**
  (First level, button/key 7, see Fig. 5-37)
  This function stores your settings and closes the current function level. The test signal generator remains active and the test signal remains on.

→ MORE

Second function level (select MORE to activate):

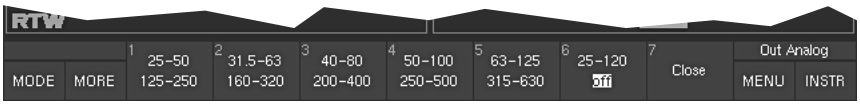


Fig. 5-38: Second Toolbar function level of the LF test signal (displayed after selecting MORE)

- **Bandwidth**
  (Second level, buttons/keys 1 to 5, see Fig. 5-38)
  These functions select the bandwidth and output of the test signal.
  - The upper value is activated the first time you select the function. The signal is then routed to the LF channel and all other channels are muted.
  - The lower value is activated when you select the function a second time. The signal is then routed to the channels set with the **Output** function (button/key 5 – previous level, see above and Fig. 5-37). When All is selected all channels including the LF are activated. When LCR or LR are activated the LF channel is muted.

  Values (in Hz):
  - 25 – 50
    125 – 250: (button/key 1 – second level)
  - 31.5 – 63
    160 – 320: (button/key 2 – second level)
  - 40 – 80
    200 – 400: (button/key 3 – second level)
  - 50 – 100
    250 – 500: (button/key 4 – second level)
  - 63 – 125
    315 – 630: (button/key 5 – second level)
  - 25 – 120
    off: (button/key 6 – second level)

    The off function switches off the LF test signal.

  The current function level remains open, so that you can reposition the sub-woofer.

- **Close**
  (Second level, button/key 7, see Fig. 5-38)
  Selecting this function ends the LF test.

The output levels of the sine wave generator are limited by default to prevent damage to the monitoring system.
If necessary you can deactivate the limiter in the **Reference Levels** menu (see Chapter 6.7).

5.8.4.3 Sine

(Button/key 3, see Fig. 5-35)

Pressing the Sine button/key opens a new level with the functions for setting the sine wave test signal parameters.

First function level:



Fig. 5-39: Screen display of the first function level of the Sine signal. Select MORE to display additional functions (level 2)

The functions in this level allow you to set the frequency and level of the sine wave test signal:

- Level (button/key 1 – first level, see above)
- Dec (button/key 2 – first level, see above)
- Level var (button/key 3 – first level, see above)
- Inc (button/key 4 – first level, see above)

- **Close**
  (Button/key 7 – first level, see Fig. 5-39)
  This function stores your settings and closes the current function level. The test signal generator remains active and the test signal remains on.

→ MORE

Second function level (select More to activate):



Fig. 5-40: Second Toolbar function level of the Sine test signal (displayed after selecting MORE)

- **Frequency selection functions (in Hz)**
  (Second level, buttons/keys 1 to 6, see Fig. 5-40)

  - 20 – 25: (button/key 1 – second level)
  - 50 – 100: (button/key 2 – second level)
  - 250 – 500: (button/key 3 – second level)
  - 1k – 2k: (button/key 4 – second level)
  - 4k – 8k: (button/key 5 – second level)
  - Off – 10k (button/key 6 – second level)

- **Close**
  (Second level, button/key 7, see Fig. 5-40)
  This function stores your settings and closes the current function level. The test signal generator remains active and the test signal remains on.

5.8.5 The CAL Instrument's SPL Meter functions (Monitoring)

Selecting SPL Meter (button/key 2 in the second function level of the CAL instrument, see Fig. 5-34 in Chapter 5.8.3) opens a new function level containing the controls for the functions of the SPL Meter including the measuring microphone input options:

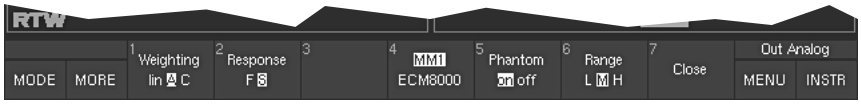


Fig. 5-41: Screen display after selecting the SPL Meter function of the CAL instrument's second function level

- **Weighting**
  (Button/key 1, see Fig. 5-41)
  This function allows you to select the A or C weighting filters. Selecting lin (linear mode) switches the weighting filters off.

- **Response**
  (Button/key 2, see Fig. 5-41)
  This function switches the integration time between fast (F, 125 ms) and slow (S, 1 s) in accordance with the IEC 651 standard.

- **MM1/ECM8000 (Microphone Select)**
  (Button/key 4, see Fig. 5-41)
  This function allows you to select the calibration microphone type:
  - MM-1: Calibration microphone MM 1, 15 mV/Pa (beyerdynamic)
  - ECM: ECM 8000 (Behringer)
    In order to prevent measurement errors there is no facility for entering microphone sensitivity values manually.

- **Phantom**
  (Button/key 5, see Fig. 5-41)
  This function switches the 48 V phantom power supply on or off.

- **Range**
  (Button/key 6, see Fig. 5-41)
  This function sets the measurement range:
  - L (low): 50 – 80 dB SPL
  - M (medium): 70 – 100 dB SPL
  - H (high): 90 – 120 dB SPL

- **Close**
  (Button/key 7, see Fig. 5-41)
  This function closes this function level, leaving the SPL instrument active and returning you to the previous function level. To redisplay the other level of the CAL instrument so that you can access the additional functions again just use the button/key **MORE**.

→ INSTR Focus on Window 3 (white frame)
→ MODE
→ MORE
→ AES/EBU STATUS

5.9 The AES/EBU STATUS Instrument

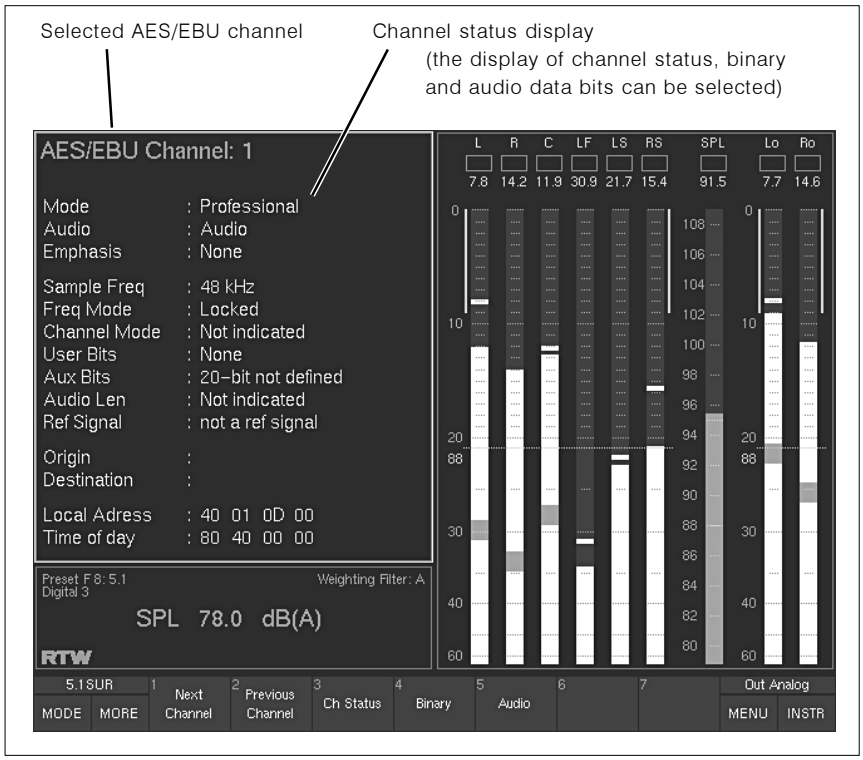


Fig. 5-42: The AES/EBU channel status monitor (AES/EBU STATUS)



The AES/EBU STATUS instrument is always displayed in Window 3. To select it assign the focus to it (indicated by a highlighted frame around the window) by pressing the **INSTR** key. When the focus is on this window the AES/EBU STATUS functions are displayed in the Toolbar (Window 1).

The **AES/EBU channel status monitor** (AES/EBU STATUS) displays the status bytes from the AES/EBU data stream as plain text. In addition to this it also displays a range of signal status information, including Confidence, Lock, Coding, Parity and Validity. Finally, the AES/EBU Status Monitor displays the audio data bits and their activity, which is useful when you need to determine the word width or identify defective bits in the data stream.

- **Next Channel and Previous Channel**
  (Buttons/keys 1 and 2, see Fig. 5-42)
  These functions switch through the available input channels so that you can display and analyse the channel information with the instrument.

- **Ch Status (Channel Status)**
  (Button/key 3, see Fig. 5-42 – toggle function linked to Binary)
  This function switches the status information display to decoded plain text (Decoded Channel Status). The information displayed includes the origin and destination of the data (Origin, Destination), the CS block address (Local Adr.) and the block number (Time-Day). If no digital input signal is connected the message „Channel data not available“ is displayed.
  This function is displayed when you select the AES/EBU instrument.

- **Binary**
  (Button/key 4, see Fig. 5-42 – toggle function linked to Ch Status)
  Selecting this function activates the hex and binary display of channel status bytes 0 – 23 of the selected channel. If no digital input signal is connected the message „Channel data not available“ is displayed.

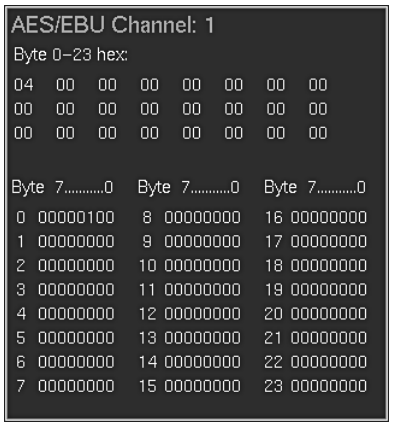


Fig. 5-43: Screen display of Window 3 after selecting the Binary function

- **Audio**
  (Button/key 5, see Fig. 5-42)
  Selecting this function activates the audio display of the active audio bits registered for the digital inputs. When pressing the button/key again the bit pattern of the current audio data is displayed.

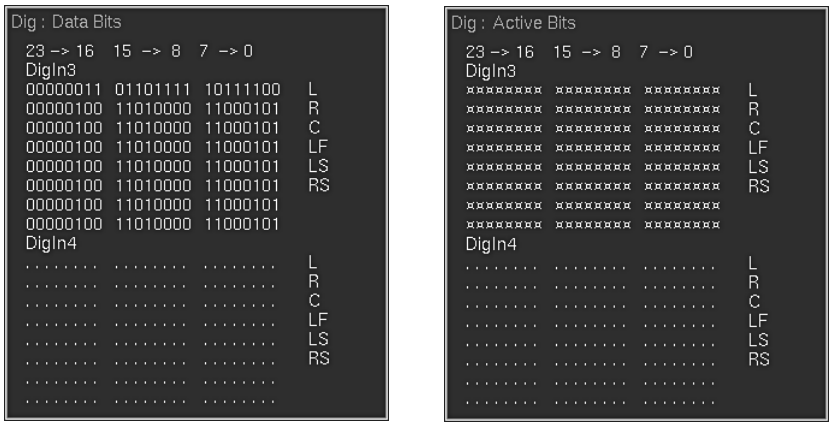


Fig. 5-44: The left screen display of Window 3 is shown after selecting the Binary function. Selecting the Audio function again will show the right screen display in Window 3.

→ INSTR Focus on Window 3 (white frame)
→ MODE
→ MORE
→ SDI STATUS

The SDI STATUS instrument is **only** available with 31900S, 31960S, 31900SD, 31960SD!

5.10 The SDI STATUS Instrument

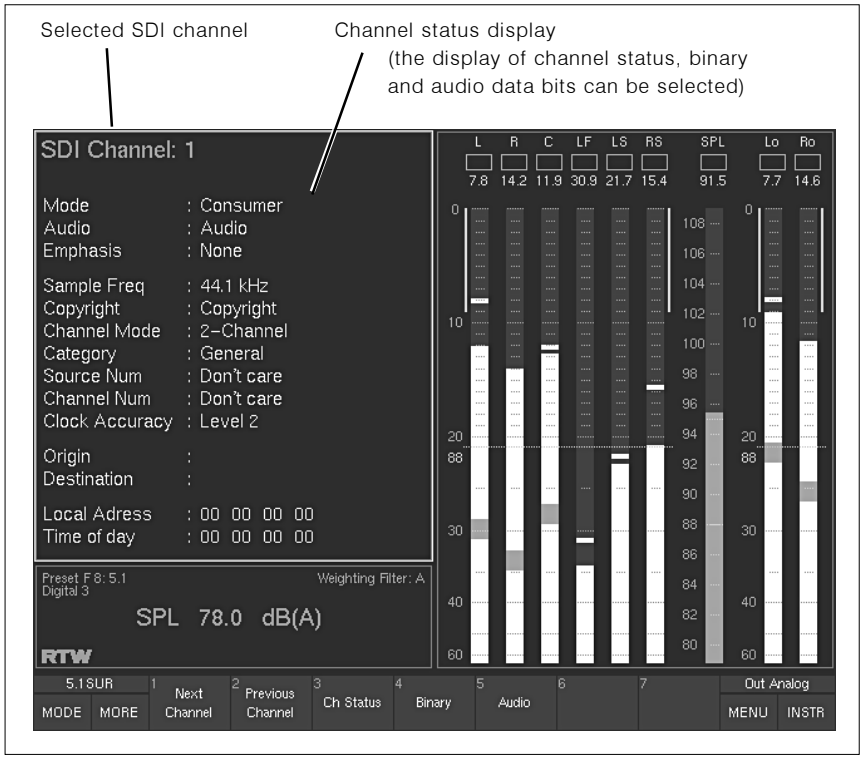


Fig. 5-45: The SDI channel status monitor (SDI STATUS)



The SDI STATUS instrument is always displayed in Window 3. To select it assign the focus to it (indicated by a highlighted frame around the window) by pressing the **INSTR** key. When the focus is on this window the SDI STATUS functions are displayed in the Toolbar (Window 1).

The **SDI channel status monitor** (SDI STATUS) displays the status bytes from the SDI data stream as plain text. In addition to this it also displays a range of signal status information, including Confidence, Lock, Coding, Parity and activity, which is useful when you need to determine the word width or identify defective bits in the data stream.

- **Next Channel and Previous Channel**
  (Buttons/keys 1 and 2, see Fig. 5-45)
  These functions switch through the available input channels so that you can display and analyze the channel information with the instrument.

- **Ch Status (Channel Status)**
  (Button/key 3, see Fig. 5-45 – toggle function linked to Binary)
  This function switches the status information display to decoded plain text (Decoded Channel Status). The information displayed includes the origin and destination of the data (Origin, Destination), the CS block address (Local Adr.) and the block number (Time-Day). If no digital input signal is connected the message „Channel data not available" is displayed. This function is displayed when you select the SDI Status instrument.

- **Binary**
  (Button/key 4, see Fig. 5-45 – toggle function linked to Ch Status)
  Selecting this function activates the hex and binary display of channel status bytes 0 – 23 of the selected channel. If no digital input signal is connected the message „Channel data not available“ is displayed.

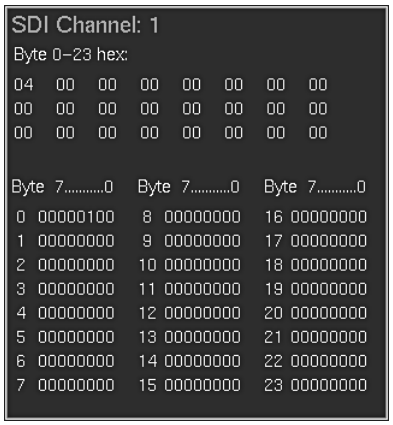


Fig. 5-46: Screen display of Window 3 after selecting the Binary function

- **Audio**
  (Button/key 5, see Fig. 5-45)
  Selecting this function activates the audio display of the active audio bits registered for the digital inputs. When pressing the button/key again the bit pattern of the current audio data is displayed.



Fig. 5-47: The left screen display of Window 3 is shown after selecting the Binary function. Selecting the Audio function again will show the right screen display in Window 3.

→ INSTR Focus on Window 3 (white frame)
→ MODE
→ MORE
→ SDI INTERFACE

The SDI INTERFACE instrument is **only** available with 31900S, 31960S, 31900SD, 31960SD!

5.11 The SDI INTERFACE Instrument

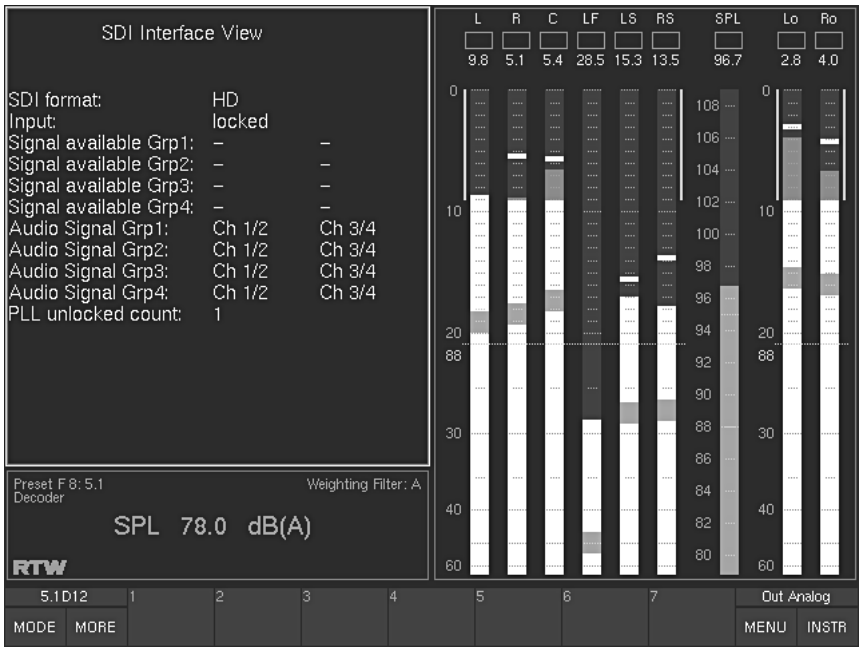


Fig. 5-48: The SDI interface status display (SDI INTERFACE)



The SDI INTERFACE instrument is always displayed in Window 3. To select it assign the focus to it (indicated by a highlighted frame around the window) by pressing the **INSTR** key. When the focus is on this window the SDI INTERFACE functions are displayed in the Toolbar (Window 1).

The HD/SD SDI deembedder interface can access all 16 (4 x 4) audio channels implemented in SDI streams and uses them for visual display as well as audio monitoring purposes.

If installed and activated (only included in the S and SD versions), the **SDI interface status display** shows the status of the interface and the SDI format, and shows the included and available audio signals and signal groups.

Note:
There are no functions available!

→ INSTR Focus on Window 3 (white frame)
→ MODE
→ MORE
→ HARDWARE STATUS

5.12 The HARDWARE STATUS Instrument

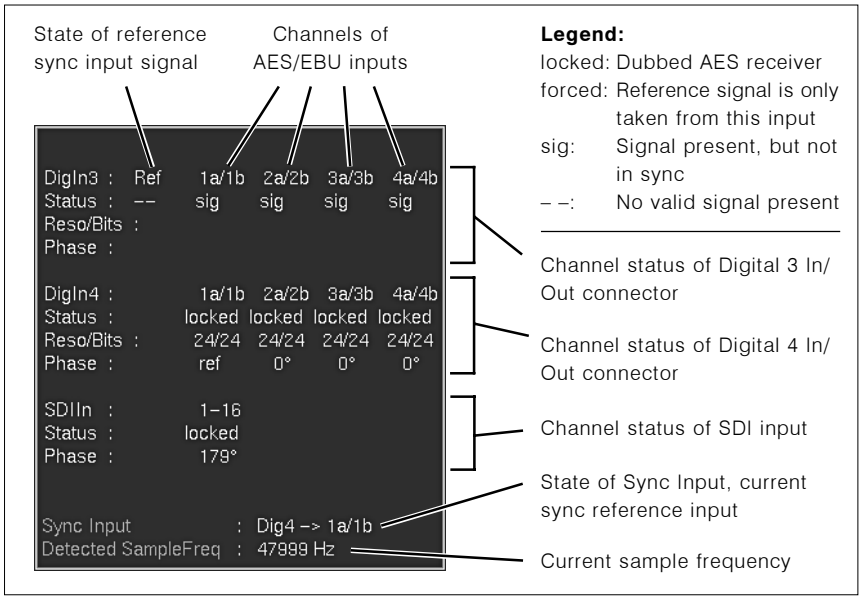


Fig. 5-49: The Hardware Status display (HARDWARE STATUS)



The HARDWARE STATUS instrument is always displayed in Window 3. To select it assign the focus to it (indicated by a highlighted frame around the window) by pressing the **INSTR** key. When the focus is on this window the HARDWARE STATUS functions are displayed in the Toolbar (Window 1).

Selecting the **Hardware status monitor** displays the status of the AES/EBU receivers for all digital input sources and shows which digital input is currently being used as the source of the unit's clock signal (reference sync signal source, marked with white color in the instrument in Window 3). If there is no signal on the selected input for reference, the message "Selected reference failure" is displayed in the Status Box in Window 4. The internal sampling rate selected on the Audio System menu tab is used as clock signal if no digital signal is present at the digital inputs (see Chapter 6.6).

See Chapter 6.6

Note:
There are no functions available!

5.12.1 Changing parameters

To change the reference sync source, please proceed as following:

1. Press the **MENU** button/key, the unit changes to menu mode.

2. Use **<** or **>** button/key to select the Audio System menu tab. The **Global Audio Settings** menu is shown.

3. Use ^ or ˅ button/key to set the menu focus to the Internal sampling rate if no external reference present combo box and enter this selection by pressing the red **Sel** (SELECT) key.

4. Use ^ or ˅ button/key to set the menu focus to the sampling rate you need. Enter this selection by pressing the red **Sel** (SELECT) key.

5. Use ^ or ˅ button/key to set the menu focus to the External reference source combo box and enter this selection by pressing the red **Sel** (SELECT) key.

6. Use ^ or ˅ button/key to set the menu focus to the source for the reference sync signal. If you want to use the Use Ref Input option, please connect the external reference signal to the **Ref Sync In** connector (see Chapter 7.3.15). Enter the selection by pressing the red **Sel** (SELECT) key.

7. If you have a unit with HD/SD SDI deembedder interface (S and SD versions), you can use the SDI input as reference. Use ^ or ˅ button/key to set the menu focus to the Force reference source to SDI input if monitoring SDI check box, if you want to use the SDI input every time you monitor SDI. Enter this selection by pressing the red **Sel** (SELECT) key.

8. Use ^ or ˅ button/key to set the menu focus to the A-D sample rate source combo box. Enter this selection by pressing the red **Sel** (SELECT) key.

9. Use ^ or ˅ button/key to set the menu focus to the option you need. Enter the selection by pressing the red **Sel** (SELECT) key.

10. If you have selected A-D follows reference below, use ^ or ˅ button/key to set the menu focus to the combo box beneath. Enter this selection by pressing the red **Sel** (SELECT) key.

11. Use ^ or ˅ button/key to set the menu focus to the input you want to use as reference sync source for the internal A-D converter. Enter this selection by pressing the red **Sel** (SELECT) key.

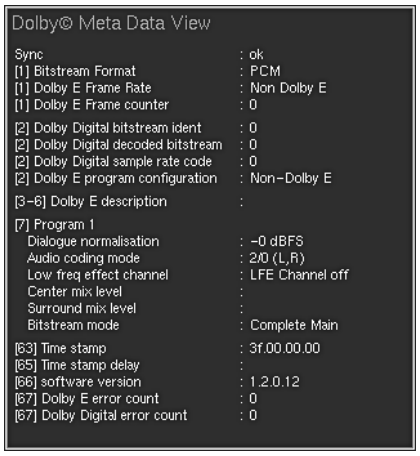
12. Click the **Safe & Exit** button or press the corresponding key to store the changes and leave the menu. The **Save Global Settings?** menu page is displayed.

13. Click the **Safe & Exit** button or press the corresponding key again. Now the changes are finally stored, the unit turns back to normal operation.

→ INSTR Focus on Window 3 (white frame)
→ MODE
→ MORE
→ DOLBY® META DATA

The DOLBY® META DATA instrument is **only** available with 31900D, 31960D, 31900SD, 31960SD!

5.13 The DOLBY® META DATA Instrument



First page of the Dolby® meta data display

Fig. 5-50: The Dolby® Meta Data display (DOLBY® META DATA)



The DOLBY® META DATA instrument is always displayed in Window 3. To select it assign the focus to it (indicated by a highlighted frame around the window) by pressing the **INSTR** key. When the focus is on this window the DOLBY® META DATA functions are displayed in the Toolbar (Window 1).

The Dolby® E and Dolby® AC-3 decoder is used for the direct access to coded data streams for analyzing and controlling purposes without the need for external decoding.

If installed and activated (only included in the D and SD versions), the **Dolby® Meta Data display** shows the status of the Dolby® E or Dolby® AC-3 signal and the status of the decoder. It also displays the decoded meta data of the received bitstream in plain text.

5.13.1 Activating the Decoder and changing parameters

See Chapter 6.5.2

If you want to use the Dolby® E and Dolby® AC-3 decoder you have to activate the decoder in the Input/Output Routing menus (see Chapter 6.5.2).

To access these menus from normal display operation please proceed as following:

1. Connect the coded signal to the BNC connector marked with **IN** on the rear side of the units.

2. Press the **MENU** button/key, the unit changes to menu mode.

3. Use ^ or v button/key to set the menu focus on the Edit selected preset button and enter this selection by pressing the red **Sel** (SELECT) key.

4. Use **<** or **>** button/key to select the Local Input/Output Routing and Instrument Settings menu tab. The **Local Routing Settings** menu is shown.

5. Use ^ or v button/key to set the menu focus on the Monitoring Input Routing button and enter this selection by pressing the red **Sel** (SELECT) key.

6. Use ^ or v button/key to set the menu focus on the Enable check box of the **Decoder** section. Enter this selection by pressing the red **Sel** (SELECT) key.

7. Now you can define the source and the type of the decoder. Use ^ or v button/key to set the menu focus to the Source and Type combo boxes and press the red **Sel** (SELECT) key.

8. Use ^ or v button/key to set the menu focus to the option you need. Enter this selection by pressing the red **Sel** (SELECT) key.

9. If you want, you can use the decoder signals for the Routing options. Use ^ or v button/key to set the menu focus to the other Source combo boxes you want to change. Enter the selections by pressing the red **Sel** (SELECT) key.

10. Use ^ or v button/key to set the menu focus to the Decoder option. Enter this selection by pressing the red **Sel** (SELECT) key.

11. If needed, you can change the assignment of the incoming signals to the desired instrument channels as displayed. Use ^ or v button/key to set the menu focus to the channel combo boxes you want to change. Enter the selections by pressing the red **Sel** (SELECT) key.

12. Use ^ or v button/key to set the menu focus to the channel with the signal you want to assign to the selected instrument channel. Enter this selection by pressing the red **Sel** (SELECT) key.

13. Proceed, until you have made all the assignments and appropriate changes.

14. Click the **Safe & Exit** button or press the corresponding key to store the changes and leave the menu. The **Save Preset** menu page is displayed.

15. Press the red **Sel** (SELECT) key, if you want to select another User Preset as the displayed one. Use the ^ or v button/key to set the menu focus to the one you prefer and press the red **Sel** (SELECT) key.

16. If you want you can change the name of the preset. The button Change name opens a keyboard to enter the name you prefer.

17. Click the **Safe & Exit** button or press the corresponding key again. Now the changes are finally stored, the unit turns back to normal operation.

5.13.2 The functions of the DOLBY® META DATA instrument

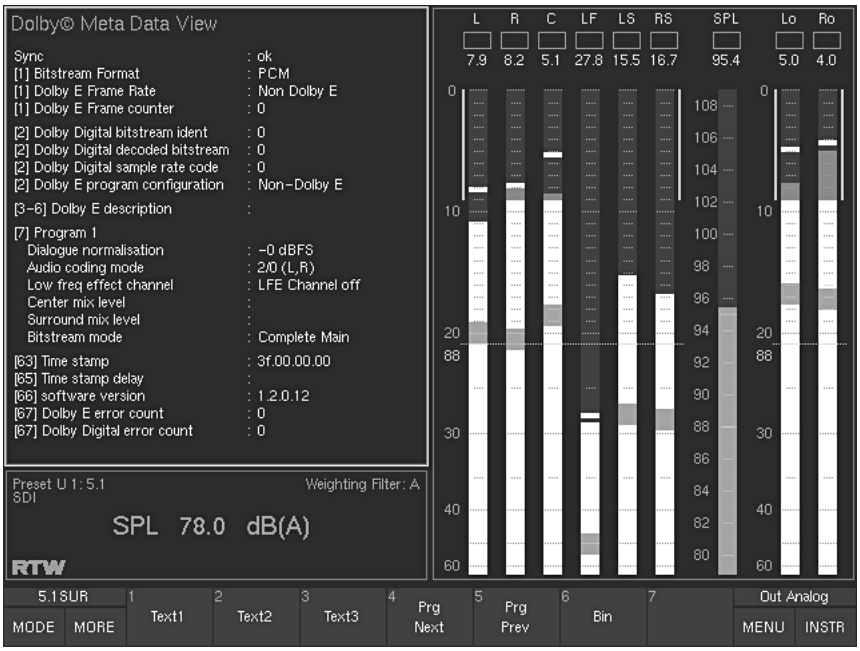


Fig. 5-51: The functions of the DOLBY® META DATA instrument displayed in the Toolbar

The meta data of the decoded signal is displayed in plain text on three pages. Another page is for the binary display of the signal. Besides all the information about the state of the incoming bitstream the information of up to eight programs is displayed representing the included program format. For example, if the bitstream carries eight different single channels, eight programs are displayed. A carried 5.1 surround format is contained in one program. Then only up to two other programs will be left. Program information with the same content are greyed in the display.

- **Text1**
  (Button/key 1, see Fig. 5-51)
  Selecting this function activates the first page of the Dolby® Meta Data in plain text. The section labelled with Program and a number can be toggled by using the **Prg Next** and **Prg Prev** button/keys (see beneath).

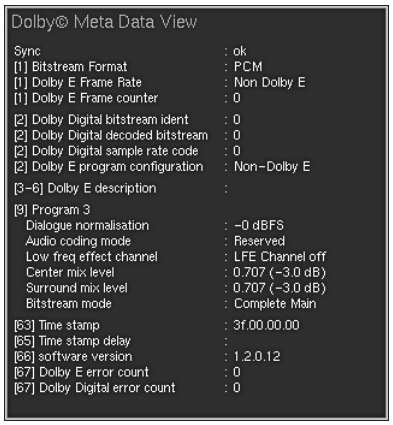


Fig. 5-52: Screen display of Window 3 with Text1 function selected

- **Text2**
  (Button/key 2, see Fig. 5-51)
  Selecting this function activates the second page of the Dolby® Meta Data in plain text. The sections labelled with Program and a number can be toggled by using the **Prg Next** and **Prg Prev** button/keys (see beneath).

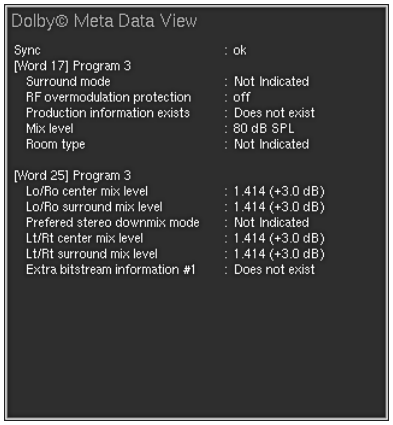


Fig. 5-53: Screen display of Window 3 with Text2 function selected

- **Text3**
  (Button/key 3, see Fig. 5-51)
  Selecting this function activates the third page of the Dolby® Meta Data in plain text. The section labelled with Program and a number can be toggled by using the **Prg Next** and **Prg Prev** button/keys (see beneath).

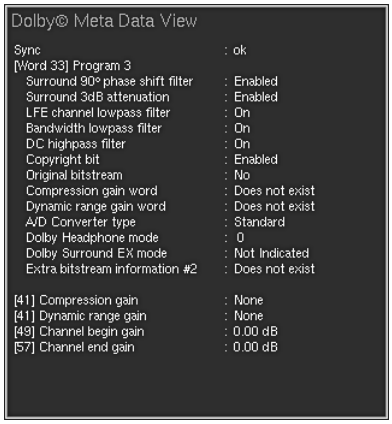


Fig. 5-54: Screen display of Window 3 with Text3 function selected

- **Prg Next (next program)**
  (Button/key 4, see Fig. 5-51)
  Selecting this function switches the program sections of the three pages labelled **Text1** to **Text3** one step forward and selects the next program.

- **Prg Prev (previous program)**
  (Button/key 5, see Fig. 5-51)
  Selecting this function switches the program sections of the three pages labelled **Text1** to **Text3** one step back and selects the previous program.

- **Bin (binary)**
  (Button/key 6, see Fig. 5-51)
  Selecting this function activates the hex and binary display of signal status bytes 0 – 63 of the coded signal.

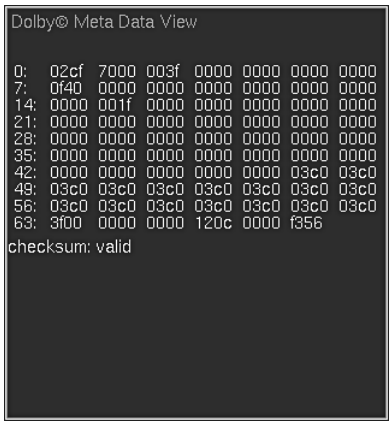


Fig. 5-55: Screen display of Window 3 after selecting the Binary function

→ INSTR Focus on Window 3 (white frame)
→ MODE
→ MORE
→ DIALNORM

The DIALNORM instrument is **only** available with Surround formats and **only** with digital input signals

5.14 The DIALNORM Instrument

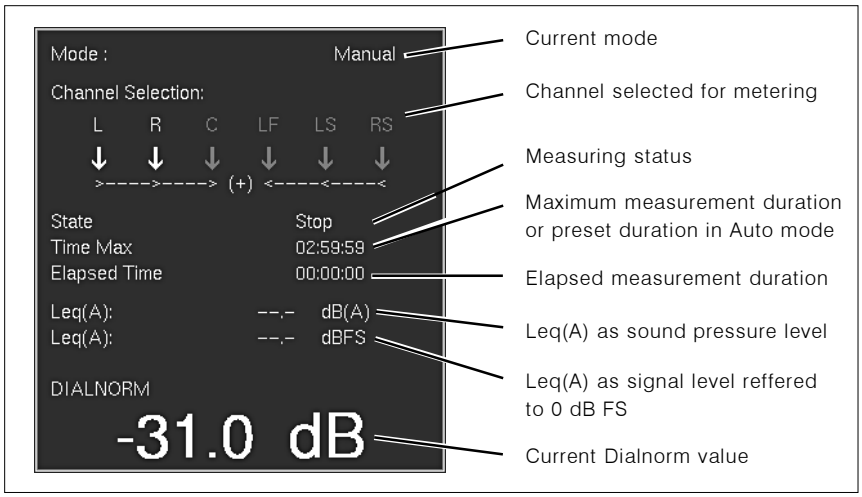
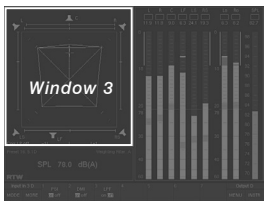


Fig. 5-56: The Dialnorm meter instrument (DIALNORM)



The DIALNORM instrument is always displayed in Window 3. To select it assign the focus to it (indicated by a highlighted frame around the window) by pressing the **INSTR** key. When the focus is on this window the DIALNORM functions are displayed in the Toolbar (Window 1).

The **Dialnorm meter** will only work in the Surround modes, therefore you should select a surround channel configuration before using Dialnorm.

The SurroundControl units can calcualte and show Dialnorm values from its digital input signals. Dialnorm is used in film sound mixing and describes the normalization of the dialog loudness level with respect to a certain reference monitoring level. With Peak Program Meter selected for the Program Meter this mode allows the measurement of the dialnorm value, the Leq(A) value referred to 0 dB FS as well as the Leq(A) value with A weighting. With ITU BS.1771 Loudness Meter selected in 5.1 surround mode for the Program Meter this mode allows the measurement of the dialnorm value, the Leq(R2LB) value referred to 0 dB FS as well as the Leq(R2LB) value with R2LB weighting.

5.14.1 Background – calculating Dialnorm values

Dialnorm has its origins in film sound mixing. The term is an abbreviation of "dialogue normalization". Dialnorm describes the normalization of the dialogue loudness level with respect to a reference value of –31 dB FS in surround applications. The idea behind this scheme is that the perceived total loudness of a mixed audio signal may be determined and kept constant at the listening end by using the dialogue level (optimized for a combination of good intelligibility and minimal nuisance through excessive volumes) with its fixed loudness ratio in relation to music and sound effects as a reference. ATSC standard A/52 specifies the transmission of the Dialnorm parameter as part of the meta data. This Dialnorm value is determined by means of a method normally used in noise pollution measurement, e. g. by measuring Leq(A), the energy-equivalent A-weighted sound pressure level as defined in IEC 60804. Dialnorm makes use of this standard with the exception that it measures the electrical signal level with reference to 0 dB FS instead of using the sound pressure level with a value of 20 μPa as a reference. The Dialnorm value with 0 dB FS as a reference corresponds to the measured Leq(A) value. The concept uses a threshold value of –31 dB FS. In the decoder, Dialnorm values above –31 dB FS lead to a level reduction of the total audio signal by (31 dB + (Dialnorm)) [dB].

Dialnorm has no effect on the dynamics of the overall audio programme or the loudness ratios of dialog, music, and effects. Only the overall level of the programme is controlled in relation to a reference value. This overall level is reduced if the Dialnorm value exceeds this reference value. To this end, the Dialnorm value is used by the decoder at the receiving end to control the average overall volume in order to achieve a constant perceived loudness. This correction operates very smoothly and will not be noticed by the listener.

5.14.2 The functions of the DIALNORM instrument

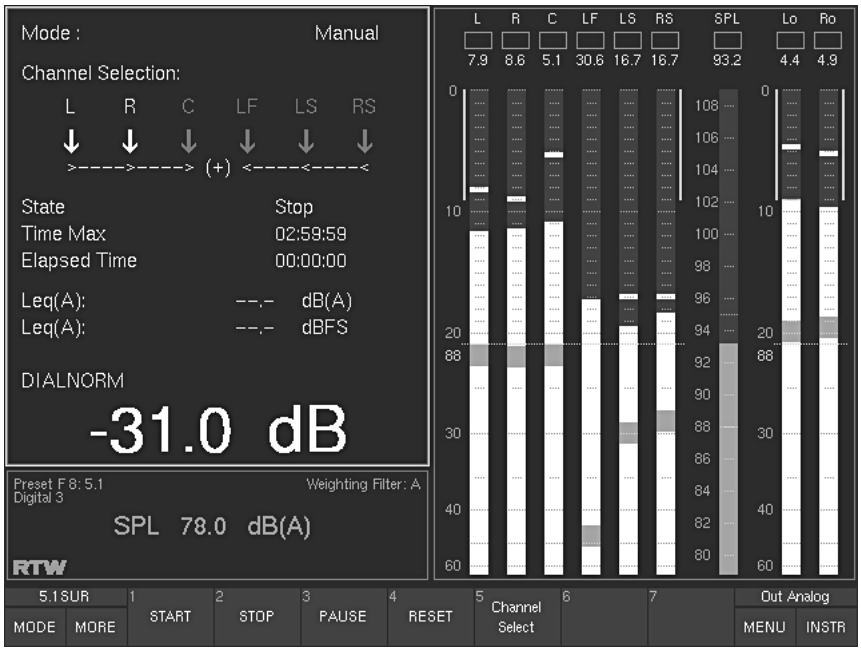


Fig. 5-57: The functions of the DIALNORM instrument displayed in the Toolbar

- **START**
  (Button/key 1, see Fig. 5-57)
  Selecting this function starts the Dialnorm measurement. The colour of the displayed values changes to green.

- **STOP**
  (Button/key 2, see Fig. 5-57)
  Selecting this function ends the measurement. The colour of the displayed values changes to yellow.

- **PAUSE**
  (Button/key 3, see Fig. 5-57)
  Selecting this function interrupts the measurement temporarily. All previously recorded values are stored automatically and the colour of the displayed values changes to red. To restart and continue the measurement select button/key 1 **START** (see above).

- **RESET**
  (Button/key 4, see Fig. 5-57)
  This function resets the time counter.

- **Channel Select**
  (Button/key 5, see Fig. 5-57)
  Selecting this function opens a new level in which you can select the channels you want to include in a Dialnorm measurement. Selecting the buttons/keys activates the corresponding channels, selecting again deactivates them. Activated channels are highlighted in yellow in the display.

• L + R:	L and R channel pair together	(Button/key 1)
• C:	Centre channel	(Button/key 2)
• LF:	LF channel	(Button/key 3)
• LS + RS:	LS and RS channel pair together	(Button/key 4)
• Close:	Terminates the selection and returns you to the previous level	(Button/key 7)

→ INSTR Focus on Window 3 (white frame)
→ MODE
→ MORE
→ BLITS

The BLITS instrument is **only** available with 5.1 Surround format

5.15 The BLITS Instrument

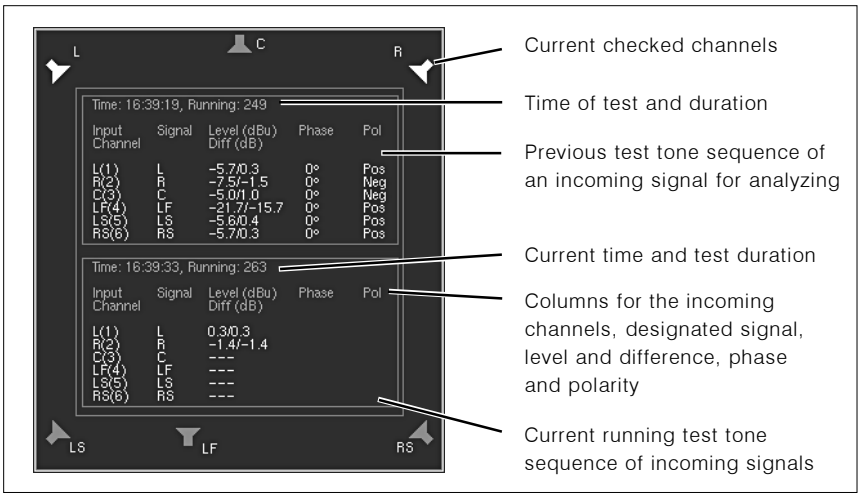
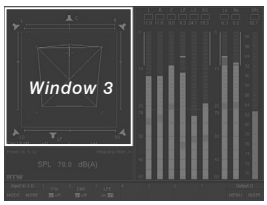


Fig. 5-58: The BLITS instrument



The BLITS instrument is always displayed in Window 3. To select it assign the focus to it (indicated by a highlighted frame around the window) by pressing the **INSTR** key. When the focus is on this window the BLITS functions are displayed in the Toolbar (Window 1).

The **BLITS instrument** provides a standardised form of channel identification and alignment for surround sound material to prevent unintentional channel swapping.
Selecting the instrument with its button in the Toolbar automatically starts the BLITS analyzer. It detects the BLITS information carried with an incoming signal. The running test sequence is displayed in the lower frame of the instrument. When finished, the result is copied to the upper frame and dipslayed for analyzing the channel alignment. A new test sequence meanwhile is started in the lower frame. The detection is stopped by selecting another instrument (select MODE in the Toolbar).
The BLITS instrument also provides the option to generate a BLITS signal cluster which can be routed to the digital and analog outputs. If the BLITS sequence is broadcasted, you can prepend a simple wave file including your broadcast station identification sound. This wave file of 1 MB maximum has to be of 8 bit mono. It can be transferred from your PC into the SurroundControl units using the integrated network interface.

5.15.1 Background – The BLITS 5.1 Surround Identification

The BLITS 5.1 surround identification tones have been developed by the Sky Television Sound Supervisiors Martin Black and Keith Lane in 2005/2006 to provide a broadcast-specific standardised form of channel identification and alignment for broadcasted surround material. BLITS stands for Black and Lane's Ident Tones for Surround and is already used throughout the Sky organisation and by many independent OB companies.

The BLITS signal cluster consists of three sequences. The first one with short single tones at a level of –18 dB FS and a duration of about 5 s is for the identification of each channel using different frequencies (L/R: 880 Hz, C: 1320 Hz, LF: 83.5 Hz, LS/RS: 660 Hz).
The second sequence with also a level of –18 dB FS is only present on the L and R channels and provides a continuous 1 kHz tone on the right channel and a four times interrupted 1 kHz tone on the left channel. The duration of this sequence is of about 5.3 s. It is intended to provide an ident that looks normal when checking a stereo downmix of the surround signal.
The third sequence finally checks the phase of the channels and takes about 3.3 s. Here a 2 kHz tone is used for all channels at a level of –24 dB FS. When the surround signal is downmixed to stereo using default downmix values, then tones with a level of about –18 dB FS on each channel should be generated.
The channel idents follow the channel order configured for the peakmeter bargraphs to identify any missing or mis-assigned channel much easier.

5.15.2 Changing parameters of the BLITS instrument

5.15.2.1 Selecting the outputs for the BLITS generator

If you want to define the outputs for the BLITS generator, please proceed as following:

1. Press the **MENU** button/key, the unit changes to menu mode.

2. Use ^ or ˅ button/key to set the menu focus on the Edit selected preset button and enter this selection by pressing the red **Sel** (SELECT) key.

3. Use < or > button/key to select the Local Input/Output Routing and Instrument Settings menu tab. The **Local Routing Settings** menu is shown.

4. Use ^ or ˅ button/key to set the menu focus on the Monitoring Output Routing button and enter this selection by pressing the red **Sel** (SELECT) key.

5. Choose one of the columns representing the output connector you want to use for the output of the generated BLITS sequence.

6. Use ^ or ˅ button/key to set the focus on the combo boxes of the desired channels you want to use for the BLITS channels. Enter the selections by pressing the red **Sel** (SELECT) key.

7. If you want to use the analog outputs, use ^ or ˅ button/key to set the menu focus on one of the BLITS labelled channels (Blits L, Blits R, ..., Blits RS). Enter the selections with the red **Sel** (SELECT) key. Proceed until all channels are assigned.

8. If you want to use the digital outputs, use ^ or ˅ button/key in the corresponding combo boxes to set the menu focus on Use direct out. Enter the selections with the red **Sel** (SELECT) key.

9. Use ^ or ˅ button/key to set the menu focus on the combo boxes labelled with **Direct Out**. Enter the selections by pressing the red **Sel** (SELECT) key.

9. Use ^ or ˅ button/key to set the menu focus on one of the BLITS labelled channels (Blits L, Blits R, ..., Blits RS). Enter the selections by pressing the red **Sel** (SELECT) key. Proceed until all channels are assigned.

10. Click the **Safe & Exit** button or press the corresponding key to store the changes and leave the menu. The **Save Preset** menu page is displayed.

11. Press the red **Sel** (SELECT) key, if you want to select another User Preset as the displayed one. Use the ^ or ˅ button/key to set the menu focus to the one you prefer and press the red **Sel** (SELECT) key.

12. If you want you can change the name of the preset. The button Change name opens a keyboard to enter the name you prefer.

13. Click the **Safe & Exit** button or press the corresponding key again. Now the changes are finally stored, the unit turns back to normal operation.

5.15.2.2 Loading a wave file intro for the BLITS sequence

If you want to assign a wave file intro to the BLITS sequence, please proceed as following:

1. Produce a 8 bit mono wave file with 1 MB maximum of size, e. g. with your broadcast station identification sound. Store this file on a PC with web browser and network connection.

2. Press the **MENU** button/key, the unit changes to menu mode.

3. Use **<** or **>** button/key to select the Communication and Time menu tab. The **Global Communication and Time Settings** menu is shown.

4. Read the IP address of your SurroundControl unit. You can keep the menu page opened.

5. Open the web browser on your PC and enter the IP address.

6. The network interface is opened in the web browser, the Software update screen is displayed. Select the BLITS intro update option.

7. The **BLITS intro update** screen is displayed. Please read carefully the instructions on this page.

8. Select the "**Durchsuchen**" (search) button, search for your wave intro file and select it.

9. When your selection is displayed in the text field beside the "Durchsuchen" button you can start the upload by pressing the Update BLITS button.

10. Restart your SurroundControl unit.

11. Press the **MENU** button/key, the unit changes to menu mode.

12. Use **<** or **>** button/key to select the Generator and BLITS Settings menu tab. The **Generator and BLITS Settings** menu is shown.

13. Use **^** or **v** button/key to set the menu focus on the Wave intro check box in the **BLITS** section. The loaded wave file is labelled right beside this chechbox. For activating the checkbox press the red **Sel** (SELECT) key.

14. Click the **Safe & Exit** button or press the corresponding key to store the changes and leave the menu. The **Save Global Settings?** menu page is displayed.

15. Click the **Safe & Exit** button or press the corresponding key again. Now the changes are finally stored, the unit turns back to normal operation.

5.15.3 The functions of the BLITS instrument

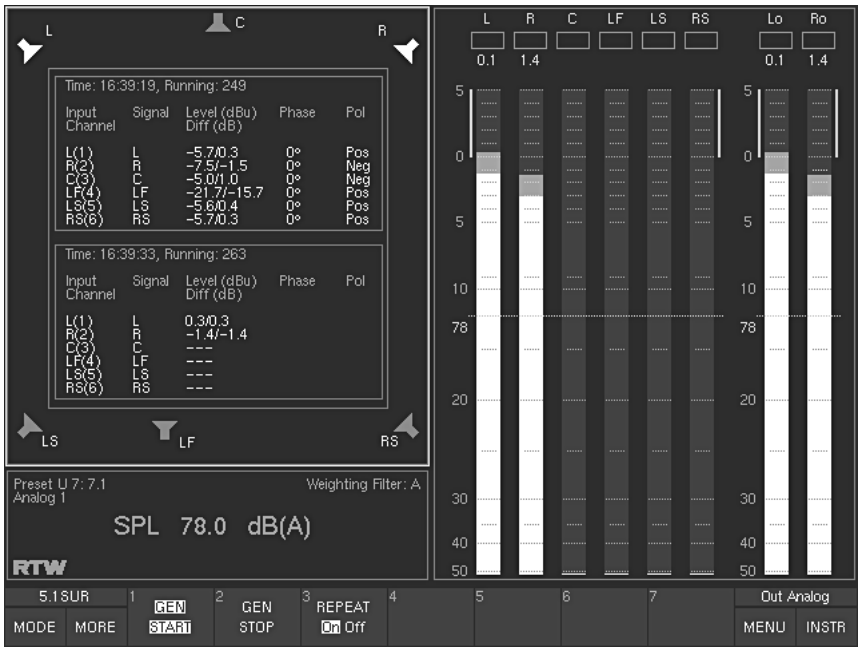


Fig. 5-59: The functions of the BLITS instrument displayed in the Toolbar

- **GEN START (Generator start)**
  (Button/key 1, see Fig. 5-59)
  Selecting this function starts the generating of a BLITS cluster which can be routed to the outputs.

- **GEN STOP (Generator stop)**
  (Button/key 2, see Fig. 5-59)
  Selecting this function stops the generation of the BLITS cluster.

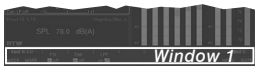
- **REPEAT**
  (Button/key 2, see Fig. 5-59)
  With this function the generation of the BLITS cluster can be repeated and routed to the outputs (On) until this function is set to Off.

6 Menu

6.1 Introduction

The SurroundControl 31900 series and the SurroundControl 31960 series are widely configurable systems with many options for precise adoption to the individual needs of different applications. All parameters are accessed through the menu system GUI occupying most of the normal display area of the unit when opened.

→ MENU



To access the menu system simply press the **Menu** key or click the **MENU** button in the Toolbar (Window 1) of the display using the mouse.

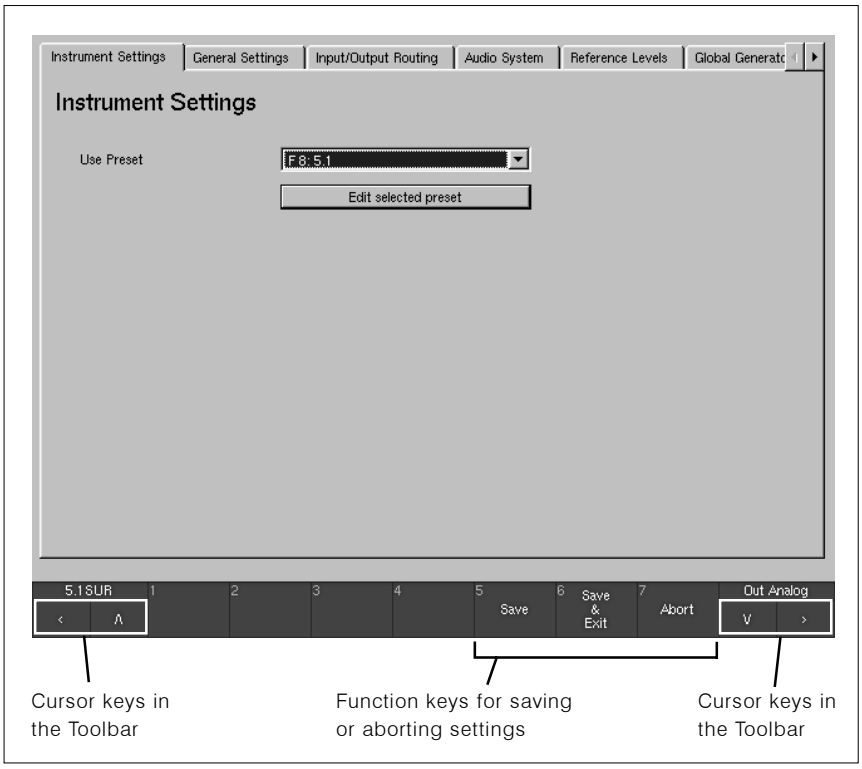


Fig. 6-1: The menu system

After opening the menu the Toolbar remains visible in the bottom area of the screen. Among others it can be used to leave the menu at any time using the following options:

- **Save**
  (Button/key 5, see Fig. 6-1)
  Saves the current status settings with all changes made in the menu system without leaving the current page

- **Save & Exit**
  (Button/key 6, see Fig. 6-1)
  Saves the current status with all changes made and returns to normal display mode

- **Abort**
  (Button/key 7, see Fig. 6-1)
  - When used on one of the menu pages for the **global** settings (see Chapter 6.1.1), pressing the Abort button/key discards any changes made in one of the menus, directly leaves the menu system without saving and returns to normal display mode.
  - When used on one of the menu pages for the **local** instrument settings (see Chapter 6.1.1), pressing the Abort button/key discards any changes only made in one of these menus, leaves the local instrument settings menu pages and returns to the Instruments Settings main menu page. If you want, you now can change the global settings. If not, press the Abort button/key again. Then you discard all changes you have made in any of the menus, leave the menu system and return to normal display mode.

See Chapter 6.1.1

See Chapter 6.1.1

The menu topics are organized in pages accessed by selecting the according tabs in the top area of the screen. Tabs that are not displayed can be accessed by using the two cursor buttons on the top right.

From any sub menu window you get back to the top level by using the **Close** button. Any changes made are retained temporarily and can then be saved by selecting **Save** (button/key 5) or **Save & Exit** (button/key 7).

In most cases the easiest way to navigate the menu will be using a mouse connected to the USB A port of the main unit. Alternatively it is possible to use the cursor buttons on the Remote Control 30050 (31900 series), the control panel of the 31960 series or on the optional Remote Display 30010 as well:

→ <
- **<**: This button/key moves the cursor to the left or displays the previous menu page.

→ >
- **>**: This button/key moves the cursor to the right or displays the next menu page.

→ v
- **v**: This button shifts the focus to the next dialog element. Inside dialog boxes it moves to the next selection.

→ ^
- **^**: This button shifts the focus to the previous dialog element. Inside dialog boxes it moves back to the previous selection.

→ SEL(ECT)
- **Sel**(ect): This button confirms the dialog element highlighted with the cursor keys (i. e. the element that currently has the focus) or changes its status by selecting or deselecting it.

6.1.1 Local vs. Global Settings

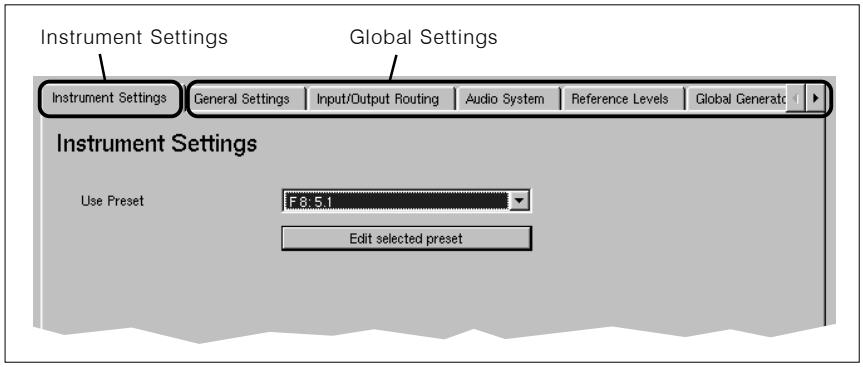


Fig. 6-2: The menu tabs for local and global settings

Of course all configuration data set in the menu is saved in the unit. The memory system consists of two different areas holding local and global settings:

- **Local settings**
  Local settings are hold in 7 factory presets and 7 user presets. The local settings are changed any time the user loads a new preset to reflect the stored settings. All settings made on the Instrument Settings page of the menu are local settings saved only for the selected preset. Presets are a good way of storing the individual settings for each user working with the unit.

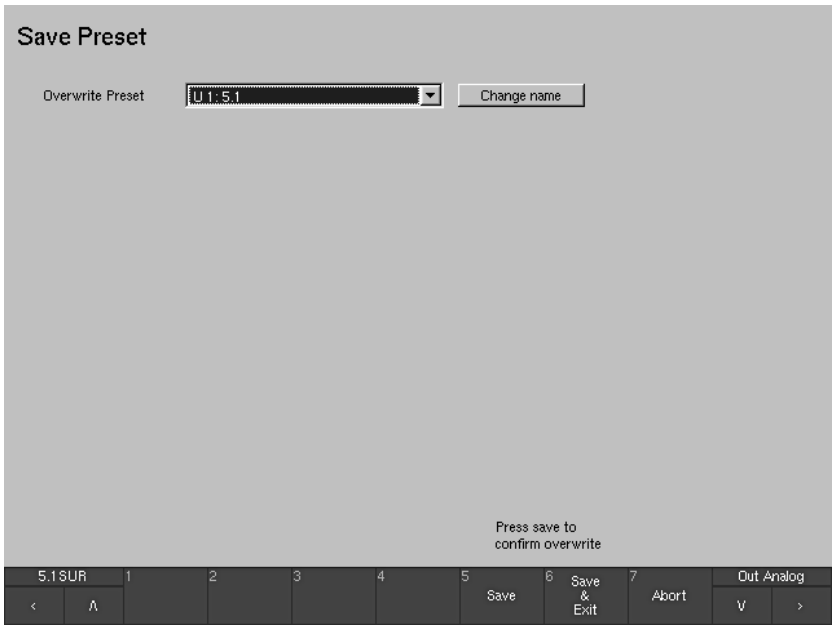


Fig. 6-3: The Save Preset menu page for holding the local settings

- **Global Settings**
  Global Settings resp. the parameters set on all other menu pages are stored globally and independent of the loaded preset. This means they won't change when a new preset is loaded. Global settings contain settings which most users do not need to modify in daily use, for example parameters related to the studio environment, reference levels etc.

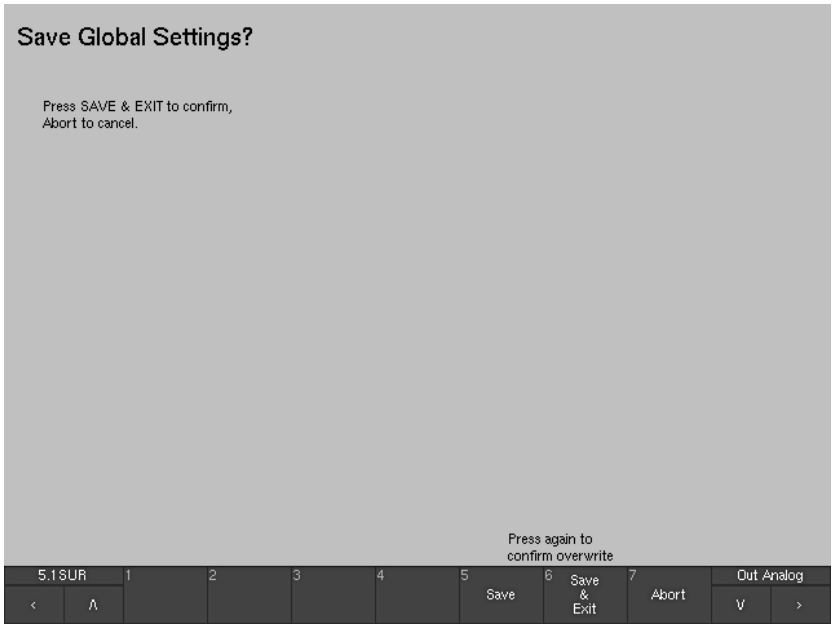


Fig. 6-4: The Save Global Settings menu page for holding the global settings

Note:
The global settings are stored separately from the (local) instrument settings. There is always only one set of global settings - you cannot store different versions as you can for the user presets.

As the input/output routing of the system is very flexible it can be part of the local or the global settings alternatively. If the routing from/to the physical input and output connectors should be fixed for a certain installation and therefore not being altered by a preset change, it can be set globally using the **Input/Output Routing** menu page. If the user prefers to vary the routing when loading a preset instead, the same parameters can be accessed on the **Instrument Settings** page as well and stored together with any user preset. For each preset the user has the option to define whether this preset should use its own individual local input/output routing (**Use Local Routing Settings**, see Chapter 6.3.1) or the global routing instead.

See Chapter 6.3.1

6.1.2 Sub Presets

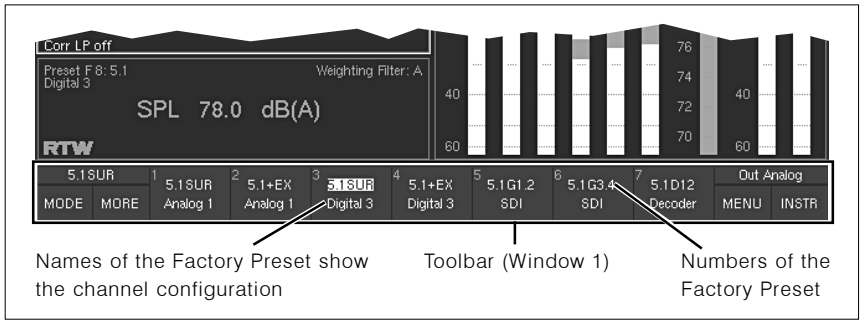


Fig. 6-5: Sub Presets 1 to 7 displayed in the Toolbar in Window 1

The concept of “Sub Presets” was introduced for making it even easier and faster to adapt to different tasks and production needs. Using Sub Presets it is not necessary to load a preset each time a new input source and routing is needed. Sub presets are accessed very fast without opening the menu system – via activating the **Input** key on the Remote Control 30050 (31900 series) or the control panel of the 31960 series and pressing one of the seven numbered keys. Each user preset as well as the global setting contains 7 Sub Presets holding, among many other parameters, the complete input routing, the preferred instrument shown in the display and detailed settings for the Peak Program Meters and the ITU BS.1771 Loudness Meter. By default, the Sub Presets are named **Key 1**, ..., **Key 7** to reflect the button/key they are assigned to, but the user has the option to rename them individually anytime. In normal operation the name of the Sub Presets is shown in the Toolbar after pressing the **Input** button/key on the Remote Control 30050 (31900 series) or the control panel of the 31960 series or on the Remote Display 30010 front panel.

Because the 7 Sub Presets are part of the routing settings they will as well follow the local/global setting made for the routing in each preset. This means the settings loaded with **Key 1** to **Key 7** might change with each new user preset loaded when the Use Local Routing Settings checkbox is activated in the loaded preset (see Chapter 6.3.1). The Sub Presets then are local sub presets. On the other hand, if the checkbox is not activated, the Sub Presets are used as global sub presets instead, as defined under **Global Routing Settings** menu (Input/Output Routing menu tab) and **Input Routing** sub menu (see Chapter 6.5.1).

See Chapter 6.3.1
→ MENU
→ INPUT/OUTPUT ROUTING
→ MONITORING INPUT ROUTING

See Chapter 6.5.1

Note:
Except the first Sub Preset which is recalled with **Key 1** all other Sub Presets are only available when they are enabled with a checkbox on the **Input Routing** sub menu page. Please refer to Chapter 6.5.2 for more details about enabling and disabling Sub Presets.

See Chapter 6.5.2

6.1.3 Channel Organization and Signal Routing

Internally, the unit uses logical channels (L, R, etc.) that match the selected audio format. For example, if you are using 5.1 surround the internal logical channels are L, R, C, LS, RS, LF, Lext, Rext, Lo and Ro. The assignment of the physical signal inputs to these logical channels is performed in the input routing, with separate settings for each input (see Chapters 6.3.2 and 6.5.1). Internally, the metering and the Monitoring Controller always use the logical channels (L, R etc.) and not the physical inputs. The same applies accordingly for the monitoring controller's outputs: The logical internal channels (L, R etc.) are routed to the physical outputs with settings in the output routing. It is possible to enter different settings for the analog and digital outputs.

See Chapters 6.3.2 and 6.5.1

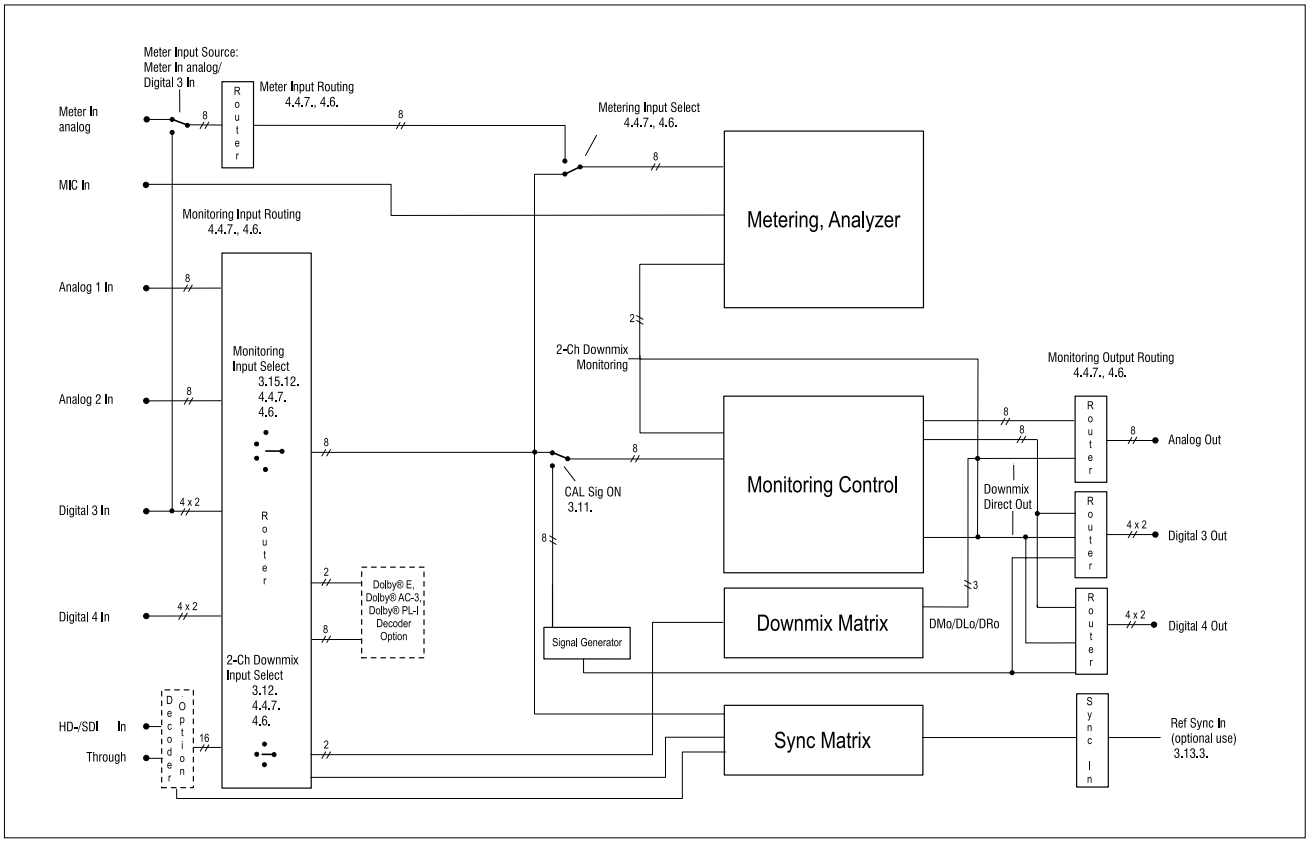
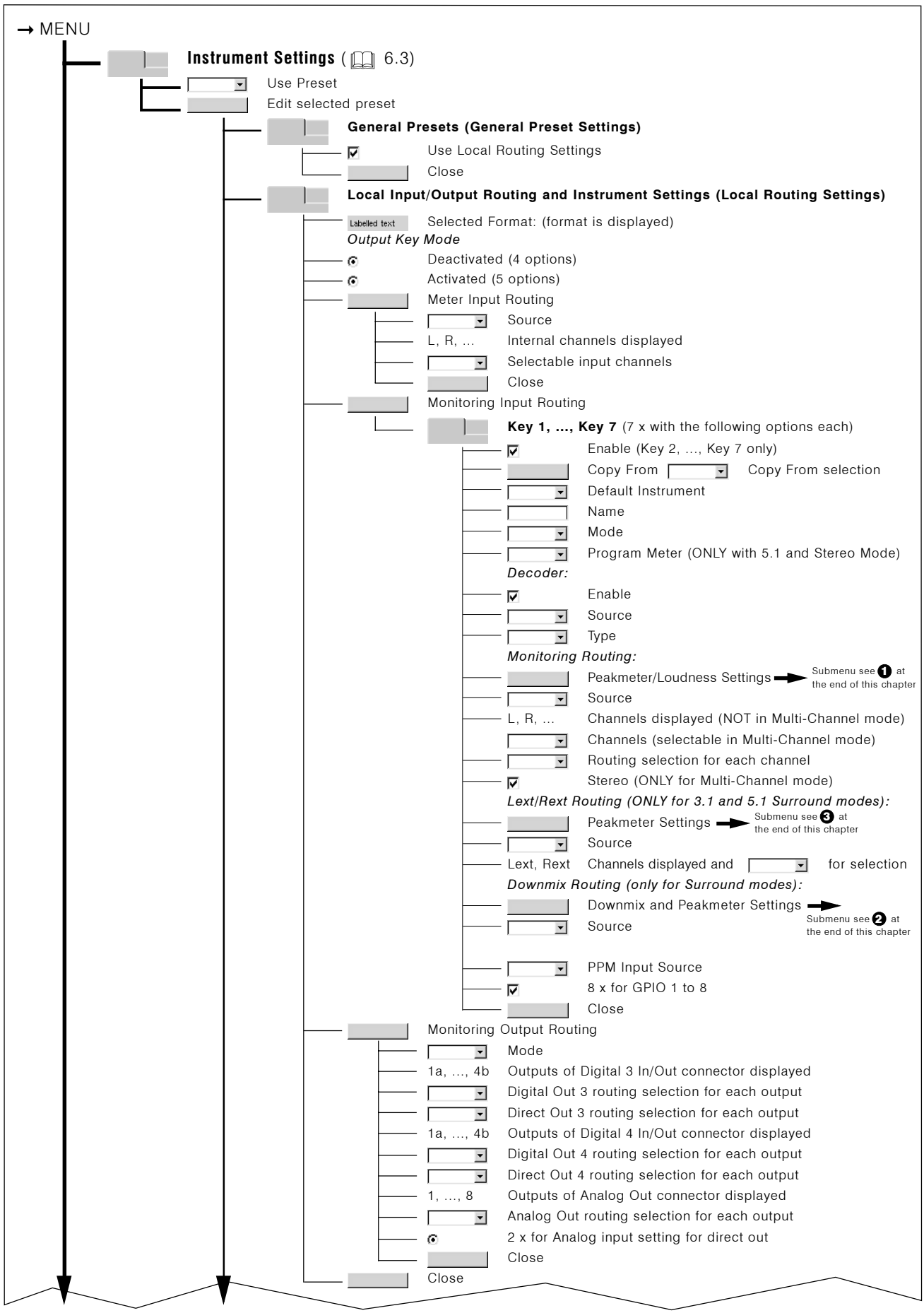
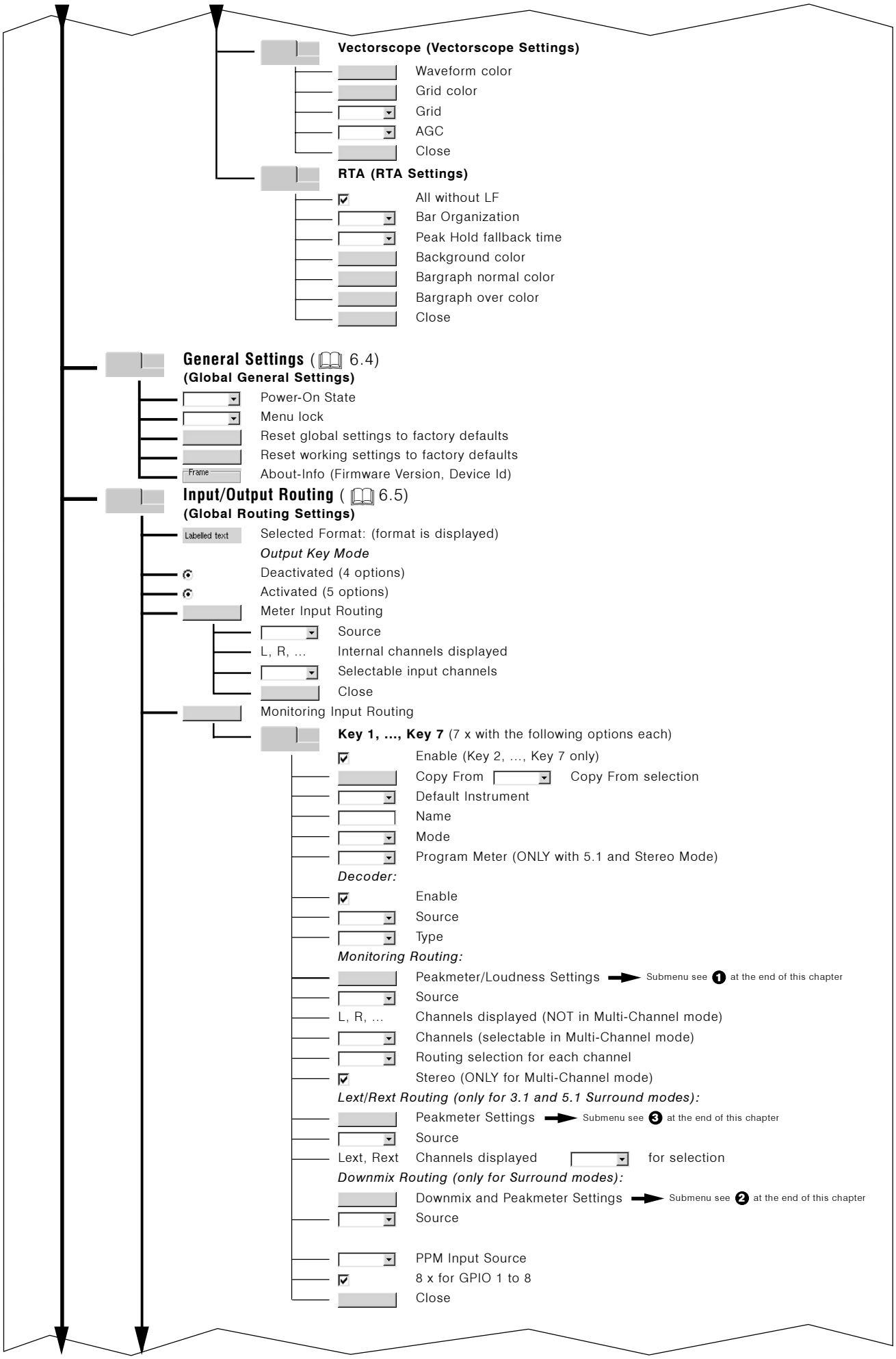
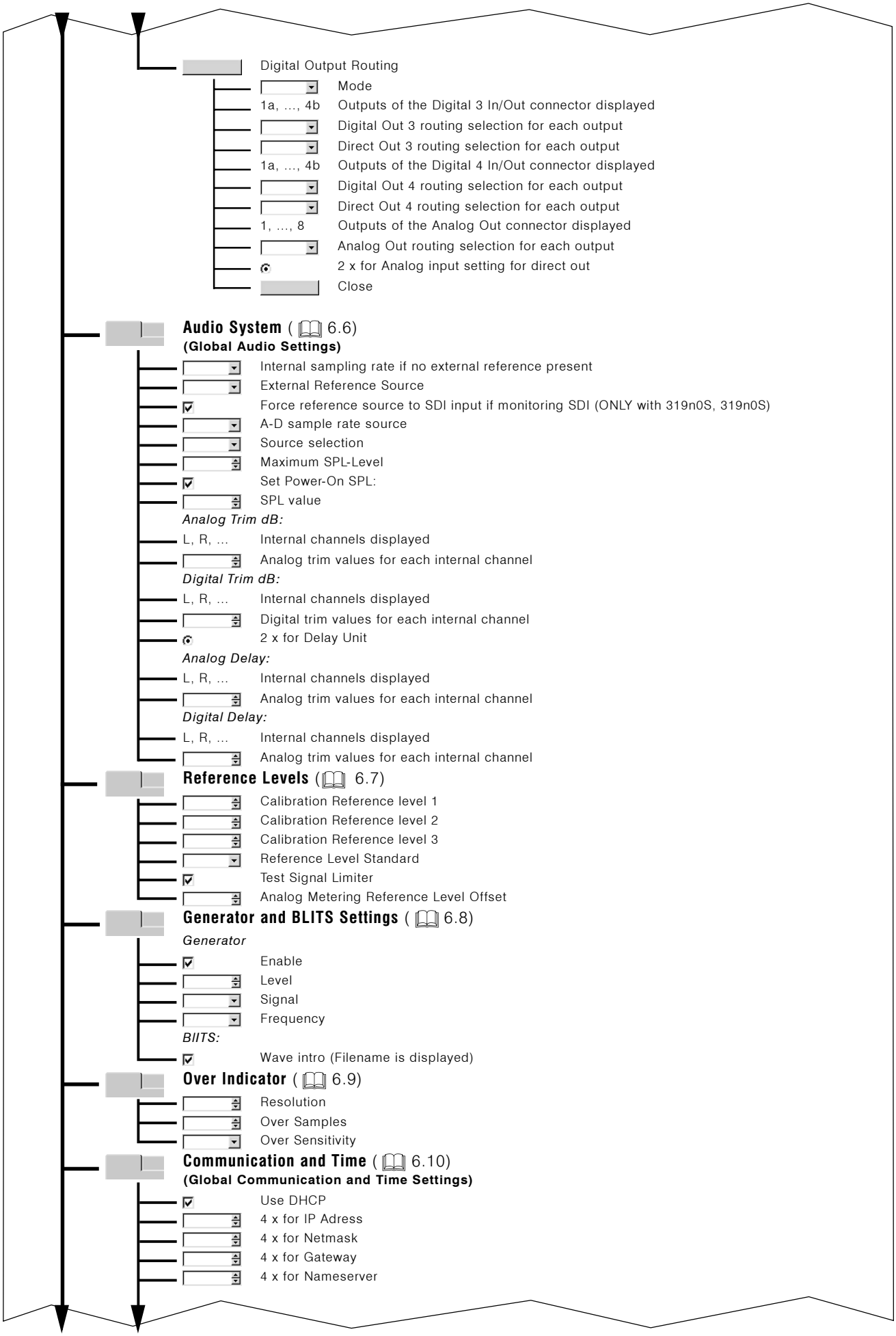


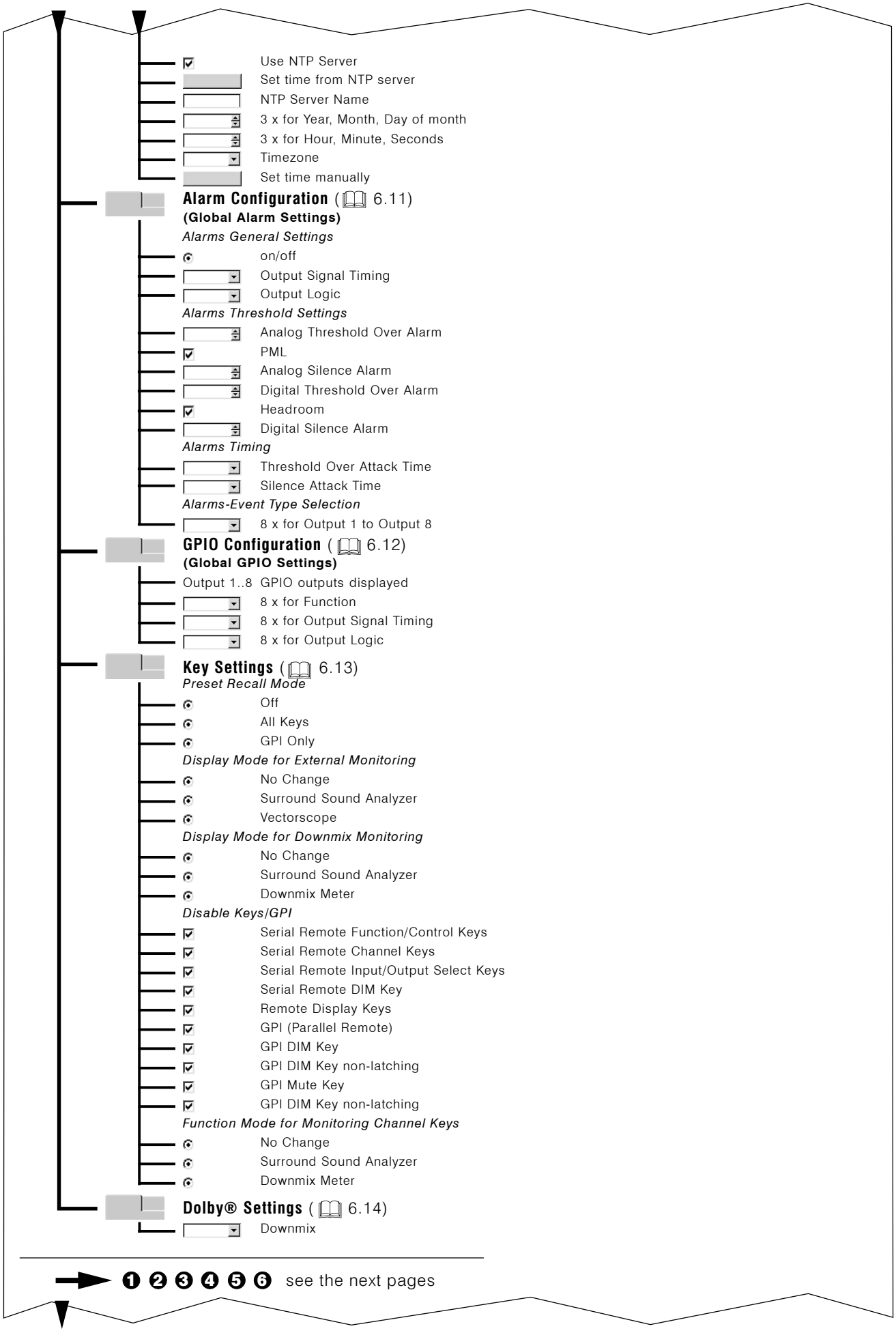
Fig. 6-6: Signal routing in the SurroundControl units

6.2 Menu Structure Reference




Vectorscope (Vectorscope Settings)
Waveform color
Grid color
Grid
AGC
Close
RTA (RTA Settings)
All without LF
Bar Organization
Peak Hold fallback time
Background color
Bargraph normal color
Bargraph over color
Close
General Settings (6.4)
(Global General Settings)
Power-On State
Menu lock
Reset global settings to factory defaults
Reset working settings to factory defaults
Frame
About-Info (Firmware Version, Device Id)
Input/Output Routing (6.5)
(Global Routing Settings)
Labelled text
Selected Format: (format is displayed)
Output Key Mode
Deactivated (4 options)
Activated (5 options)
Meter Input Routing
Source
L, R, ...
Internal channels displayed
Selectable input channels
Close
Monitoring Input Routing
Key 1, ..., Key 7 (7 x with the following options each)
Enable (Key 2, ..., Key 7 only)
Copy From
Copy From selection
Default Instrument
Name
Mode
Program Meter (ONLY with 5.1 and Stereo Mode)
Decoder:
Enable
Source
Type
Monitoring Routing:
Peakmeter/Loudness Settings
Submenu see 1 at the end of this chapter
Source
L, R, ...
Channels displayed (NOT in Multi-Channel mode)
Channels (selectable in Multi-Channel mode)
Routing selection for each channel
Stereo (ONLY for Multi-Channel mode)
Lext/Rext Routing (only for 3.1 and 5.1 Surround modes):
Peakmeter Settings
Submenu see 3 at the end of this chapter
Source
Lext, Rext
Channels displayed
for selection
Downmix Routing (only for Surround modes):
Downmix and Peakmeter Settings
Submenu see 2 at the end of this chapter
Source
PPM Input Source
8 x for GPIO 1 to 8
Close


Digital Output Routing
Mode
1a, ..., 4b
Outputs of the Digital 3 In/Out connector displayed
Digital Out 3 routing selection for each output
Direct Out 3 routing selection for each output
1a, ..., 4b
Outputs of the Digital 4 In/Out connector displayed
Digital Out 4 routing selection for each output
Direct Out 4 routing selection for each output
1, ..., 8
Outputs of the Analog Out connector displayed
Analog Out routing selection for each output
2 x for Analog input setting for direct out
Close
Audio System (6.6)
(Global Audio Settings)
Internal sampling rate if no external reference present
External Reference Source
Force reference source to SDI input if monitoring SDI (ONLY with 319n0S, 319n0S)
A-D sample rate source
Source selection
Maximum SPL-Level
Set Power-On SPL:
SPL value
Analog Trim dB:
L, R, ...
Internal channels displayed
Analog trim values for each internal channel
Digital Trim dB:
L, R, ...
Internal channels displayed
Digital trim values for each internal channel
2 x for Delay Unit
Analog Delay:
L, R, ...
Internal channels displayed
Analog trim values for each internal channel
Digital Delay:
L, R, ...
Internal channels displayed
Analog trim values for each internal channel
Reference Levels (6.7)
Calibration Reference level 1
Calibration Reference level 2
Calibration Reference level 3
Reference Level Standard
Test Signal Limiter
Analog Metering Reference Level Offset
Generator and BLITS Settings (6.8)
Generator
Enable
Level
Signal
Frequency
BIITS:
Wave intro (Filename is displayed)
Over Indicator (6.9)
Resolution
Over Samples
Over Sensitivity
Communication and Time (6.10)
(Global Communication and Time Settings)
Use DHCP
4 x for IP Adress
4 x for Netmask
4 x for Gateway
4 x for Nameserver


Use NTP Server
Set time from NTP server
NTP Server Name
3 x for Year, Month, Day of month
3 x for Hour, Minute, Seconds
Timezone
Set time manually
Alarm Configuration (📖 6.11)
(Global Alarm Settings)
Alarms General Settings
on/off
Output Signal Timing
Output Logic
Alarms Threshold Settings
Analog Threshold Over Alarm
PML
Analog Silence Alarm
Digital Threshold Over Alarm
Headroom
Digital Silence Alarm
Alarms Timing
Threshold Over Attack Time
Silence Attack Time
Alarms-Event Type Selection
8 x for Output 1 to Output 8
GPIO Configuration (📖 6.12)
(Global GPIO Settings)
Output 1..8 GPIO outputs displayed
8 x for Function
8 x for Output Signal Timing
8 x for Output Logic
Key Settings (📖 6.13)
Preset Recall Mode
Off
All Keys
GPI Only
Display Mode for External Monitoring
No Change
Surround Sound Analyzer
Vectorscope
Display Mode for Downmix Monitoring
No Change
Surround Sound Analyzer
Downmix Meter
Disable Keys/GPI
Serial Remote Function/Control Keys
Serial Remote Channel Keys
Serial Remote Input/Output Select Keys
Serial Remote DIM Key
Remote Display Keys
GPI (Parallel Remote)
GPI DIM Key
GPI DIM Key non-latching
GPI Mute Key
GPI DIM Key non-latching
Function Mode for Monitoring Channel Keys
No Change
Surround Sound Analyzer
Downmix Meter
Dolby® Settings (📖 6.14)
Downmix
❶ ❷ ❸ ❹ ❺ ❻ see the next pages

❶ **Peakmeter Settings** (6.5.2.6)

- Labelled text — Channel Mode (mode is displayed)
- Weighting Filter
- RMS response
- Peak Hold fallback time
- Background color
- Position (each group)
- Channel Group (the number depends on the mode selected) → ❸ ❹
- Close

resp.:

Loudness Settings (6.5.2.9)

- Labelled text — Channel Mode (mode is displayed)
- Filter
- Scale
- Reference
- Background color
- Channel Group (Loudness) → ❺
- Sum Group (Loudness) → ❻
- Close

❷ **Two Channel Downmix Settings** (6.5.2.7)

Downmix Parameter

- Rear (SL/SR)
- Center (SC - 6.1 only)
- Front (C)
- Front (CL/CR - 7.1 only)
- Downmix Mono Matrix

Downmix Vectorscope

- Waveform color
- Grid color
- Grid
- AGC
- Channel Group → ❸
- Close

❸ **Peakmeter – Channel Group** (6.5.2.8)

→ **Settings separately for each Channel Group:**

- Peakmeter - Channel Group 1 to 4, (except Channel Group 3 in Surround modes, see ❹),
- Lext/Rext - Channel Group,
- Downmix - Channel Group

- Labelled text — Mode Selected (mode is displayed)
- Mode Select (ONLY with Channel Group 2 in Surround and some Multi-channel modes)
- Standard Settings Digital
- Scale
- Integration time
- PH Integration time
- DC-Filter
- Headroom
- Operation indicator area
- Standard Settings Analog
- Scale
- Integration time
- PH integration time
- Operation indicator area
- VU-Lead
- Grid color
- Label Font color
- Bargraph enabled ***)**
- Bargraph normal color ***)**
- Bargraph operation color ***)**
- Bargraph over color ***)**
- RMS indicator color ***)**
- Bargraph background color ***)**
- Tracklayout (surround modes only)
- SPL Reference indicator
- Close

***)**: one button for each channel

❹ **Peakmeter – Channel Group** (6.5.2.8)

→ **In Surround Modes settings for:**

- Peakmeter - Channel Group 3

- Labelled text — Mode Selected: SPL (displayed)
- Grid color
- Label Font color
- RMS indicator color
- Bargraph background color
- Close

❺ **Channel Group (Loudness)** (6.5.2.40) ERS_FILTER_BUG

Settings for the Channel Group:

- Standard Settings Digital
- Scale
- Integration time
- PH Integration time
- DC-Filter
- Headroom
- Operation indicator area
- Peak Hold fallback time
- Mode
- PPM Type
- Loudness
- Operation indicator area
- Tracklayout (5.1 Surround mode only)
- PPM Grid color
- (PPM) Scale font color
- (PPM) Enabled ***)**
- (PPM) Normal color ***)**
- (PPM) Operation color ***)**
- (PPM) Over color ***)**
- (PPM) Background color ***)**
- Loudness Grid color
- (Loudness) Label/scale/numeric font color (3 x)
- (Loudness) Enabled ***)**
- (Loudness) Normal color ***)**
- (Loudness) Operation color ***)**
- (Loudness) Over color ***)**
- (Loudness) Background color ***)**
- Close

***)**: one check box/button for each channel of 5.1 Surround mode or 2-Channel Stereo mode

❻ **Sum Group (Loudness)** (6.5.2.41) ERS_FILTER_BUG

Settings for the Sum Group:

- General
- Alarm Threshold
- Alarm Hold
- Momentary
- Integration time
- Integrated
- Weighting time
- Longterm
- Use Threshold
- Threshold mode
- Threshold absolute (with “fixed” Threshold mode)
- Threshold offset (with “dynamic” Threshold mode)
- Integration time (2 x for days and hours)
- Recalc data
- Operation indicator area
- Grid color
- Label/numeric font color (2 x)
- Channel (3 x)
- Bargraph enabled (3 x)
- Bargraph normal color (3 x)
- Bargraph operation color (3 x)
- Bargraph over color (3 x)
- Bargraph background color (3 x)
- Numerical enabled (ONLY for “I” and “L” value)
- Channel Weighting ITU BS.1771 Format 5.1
  5 x for Left, Right, Center,
  Left Surround, Right Surround
- Close

→ MENU
Start page after first initializing
(→ Instrument Settings)

6.3 Instrument Settings: The Instrument Settings Menu

After selecting the Instruments Settings tab the Instruments Settings menu page is shown.

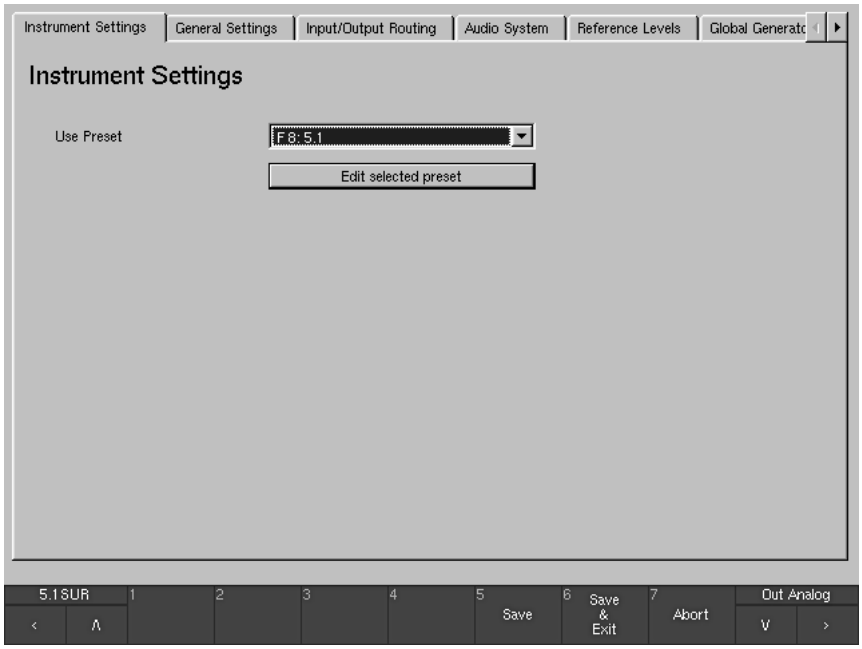


Fig. 6-7: The Instrument Settings menu page

This menu page is used to load a new preset (Use Preset, the currently selected preset is displayed) or to change the settings of the current preset (select **Edit selected preset** button). An instrument setting stores the parameters for all available instruments in a single preset. There are 7 user presets (U 1 to U 7) that can be modified by the user and 7 read-only factory presets (F 8 to F 14) available. See Chapters 3, 6.5.2 and Appendix A for details.

See Chapters 3, 6.5.2, and Appendix A

With a mouse installed at the USB A connector right-clicking in an instrument window switches from normal display mode to the menu system showing the settings of the current preset. If this is a factory preset you will be prompted to save any changes in one of the 7 user presets when you exit the instrument menu (see Fig. 6-3). If you do not do this, any changes made will be lost.

See Fig. 6-3

→ Use Preset

- If you want to load a new preset, please select one of the preset names shown in the Use Preset combo box on the **Instrument Settings** menu page and return to normal display mode using the **Save & Exit** button.

→ Edit selected Preset

- If you want to edit a preset, click the Edit selected preset button on the **Instrument Settings** main page. A new menu page with the Instrument Settings of the selected preset opens up, containing the four menu tabs General Presets, Local Input/Output Routing and Instrument Settings, Vectorscope and RTA. Any changes made on this menu page are stored to a user preset after leaving this section with **Save** or **Save & Exit**. Leaving the menu section with **Abort** instead discards all edits made.

6.3.1 Edit selected Preset: General Presets

After selecting the General Presets tab the General Preset Settings menu page is shown.

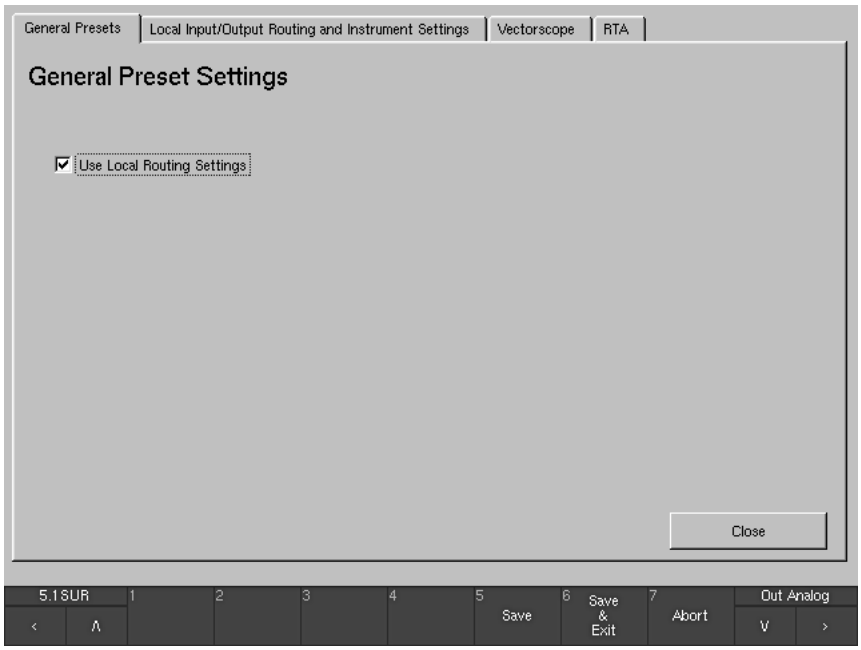


Fig. 6-8: The General Preset Settings menu page

- **Use Local Routing Settings** ☑
  The status of this checkbox decides whether the routing of the **local** instrument settings stored in the individual user preset or the **global** settings of the unit are used when loading this preset.
  - With this option enabled, all routing settings made on the **Local Routing Settings** menu page (Local Input/Output Routing and Instrument Settings menu tab) are used when the edited preset is loaded.
  - With this option disabled, these local settings are NOT used when the edited preset is loaded. The global routing settings made on the **Global Routing Settings** menu page (Input/Output Routing menu tab) and its sub menus (see Chapter 6.5.1) are used instead. See Chapter 6.1.1 for further explanation of local and global settings.

See Chapters 6.5.1 and 6.1.1

Note:
As the Sub Presets are part of the routing settings, this option also defines whether the local or the global set of Sub Presets is used with a certain user preset (see Chapter 6.1.2).

See Chapter 6.1.2

- **Close**
  This button closes the menu page and prompts you to save the preset to one of the user presets (U 1 to U 7, see Fig. 6-9). You can also enter an individual name for the preset with the Change name button (6 characters, see Fig. 6-10).

See Fig. 6-9 and 6-10

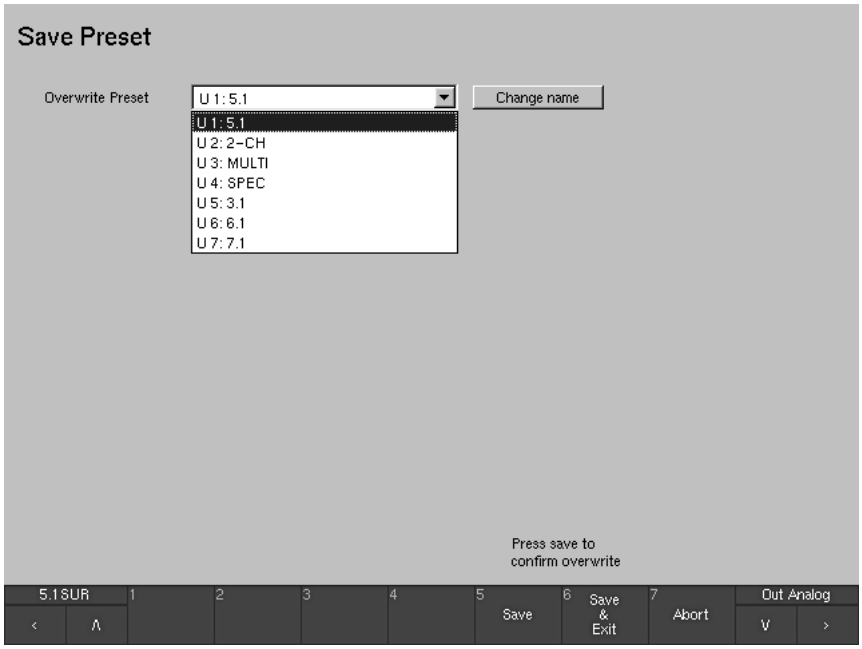


Fig. 6-9: The Save Preset menu page

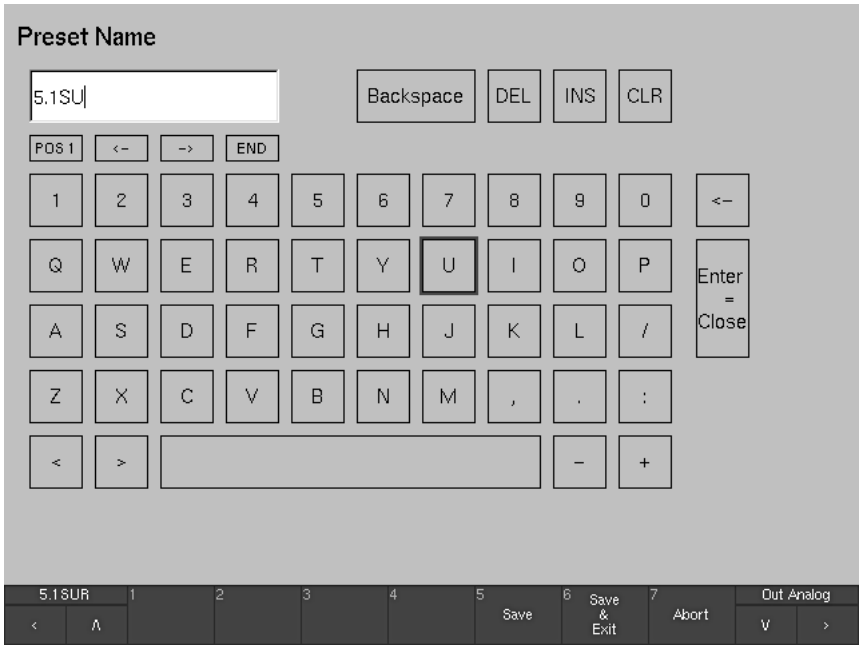


Fig. 6-10: The keypad on the Preset Name menu page for changing the preset name

→ Local Input/Output Routing and Instrument Settings

6.3.2 Edit selected Preset: Local Input/Output Routing and Instrument Settings

After selecting the Local Input/Output Routing and Instrument Settings menu tab, the **Local Routing Settings** menu page is shown. The options are only accessible when the Use Local Routing Settings checkbox of the **General Preset Settings** menu is activated (see Chapter 6.3.1).

See Chapter 6.3.1

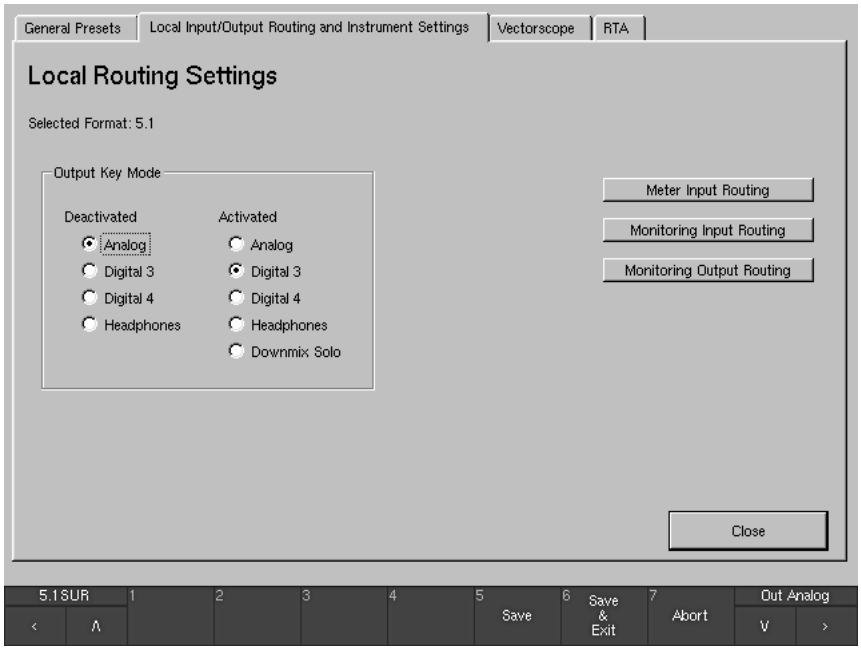


Fig. 6-11: The Local Routing Settings menu page

As, in almost every aspect, the **local** input/output routing is identical to the **global** input/output routing described in Chapter 6.5. Please refer to this Chapter for a detailed explanation of all parameters.

See Chapter 6.5

Note:
Nevertheless, please keep in mind that, in contrary to the global settings, the Local Input/Output Routing and Instrument Settings are only applied when the Use Local Routing Settings checkbox is activated for the preset in use (see Chapter 6.3.1).

See Chapter 6.3.1

6.3.3 Edit selected Preset: Vectorscope

After selecting the Vectorscope tab the Vectorscope Settings menu page is shown.

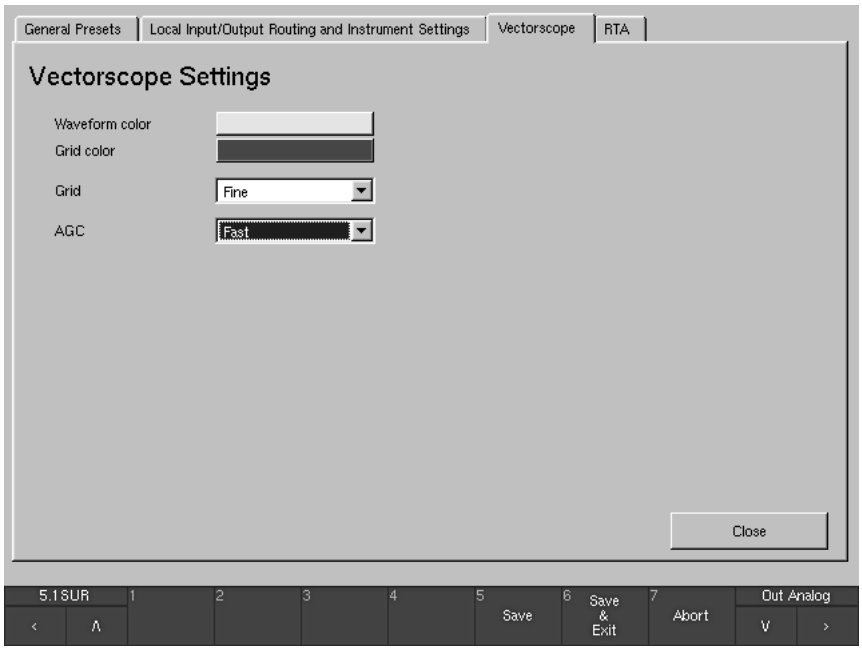


Fig. 6-12: The Vectorscope Settings menu page

- **Waveform color**
  This button displays the color selector so that you can select the display color to be used for the signal in the vectorscope display.

- **Grid Color**
  This button displays the color selector so that you can select the display color to be used for the coordinate grid in the vectorscope display.

- **Grid**
  This combo box is for changing the setting of the coordinate grid in the vectorscope display. Options: Fine (dots) or Normal (lines)

- **AGC**
  This combo box is for adjusting the vectorscope's AGC (Automatic Gain Control) response time. Options: Fast or Slow.

- **Close**
  This button closes the page and prompts you to save the preset (see Chapter 6.3) to one of the user presets (U 1 to U 7, see Fig. 6-9). You can also enter an individual name for the preset with the Change name button (6 characters, see Fig. 6-10).

See Fig. 6-9 and 6-10

6.3.4 Edit selected Preset: RTA

After selecting the RTA tab the RTA Settings menu page is shown.

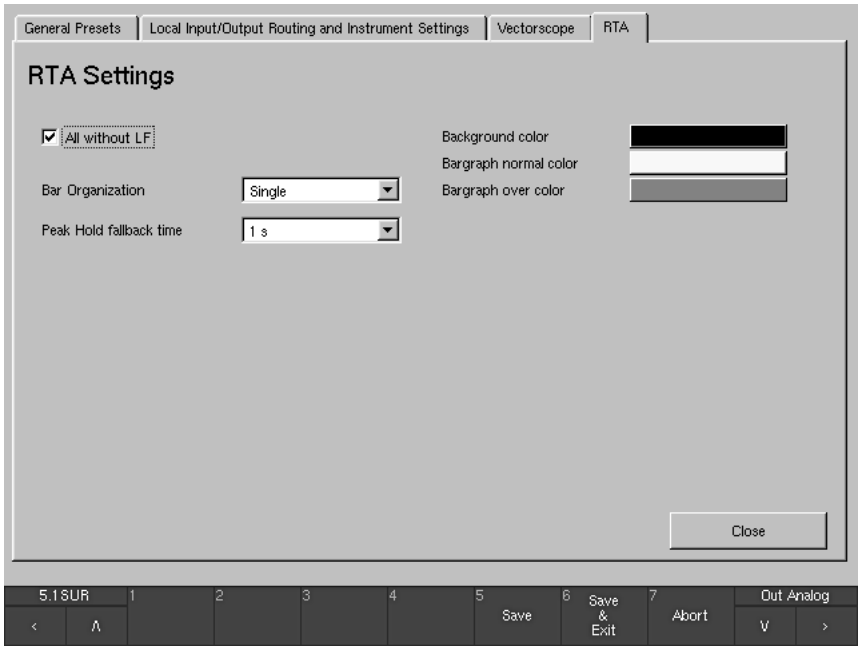


Fig. 6-13: The RTA Settings menu page

- **All without LF** ☑

  This check box determines the behavior of function key/button 1 when the function Input Select (see Chapter 5.6.2) is selected in the instruments RTA 1/3 and RTA 1/6:

  - If the check box is disabled, button/key 1 is labeled All. In this case all channels including the LF channel are used for the Real Time Analyzer display.
  - If the check box is enabled, the button/key 1 is labeled All w/o LF. In this case all channels except the LF channel are used for the Real Time Analyzer display.

See Chapter 5.6.2

- **Bar Organization**

  This combo box is for changing the way the bargraphs are arranged in the RTA display. You can choose between single bars (Single), groups of three (Group 1/3 Octave) and blocks of three (Block 1/3 Octave).

- **Peak Hold fallback time**

  This combo box is for setting the display duration for the peak hold display. Options: 1 s, 2 s, 4 s, 10 s, 20 s, 30 s and Manual Reset. With Manual Reset selected, you can reset the peak hold display with the PHold Reset function in the RTA 1/3 or RTA 1/6 instrument (see Chapter 5.6.2).

See Chapter 5.6.2

- **Background color**

  This button displays the color selector so that you can change the color of the background of the bargraph display in the RTA instrument.

- **Bargraph normal color**
  This button displays the color selector so that you can choose the display color for the normal range of the bargraphs in the RTA instrument.

- **Bargraph over color**
  This button displays the color selector so that you can choose the display color for the overload range of the bargraphs in the RTA instrument.

- **Close**
  This button closes the page and prompts you to save the preset (see Chapter 6.3) to one of the user presets (U 1 to U 7, see Fig. 6-9). You can also enter an individual name for the preset with the Change name button (6 characters, see Fig. 6-10).

See Chapter 6.3 and Fig. 6-9 and 6-10

6.4 General Settings: The Global General Settings Menu

After selecting the General Settings tab the Global General Settings menu page is shown.

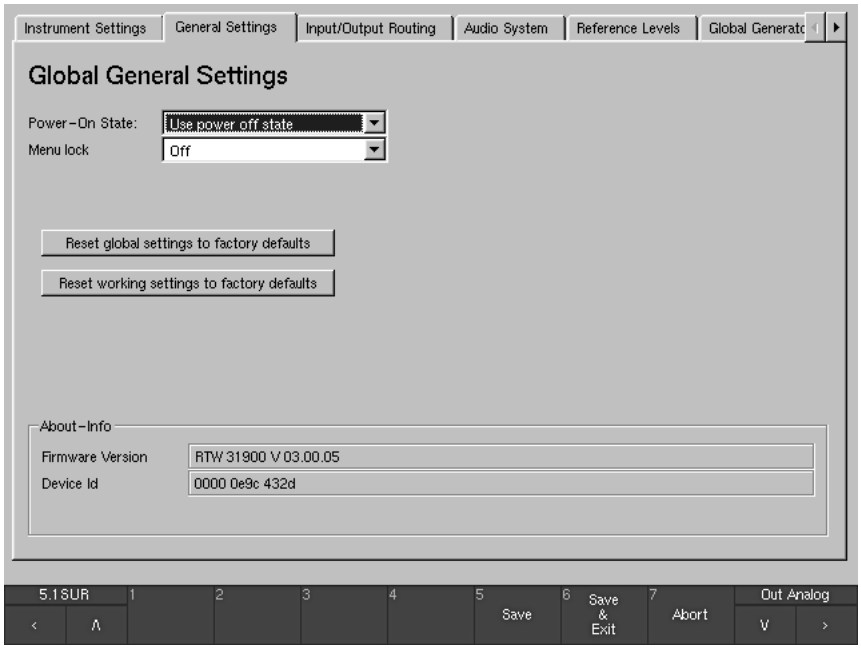


Fig. 6-14: The Global General Settings menu page

- **Power-On State:**
  This combo box selects the preset that is loaded and activated when the unit is switched on (Use Preset: ...). You can select any of the 7 user presets (U 1 to U 7) or the 7 factory presets (F 8 to F 14). Selecting the option Use power off state loads the last preset used when the unit was switched off.

- **Menu lock**
  This combo box allows you to choose whether the menu system is freely accessible (Off) or only available after the user has entered one of the eight 4-digit numeric codes (PINs) offered. After activating the menu lock function by selecting and saving a PIN, a prompt asking the user to enter the PIN code will be displayed when the **MENU** button/key is activated in normal mode. The buttons in the Toolbar are then labeled with numbers to allow entry of the PIN code. The digits 1 to 6 and Abort button are displayed on the first level and the digits 7 to 9, digit 0, a backspace key (DEL), a Select button and an Abort button are displayed on the second level of the menu, which can be displayed by selecting the ˅ button/key. Pressing the ^ key takes you back to the first level. On both levels the seventh button/key in the Toolbar offers the Abort function which cancelles the procedure.

Note:
If you entered a wrong password by pressing the Select button, the message „Wrong password, please try again“ will be shown in the Toolbar (Window 1).

- **Reset global settings to factory defaults**
  With this button all Global Settings (all menu tabs except the Instrument Settings menu tab) can be set back to their factory default settings. A safety request has to be confirmed. When the system returns to normal operation display, the Toolbar shows the message „Global config initialized with factory settings“ for a short time.

- **Reset working settings to factory defaults**
  With this button all settings done in the Toolbar during normal operation of the unit are set back to their factory default settings. A safety request has to be confirmed. When the system returns to normal operation display, the Toolbar shows the message „Working config initialized with factory settings“ for a short time.



Note:
The Reset buttons both are used to return the unit to normal operation after the user has unintentionally made faulty settings.

Only available with units of the 31960 series



- **Display Brightness**
  (ONLY available with units of the 31960 series)
  With this list box the brightness of the integrated TFT display can be adjusted in a range from 20 % to 100 % in steps of 10 %.

- **About-Info** Frame
  This frame displays information on the firmware version of your RTW unit.

→ MENU
→ Input/Output Routing menu tab

6.5 Input/Output Routing: The Global Routing Settings

After selecting the Input/Output Routing tab the Global Routing Settings menu page is shown.

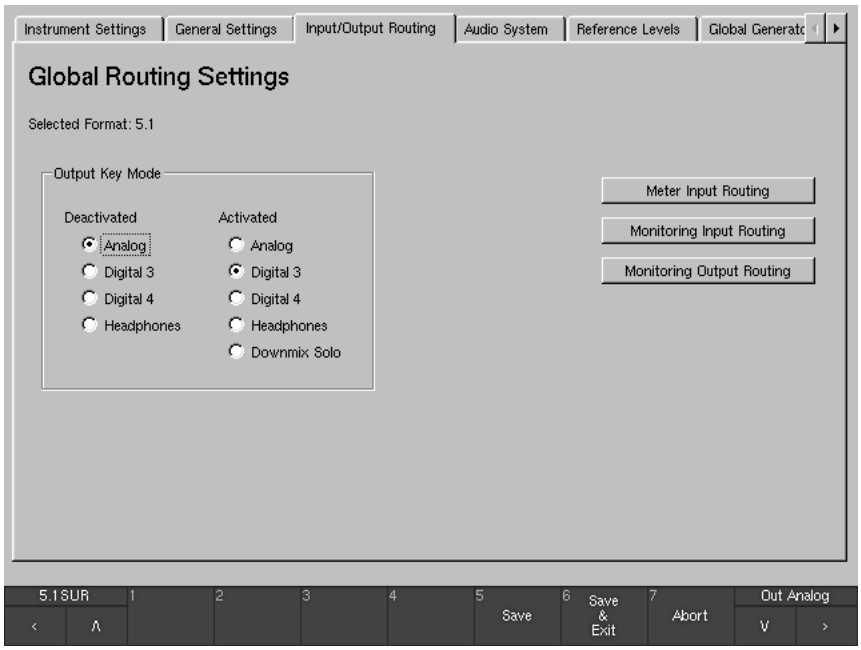


Fig. 6-15: The Global Routing Settings menu page

Note:
All settings made on this menu page or the sub menu pages entered from here are **Global Routing Settings**. This means that they are only active when the Use Local Routing Settings checkbox in the loaded preset, displayed after pressing the Edit selected Preset button, is NOT selected (disabled) in the **General Preset Settings** menu (see Chapter 6.3.1).

See Chapter 6.3.1

Note:
When the Use Local Routing Settings checkbox is selected, the local routing settings stored for the loaded preset are used instead. Details about setting up the local routing for the selected preset are described in Chapters 6.3.1 and 6.3.2. Because the **Local Routing Settings** are similar to the **Global Routing Settings**, the following descriptions also can be applied to the local settings.

See Chapters 6.3.1 and 6.3.2

Among many other options, the **Global Routing Settings** menu page is used to set the channel formats used by the unit as well as the input/output routing of the monitor controller and the input routing of the metering. The settings configured here are used to allocate the physical inputs and outputs to the internal logical channels L, R, and so on.

- **Selected Format** Labelled text

  In this line the channel format (e. g. 5.1 or 2 channel stereo) used by the unit is displayed. It depends on the Use Preset selection on the **Instrument Settings** menu page (see the second paragraph of Chapter 6.3)

See Chapter 6.3

Note:
This field cannot be edited by the user.

To change the selected format, please use the Monitoring Input Routing button on the same menu page to set the channel format instead (see Chapter 6.5.2).

See Chapter 6.3

- **Output Key Mode** Frame

  The **Output** key on the Remote Control 30050 (31900 series) or the control panel of the 31960 series is used to switch the output signal of the monitoring controller between two output connectors which can be selected with this option.

  - Deactivated: The output connector selected here is used when the **Output** key is not illuminated (inactive).
    - Options: Analog, Digital 3, Digital 4, Headphones (on the front panels of the units)
  - Activated: The output connector selected here is used when the **Output** key is illuminated (active).
    - Options: Analog, Digital 3, Digital 4, Headphones (on the front panels of the units), Downmix Solo.

With the Downmix Solo option selected, the unit switches the soloed downmix signal to the front speakers of the monitoring setup as soon as the **Output** key is activated. All other output signals are muted. The downmix signal monitored here is selected in the **Downmix Routing** section of the **Monitoring Input Routing** (see Chapter 6.5.2.5).

See Chapter 6.5.2.5

On Global Routing Settings menu page:
→ Meter Input Routing

6.5.1 Meter Input Routing

This button opens the Global Meter Input Routing menu page showing a routing matrix for selecting the feed of the metering.

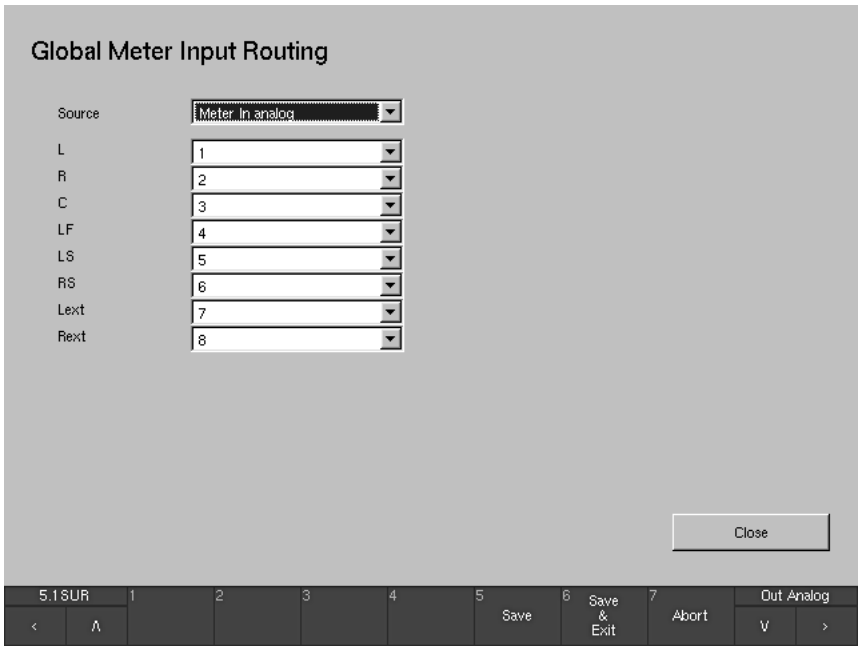


Fig. 6-16: The Global Meter Input Routing menu page

The metering signal source can be selected in two different ways:

- With the toggle option Meter In analog/Monitoring in the Toolbar (see Chapter 5.2.1.2) switched to Monitoring, the metering will always show the sources selected on the **Monitoring Input Routing** menu page (see Chapter 6.5.2). This means the metering will always follow the monitoring source selection in this mode. In this case the settings made on this menu page are irrelevant.
- With the toggle option Meter In analog/Monitoring in the Toolbar (see Chapter 5.2.1.2) switched to Meter In analog, a second input routing for the metering is available (independently from the monitoring input routing). In this way it would be possible to watch a certain signal source in the metering while monitoring a different signal source on the speakers at the same time. In this case the input source of the metering is selected here.

See Chapter 5.2.1.2
See Chapter 6.5.2
See Chapter 5.2.1.2

- **Source**
  This menu item selects the input connector used for the metering routing. Options: Meter In analog, Digital 3.

- **L, R, C, etc.** Labelled text
  This matrix is used to assign the internal logical channels L, R, etc. to the physical input connector selected in the Source selection (see above). The actual channel configuration shown here depends on the channel mode setting on the **Monitoring Input Routing** menu page (see Chapter 6.5.2). Each channel can be assigned individually.

See Chapter 6.5.2.6

- **Close**
  This button closes the page and returns you to the the **Global Routing Settings** menu page from which you selected the Meter Input Routing.

On Global Routing Settings menu page:
→ Monitoring Input Routing

6.5.2 Monitoring Input Routing

After selecting the Monitoring Input Routing button, a new menu area opens up, containing 7 tabs labeled Key 1 to Key 7.



Fig. 6-17: The Key 1 to 7 menu tabs after pressing the Monitoring Input Routing button

These tabs represent the 7 Sub Presets available within the global settings that can be switched easily using the 7 numbered keys on the Remote Control 30050 (31900 series) or the control panel of the 31960 series or on the Remote Display 30010 front panel or selecting the appropriate Toolbar buttons on the screen. This option makes it very easy and fast to switch between individual channel modes, routings, instruments and peakmeter setups without having to load a new factory or user preset using the menu. For example, after having defined several Sub Presets it is very easy to check all signal sources connected to the device with the preferred instrument readily configured on the screen. The active Sub Preset is always shown on the input source selected button in the left corner of the Toolbar (Window 1 of the display). The corresponding input connector is displayed below the name of the active preset in the Status Box (Window 4).

Note:
Even after switching to a new channel mode on one of the seven **Key** menu pages, the settings for the old mode on this individual Key page are „remembered“ by the device. Therefore, as soon as the old mode is selected again, all parameters will switch back to the settings defined for that mode earlier.

Depending on the channel mode defined for any key, this menu page can look quite different. For example, the **Lext/Rext Routing** section of the menu page will be only available when channel modes 3.1 or 5.1 are selected. Also, the channels available in the **Monitoring Routing** section depend on the selected mode. Please refer to the following screen shots to see how the page looks like in each mode.

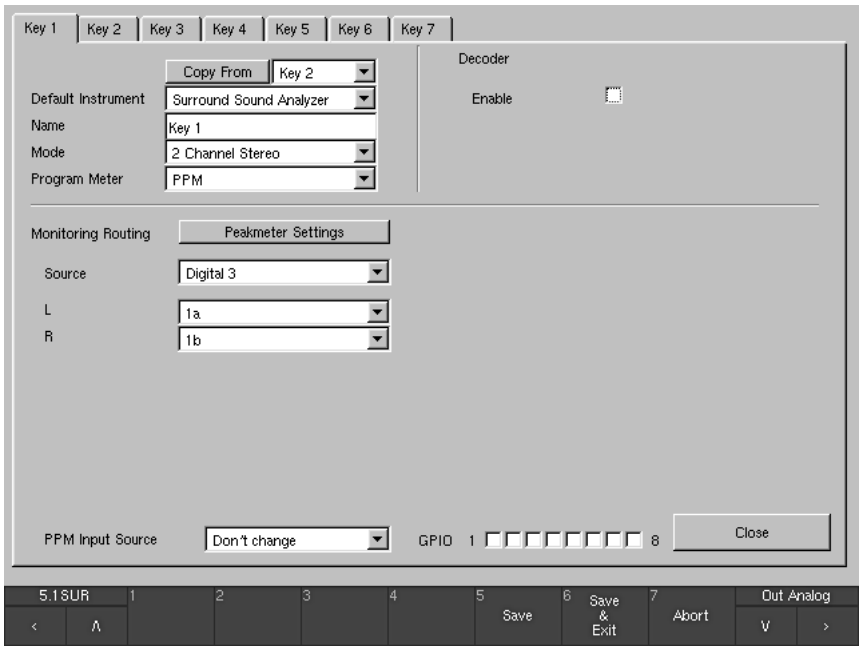


Fig. 6-18: Global Monitoring Input Routing menu page with „2 Channel Stereo“ mode selected

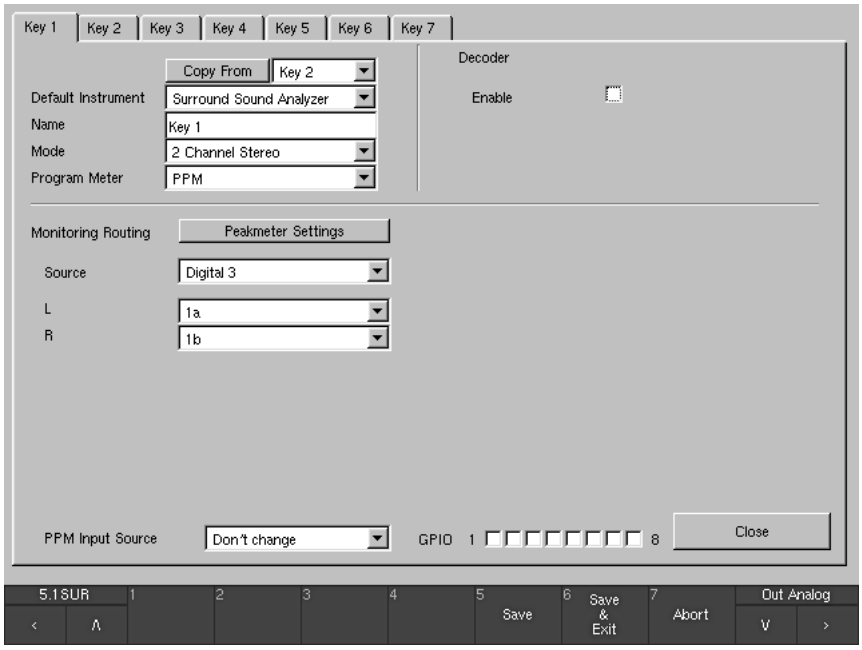


Fig. 6-19: Global Monitoring Input Routing menu page with „3.1“ mode selected



Fig. 6-20: Global Monitoring Input Routing menu page with „5.1“ mode selected

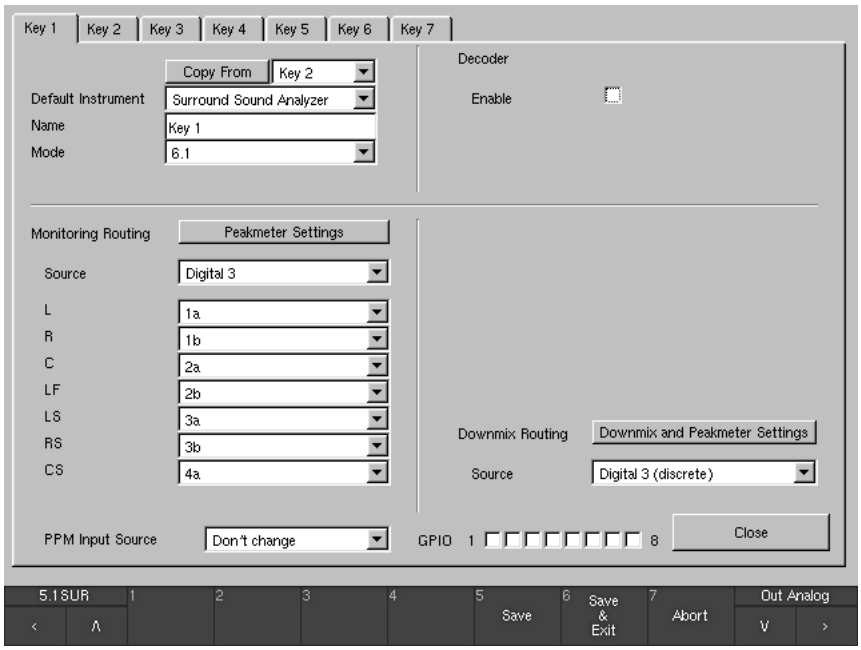


Fig. 6-21: Global Monitoring Input Routing menu page with „6.1“ mode selected

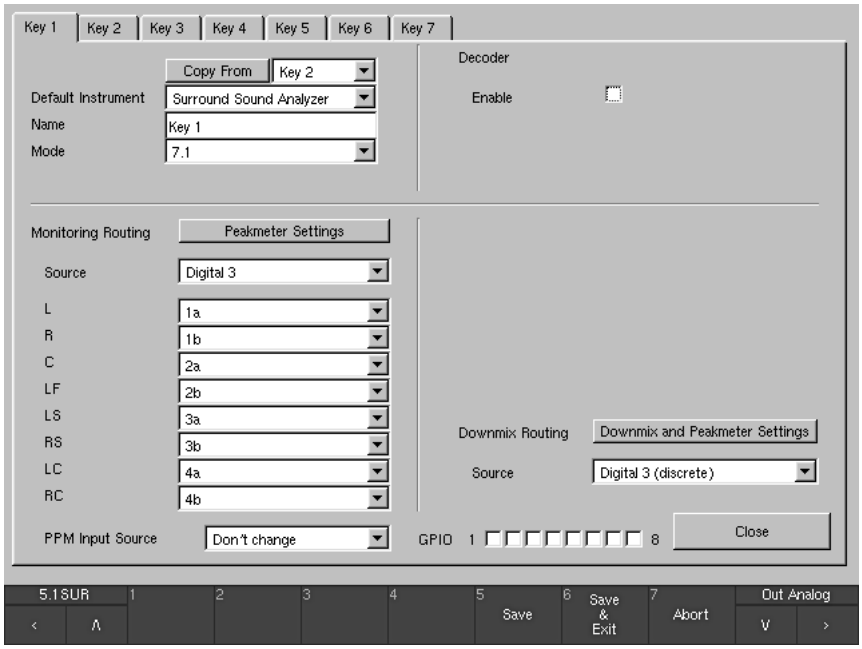


Fig. 6-22: Global Monitoring Input Routing menu page with „7.1“ mode selected

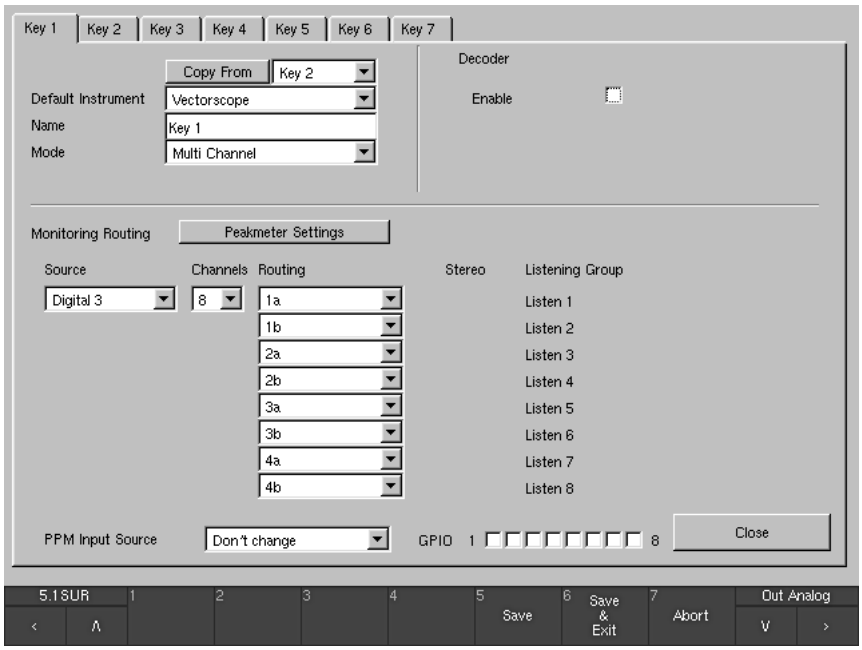


Fig. 6-23: Global Monitoring Input Routing menu page with „Multi Channel“ mode selected (8-Channel)

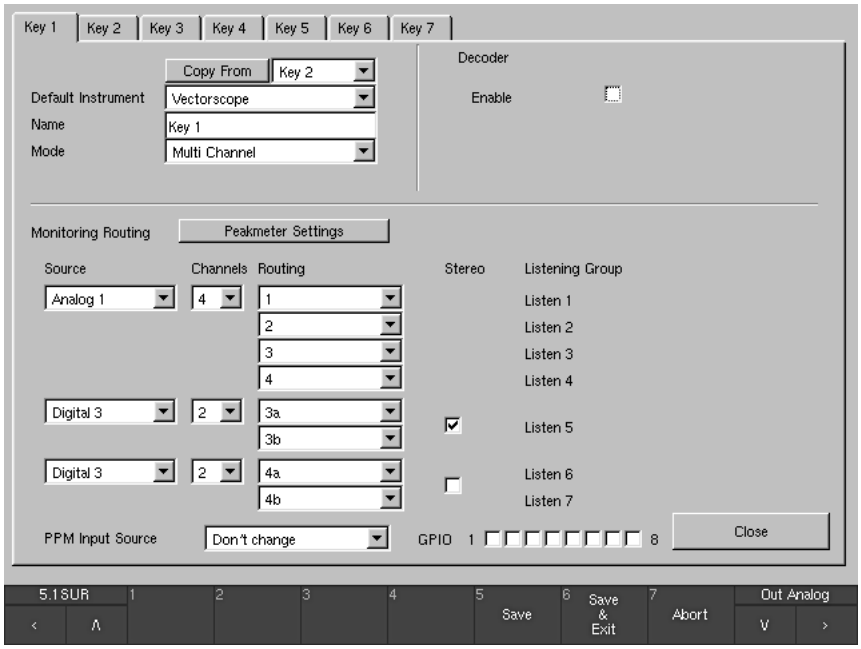


Fig. 6-24: Global Monitoring Input Routing menu page with „Multi Channel" mode selected (4-Channel, 2-Channel Stereo, 2-Channel)

Generally, the **Key 1** to **Key 7** menu tabs are devided into several sections with the following functions:

See Chapter 6.5.2.1

- **Main settings**
  This section is placed in the upper left edge and described in Chapter 6.5.2.1

See Chapter 6.5.2.2

- **Decoder**
  This section is placed in the upper right edge and described in Chapter 6.5.2.2

See Chapter 6.5.2.3

- **Monitoring Routing**
  This section is placed in the middle left area and described in Chapter 6.5.2.3

See Chapter 6.5.2.4

- **Lext/Rext Routing**
  This section is placed in the upper middle right area and described in Chapter 6.5.2.4

See Chapter 6.5.2.5

- **Downmix Routing**
  This section is placed in the lower middle right area and described in Chapter 6.5.2.5

- **PPM Input Source**
  Normally, the sources used by the Peakmeter are the Monitoring inputs. The source can manually be changed to Meter In analog. Please use button/key **6** in the Toolbar of the Peak Program Meter instrument in normal display operation to toggle between these input sources.

If the SurroundControl unit should use varying input sources depending on the application, it might be useful to define an input source for each Sub Preset rather than to switch the source manually in the Program Meter instrument.
With this combo box you can select the options Use Monitoring, Use Meter in and Don't change to define the input source for the Peakmeter.

- Use Monitoring:
  The Peakmeter always uses the Monitoring inputs as signal sources.
- Use Meter in:
  The Peakmeter always uses the **Meter In analog** input as signal sources.
- Don't change (default setting by factory):
  When activating a Sub Preset in normal operation with this option selected on the corresponding key menu page, the Peakmeter will use the input source (Monitoring or Meter In) that was active before selecting the new Sub Preset. By default, the Peakmeter uses the monitoring inputs as signal sources.



Example:
Let's say you have defined the option Use Monitoring for the PPM input source on the **Key 1** menu page, Use Meter In on the **Key 2** menu page and Dont't change on the **Key 3** menu page.
If you switch from Sub Preset 1 (Key 1) to Sub Preset 3 (Key 3) in normal operation, the Program Meter will continue to use the Monitoring as its input source. The correspondent function button/key of the Program Meter instrument shows Monitoring.
On the other hand, if you switch from Sub Preset 2 (Key 2) to Sub Preset 3 (Key 3), the Program Meter will continue to use the **Meter In** connector as its input source. The correspondent function button/key of the Program Meter instrument shows Meter In analog.

Note:
All Sub Presets with the Don't change option selected will follow the last used Sub Preset with the **PPM Input Source** set to the Use Monitoring or Use Meter in option.

- **GPIO 1 to 8** ☑
  These check boxes can be used to define which GPIO outputs are activated, when selecting the corresponding Sub Preset key in normal operation (to do this, press the **Input** key on the Remote Control 30050 or on the control panel of the 31960 and select a Sub Preset from the Toolbar in Window 1). GPIO outputs used for alarm control signals, as defined on the **Global GPIO Settings** menu page (see Chapter 6.12), are not available on the **Key 1** to **Key 7** menu pages. These check boxes are greyed out instead. You also can determine several GPIO outputs, so you can use e. g. two different outputs with four different switching states for activating or deactivating external instruments, applications or system units. See Chapters 4.4.2, 6.12 and 7.3.16.

See Chapter 6.12



See Chapters 4.4.2, 6.12 and 7.3.13



- **Close**
  This button closes the selected Key menu page and returns you to the **Global Routing Settings** menu page from which you selected the Input Routing.

6.5.2.1. Main Settings

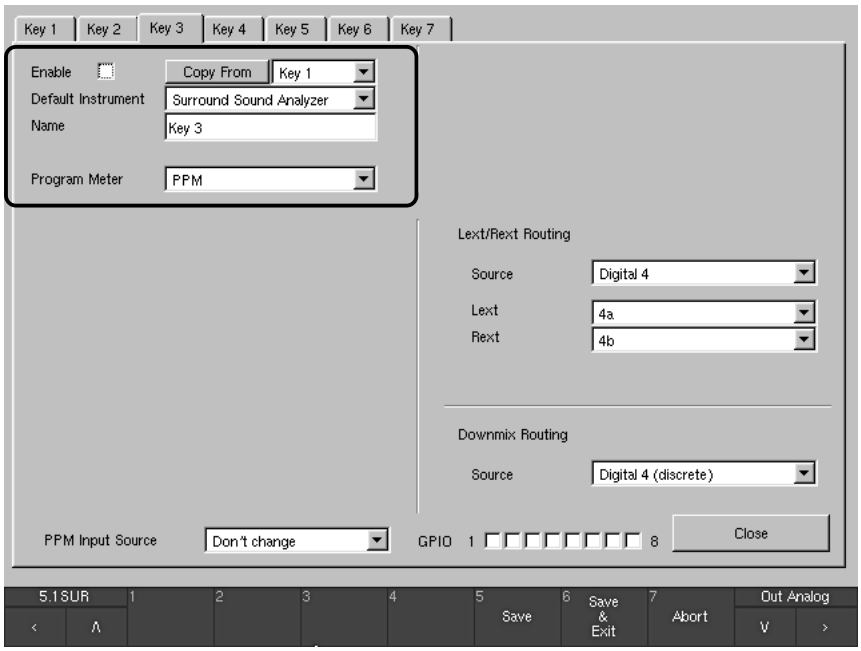


Fig. 6-25: Example for the menu pages of disabled keys

- **Enable** (see Fig. 6-25) ☑
  (ONLY available for the **Key 2**, ..., **Key 7** menu pages)
  The number of the Sub Presets available in the **Monitoring Input Settings** is freely variable from 1 to 7. To set the desired number of available Sub Presets, the **Key 2** to **Key 7** pages can be individually enabled or disabled using this checkbox. The **Key 1** page has no Enable checkbox because at least one setting must always be available for the **Monitoring Input Settings**. Please refer to Chapter 6.1.2 for more details about Sub Presets.

See Chapter 6.1.2

Note:
Pages for disabled Sub Preset keys are greyed out in the Toolbar on the screen (example see Fig. 6-26). Their buttons cannot be clicked. Pressing their corresponding keys on the Remote Control 30050 (31900 series), the control panel of the 31960 series or on the Remote Display 30010 front panel also has no effect.

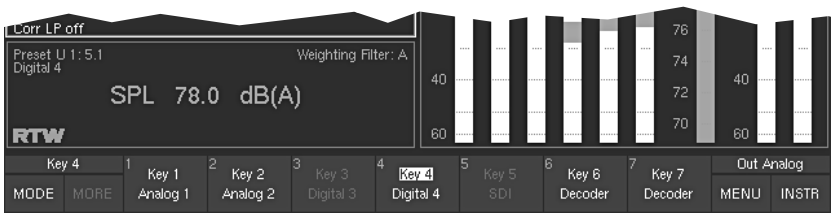


Fig. 6-26: Example for the display of greyed Sub Preset keys in the Toolbar

- **Copy From** (see Figs. 6-18 to 6-24)
  This function, activated by pressing this button, is helpful if you decide to build a new Sub Preset that shares many settings with another Sub Preset already set up. Access the page of the new Sub Preset and select the Sub Preset you want to copy the settings from in the combo box on the right of the Copy From button. By selecting Copy From, all settings are copied to the new Sub Preset. You can adapt the settings that should be altered after that for the individual application of the new Sub Preset.

- **Default Instrument** (see Figs. 6-18 to 6-24)
  For each Sub Preset, an individual instrument (display mode) can be defined with this combo box that then shows up in Window 3 of the screen after this Sub Preset is selected. The following instrument types are available:
  - Surround Sound Analyzer
  - Vectorscope
  - Multicorrelator
  - RTA 1/3
  - RTA 1/6
  - Downmix
  - Monitoring
  - AES/EBU Status
  - SDI Status (ONLY with 31900S, 31960S, 31900SD, 31960SD)
  - SDI Interface (ONLY with 31900S, 31960S, 31900SD, 31960SD)
  - Hardware Status
  - Dolby® Meta Data (ONLY with 31900D, 31960D, 31900SD, 31960SD)
  - Dialnorm
  - Blits

See Chapter 5

Note:
Please refer to Chapter 5 to learn more about the display modes available in the unit.

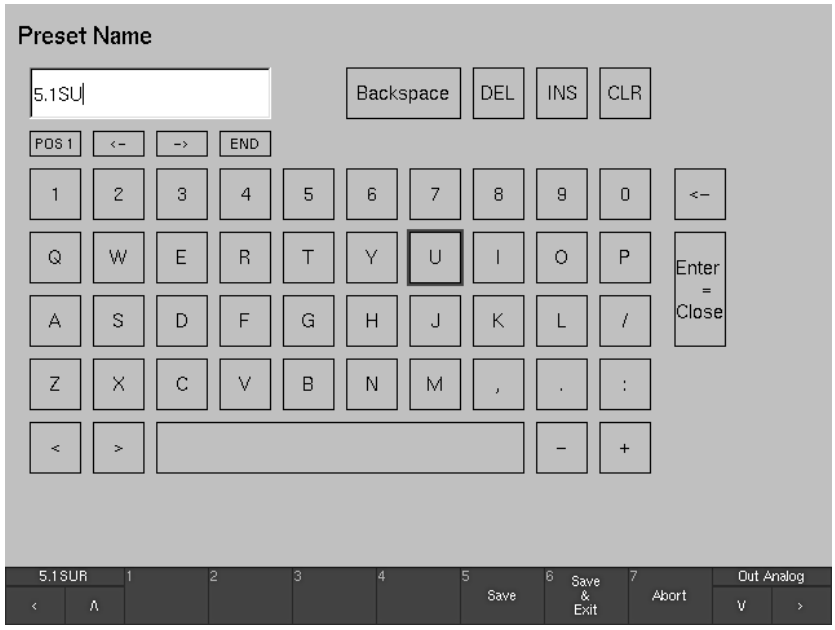


Fig. 6-27: The keypad on the Preset Name menu page, desription see next page

- **Name** (see Figs. 6-18 to 6-24)
  By default, the 7 Sub Presets are named Key1 to Key 7. However, they can be renamed by selecting the Name description field or clicking in the Name description field with the right mouse key. A new menu page with a set of alpha-numeric buttons opens up after this (see Fig. 6-27 on the previous page). Click the buttons to enter the characters you want with the left mouse key. A maximum of 6 characters is allowed.

- **Mode** (see Figs. 6-18 to 6-24)
  The parameters in this combo box are used to define the overall internal channel configuration of the unit.

Note:
For each Sub Preset (**Key 1**, ..., **Key 7**) an individual channel mode setting can be made. In this way the user can switch channel modes very easy by selecting a new Sub Preset on the toolbar (Window 1) without entering the menu.

By switching channel modes you decide which channels will be processed in the monitor controller section. For example, if you select a 7.1 format, the unit activates the internal channels L, LC, C, RC, R, LS, RS and LF. These are then selected and adjusted with the channel keys and the volume control on the Remote Control 30050 (31900 series) or the control panel of the 31960 series.

The available options and channel configurations are:
- 2 Channel Stereo: L, R
- 3.1: L, C, R, S
- 5.1: L, R, C, LF, LS, RS
- 6.1: L, R, C, LS, RS, CS, LF
- 7.1: L, R, LC, C, RC, LS, RS, LF
- Multi Channel : independent channels or channel groups

Use the appropriate Stereo or Surround mode to reflect the channel configuration of the input signal to be monitored. The Multi Channel mode is useful for sources with unrelated channels or channel groups which should be monitored separately, e. g. Aux sends or SDI groups.

Note:
Even after switching to a new channel mode on one of the seven **Key** menu pages, the settings for the old mode on this individual key page are „remembered“ by the device. Therefore, as soon as the old mode is selected again, all parameters will switch back to the settings defined for that mode earlier.

Note:
Depending on this mode setting the menu page will change its options. Please refer to the screen shots earlier in this Chapter to see how the page looks like in each mode (see Figs. 6-18 to 6-24).

See Figs. 6-18 to 6-24

- **Program Meter** (see Figs. 6-18 to 6-24)
  (ONLY available when 5.1 or 2 Channel Stereo is selected with the Mode combo box, see above)
  By default, the bargraphs in Window 2 show the Peak Program Meters (PPM) with the settings configured after selecting the Peakmeter Settings button in the **Monitoring Routing** section of this page (see chapter 6.5.2.3). However, there is also the option to show a combination of PPM and loudness bargraphs (the loudness section of this display mode conforming to ITU BS.1771 standard). This mode divides the bargraphs into three vertical sections: The center shows the loudness conforming to ITU BS.1771 while the both outer sections show the PPM metering as usual.

See Chapter 6.5.2.3

The available options are:
  - PPM
  - ITU BS.1771

Note:
This mode is only available when one of the following channel modes is selected in the Mode combo box (see above):
- 2 Channel Stereo: L, R
  or
- 5.1: L, R, C, LF, LS, RS

Furtheron, selecting ITU BS.1771 in the Program Meter combo box will automatically switch the Source selection in the **Monitoring Routing** section of this menu page to one of the digital sources Digital 3 or Digital 4 (see chapter 6.5.2.3).

See Chapter 6.5.2.3

These restrictions are made because ITU BS.1771 is only defined for digital input signals in 2 channel stereo or 5.1 surround channel configurations.

Note:
Selecting the ITU BS.1771 option in the Program Meter combo box switches the Peakmeter Settings button in the **Monitoring Routing** section of this menu page to Loudness Settings. See chapter 6.5.2.3 for details.

See Chapter 6.5.2.3

The Decoder is **only** available with 31900D, 31960D, 31900SD, 31960SD

6.5.2.2 Decoder

The SurroundControl 31900 and SurroundControl 31960 are available as „D“ versions fitted with the Dolby® decoder option. These versions feature an internal Dolby® decoder processing Dolby® Pro Logic I, Dolby® AC-3 or Dolby® E signals. The decoder can be switched into the signal chain in between the physical audio inputs and the internal channels selected by the channel mode setting. This offers many additional options, e. g. decoding Dolby® E coded surround signals transmitted via SDI for monitoring and metering in various ways.
When using the internal decoder, the physical input connector used is selected by the Source parameter of the decoder section. After this, the decoder output signal can be selected as source in the **Monitoring Routing** section.

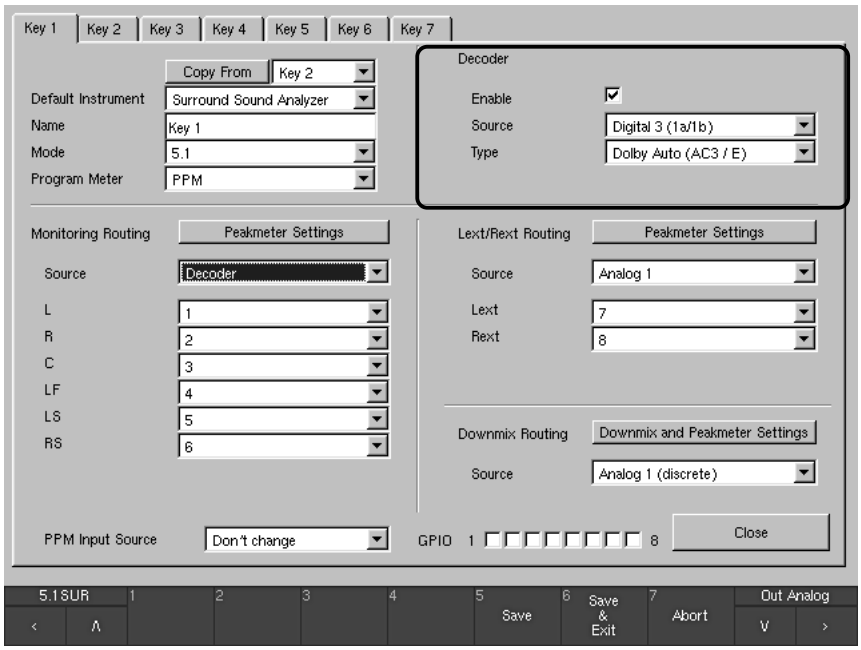


Fig. 6-28: Example for the enabled Dolby® decoder (only with D and SD versions)

- **Enable** ☑
  Enabling the **Decoder** adds the two additional parameters Source and Type to the decoder section.

- **Source**
  After enabling the **Decoder**, the physical input connector carrying the encoded signal can be selected here. Only channel pairs are selectable as sources because the decoder must be fed with a 2-channel signal.

  The available options for this combo box depend on the Type setting of the decoder as follows:

- Selected Type: Dolby® Pro Logic I
  All channel pairs on both analog input connectors, on both digital input connectors and on the SDI interface (if fitted) are available as sources.
- Selected Type: Dolby® Auto, Dolby® AC-3 or Dolby® E
  All channel pairs on both digital input connectors and on the SDI interface (if fitted) are available as sources.



Note:
The analog connectors are not available for Dolby® Auto, Dolby® AC-3 or Dolby® E because these signal types cannot be transmitted on analog lines.

- **Type** 
  Different decoder types can be selected here. The available options for this combo box depend on the Mode setting on the upper left section of this menu page as follows:
  - Selected Mode: 3.1
    Dolby® Pro Logic I or Dolby® E are the options available for the decoder type.
  - Selected Mode: 5.1
    Dolby® Auto, Dolby® AC-3 or Dolby® E are the options available for the decoder type.
    When Dolby® Auto is selected for the decoder type, the decoder will automatically analyze the incoming signal format and switch between Dolby® AC-3 and Dolby® E accordingly.
  - All other modes:
    Only Dolby® E is available as options for the decoder type.

6.5.2.3 Monitoring Routing

The **Monitoring Routing** section is used to select a physical input source for the internal monitoring metering and to individually assign the channels of this source to the internal channels. The allocated options for the 2-Channel Stereo and Surround modes differ from the Multi Channel mode:

- **Surround modes and 2-Channel Stereo mode**

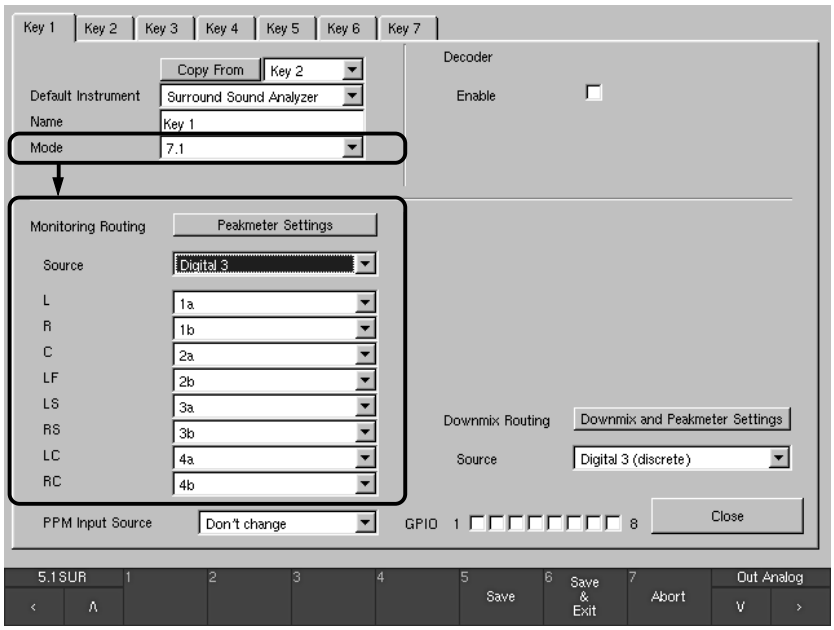


Fig. 6-29: The Monitoring Routing section in 7.1 Surround mode as an example

Depending on the 2-Channel Stereo or one of the Surround modes (3.1 to 7.1) selected above in the Mode combo box on the same menu page, up to eight logical channels L, R, ... with combo boxes are displayed below here. Each combo box offers the available physical input channels (e. g. 1a, 1b, ..., 4a, 4b). The individually selected physical input channel in one of the combo boxes is assigned to the corresponding logical channel (see Fig. 6-29).

See Fig. 6-29

- **Multi Channel mode**

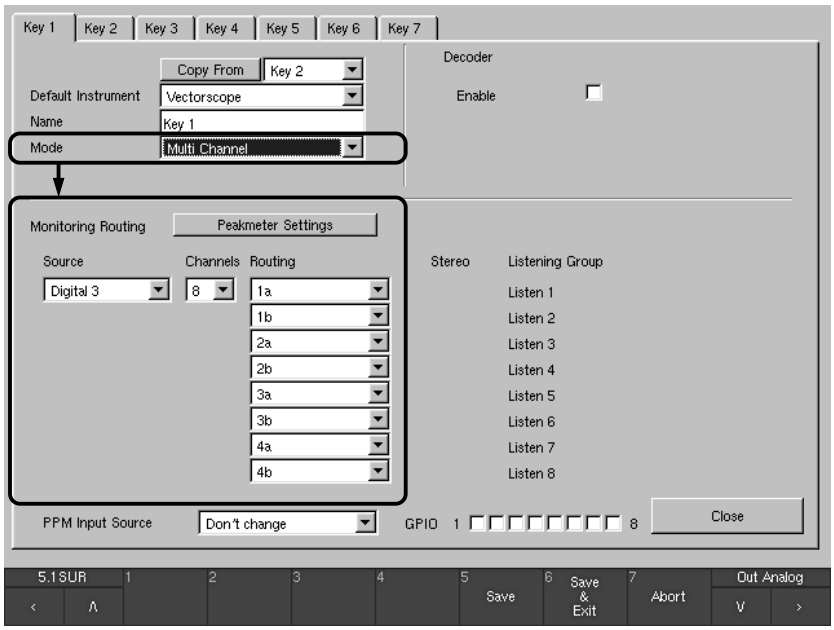


Fig. 6-30: The Monitoring Routing section when Multi-Channel mode has been selected

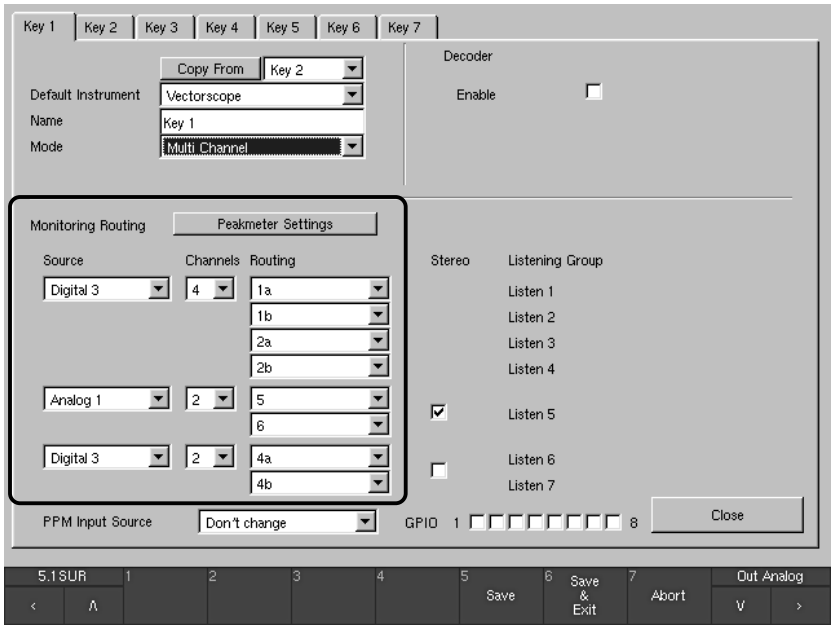


Fig. 6-31: The channels of the Multi-Channel mode devided in groups

With the Multi Channel mode selected, the channel assignment differs. Individual selections for Source, Channels, Routing and Stereo are available (see Fig. 6-30). The additional combo box labeled Channels features the option to define channel groups with individual source selections. Up to four individual groups are available with a maximum of eight internal channels in total (see Fig. 6-31).

See Fig. 6-30

See Fig. 6-31

- **Peakmeter Settings**

  This button is shown when the Program Meter combo box above (see Chapter 6.5.2.1) is set to the PPM option. The peakmeter section of the unit can be configured individually for each Sub Preset and each channel mode selected. The button Peakmeter Settings opens a new menu page which is described in detail in Chapter 6.5.2.6.

See Chapter 6.5.2.6

- **Loudness Settings**

  This button is shown when the Program Meter combo box above (see Chapter 6.5.2.1) is set to the ITU BS.1771 option. The loudness options of the unit can be configured individually for each Sub Preset and only for the channel modes 2 Channel Stereo and 5.1. The button Loudness Settings opens a new menu page which is described in detail in Chapter 6.5.2.9.

See Chapter 6.5.2.9

- **Source**

  Use this option to select the input connector carrying the desired monitoring signal.
  - While the PPM option is selected in the Program Meter combo box, the following options are available:
    Analog 1, Analog 2, Digital 3, Digital 4, SDI (if fitted, S and SD versions), Decoder (if enabled, D and SD versions).
  - While the ITU BS.1771 option is selected in the Program Meter combo box, the following options are available:
    Digital 3, Digital 4, SDI (if fitted, S and SD versions), Decoder (if enabled, D and SD versions).

Note:
The output signal of the decoder is only selectable as a source if the decoder was enabled in the decoder section above right on the same menu page (see Chapter 6.5.2.2).

See Chapter 6.5.2.2

- **L, R, ...** Labelled text

  (ONLY available with 2-Channel Stereo and Surround modes, see Fig. 6-29)
  Depending on the channel mode selected above in the Mode combo box on the same menu page, up to eight logical channels L, R, ... with combo boxes are displayed. Each combo box offers the available physical input channels. The individually selected physical input channel in one of the combo boxes is assigned to the corresponding logical channel.

  The routing for the 2-Channel Stereo and Surround modes is best described with an example:

  With 7.1 selected in the Mode combo box above on the same menu page (see Chapter 6.5.2.1), the logical channels L, R, C, LF, LS, RS, LC and RC are available and labeled. For each logical channel there is a combo box offering all (up to 16) physical input channels of the selected source. In this way, each individual monitoring channel can be assigned to any physical input channel from that source.
  - With Analog selected as source signal, 8 channels are available:
    1, ..., 8
  - With Digital selected as source signal, 8 channels are available:
    1a, 1b, ..., 4a, 4b

See Chapter 6.5.2.1

- With SDI selected as source signal, all 16 SDI channels are available: 4 groups (Grp 1, ..., Grp 4) with 4 channels (Ch 1, ..., Ch 4) each.
- With Decoder selected as input source, a reasonable input assignment between the decoder output channels and the internal channels is performed automatically by the unit.

  Examples:
  - With channel mode 3.1 selected, the decoder is set to the Dolby® Pro Logic I type (see Type combo box above right) and the decoder output is routed to the four internal channels this way:

    L > left
    R > right
    C > center
    S > surround
  - With channel mode 5.1 selected, the decoder is set to the Dolby® Auto (AC-3 / E) type (see Type combo box above right on the menu page) and the decoder output is routed to the channels 1 to 6.

Nevertheless, the user has the option to modify this pre-selected assignment anytime.

See Chapters 6.5.2.1 and 6.5.2.2

A special selection can be made when 5.1 is selected in the Mode combo box (see Chapter 6.5.2.1) and the decoder type is set to Dolby® AC-3 (see Chapter 6.5.2.2):

- With Decoder selected as input source, the two output channels Aux L and Aux R are available for assignment in addition to the decoded output signals. These two channels carry the downmix signal automatically generated by the internal Dolby® decoder. Please do not confuse these signals with the downmix options that are configurable manually in the unit (see Chapter 6.5.2.5). The downmix signals Aux L and Aux R are a useful way to check how a consumer receiver would generate a downmix signal automatically.

See Chapter 6.5.2.5

Note:
It is not possible to mix input channels coming from different sources, e. g. if Digital 3 is selected as source connector, only the eight channels of this source are available for assignment.

- **Channels**

(ONLY available with Multi Channel mode, see Fig. 6-30 and Fig. 6-31)
Use this option to define the channel count for the selected source. Available options: 8, 4, 2.

- With 8 selected, all internal channels are assigned to one source as usual.
- With 4 selected, only four internal channels are available in the routing and a second group of four channels is introduced with its own source selection. This second group can be divided into two groups of two channels with its own Channels combo box set to 2.
- With 2 selected in the first group, up to four groups can be defined this way.

To define groups with different channel counts like 3, it is possible to select a four channel group and switch off one channel in the routing.

- **Routing**
  (ONLY available with Multi Channel mode)
  In every group the Routing combo boxes are used to assign the physical input channels of the selected source to the internal channels. Each channel can be assigned individually.

- **Stereo**
  (ONLY available with Multi Channel mode)
  This option is only available for Groups with two channels. These groups can be defined as Stereo groups instead of 2-Channel groups. In Stereo groups, both channels share the same Listening Group while two separate listening groups for both channels are defined if the Stereo option is not checked.

- **Listening Group** Labelled text
  Up to eight Listening Groups (Listen 1 to Listen 8) are defined depending on the selection of the Channels and Stereo options. Each listening group can be monitored separately through the speakers.

Note:
While monitoring Multi Channel sources, all channels are played back via the L and R speakers. The corresponding Peakmeter bargraphs are marked with green loudspeaker symbols on top (see Fig. 6-57). Stereo groups are listened to in stereo while all other channels of a listening group are mixed to mono.

See Fig. 6-57

Note:
In Multi Channel mode only, the RTA instrument will follow the selected listening group.

6.5.2.4 Lext/Rext Routing

(ONLY available with 3.1 and 5.1 Surround modes while the Program Meter combo box is set to the PPM option)

In channel modes 3.1 and 5.1, the user has the option to use free internal channels for monitoring an external two channel signal using the **EX** key on the Remote Control 30050 (31900 series) or the control panel of the 31960 series. In this way it is very easy to quickly check an external stereo signal, e. g. coming from a CD player, by just pressing the **EX** key without having to select a new Sub Preset.
The **Lext**/**Rext** section offers individual routing and peakmeter settings for this external signal.

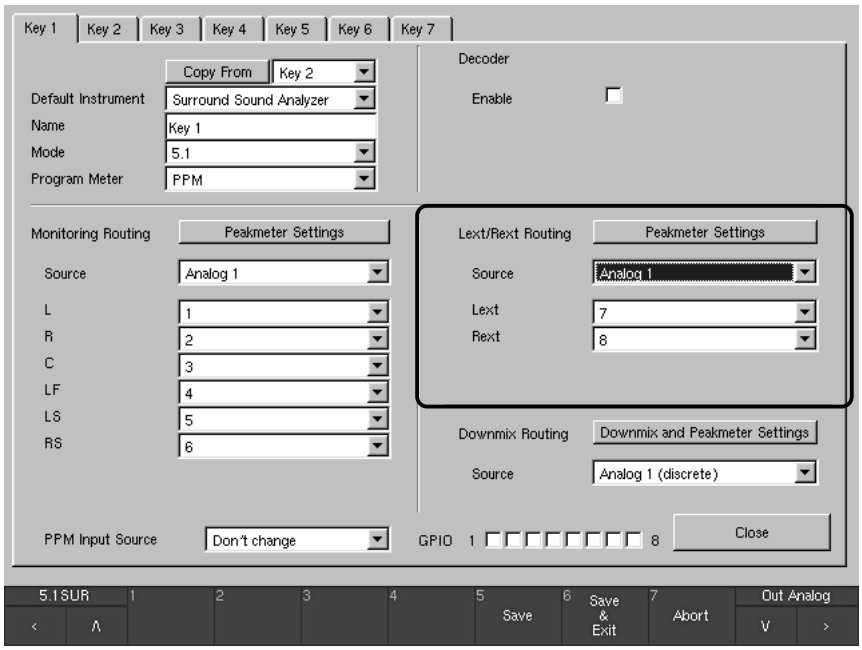


Fig. 6-32: The Lext/Rext Routing section

- **Peakmeter Settings**
  The button Peakmeter Settings opens a new menu page used to configure the individual appearance of the peakmeter for the **Lext**/**Rext** section.

Note:
The parameters on this menu page are also found when selecting the Channel Group buttons on the **Peakmeter Settings** menu page for the **Monitoring Routing** section and the Channel Group button on the **Two Channel Downmix Settings** menu page of the **Downmix Routing** section. Therefore the menu page for the peakmeter parameters is described in detail once in Chapter 6.5.2.8.

See Chapter 6.5.2.8

- **Source**

  All physical input connectors plus the decoder output (if enabled, D and SD versions) are available as the Lext/Rext input source. Options: Analog 1, Analog 2, Digital 3, Digital 4, SDI (if fitted, S and SD versions), Decoder (if enabled, D and SD versions).



Note:
The output signal of the decoder is only selectable as a source if the decoder was Enabled in the **Decoder** section on the same menu page (see Chapter 6.5.2.2).

See Chapter 6.5.2.2

- **Lext/Rext**

  These combo boxes are used to assign the channels of the selected signal source (see above) to the internal channels Lext and Rext.



Note:
Please use the Display Mode for external Monitoring option on the **Key Settings** menu page (see Chapter 6.13) to select the display mode used after pressing the **EX** button/key.

See Chapter 6.13



6.5.2.5 Downmix Routing

(ONLY available with 3.1, 5.1, 6.1 and 7.1 Surround modes while the Program Meter combo box is set to the PPM selection)

This section offers the option to generate an internal downmix from a selectable source. A stereo-compatible 2-channel signal is downmixed using adjustable factors (see **Peakmeter Settings** section below). The unit makes the 2-channel downmix signal available as Downmix Direct Out (Routing Matrix designations: DLo, DRo, DMo) and Downmix Volume Out (VLo, VRo) (see Chapter 5.7.1). The Direct Out signal is generated independently of all the channel functions and can be used for recording or as a parallel signal for transmission as a stereo broadcast. The Vol signal is used for monitoring and is thus routed via the Monitoring Controller. You can switch this signal to the L/R channels of the main monitoring system with the **2C** key on the Remote Control 30050 (31900 series) or the control panel of the 31960 series. All other channels are then muted. Alternatively, you can switch the signal to separate outputs with the **Output** key, for example when you want to monitor it on a near field loudspeaker system. The necessary settings are made on the **Monitoring Output Routing** menu page (see Chapter 6.5.3).

See Chapter 6.5.2.6

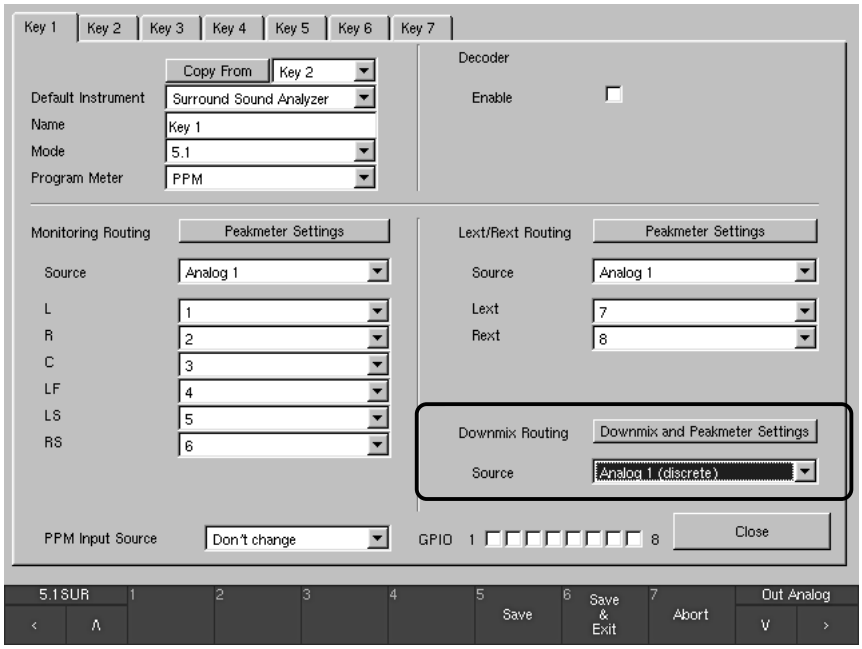


Fig. 6-33: The Downmix Routing section (Markierung)

- **Downmix and Peakmeter Settings**
  The button Peakmeter Settings opens a new menu page which can be used to configure the level parameters for the downmix (frame labelled **Downmix Parameters**) and the parameters for the **Downmix Vectorscope** (buttons and combo boxes on the right). This menu page is described in detail in Chapter 6.5.2.7.

See Chapter 6.5.2.7

- **Source**
  All physical input connectors plus the decoder output (if enabled, D and SD versions) are available as the Downmix input source. Options:
  Analog 1 (discrete), Analog 2 (discrete), Digital 3 (discrete), Digital 4 (discrete), SDI (discrete) (if fitted, S and SD versions), Decoder (discrete) (if enabled, D and SD versions), Decoder (if enabled, S and SD versions).

Note:
The output signal of the decoder is only selectable as a source if the decoder was Enabled in the **Decoder** section on the same menu page (see Chapter 6.5.2.2). The Decoder option uses the downmix signal automatically generated by the Dolby® decoder itself, while Decoder (discrete) uses the discrete surround signals delivered by the Dolby® decoder.

See Chapter 6.5.2.2

Note:
Please use the Display Mode for Downmix Monitoring option on the **Key Settings** menu page (see Chapter 6.13) to select the display mode used for Downmix Monitoring.

6.5.2.6 Peakmeter Settings for Monitoring Routing section

(Peakmeter Settings menu page)

The peakmeter section of the unit can be configured individually for each Sub Preset and each channel mode selected. The button Peakmeter Settings of the Monitoring Metering Routing section (see 6-18 to 6-24) opens the Peakmeter Settings menu page which can be used to configure the individual appearance of the peakmeter for the selected Sub Preset. The parameters on this page are defined for all channel groups.

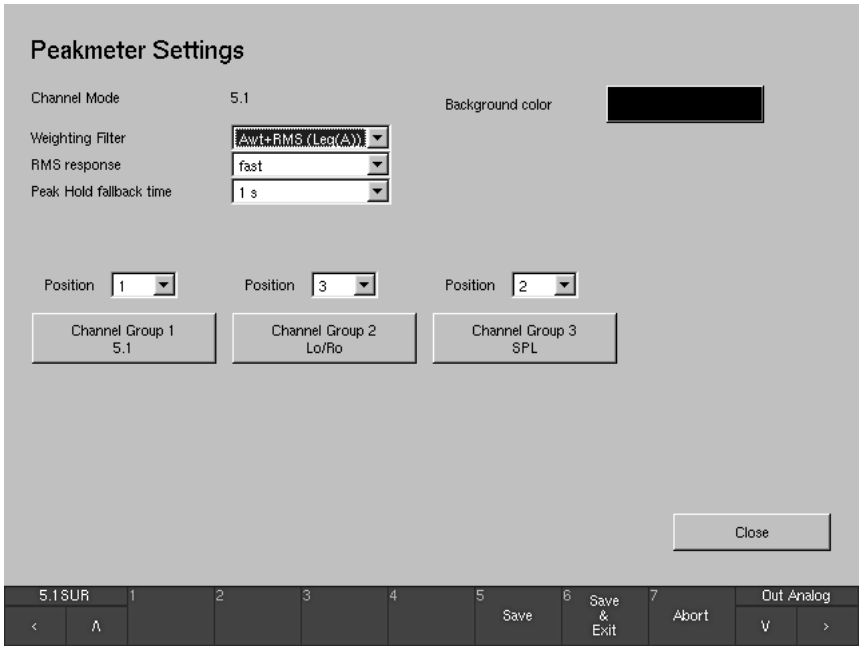


Fig. 6-34: The Peakmeter Settings menu page (e. g. 5.1 Surround mode)

- **Channel Mode** Labelled text

  This field shows the channel mode selected for the Sub Preset you are working on. To edit the channel mode, close the **Peakmeter Settings** menu page and select a new setting in the Mode combo box.

- **Weighting Filter**

  This combo box is for selecting the weighting filter for the volume level display. Options: Linear+RMS, Awt+RMS (Leq(A)), Cwt+RMS, CCIR+RMS (Leq(M)), ITU BS 1770 R2LB.

- **RMS response**

  This combo box is for setting the response time of the RMS detector for the volume level display. Options: fast, slow.

- **Peak Hold fallback time**

  This combo box is for setting the hold time for the peak hold display. Options: 1 s, 2 s, 4 s, 10 s, 20 s, 30 s and Manual Reset. With Manual Reset selected, you can reset the peak hold display with the Reset function in the PPM instrument (see Chapter 5.2.1.2).

See Chapter 5.2.1.2

- **Background color**
  This button displays the color selector so that you can change the color of the background of the screen display.

- **Position**
  With these combo boxes the peakmeter channel groups can be activated and arranged (Off: deactivated, 1: position 1, the channel group is set to the left, 2: position 2, 3: position 3 and 4: position 4, the channel group is set to the right).

- **Channel Group**
  The peakmeter bargraphs can be arranged in individual groups separated from each other. Depending on the selected channel mode, up to four channel groups are available.

  - **Surround modes:**
    All the channels of a surround signal (3.1, 5.1, 6.1 or 7.1), the Lo/Ro or Lext/Rext channels and a SPL bargraph can be displayed in separate groups.

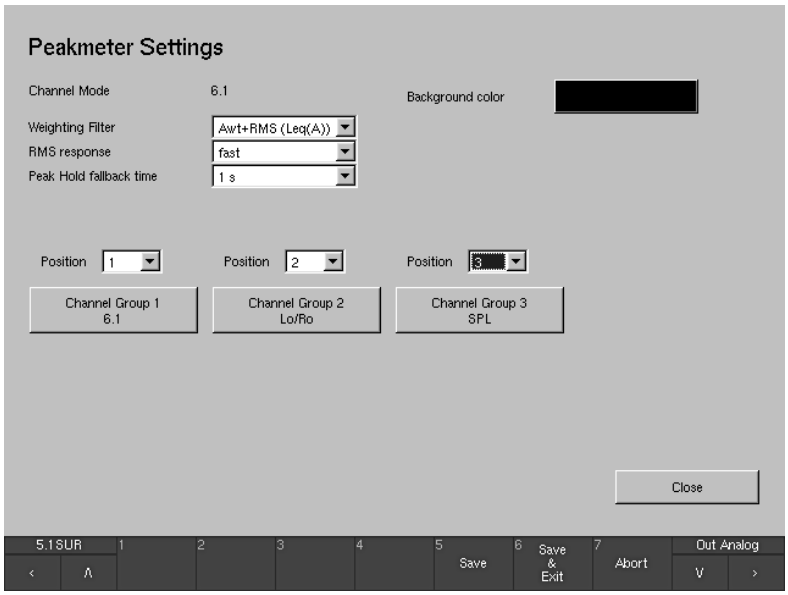


Fig. 6-35: The Peakmeter Settings menu page in 6.1 Surround mode as an example

- **Multi Channel modes:**
  The 8 channels of multi channel signals can be displayed all in one group, in two groups with four each, in one group with four and two groups with one pair each and as pairs in four separate groups.

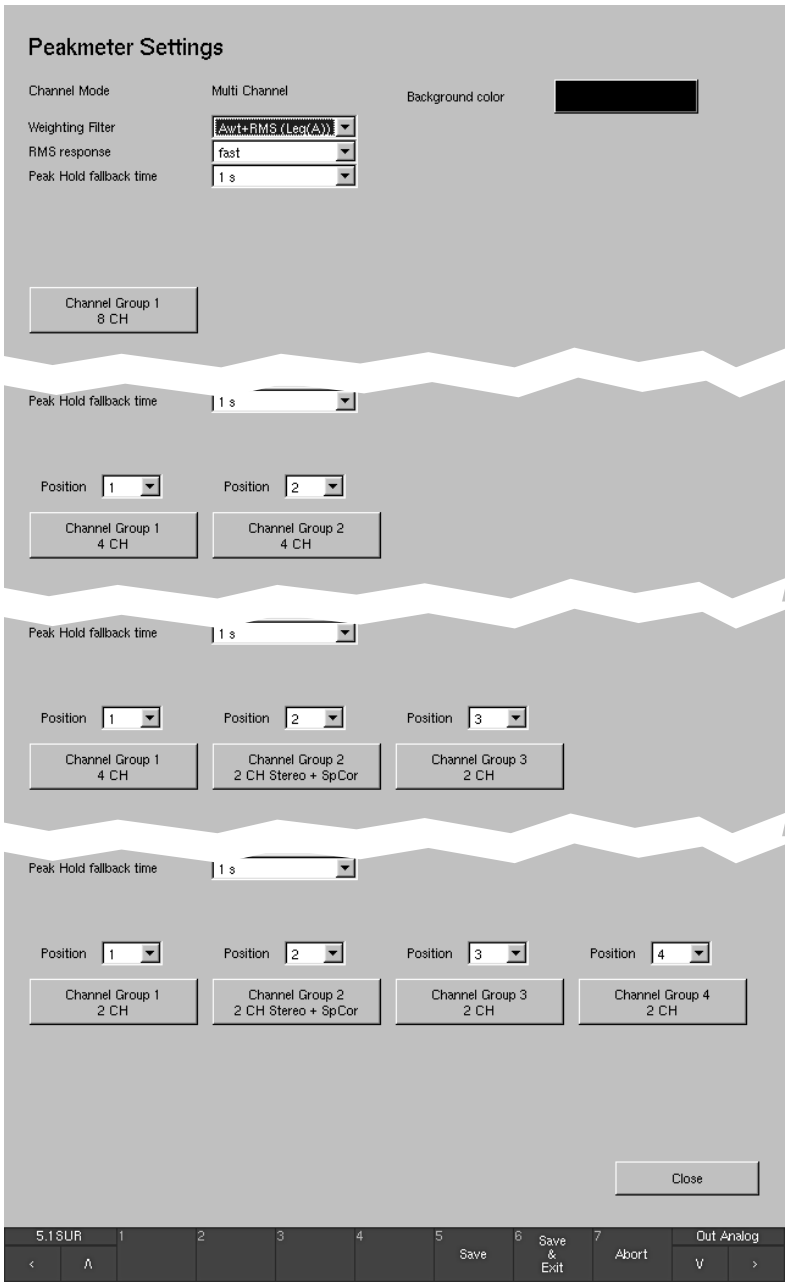


Fig. 6-36: The Peakmeter Settings menu pages with different Multi-Channel modes

- **2 Channel Stereo mode:**
  The 2 channels of the Stereo channel pair and a SPL bargraph can be displayed in separate groups.

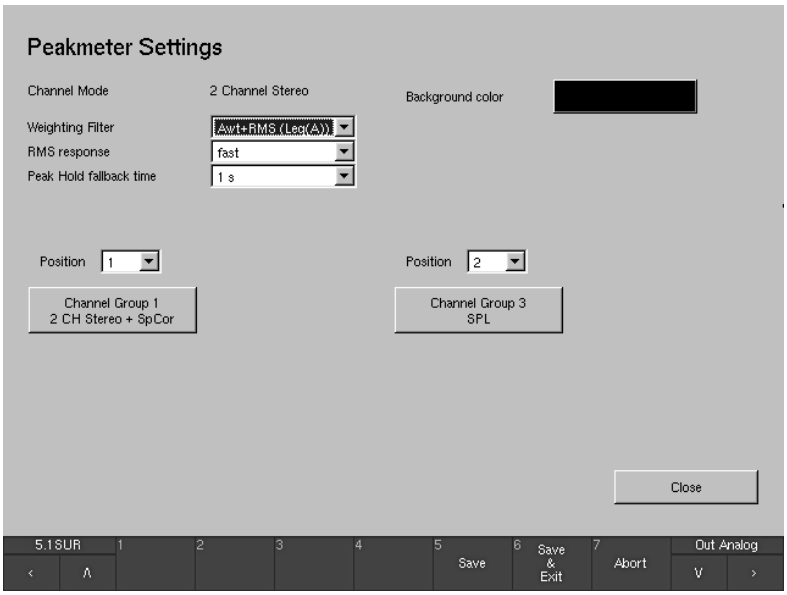


Fig. 6-37: The Peakmeter Settings menu page in 2 Channel Stereo mode

These buttons open the menu pages with the parameters for the peakmeter settings of the corresponding channel groups.

Note:
The menu pages with the peakmeter parameters are nearly identical for the various channel groups of the **Peakmeter Settings** menu pages in the **Monitoring Routing** section (see Figs. 6-18 to 6-24), for the channel group of the **Two Channel Downmix Settings** menu page in the **Downmix Routing** section (see Figs. 6-19 to 6-22) and for the Peakmeter Settings in the **Lext/Rext Routing** section (see Figs. 6-19 to 6-20). Therefore the menu page for the peakmeter parameters is described in detail once in Chapter 6.5.2.8.

See Chapter 6.5.2.8

- **Close**
  This button closes the menu page and returns you to the **Key** menu page from which you selected the Peakmeter Settings for the **Monitoring Routing** section.

6.5.2.7 Downmix and Peakmeter Settings for Downmix Routing section

(Two Channel Downmix Settings menu page)

The Downmix and Peakmeter Settings button of the Downmix Routing section (see Figs. 6-19 to 6-22) opens the **Two Channel Downmix Settings** menu page which can be used to configure the level parameters for the downmix (frame with list boxes labeled **Downmix Parameter**), the parameters for the downmix peakmeter (Channel Group button below) and the parameters for the **Downmix Vectorscope** (frame on the right with buttons and combo boxes).

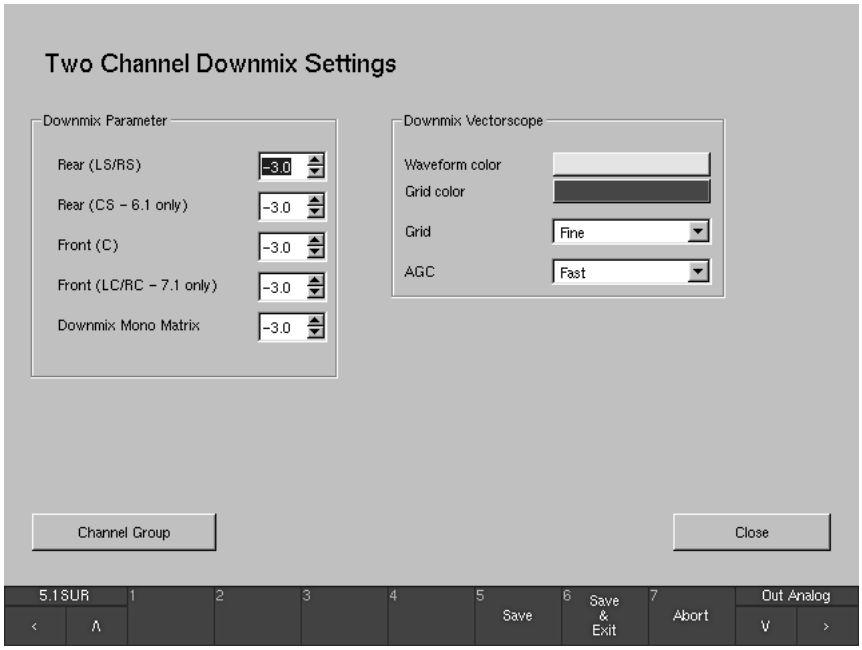


Fig. 6-38: The Two Channel Downmix Settings menu page

- **Downmix Parameter** Frame
  The downmix parameters adjust the mixing gains for the individual channel groups (values in dB, adjustment in 0.5 dB steps). In 5.1 format, the surround channels LS and RS are output to the left and right channels, and the Center channel is mixed into both channels with the same level on each side. It is advisable to apply an attenuation of 3 dB for the Center channel.

- **Downmix Vectorscope** Frame

  - **Waveform color**
    This button displays the color selector so that you can select the display color to be used for the signal in the vectorscope of the DOWNMIX instrument displayed in Window 3 of the normal operation mode.

  - **Grid color**
    This button displays the color selector so that you can select the display color to be used for the coordinate grid in the vectorscope of the DOWNMIX instrument displayed in Window 3 of the normal operation mode.

- **Grid**
  This combo box is for changing the setting of the coordinate grid in the vectorscope of the DOWNMIX instrument displayed in Window 3 of the normal operation mode. Available settings are:
  Fine (dots) or Normal (lines).

- **AGC**
  This combo box is for adjusting the downmix vectorscope's AGC (Automatic Gain Control) response time. Available settings are:
  Fast or Slow.

- **Channel Group**
  This button opens a new menu page used to configure the individual appearance of the downmix peakmeter.

Note:
The menu page with the peakmeter parameters selected from here is nearly identical to the menu pages for the different channel groups of the **Peakmeter Settings** menu pages in the **Monitoring Routing** section (see Figs. 6-18 to 6-24) and the menu page for the Peakmeter Settings in the **Lext**/**Rext Routing** section (see Figs. 6-19 to 9-20). Therefore the menu page for the peakmeter parameters is described in detail once in Chapter 6.5.2.8.

See Chapter 6.5.2.8

- **Close**
  This button closes the menu page and returns you to the **Key** menu page from which you selected the Peakmeter Settings for the **Downmix Routing** section.

6.5.2.8 Peakmeter Parameters available in the channel groups

After selecting one of the Channel Group buttons as described in 6.5.2.6, different labeled menu pages with generally the same content of peakmeter parameters are opened.

See Chapter 6.5.2.6 and Figs. 6-35 to 6-37

- The **Peakmeter – Channel Group** menu pages are opened with the Channel Group buttons of the **Peakmeter Settings** menu page (see Chapter 6.5.2.6 and Figs. 6-35 to 6-37).

  - **Surround modes:**

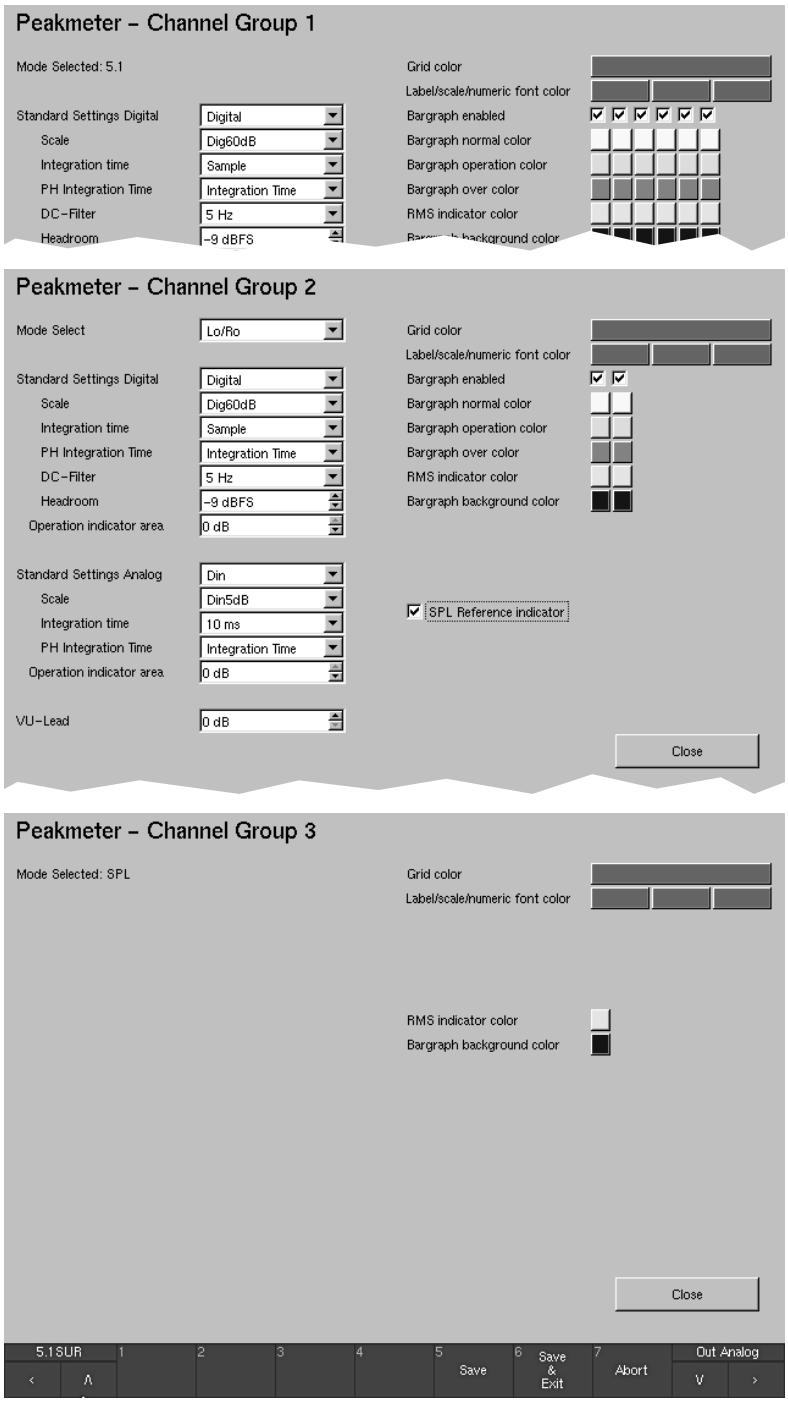


Fig. 6-39: Example for the Peakmeter – Channel Group menu pages in Surround modes

- **Multi Channel mode:**

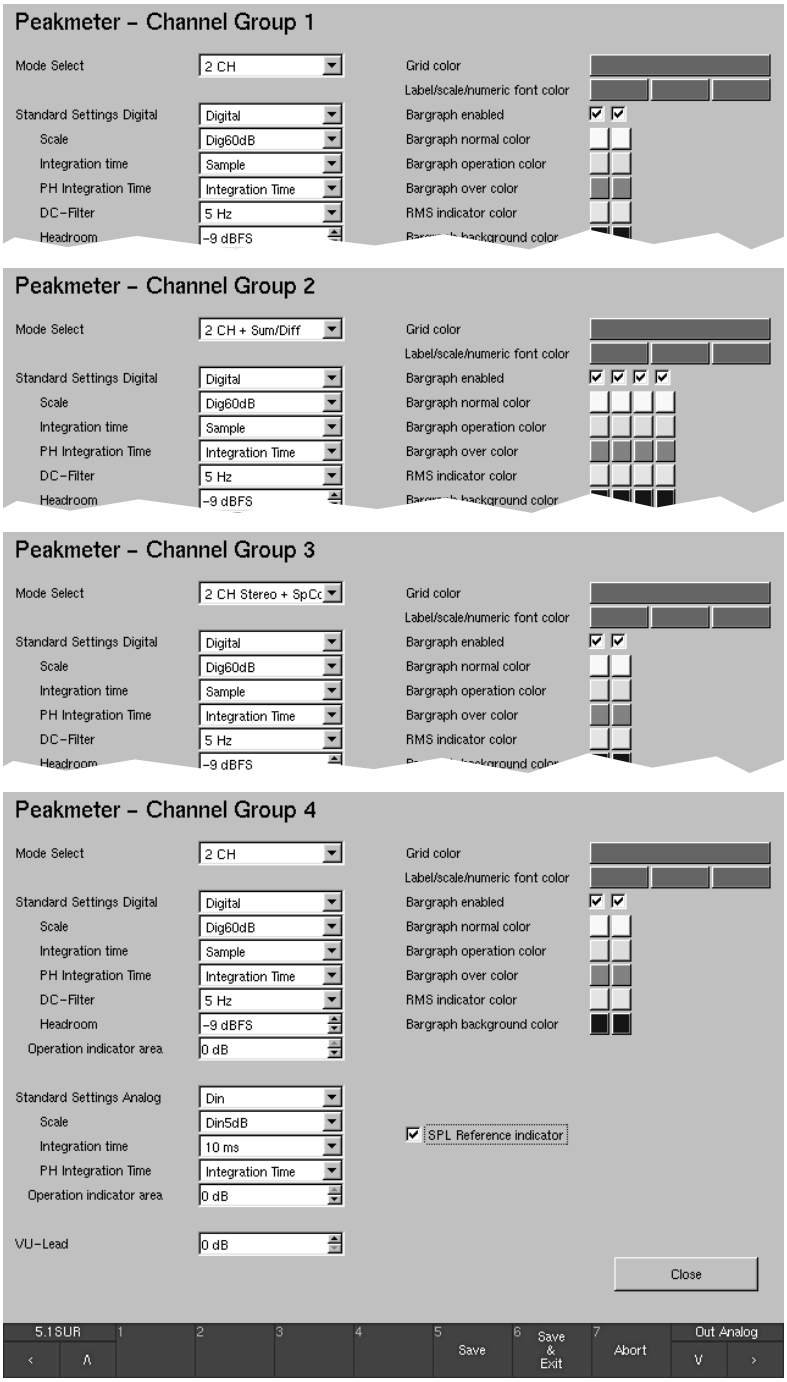


Fig. 6-40: Example for the Peakmeter – Channel Group menu pages in Multi-Channel mode

- **2 Channel Stereo mode:**

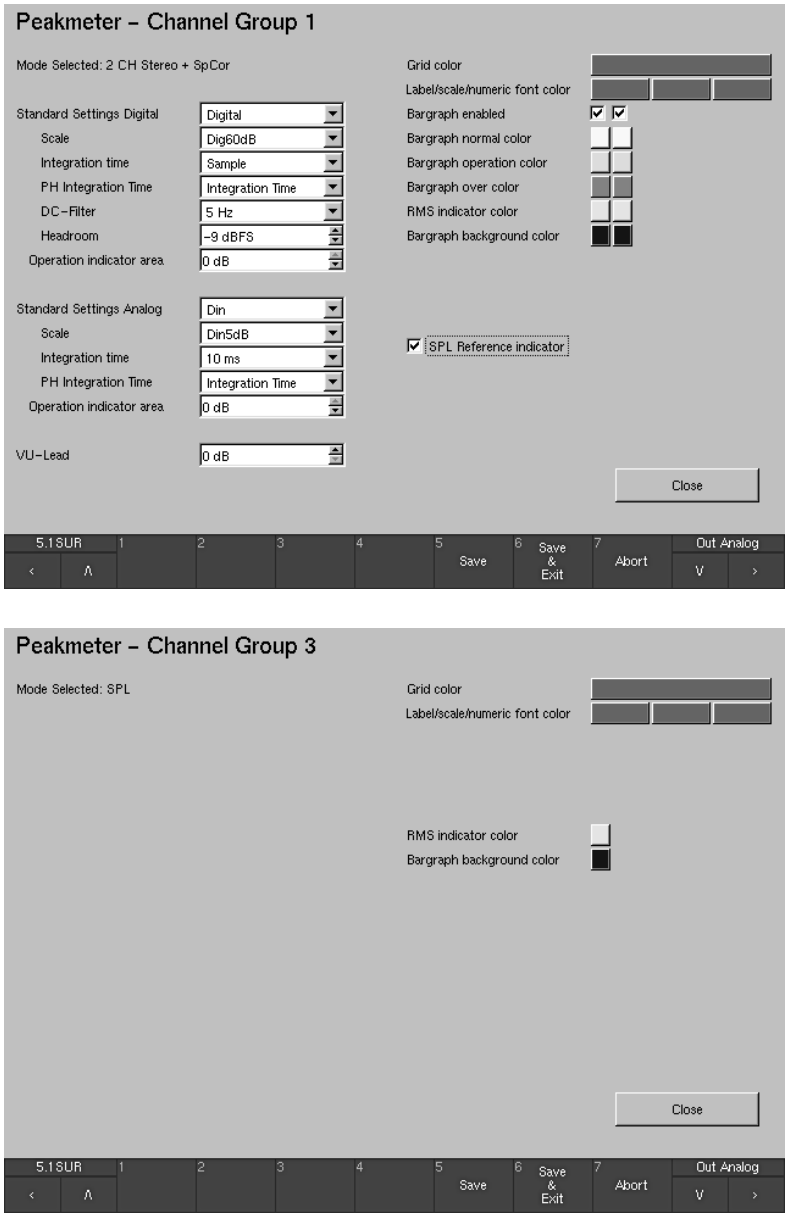


Fig. 6-41: The Peakmeter – Channel Group menu pages in 2 Channel Stereo mode

See Chapter 6.5.2.4 and Fig. 6-32

- The **Lext/Rext – Channel Group** menu page is opened with the Peakmeter Settings button of the **Lext/Rext Routing** section of the **Key 1** to **Key 7** menu pages (see Chapter 6.5.2.4 and Fig. 6-32).

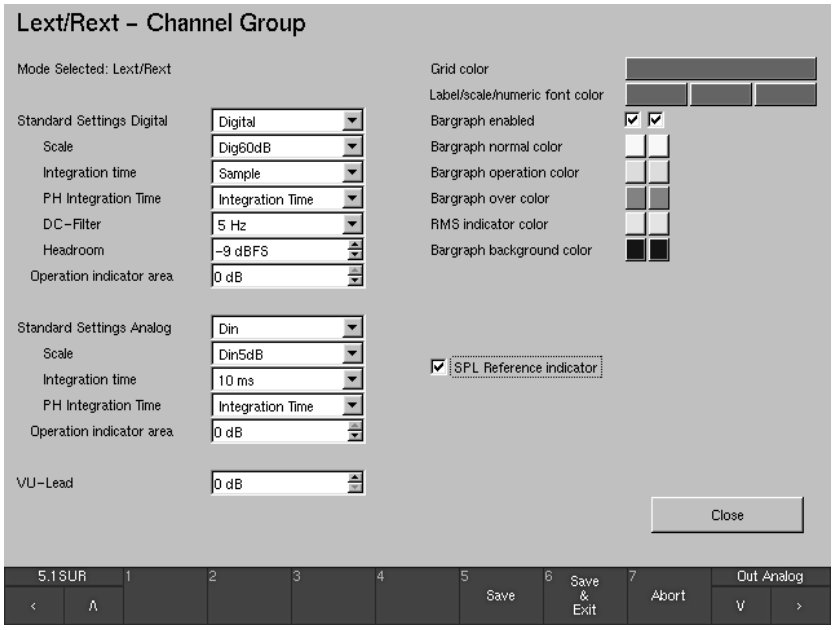


Fig. 6-42: The Lext/Rext – Channel Group menu page

See Chapter 6.5.2.7 and Fig. 6-38

- The **Downmix – Channel Group** menu page is opened with the Channel Group button of the **Two Channel Downmix Settings** menu page (see Chapter 6.5.2.7 and Fig. 6-38).

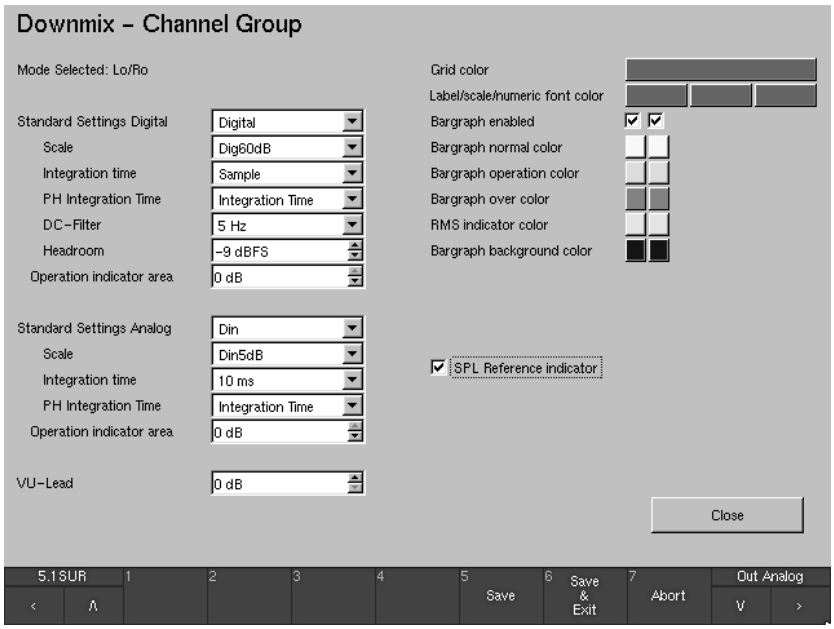


Fig. 6-43: The Downmix – Channel Group menu page

These menu pages can be used to configure the peakmeter display individually for each channel group mentioned. They contain settings for the operating modes, standard settings for the digital and analog signal paths, VU Lead and the display colors for the individual elements. With some exceptions, they apply for all channel groups. The exceptions and individual differences are all explained explicitly where applicable.

- **Mode Selected** Labelled text
  (Does NOT apply for all Channel Groups, see the following description)

  - **Surround modes:**
    - In **Peakmeter – Channel Group 1**, this field shows the channel mode selected for the Sub Preset you are working on. To edit the channel mode, close the **Peakmeter – Channel Group** menu and the **Peakmeter Settings** menu and select a new Mode setting.
    - In **Peakmeter – Channel Group 3**, this field shows the mode assigned to this channel group, i. e. SPL.
    - In **Lext/Rext – Channel Group**, this field shows the mode assigned to this channel group, i. e. Lext/Rext (only available with 3.1 and 5.1 surround format).
    - In **Downmix – Channel Group**, this field shows the mode assigned to this channel group, i. e. Lo/Ro.

  - **Multi Channel mode:**
    - When 8 CH or 4 CH is selected as Channels settings in the **Monitoring Routing** section, in **Peakmeter – Channel Group 1** this field shows the channel mode selected for the Sub Preset you are working on. To edit the channel mode, close the **Peakmeter – Channel Group** menu page and the **Peakmeter Settings** menu and select a new Mode setting.

  - **2 Channel Stereo mode:**
    - In **Peakmeter – Channel Group 1**, this field shows the channel mode selected for the Sub Preset you are working on. To edit the channel mode, close the **Peakmeter – Channel Group** menu page and the **Peakmeter Settings** menu and select a new Mode setting.
    - Peakmeter – Channel Group 2 is not available.
    - In **Peakmeter – Channel Group 3**, this field shows the mode assigned to this channel group, i. e. SPL.

- **Mode Select**
  (Does ONLY apply for some Channel Groups, see the following description)

  - **Surround modes:**
    This combo box is used to select the display mode for **Peakmeter – Channel Group 2**. The available options are the downmix signals either generated from the surround format (Lo/Ro) set with the Mode parameter (see Chapter 6.5.2.1) or input from an external source (Lext/Rext). For both signals you can also select the display of the downmix parameters with separate bargraphs for sum and difference (Lo/Ro + Sum/Diff and Lext/Rext + Sum/Diff).

See Chapter 6.5.2.1

- **Multi Channel mode:**
  When 2 CH is selected for each group as Channels settings in the **Monitoring Routing** section, these combo boxes are used to select the display mode for the **Peakmeter – Channel Groups 1** to **4**. The available options are either the solely channel pairs (2 channels or Stereo) or the channel pairs with additional displays of sum and difference in separate bargraphs. The available signals you can select for display are 2 CH or 2 CH + Sum/Diff resp. 2 CH Stereo + SpCor or 2 CH + Sum/Diff + SpCor.

- **2 Channel Stereo mode:**
  In 2 Channel Stereo mode there are no combo boxes in the available channel groups. The mode selected is displayed (see **Mode Selected** above).



Note:
Stereo channel pairs are defined and marked with a spot correlator (SpCor) between the corresponding bargraphs.

- **Standard Settings Digital**
  (Does NOT apply for Peakmeter – Channel Group 3 in Surround modes and 2 Channel Stereo mode, see Figs. 6-39 and 6-41)
  This combo box applies to the four combo boxes and two list boxes grouped directly below it.
  When you select Digital or ARD all these combo boxes are automatically set to values corresponding to the digital or the ARD standards. If you then change any of the settings of these combo boxes with the exception of the PH integration time combo box and the Operation indicator area combo box manually, the text „Non Standard“ is displayed in the Standard Settings Digital combo box. Reselecting Digital or ARD automatically resets all decisive boxes grouped below to the standard values of these presets.

  - **Scale**
    (Does NOT apply for Peakmeter – Channel Group 3 in Surround modes and 2 Channel Stereo mode, see Figs. 6-39 and 6-41)
    This combo box allows you to select the available scales:
    - Dig60dB (–60 dB FS to 0 dB FS, standard settings digital)
    - Dig20dB (–20 dB FS to 0 dB FS)
    - Dig+18 dB... 0 dB (0 dB FS = +18 dB)
    - Dig+18 dB... 0... –18 dB (0 dB FS = +18 dB)
    - Dig+20 dB... 0... –40 dB (0 dB FS = +20 dB)
    - ARD +9 dB... –60 dB (0 dB FS = +9 dB)
    - <q> DIN 5 dB (quasi-DIN scale, 0 dB = –9 dB FS)
    - <q> DIN 10 dB (quasi-DIN scale, 0 dB = –9 dB FS)
    - <q> Zoom +/– 10 dB (quasi-DIN scale, 0 dB = –9 dB FS)
    - <q> Zoom +/– 1 dB (quasi-DIN scale, 0 dB = –9 dB FS)
    - <q> Nordic (quasi-Nordic scale, +6 dB = –9 dB FS)

- **Integration time**

  (Does NOT apply for Peakmeter – Channel Group 3, see Figs. 6-39)
  This combo box allows you to select the integration time of the level display:
  - 10 ms
  - 20 ms
  - 1 ms
  - 0.1 ms
  - Sample (standard settings digital)

- **PH Integration Time**

  (Does NOT apply for Peakmeter – Channel Group 3 in Surround modes and 2 Channel Stereo mode, see Figs. 6-39 and 6-41)
  This combo box sets the integration time for the peak hold display:
  - Integration Time: Uses the same integration time as for the level display (standard settings digital).
  - Sample: Uses a sample-precise integration time that is independent of the level display.

- **DC-Filter**

  (Does NOT apply for Peakmeter – Channel Group 3 in Surround modes and 2 Channel Stereo mode, see Figs. 6-39 and 6-41)
  This combo box sets the DC filter. You can switch the filter off (Off) or set it to 5 Hz (standard settings digital), 10 Hz or 20 Hz.

- **Headroom**

  (Does NOT apply for Peakmeter – Channel Group 3 in Surround modes and 2 Channel Stereo mode, see Figs. 6-39 and 6-41)
  This list box sets the beginning of the headroom in the range between –20 dB FS and –5 dB FS. The digital standard setting is –9 dB FS.



Note:
The headroom of the ARD+9 dB..–60 dB scale is fixed to –9 dB FS, a selection in the Headroom list box has no effect.

- **Operation indicator area**

  (Does NOT apply for Peakmeter – Channel Group 3 in Surround modes and 2 Channel Stereo mode, see Figs. 6-39 and 6-41)
  This list box sets the area over which the indicator for the operating area is activated. You can enter values between –20 dB and 0 dB. The digital standard setting is 0 dB.

- **Standard Settings Analog**

  (Does NOT apply for Peakmeter – Channel Group 3 in Surround modes and 2 Channel Stereo mode, see Figs. 6-39 and 6-41)
  This combo box applies to the three combo boxes and the one list box grouped directly below it.
  If you select one of the standards listed below the first two boxes are automatically set to the values corresponding to the selected standard. If you then change one of these two combo boxes manually the text “Non Standard” is displayed in the Standard Settings Analog combo box. If you then reselect one of the standards the decisive boxes grouped below are automatically reset to the values corresponding to the selected standard.

The following analog standards are available:

- DIN
- Nordic
- British IIa
- British IIb
- VU
- SMPTE
- NHK
- Non Standard

- **Scale**

  (Does NOT apply for Peakmeter – Channel Group 3 in Surround modes and 2 Channel Stereo mode, see Figs. 6-39 and 6-41)

  This combo box allows you to select the scale you want to use:

  - Din5dB (–50 dB to +5 dB, 0 dB display is referred to +6 dBu, DIN standard setting)
  - DIN 10 dB (–50 dB to +10 dB, 0 dB is +6 dBu)
  - Nordic (–42 dB to +12 dB, 6 dB is +6 dBu, Nordic standard setting)
  - British IIa („1“ to „7“, „6“ is +8 dBu, British IIa standard setting)
  - British IIb („–12“ to „+12“, „8“ is +8 dBu, British IIb & SMPTE standard setting)
  - VU (–20 dB to +3 dB, 0 dB is +6 dBu, VU standard setting)
  - Zoom +/–10dB (–10 dB to +10 dB, 0 dB is +6 dBu)
  - Zoom +/–1dB (–1 dB to + 1 dB, 0 dB is +6 dBu)

See Chapter 6.7

  - SMPTE24dB–abs (–35 dB to +24 dB, 0 dB is 0 dBu)
    Only available when SMPTE/RP155 (+24 dBu) is selected as Reference Level Standard in the **Reference Levels** menu (see Chapter 6.7).

See Chapter 6.7

  - SMPTE20dB–rel (–40 to +20 dB, 0 dB is +4 dBu)
    Only available when SMPTE/RP155 (+24 dBu) is selected as Reference Level Standard in the **Reference Levels** menu (see Chapter 6.7). The reference level for the 0 dB display is +4 dBu.

See Chapter 6.7

  - NHK
    Only available when SMPTE/RP155 (+24 dBu) or User (+18 … +24 dBu) is selected as Reference Level Standard in the **Reference Levels** menu. The reference level for the 0 dB display refers to the selected standard resp. to the individual selected reference level with the User list box in the **Reference Levels** menu (see Chapter 6.7).

- **Integration time**

  (Does NOT apply for Peakmeter – Channel Group 3 in Surround modes and 2 Channel Stereo mode, see Figs. 6-39 and 6-41)

  This combo box sets the integration time for the level display:

  - 10 ms (DIN, Nordic & SMPTE standard setting)
  - 20 ms (British IIa & British IIb standard setting)
  - 1 ms
  - 0.1 ms
  - 300 ms (VU standard setting)

- **PH Integration Time**

  (Does NOT apply for Peakmeter – Channel Group 3 in Surround modes and 2 Channel Stereo mode, see Figs. 6-39 and 6-41)

  This combo box sets the integration time for the peak hold display:

  - Integration Time: Uses the same integration time as for the level display. This applies for all standard settings.
  - Sample: Uses a sample-precise integration time that is independent of the level display.

- **Headroom**

  (Is ONLY available with NHK scale selected and does NOT apply for Peakmeter – Channel Group 3 in Surround modes and 2 Channel Stereo mode, see Figs. 6-39 and 6-41)

  This list box sets the beginning of the headroom in the range between –20 dB FS and –5 dB FS. The standard setting is –9 dB FS.

- **Operation indicator area**

  (Does NOT apply for Peakmeter – Channel Group 3 in Surround modes and 2 Channel Stereo mode, see Figs. 6-39 and 6-41)

  This list box sets the area over which the indicator for the operating area is activated. You can enter values between –20 dB and 0 dB. A setting of 0 dB corresponds to 0 dBr. The standard setting is 0 dB.

- **VU-Lead**

  (Does NOT apply for Peakmeter – Channel Group 3 in Surround modes and 2 Channel Stereo mode, see Figs. 6-39 and 6-41)

  This list box is for setting the lead for the VU display. You can enter values between 0 dB and 10 dB.

- **Grid Color**

  This button displays the color selector so that you can change the color of the scale grid for the bargraph display.

- **Label/scale/numeric font color**

  These three buttons each display the color selector so that you can change the color of the label font, the scale font and the numeric font used in the peakmeter display.

- **Bargraph enabled**

  (Does NOT apply for Peakmeter – Channel Group 3 in Surround modes and 2 Channel Stereo mode, see Figs. 6-39 and 6-41)

  With these check boxes the display of each bargraph can be deactivated separately for every channel in the peakmeter display.

- **Bargraph normal color**

  (Does NOT apply for Peakmeter – Channel Group 3 in Surround modes and 2 Channel Stereo mode, see Figs. 6-39 and 6-41)

  These buttons open the channel selector separately for every channel so that you can change the color of each bargraph in the peakmeter display.

- **Bargraph operation color**
  (Does NOT apply for Peakmeter – Channel Group 3 in Surround modes and 2 Channel Stereo mode, see Figs. 6-39 and 6-41)
  These buttons open the channel selector separately for every channel so that you can change the color of the working range of each bargraph in the peakmeter display.

- **Bargraph over color**
  (Does NOT apply for Peakmeter – Channel Group 3 in Surround modes and 2 Channel Stereo mode, see Figs. 6-39 and 6-41)
  These buttons open the channel selector separately for every channel so that you can change the color of the over range of each bargraph in the peakmeter display.

- **RMS indicator color**
  This button displays the color selector so that you can change the color of the RMS indicator of the bargraphs in the peakmeter display.

- **Bargraph background color**
  These buttons open the channel selector separately for every channel so that you can change the background color of each bargraph in the peakmeter display.

- **Tracklayout**
  (Does ONLY apply for Peakmeter – Channel Group 1 in Surround modes)
  This combo box is for selecting the channel sequences of the bargraphs for the individual channel groups. The selection options are available for the 5.1 surround format, for the formats 3.1, 6.1 and 7.1 the track layout is displayed:
  - 3.1: 3.1
  - 5.1: SMPTE.TV: L.R.C.LF.LS.RS
    SMPTE.FILM: L.LS.C.RS.R.LF
    DTS: L.R.LS.RS.C.LF
    FILM: L.C.R.LS.RS.LF
    L,C,R,LF,LS,RS
  - 6.1: DTS: L.C.R.LS.CS.RS.LF
  - 7.1: SMPTE: L.LC.C.RC.R.LS.RS.LF

  For the selection of the format use the Mode combo box of the **Key 1** to **Key 7** menu pages (see Chapter 6.5.2.1).

- **SPL Reference indicator**
  With this option, a spot indicator can be activated for each bargraph of the channel group showing the SPL measurement in each channel.

- **Close**
  This button closes the menu page and returns you to the menu page from which you have selected the Channel Group.

6.5.2.9 Loudness Settings for Monitoring Routing section

(ITU BS.1771 Loudness Settings menu page)

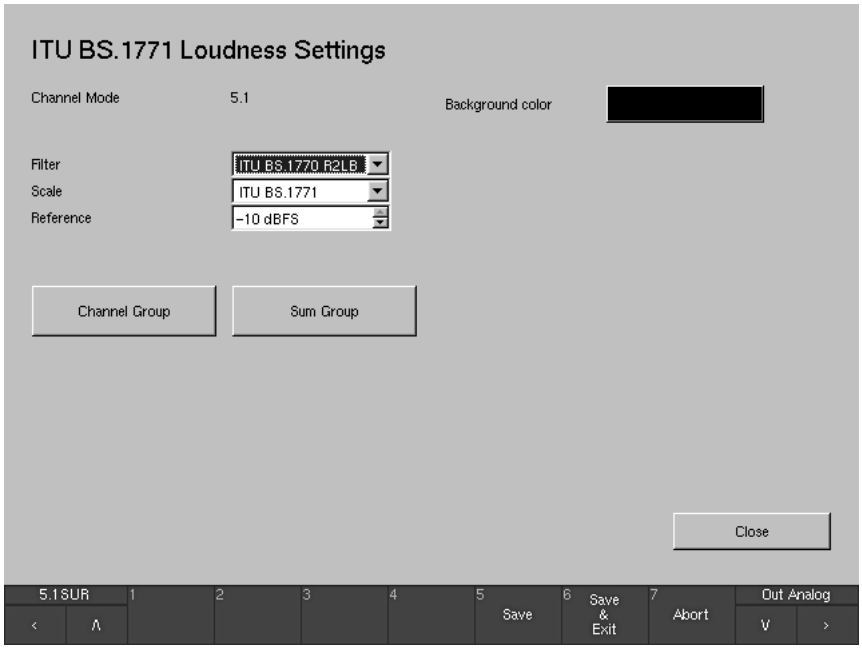


Fig. 6-44: The ITU BS.1771 Loudness Settings menu page

See Chapters 6.5.2.1 and 6.5.2.3 and Figs. 3-16 and 6-17 to 6-20

The Loudness Settings button is shown in the **Monitoring Routing** section of the **Key 1** to **Key 7** menu pages when the Program Meter combo box on these menu pages is set to the ITU BS.1771 option (see Chapters 6.5.2.1 and 6.5.2.3 and Figs. 3-16 and 6-17 to 6-20). The loudness options of the unit can be configured individually for each Sub Preset and the channel modes 2 channel stereo and 5.1.

After clicking the Loudness Settings button, the **ITU BS.1771 Loudness Settings** menu page is opened showing the following options (see Fig. 6-44):

- **Channel Mode** Labelled text
  This field shows the channel mode selected for the Sub Preset you are working on.

- **Background color**
  This button displays the color selector so that you can change the color of the background of the Program Meter area in loudness mode.

- **Filter**
  This option selects the weighting filter used for the loudness calculation. The only option available at this time is the R2LB filter defined by ITU BS.1770.

- **Scale**
  This option selects the scale used for the bargraphs in ITU BS.1771 mode. The only option available at this time is the scale defined by ITU BS.1771.

- **Reference**
  This option selects the digital reference level (in dB FS) for a sine input signal reading 0 dB LU on the loudness bargraphs. For instance, when set to -24 dB FS, a digital sine signal with -24 dB FS at the input will cause the loudness bargraph to read 0 dB LU. The reference can be set to values between –10 dB FS and –30 dB FS in steps of 1 dB FS.

- **Channel Group**
  The menu page opening after clicking the Channel Group button lets you configure the way the bargraphs in the channel section of the **Program Meter** work after the Program Meter combo box is set to ITU BS.1771. The parameters of this Channel Group are described in detail in Chapter 6.5.2.10.

See Chapter 6.5.2.10

- **Sum Group**
  The Sum Group, located right to the bargraphs of the Channel Group, contains up to 3 additional bargraphs (Momentary, Integrated, Long term) with special functions of the ITU BS.1771 (Loudness) mode of the **Program Meter**. The parameters of the Sum Group are described in detail in Chapter 6.5.2.11.

See Chapter 6.5.2.11

- **Close**
  This button closes the menu page and returns you to the **Key** menu page from which you selected the Loudness Settings for the **Monitoring Routing** section.

6.5.2.10 Parameters available in the Loudness Channel Group

The **Channel Group** menu page opening after clicking the Channel Group button on the **ITU BS.1771 Loudness Settings** menu page lets you configure the way the bargraphs in the channel section of the **Program Meter** work after the Program Meter combo box is set to ITU BS.1771.

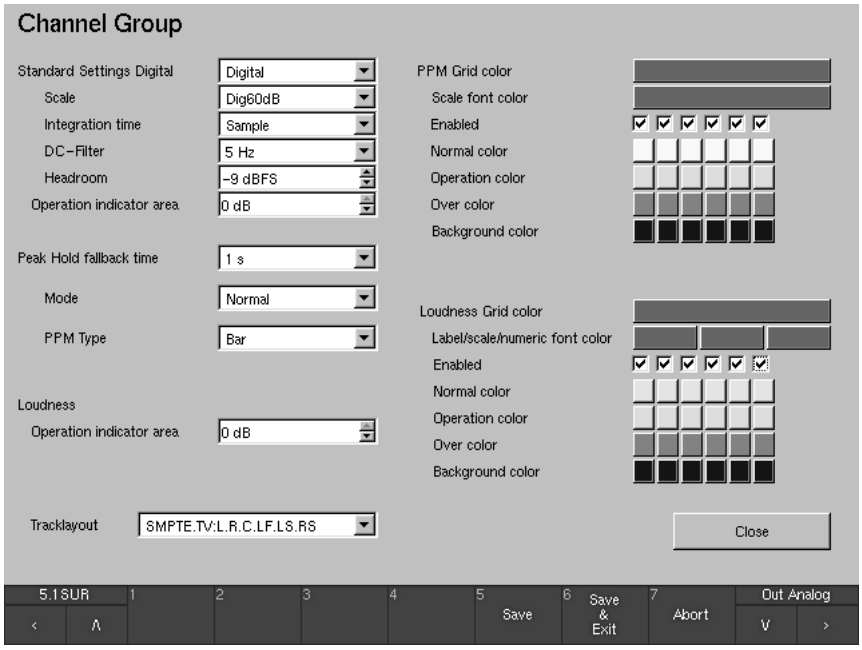


Fig. 6-45: The Channel Group menu page for the Loudness Settings

The Channel Group consists of 2 bargraphs in 2 channel stereo mode and 6 bargraphs in 5.1 mode. Each bargraph shows a combination of PPM and Loudness bargraphs (the loudness section of this display mode conforming to ITU BS.1771 standard). This mode divides the bargraphs into three vertical sections: The center shows the loudness conforming to ITU BS.1771 while the both outer sections show the PPM metering being set on this page.

- **Standard Settings Digital**
  As the ITU BS.1771 standard is only defined for digital input signals, the only option selectable here is Digital.

  - **Scale**
    With this combo box the digital and quasi analog scales available for the peakmeter instruments can be selected (see Chapter 6.5.2.8). Standard setting digital is Dig60dB (–60 dB FS to 0 dB FS).

  - **Integration time**
    This combo box allows you to select the integration time of the level display:
    - 10 ms
    - 20 ms
    - 1 ms
    - 0.1 ms
    - Sample (standard settings digital)

- **DC-Filter**
  This combo box sets the DC filter. You can switch the filter off (Off) or set it to 5 Hz (standard settings digital), 10 Hz or 20 Hz.

- **Headroom**
  This list box sets the beginning of the headroom in the range between –20 dB FS and –5 dB FS. The digital standard setting is –9 dB FS.

- **Operation indicator area**
  This list box sets the area over which the indicator for the operating area is activated. You can enter values between –20 dB and 0 dB. The digital standard setting is 0 dB.

- **Peak Hold fallback time**
  This combo box is for setting the hold time for the peak hold display. Options: 1 s, 2 s, 4 s, 10 s, 20 s, 30 s and Manual Reset. With Manual Reset selected, you can reset the peak hold display with the **Reset** function in the ITU BS.1771 Loudness Meter (see Chapter 5.2.2).

See Chapter 5.2.2

  - **Mode**
    This combo box is for switching the Peak Hold function on or off. Options: Normal, Peakhold.

  - **PPM Type**
    This combo box is for selecting the type of the PPM display. Options: Bar, Spot.

- **Loudness** Labelled text

  - **Operation indicator area**
    This list box sets the area over which the indicator for the operating area is activated. You can enter values between –20 dB and 0 dB. The digital standard setting is 0 dB.

- **PPM**

  - **Grid Color**
    This button displays the color selector so that you can change the color of the scale grid for the PPMs.

  - **Scale font color**
    This button displays the color selector so that you can change the color of the scale font used for the PPM labels.

  - **Enabled**
    With these check boxes the PPM part of each bargraph can be deactivated separately for every channel in the Channel Group.

  - **Normal color**
    These buttons open the channel selector separately for every channel so that you can change the color of each PPM bargraph.

- **Operation color**
  These buttons open the channel selector separately for every channel so that you can change the color of the working range of each PPM bargraph in the Channel Group.

- **Over color**
  These buttons open the channel selector separately for every channel so that you can change the color of the over range of each PPM bargraph in the Channel Group.

- **Background color**
  These buttons open the channel selector separately for every channel so that you can change the background color of each PPM bargraph in the Channel Group.

- **Loudness**

  - **Grid Color**
    This button displays the color selector so that you can change the color of the scale grid for the loudness bargraphs.

  - **Label/scale/numeric font color**
    These three buttons each display the color selector so that you can change the color of the label font, the scale font and the numeric font used for the loudness bargraphs.

  - **Enabled** ☑
    With these check boxes the Loudness part of each bargraph can be deactivated separately for every channel in the Channel Group.

  - **Normal color**
    These buttons open the channel selector separately for every channel so that you can change the color of each loudness bargraph in the Channel Group.

  - **Operation color**
    These buttons open the channel selector separately for every channel so that you can change the color of the working range of each loudness bargraph in the Channel Group.

  - **Over color**
    These buttons open the channel selector separately for every channel so that you can change the color of the over range of each loudness bargraph in the Channel Group.

  - **Background color**
    These buttons open the channel selector separately for every channel so that you can change the background color of each loudness bargraph in the Channel Group.

- **Tracklayout**
  This combo box is for selecting the channel sequences of the bargraphs for the individual channel groups.
  - 5.1: SMPTE.TV: L.R.C.LF.LS.RS
    SMPTE.FILM: L.LS.C.RS.R.LF
    DTS: L.R.LS.RS.C.LF
    FILM: L.C.R.LS.RS.LF
    L,C,R,LF,LS,RS

  For the selection of the format use the Mode combo box of the **Key 1** to **Key 7** menu pages (see Chapter 6.5.2.1).

- **Close**
  This button closes the page and returns you to the **ITU BS.1771 Loudness Settings** menu page from which you have selected the Channel Group.

6.5.2.11 Parameters available in the Loudness Sum Group

In normal display operation up to three additional Loudness bargraphs (Loudness Sum Group) with special functions of the ITU BS.1771 (Loudness) mode are located right to the Loudness channel bargraphs (Loudness Channel Group) in the **Program Meter** display (see Fig. 5-8).
The additional bargraphs are:

- **Momentary bargraph**
  The „Momentary“ bargraph, labelled **M** by default, shows the summed loudness of all channels in the Channel Group. The integration time used for this is variable.

- **Integrated bargraph**
  The „Integrated“ bargraph, labelled **I** by default, shows the integration of the loudness history of the summed signal over the last 5 - 20 seconds. This calculation uses a dynamic time window.

- **Longterm bargraph**
  The „Longterm“ bargraph, labelled **L** by default, shows the integration of loudness values over up to 7 days 23 hours. This is done by taking integrated loudness values once a second, recording them in the internal memory and calculating the average loudness. Special care is taken to exclude signal breaks from the calculation by introducing a threshold level. As soon as the signal level falls under this value, the values are no longer included in the calculation.

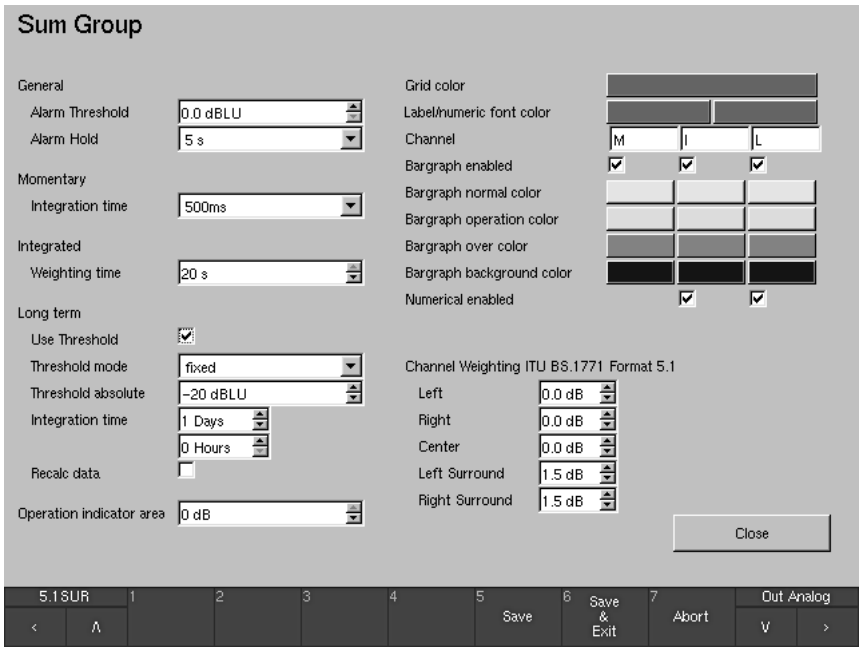


Fig. 6-46: The Loudness Sum Group menu page

The parameters of the Sum Group selected with the Sum Group button on the **ITU BS.1771 Loudness Settings** menu page are as follows:

- **General** Labelled text

  - **Alarm Threshold**
    With this list box the Alarm threshold value in dB LU can be set. Signals exceeding this value are triggering the Alarm signalisation in the display. Options: 0.0 dB LU to 9.0 dB LU in steps of 0.5 dB LU.

  - **Alarm Hold**
    With this combo box the hold time for the Alarm signalisation can be selected. Options: 1 s, 5 s, Manual Reset.

- **Momentary** Labelled text

  - **Integration time**
    With this combo box the integration time for the Momentary bargraph can be selected. Options: IEC 125 ms, 250 ms, 500 ms, 750 ms, IEC 1000 ms, 1500 ms, 2000 ms.

- **Integrated** Labelled text

  - **Weighting time**
    With this list box the Weighting time for the Integrated bargraph can be set. Options: 5 s to 20 s in steps of 1 second.

- **Longterm** Labelled text

  - **Use Threshold**
    With this check box activated, the threshold function is used so that values falling under the threshold selected are ignored in the calculation.

  - **Threshold mode**
    With this combo box the properties of the Threshold can be selected:
    - fixed: The Threshold can be set to an absolute value, the list box below is correspondently labelled with Threshold absolute.
    - dynamic: The Threshold can be set to a dynamic time window as described in the Longterm bargraph section above. The list box below now is correspondently labelled with Threshold offset.

  - **Threshold absolute**
    This list box sets the absolute threshold value used when the Threshold mode is set to fixed. Signals under the selected value are ignored in the calculation. Options: –40 to 0 dB LU in 1 dB LU steps.

  - **Threshold offset**
    This list box sets the threshold offset value used when the Threshold mode is set to dynamic. Options: –12 to 0 dB LU in 1 dB LU steps.

- **Integration time**
  This option sets the integration time for the Longterm calculation. The time interval can be entered in days/hours with two list boxes to the maximum of 7 days 23 hours in steps of 1 hour.

- **Recalc data**
  With this check box activated it is possible to execute a recalculation of the Loudness values when any Loudness parameters have been changed.

- **Operation indicator area**
  This list box sets the area over which the indicator for the operating area is activated. You can enter values between –20 dB and 0 dB. The digital standard setting is 0 dB.

- **Grid Color**
  This button displays the color selector so that you can change the color of the scale grid for the **M**, **I** and **L** bargraphs.

- **Label/numeric font color**
  These two buttons each display the color selector so that you can change the color of the label font and the numeric font used for the **M**, **I** and **L** bargraphs.

- **Channel**
  These text fields are used to enter individual names for the three bargraphs of the Sum Group. While positioning the mouse into the field you want to edit, use the right mouse key to open the alphanumerical **Channel Label** menu page and select individual names.

- **Bargraph enabled**
  With these check boxes each bargraph can be deactivated separately.

- **Bargraph normal color**
  These buttons open the channel selector so that you can change the color of each bargraph in the Sum Group.

- **Bargraph operation color**
  These buttons open the channel selector so that you can change the color of the working range of each bargraph in the Sum Group.

- **Bargraph over color**
  These buttons open the channel selector separately for every channel so that you can change the color of the over range of each bargraph in the Sum Group.

- **Bargraph background color**
  These buttons open the channel selector separately for every channel so that you can change the background color of each bargraph in the Sum Group.

- **Numerical enabled**
  With these check boxes the numerical displays of the **I** and **L** bargraphs can be deactivated.

- **Channel Weighting ITU BS.1771 Format 5.1** Labelled text
  For 5.1 mode, the weighting of each individual channel for the calculation of the **M**, **I** and **L** bargraphs can be varied with this option between –3 and +3 dB in steps of 0.5 dB.



Note:
For 2 Channel Stereo mode, only the list boxes for the left and the right channel are available. There is then no headline for this section.

- **Close**
  This button closes the page and returns you to the **ITU BS.1771 Loudness Settings** menu page from which you have selected the Sum Group.

On Global Routing Settings menu page:
→ Monitoring Output Routing

6.5.3 Monitoring Output Routing

This button opens the **Global Monitoring Output Routing** menu page. It contains routing matrices for the outputs of the Monitoring connectors **Digital 3 In/Out**, **Digital 4 In/Out** and **Analog Out**. The channels of the output connectors can be assigned to individual internal channels (L, R, etc.) independently. This gives the option to set up separate output routings. Using the **Output** key on the Remote Control 30050 (31900 series) or the control panel of the 31960 series (or the Out toggle button in the Toolbar on the screen), it is easy to switch between two independent monitoring systems connected to the unit, for example one analog and one digital. Please use the **Output Key Mode** section on the **Global Routing Settings** menu page (see Chapter 6.5) to define how the **Output** key works.

See Chapter 6.5.2.6

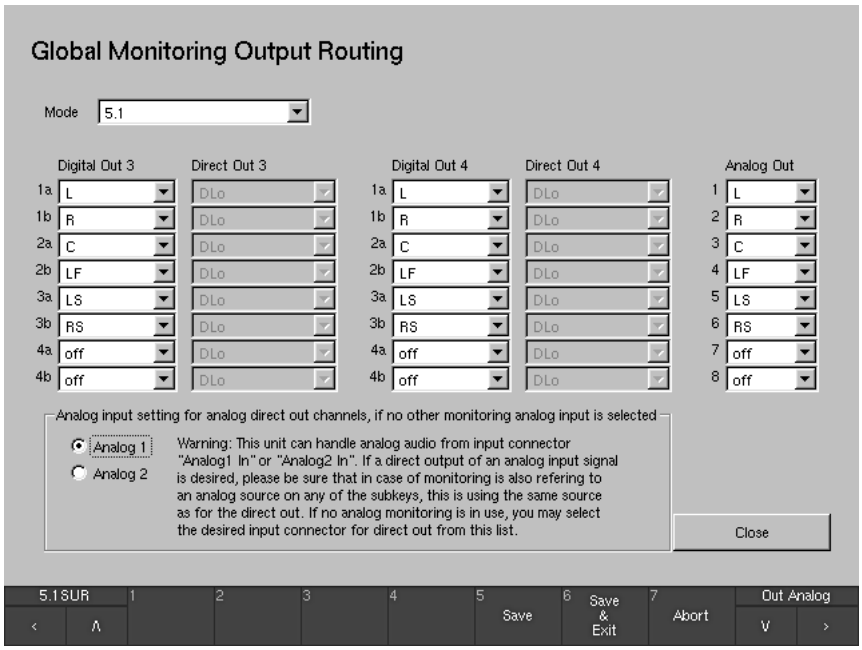


Fig. 6-47: The Global Monitoring Output Routing menu page

- **Mode**
  It is possible to select an individual channel mode for the output section independently from the channel mode selected for the monitoring input routing and the internal processing. All channel modes from 2 channel stereo to multi channel mode are available for the outputs. Nevertheless, the default setting for this option will always be the same as the monitoring input routing channel mode selected for the Sub Preset you are working on. This can be modified by selecting a different channel mode here if needed.

- **Digital Out 3, Direct Out 3, Digital Out 4, Direct Out 4**
  For each Digital Out 3 and Digital Out 4 channel (1a, 1b, ..., 4a, 4b) of the **Digital 3 In**/**Out** and **Digital 4 In**/**Out** connectors, an individual signal is selectable depending on the channel mode selected (see previous option).

  If the option use direct out is selected instead in Digital Out 3 or Digital Out 4, this output connector can be used as a multi-purpose direct output similar to a router. All analog and digital input signals, the discrete output signals and the downmixed decoder outputs can be directed to the direct outs. Also the signal of the **Generator** (see Chapter 6.8) or the **BLITS** output signals (see Chapters 5.15 and 6.8) are available. None of the monitor controller functions (solo, mute, listening levels) are applied to the direct out signals.

- **Analog Out**
  For each Analog Out channel (1 - 8) of the **Analog Out** connector, an individual signal is selectable depending on the channel mode selected (see option above).

6.6 Audio System

After selecting the Audio System menu tab the **Global Audio Settings** menu page is shown.

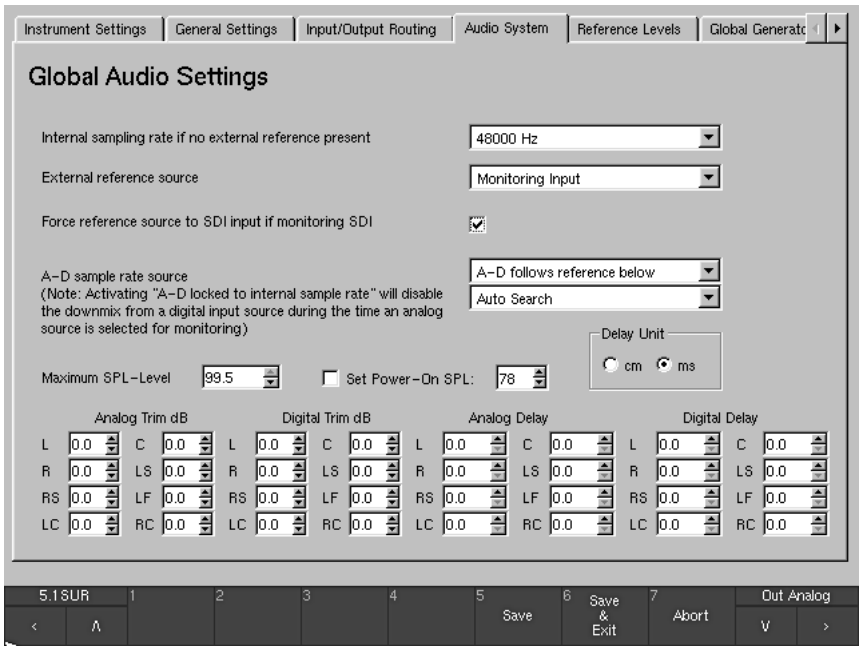


Fig. 6-48: The Global Audio Settings menu page

This menu page is used to configure the audio processing of the unit and, among others, contains all settings related to system clocking, sample rates and analog and digital level- and delay settings for the monitoring outputs.

- **Internal sampling rate if no external reference present**
  With this combo box one of the available internal sampling rates (44100 Hz, 48000 Hz, and 96000 Hz) can be set to be used for the analog inputs when no digital signal is available to be used as a reference sync signal. As soon as digital signals are input to the unit or a valid external reference signal is available and is selected as the sync source with the External Reference Source combo box (see next option), the internal A/D and D/A converters and the digital outputs will always use the sampling rate of the digital signal or reference sync signal.

- **External reference source**
  This function offers many different options for synchronizing the unit to an external reference source, taking into respect several conditions.

  In an ideal world, there's a common reference clock for all digital equipment used in the studio environment. In this case, all digital sources connected to the digital audio inputs of the unit are in sync.

Nevertheless in the real world it happens that digital sources are connected to the unit that are not in sync to the studio reference, e. g. an external DVD player or a SDI signal. In this case, the reference source option Monitoring Input can be used. In this setting, the reference source will always follow the monitoring input signal selected by the user. In this way, the unit will be in sync to its digital input signal at any given time.

Note:
Whereas the analog monitoring output signal will be muted while digital input signals are switched in this mode to avoid clicks caused by the switching of the reference source, it is not possible to avoid this for the digital outputs. It is therefore strongly recommended to mute the connected digital components while switching the reference source.

The following options are available for the external reference source:

- Monitoring Input: The monitoring input signal selected by the user is used as external reference source.
- Auto Search This setting automatically polls the digital inputs for a valid digital signal. As soon as a valid signal is found it is used as the reference sync signal. If this signal is no longer available the system polls the other inputs until it finds a valid signal, and the digital inputs are muted while this is being done.
- Use Ref Input: Presets the system to the **Ref Sync IN** input connector (see Chapter 7.3.15).

Note:
No automatic search is performed when this setting is activated! If there is no reference sync signal, the digital input signals are no longer displayed and the analog input signals are only displayed with a very narrow bandwidth.

- Dig 3.12 to Dig 4.78: One of the eight available digital input pairs can be selected so that its digital signals can be used as the reference sync signal:
  Dig 3.12 is AES input 1 of the Digital 3 In/Out connector, internal channels 1 and 2;
  Dig 3.34 is AES input 2 of the Digital 3 In/Out connector, internal channels 3 and 4;
  …;
  Dig 4.56 is AES input 3 of the Digital 4 In/Out connector, internal channels 5 and 6;
  Dig 4.78 is AES input 4 of the Digital 4 In/Out connector, internal channels 7 and 8

Note:
No automatic search is performed when this setting is activated! If there is no reference sync signal, the digital input signals are no longer displayed and the analog input signals are only displayed with a very narrow bandwidth.

Only available with 31900S, 31960S, 31900SD, 31960SD

- Use SDI Input: If using the signal connected to the SDI interface, the SDI source must always be the master.

Only available with 31900S, 31960S, 31900SD, 31960SD

- **Force reference source to SDI input if monitoring SDI**
  If one of the digital inputs, the Auto Search function or the reference input is selected for the reference source, with this option the unit can be forced to switch its reference to the SDI input whenever monitoring a SDI source. This option can be seen as a special version of the Monitoring Input option (see above) where the reference source only follows the monitoring selection in case SDI is selected for monitoring. For all other monitoring sources except SDI the unit will use the reference source selected under External Reference Source (see above).

  Note:
  If Monitoring Input or Use SDI Input is selected for the external reference source, this option of course is not available.

- **A-D Samplerate Source**
  Using this option, it is possible to define a separate sample rate source only for the A-D converters of the unit. For example, this can be useful to synchronize the A-D converters to the internal 96 kHz clock while the unit is locked to a 48 kHz digital input signal.

  - A-D locked to internal samplerate
    The A-D converters are always locked to the internal reference selected for the unit.

    Note:
    Activating this option will disable the downmix from a digital input source during the time an analog source is selected for monitoring. Digital signals are synchronized to the closest available digital sample rate.

  - A-D follows reference below
    The A-D converters use the digital reference source selected in the combo box now available below.
    The following options are available:
    - Auto Search — This setting automatically polls the digital inputs for a valid digital signal. As soon as a valid signal is found it is used as the reference sync signal. If this signal is no longer available the system polls the other inputs until it finds a valid signal, and the digital inputs are muted while this is being done.
    - Use Ref Input — Presets the system to the **Ref Sync IN** input.
    - Dig 3.12 to Dig 4.78: One of the eight available digital input pairs can be selected so that its digital signal can be used as the reference sync signal:
      Dig 3.12 is AES input 1 of the Digital 3 In/Out connector, internal channels 1 and 2;
      Dig 3.34 is AES input 2 of the Digital 3 In/Out connector, internal channels 3 and 4;
      …;
      Dig 4.56 is AES input 3 of the Digital 4 In/Out connector, internal channels 5 and 6;
      Dig 4.78 is AES input 4 of the Digital 4 In/Out connector, internal channels 7 and 8

Only available with 31900S, 31960S, 31900SD, 31960SD

- Use SDI Input: If using the signal connected to the SDI interface, the SDI source is always the master. In this case, the unit has to be synchronized to its SDI input.

- **Maximum SPL-Level**
  This option defines the maximum SPL that the user can set with the monitoring level control on the Remote Control 30050 (31900 series) or the control panel of the 31960 series. Available range: 10 dB to 99.5 dB.

- **Set Power-On SPL**
  This option is used to define the SPL level the system uses after Power On. Available range: 20 dB to 100 dB.

- **Analog Trim dB/Digital Trim dB**
  These list boxes read the monitor level trim values of individual speaker channels selected as defined in the CAL instrument (see Chapter 5.8.3). A modification can also be performed here.

See Chapter 5.8.3

- **Delay Unit**
  The delay setting can be made with the units **cm** (centimeter) or **ms** (milliseconds). This function corresponds to the Delay Unit function of the CAL instrument (see Chapter 5.8.3).
  - ms: Allows you to set the desired delay individually for each channel
  - cm: Deviation of the loudspeaker's position from the ITU ideal position in cm

See Chapter 5.8.3

- **Analog Delay/Digital Delay**
  With these list boxes, the delay values can be set separately for both analog or digital outputs (see the CAL instrument, the sub-function of the Monitoring instrument, in Chapters 5.8.2 and 5.8.3).
  - With the selection ms as the unit (see **Delay Unit** option before and Chapter 5.8.3); individual time delay values may be set for all speaker channels.
  - With the selection of cm as the unit the left front speaker (L) is used as the reference point (marked with Ref in the display of the MONITORING instrument). Loudspeaker positioning according to the ITU standard is assumed as the basis. Deviations from this ideal circle can be set for all loudspeaker positions in the CAL instrument as positive (larger) and negative (smaller) distance values in cm, separately for analog and digital outputs:
    - Entering positive values in the CAL instrument delays the selected channel and moves it back acoustically. The corresponding values are also displayed on the menu page here in the list boxes for the delay. See Fig. 6-49 on the next page.

See Chapters 5.8.2 and 5.8.3

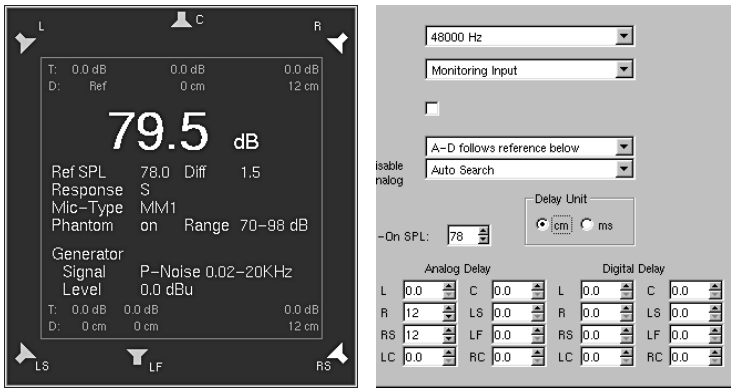


Fig. 6-49: Comparison of the entered positive delay values in the CAL instrument and the displayed values on the Audio System menu page

- Entering negative values in the CAL instrument (e. g. –12 cm) leaves the selected channel unchanged and applies the select delay value (e. g. 12 absolute) to all the other channels. All channels are delayed except the selected channel, thus moving the selected channel forward acoustically. This is reflected in the values displayed in the delay list boxes on the menu page here (e. g. selected channels: 0 cm, all other: 12 cm)

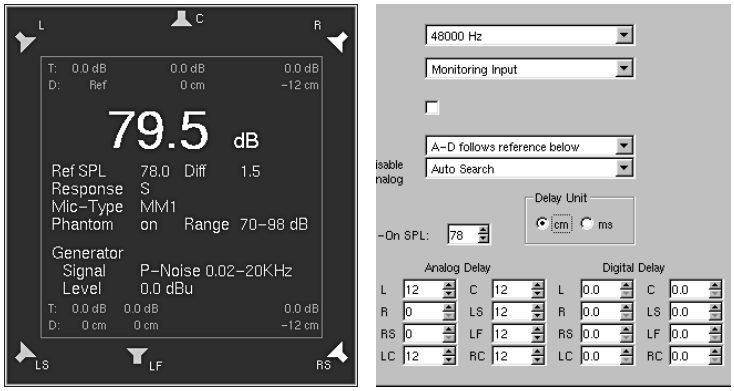


Fig. 6-50: Comparison of the entered negative delay values in the CAL instrument and the displayed values on the Audio System menu page

Note:
Delay settings can be used to compensate for surround or stereo monitoring installations where not all speakers are positioned at equal distances to the listener.

Note:
The latency introduced by the A-D and D-A converters in the signal chain are not reflected by these settings. To compensate for the delay between the analog and digital outputs, the converter delays for the sample rate used must be entered in the digital delay settings (see table in Chapter 5.8.3 showing the converter latency at the available sample rates).

See Chapter 5.8.3

→ MENU
→ Reference Levels menu tab

6.7 Reference Levels

This menu page contains options for setting the reference levels of the analog inputs and outputs and the calibration levels of the test signal generator (see Chapters 5.8.4 and 5.8.4.3).
The Analog Metering Reference Level Offset list box can be used to adjust the analog inputs to local applications.

See Chapters 5.8.4 and 5.8.4.3

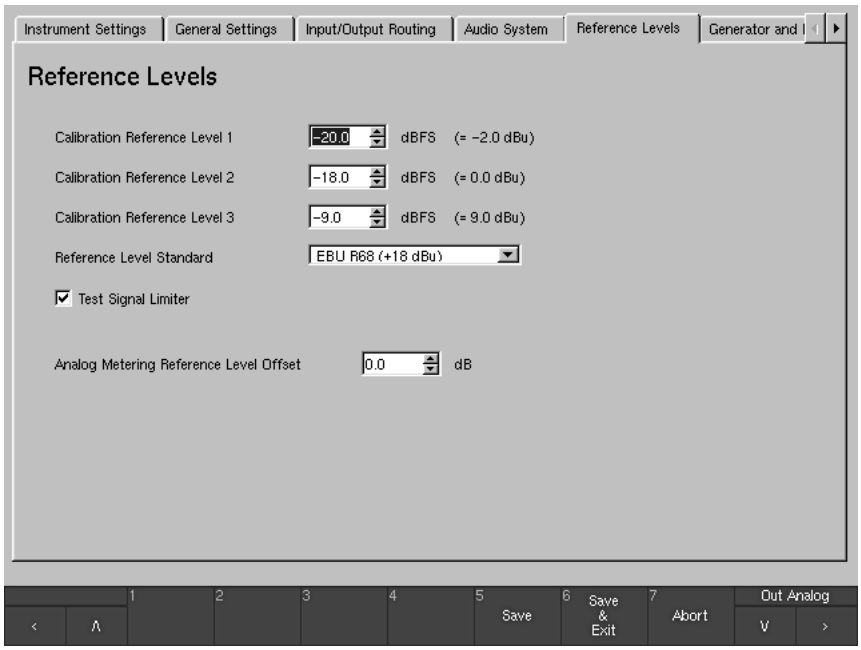


Fig. 6-51: The Reference Levels menu page

- **Calibration Reference Level 1 to 3**
  These list boxes are used to set the various output levels for the test signal generator. The factory defaults are –20 dB FS, –18 dB FS and –9 dB FS. The adjustment of values is possible in 0.5 dB steps. The current settings are also converted to dBu and displayed to the right of the list boxes.

- **Reference Level Standard**
  This combo box sets the analog output level that corresponds to the digital value 0 dB FS. Available options:
  - EBU R68 (+18 dBu)
  - SMPTE/RP155 (+24 dBu)
  - ARD HFBL-K (+15 dBu)
  - User (+18...+24 dBu)

  With the User option selected an additional list box opens for the individual selection of the maximum level between +18 dBu and +24 dBu.

Note:
Depending on the selections here the Scale combo box for the Standard Settings Analog on the **Channel Group** menu pages features different numbers of scales. Please refer to Chapter 6.5.2.8.

See Chapter 6.5.2.8

See Chapter 5.8.4.3

- **Test Signal Limiter** ☑

  The test signal generator (see Chapter 5.8.4.3) is equipped with an automatic limiter for sine wave signals to protect the monitoring system. The maximum level of the test signal generator is –9 dB FS for frequencies up to 1 kHz and –18 dB FS for frequencies above 1 kHz.
  By default, this limiter is active. It can be switched off by deselecting this checkbox.

- **Analog Metering Reference Level Offset**

  With this list box the reference level of the metering display can be adapted to local conditions. Selections can be made in 0.1 dB steps in a range of –8 dB to 8 dB.

  Example:

  The unit is factory preset to "0 dB" display at +6 dBu input level for analog signals using the DIN scale.
  Selecting +1 dB in the Analog Metering Reference Level Offset list box will move the "0 dB" mark of the metering 1 dB up the scale. Put another way, the input signal is attenuated 1 dB. This means that an input signal level of +6 dBu will be displayed "–1 dB" instead of "0 dB".
  The other way round, selecting –1 dB in the Analog Metering Reference Level Offset list box will move the "0 dB" mark of the metering 1 dB down the scale. Put another way, the input signal is amplified 1 dB. This means that an input signal level of +6 dBu will be displayed "+1 dB" instead of "0 dB".

→ MENU
→
→ Generator and BLITS Settings menu tab

6.8 Generator and BLITS Settings

If you have the need of a permanently available test signal, the options for the **Generator** (a simple digital test signal generator) can be selected on this menu page. In this case the signal must be routed to one or more of the digital outputs. To do this, use the Generator option which can be found in the Direct Out 3 and Direct Out 4 combo boxes on the **Global Monitoring Output Routing** menu page of the **Global Routing Settings** menu page (see Chapter 6.5.3) resp. the corresponding menu pages of the Local Routing. You also can activate a wave file intro for the **BLITS** test tones generator. To do this, a 8 bit mono wave file with 1 MB maximum of size can be loaded into the SurroundControl units using the network interface (see Chapters 5.15.2.2 and 8.2.5).

See Chapter 6.5.3

See Chapters 5.12.2.2 and 8.2.4

Note:
This **Generator** is working independently from the Test Signal Generator of the CAL instrument (see Chapter 5.8.4) and from the **BLITS** test tones generator!

See Chapter 5.8.4

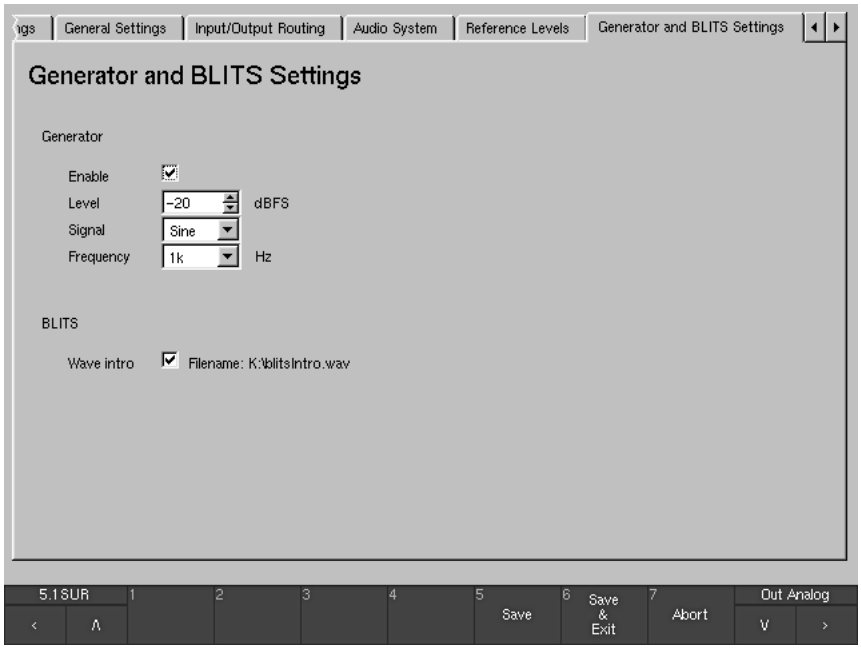


Fig. 6-52: The Generator and BLITS Settings menu page

- **Generator** Labelled text
  - **Enable**
    Activating this check box enables the Generator and routes the digital test signal to the selected outputs.
  - **Level**
    With this list box the level for the test signal can be set. Values between –60 dB FS and 0 dB FS in steps of 1 dB are available.

- **Signal**
  With this combo box the character of the signal can be selected: Sine (sine wave) or Noise.

- **Frequency**
  This combo box is used for the selection of the frequency for the test signal. The following values are available: 20, 25, 50, 100, 250, 500, 1k, 2k, 4k, 8k and 10k Hz.

- **BLITS**

  - **Wave intro**
    With this check box activated the wave file loaded into the Surround-Control units can be enabled. It is then prepended to and used as intro for the test tone sequence of the BLITS generator routed to selected outputs. The name of the loaded wave file (8 bit mono, 1 MB max.) is displayed right beside the Wave intro check box.

→ MENU
→ 
→ Over Indicator
menu tab

6.9 Over Indicator

This menu page contains options for setting the response of the digital Over indicator.

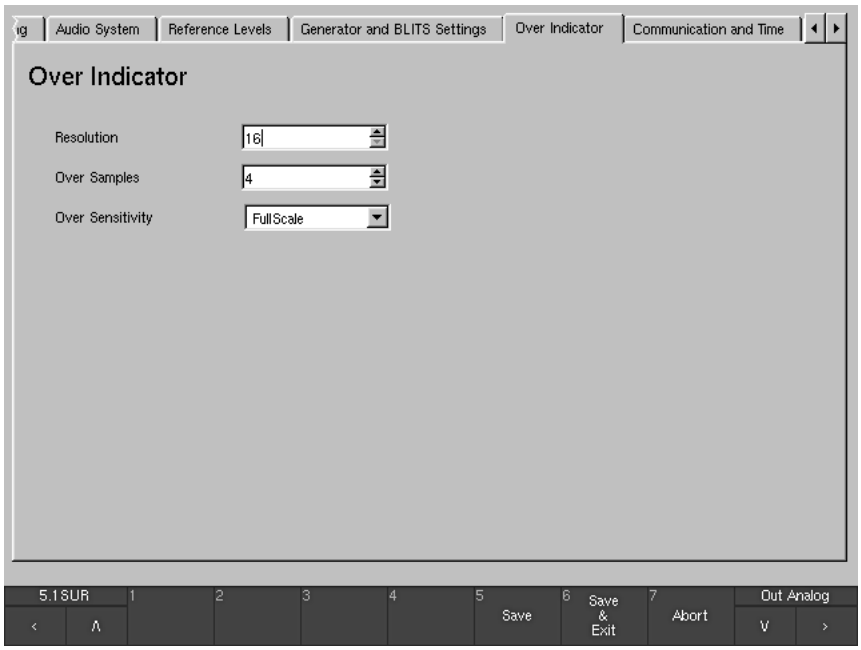


Fig. 6-53: The Over Indicator menu page

- **Resolution**
  This list box allows you to switch the digital word length to be evaluated for the Over display between 16 and 24 bits.

- **Over Samples**
  This list box is for setting the number of directly successive samples that must meet the condition set with the Over Sensitivity option (see next option) for an Over display to be triggered. You can adjust the number of Over Samples between 1 and 15.

- **Over Sensitivity**
  This combo box is for setting the response threshold for the Over display. Available conditions: Full Scale, Full Scale –1LSB, Full Scale –2 LSB, –0.1 dB, –0.5 dB, –1.0 dB, –2.0 dB and –3.0 dB.

→ MENU
→ 
→ Communication and Time menu tab

6.10 Communication and Time

This menu tab opens the **Global Communication and Time Settings** menu page used to set an IP address and the internal time system. The IP address is used for the operation of the unit in a network and essential for software upgrades as well as the import or export of user presets (see Chapter 8 for more details). The internal time system can either be synchronized to a NTP server or be set manually. It e. g. provides the basis for the ITU BS.1771 Longterm readings and documentation.

Note:
If you want to use DHCP, the TCP/IP protocol or the NTP Time server, please make sure, that your unit is connected to the network via the Ethernet connector (see Chapter 7.3.4).

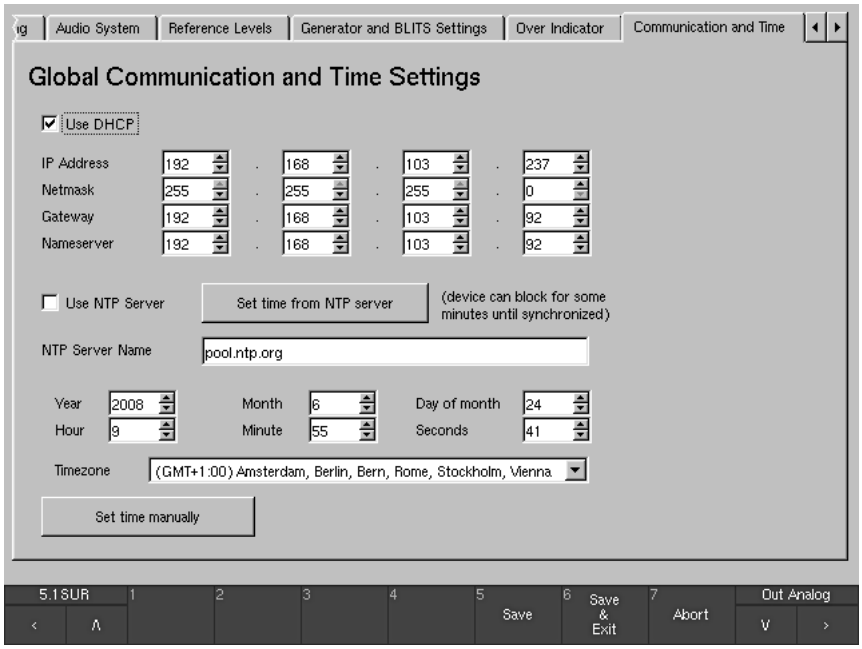


Fig. 6-54: The Global Communication and Time Settings menu page

- **Use DHCP (Dynamic Host Configuration Protocol)** ☑
  With this checkbox the automatic and dynamic allocation of an IP address can be activated when a suitable server is used.

- **IP Address (4 x)**
  The unit can be accessed in a network via an IP address. All four 3-digit blocks of the address in the four list boxes must be entered.

- **Netmask (4 x)**
  These four list boxes define up to what part of an IP address the network or the computer is specified.

- **Gateway (4 x)**
  These four list boxes define the IP address of the computer used as bridge to other networks.

- **Nameserver (4 x)**
  The nameserver converts domain names into appropriate IP addresses and vice versa. This allows the entry of a name in plain text into a text field e. g. for the NTP Server (see below) without knowing its IP address. These four list boxes define the IP address where the nameserver is located.



Note:
When the startup sequence of the SurroundControl units is running the TCP/IP and the netmask addresses are shown in the lower right edge of the display.

- **Use NTP Server**
  The Network Time Protocol (NTP) is a protocol for synchronizing a system clock by querying NTP servers. This check box enables the internal NTP client, which every day synchronizes the time system with the NTP server named with the NTP Server Name text field.

- **Set time from NTP server**
  Pressing this button immediately starts the synchronization of the time system via NTP server. The device can be blocked for some minutes until it is synchronized.

- **NTP Server Name**
  Selecting the text field opens the **NTP Server** menu page with a keypad for entering the internet address of the NTP server (e. g. pool.ntp.org, see Fig. 6-54).

- **Year, Month, Day of month, Hour, Minute, Seconds**
  With these list boxes the current date and the current time can be set manually.

- **Timezone**
  This combo box offers the common defined time zones. Select the one which corresponds to your country.

- **Set time manually**
  This button starts running the time system with the settings made for the current date, the current time and the corresponding time zone.

→ MENU
→
→ Alarm Configurtation menu tab

6.11 Alarm Configuration

This tab opens the **Global Alarm Setting** menu page used to configure the display or output of alarm events for the modes.

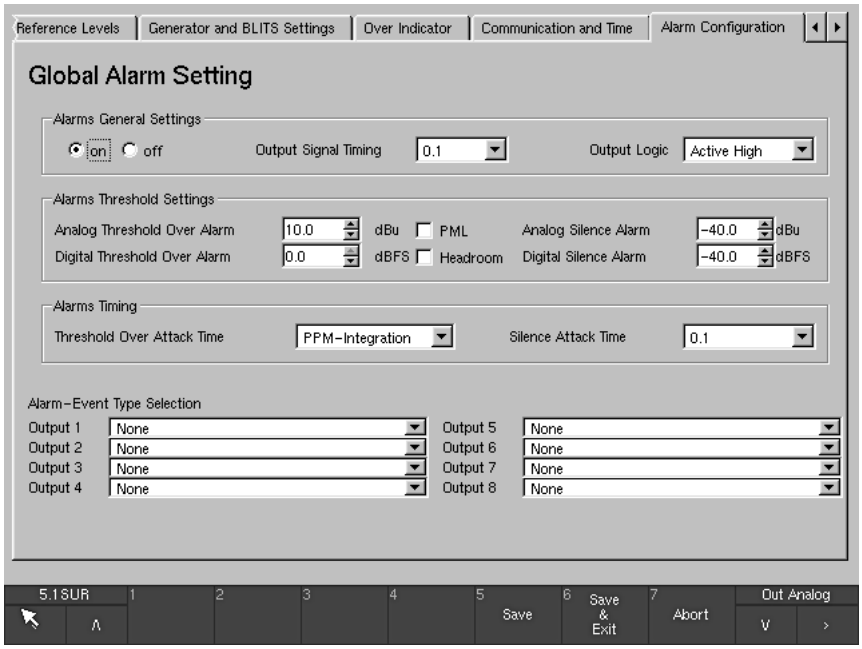


Fig. 6-55: The Global Alarm Setting menu page

6.11.1 Alarms General Settings

Frame

(see Fig. 6-55)

- **On/Off**

  With these option boxes the alarm functions can be activated (On) or deactivated (Off).

  When the alarm functions are activated the preset threshold levels are marked with small triangles right beside the bargraphs of the peakmeter. The identified events are displayed in the display areas of the Digital Over indicator (see Figs. 6-56 and 6-57) for each channel without any weighting. The alarm events also can be output via the outputs of the GP IO interface (see Chapter 7.3.16).

See Chapter 7.3.16

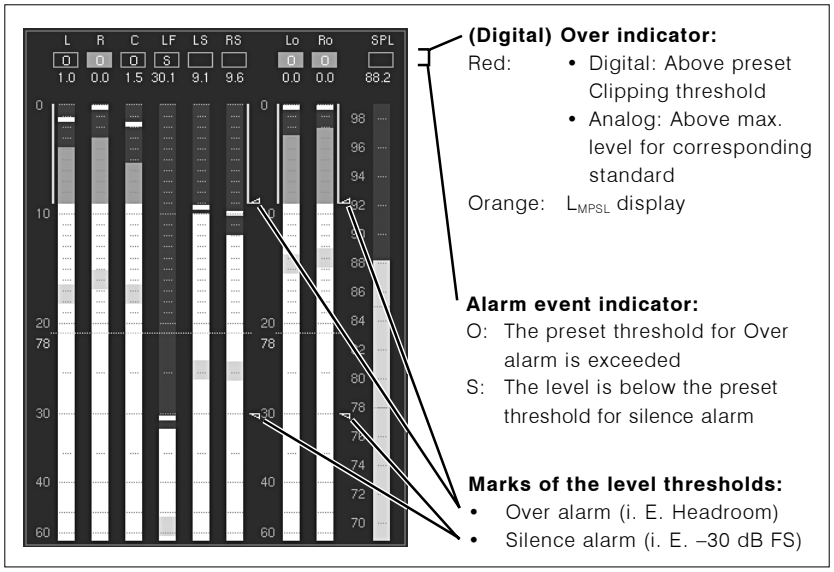


Fig. 6-56: Display elements of the Program Meter instruments alarm functions. Example: PPM in Surround mode

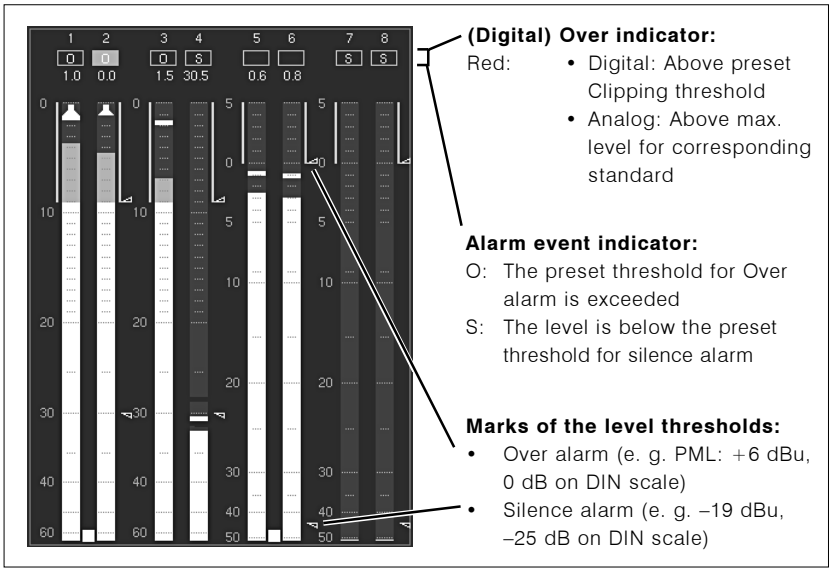


Fig. 6-57: Display elements of the Program Meter instruments alarm functions. Example: PPM in Multi-Channel mode

- **Output Signal Timing**
  This combo box is used for the selection of the time period of the display or output impulse activated when an alarm event is identified.
  - Selecting 0.1, 0.5, 1, 2 or 4 defines the time period in seconds in which the event output is active. It remains active after the selected time period has passed when the conditions for the alarm event are still or again complied.
  - Selecting Hold defines the active state to be kept until a reset with the **Reset** button/key 2 of the PPM instrument (see Chapter 5.2.1.2) resp. button/key 4 of the ITU BS.1771 Loudness Meter (see Chapter 5.2.2.3) is made.
  - Selecting Event keeps the output active as long as the condition for the alarm event is complied.

See Chapters 5.2.1.2 and 5.2.2.3

With the Alarm-Event Type Selection combo boxes (see Chapter 6.11.4) the several impulse types of each channel of the selected mode can be routed to the corresponding outputs.

- **Output Logic**
  This combo box defines the logical state of the active event outputs. Available options: Active Low and Active High.

6.11.2 Alarms Threshold Settings

Frame

(see Fig. 6-55)

- **Analog Threshold Over Alarm**
  This list box is used for setting the Over level threshold in dBu. Exceeding this threshold will activate the alarm event “Over” for the time period selected in the **Alarms Timing** section (see Chapter 6.11.3).
  Values between +18 dBu and –55 dBu can be selected in 0.5 dB steps.

- **PML**
  This check box activates the Permitted Maximum Level function („0 dB“). The alarm event “Over” will be activated when the PML value of the displayed peakmeter is exceeded. This value depends on the current scale (see example in Fig. 6-57). With the PML check box activated, the selected value for Analog Threshold Over Alarm has no effect, this list box is hided.

- **Analog Silence Alarm**
  This list box is used for setting the Silence level threshold in dBu. A signal falling below this threshold will activate the alarm event “Silence” for the time period selected in the **Alarms Timing** section (see Chapter 6.11.3).
  Values between 0 dBu and –60 dBu can be selected in 0.5 dB steps.

Note:
The threshold value is indicated in dBu as absolute level. The setting of the Analog Metering Reference Level Offset list box on the **Reference Levels** menu page (see Chapter 6.8) has no effect on the supplied threshold values.

See Chapter 6.8

- **Digital Threshold Over Alarm**
  This list box is used for setting the Over level threshold in dB FS. Exceeding this threshold will activate the alarm event “Over” for the time period selected in the **Alarms Timing** section (see Chapter 6.11.3).
  Values between 0 dB FS and –55 dB FS can be selected in 0.5 dB steps.

- **Headroom**
  With this check box enabled, the alarm event “Over” will be activated when the Headroom value of the displayed peakmeter is exceeded (see Fig. 6-57). With the Headroom check box activated, the selected value for Digital Threshold Over Alarm has no effect, this list box is hided.

- **Digital Silence Alarm**
  This list box is for setting the Silence level threshold in dB FS. Falling below this threshold will activate the alarm event “Silence” for the time period selected in the **Alarms Timing** section (see Chapter 6.11.3).
  Values between –10 dB FS and –55 dB FS can be selected in 0.5 dB steps.

6.11.3 Alarms Timing

Frame

(see Fig. 6-55)

- **Threshold Over Attack Time**
  This combo box is used to select the time period for the threshold condition (see Chapter 6.11.2) before the alarm event “Over” is activated.
  - With PPM-Integration selected, the current integration time of the displayed peakmeter is used without any weighting.
  - The values 0.1, 0.5, 1, 2 or 4 define a corresponding integration time in seconds.

- **Silence Attack Time**
  This combo box is used to select the time period for the threshold condition (see Chapter 6.11.2) before the alarm event “Silence” is activated.
  Available values are 0.1, 0.5, 1, 2, 4 or 8 seconds.

6.11.4 Alarm-Event Type Selection

Frame

(see Fig. 6-55)

The following eight combo boxes are used to define which alarm event type is routed to which output of the GP IO interface (see Chapter 7.3.16).
The tables on the next pages (Figs. 6-58 and 6-59) show the assignments with different modes selected.



Note:
If combo boxes are greyed, the GP IO outputs are used for the Key Presets as defined on the **Global GPIO Settings** menu page (see Chapter 6.12).

See Chapter 6.12

- **Threshold Over:** Exceeding the upper threshold value activates the alarm event Over according to the settings.
- **Digital Over:** Meeting or exceeding the above preset clipping threshold Digital Over activates the alarm event according to the settings.
- **Silence:** Falling below the lower threshold value activates the alarm event Silence according to the settings.

- **Surround modes**

Output	Options selectable	Function
Output 1		
	None Front Threshold Over Front Digital Over Front Silence	Alarm release after the level of the front channels has reached the threshold marks
Output 2		
	None Rear Threshold Over Rear Digital Over Rear Silence	Alarm release after the level of the rear channels has reached the threshold marks
Output 3		
	None Any Surround Ch Threshold Over Any Surround Ch Digital Over Any Surround Ch Silence	Alarm release after the level of any surround channel has reached the threshold marks
Output 4		
	None 2 Ch Downmix Threshold Over 2 Ch Downmix Digital Over 2 Ch Downmix Silence	Alarm release after the level of the internal downmix channels has reached the threshold marks
Output 5		
	None Ext Threshold Over Ext Digital Over Ext Silence	Alarm release, when the level of the external signals has reached the threshold marks
Output 6		
	None L/R Threshold Over L/R Digital Over L/R Silence	Alarm release after the level of the L and R channels has reached the threshold marks
Output 7		
	None LF Threshold Over LF Digital Over LF Silence	Alarm release after the level of the LF channel has reached the threshold marks
Output 8		
	None Digital Over Channel 1 - 8 "ored" Digital Over Surround Ch "ored"	Alarm release after the level of one channel has reached the threshold marks

Fig. 6-58: Selection of the alarm event type options (Alarm Event Type Selection) in Surround mode

- **Multi Channel modes**

Output	Options selectable	Function
Output 1		
	None Group 1 Threshold Over Group 1 Digital Over Group 1 Silence	Alarm release after the level of the front channels has reached the threshold marks
Output 2		
	None Group 2 Threshold Over Group 2 Digital Over Group 2 Silence	Alarm release after the level of the rear channels has reached the threshold marks
Output 3		
	None Group 3 Threshold Over Group 3 Digital Over Group 3 Silence	Alarm release after the level of any surround channel has reached the threshold marks
Output 4		
	None Group 4 Threshold Over Group 4 Digital Over Group 4 Silence	Alarm release after the level of the internal downmix channels has reached the threshold marks
Output 5		
		no selection available
Output 6		
		no selection available
Output 7		
		no selection available
Output 8		
	None Digital Over Channel 1 - 8 "ored"	Alarm release after the level of one channel has reached the threshold marks

Fig. 6-59: Selection of the alarm event type options (Alarm Event Type Selection) in Multi-Channel mode

→ MENU
→ 
→ GPIO Configuration
menu tab

6.12 GPIO Configuration

This menu tab opens the **Global GPIO Settings** menu page with the options to define whether the GP IO outputs function as alarm event outputs or as Key Preset outputs which are activated with the further displayed options when selecting one of the Sub Preset. You then can control external applications or units.

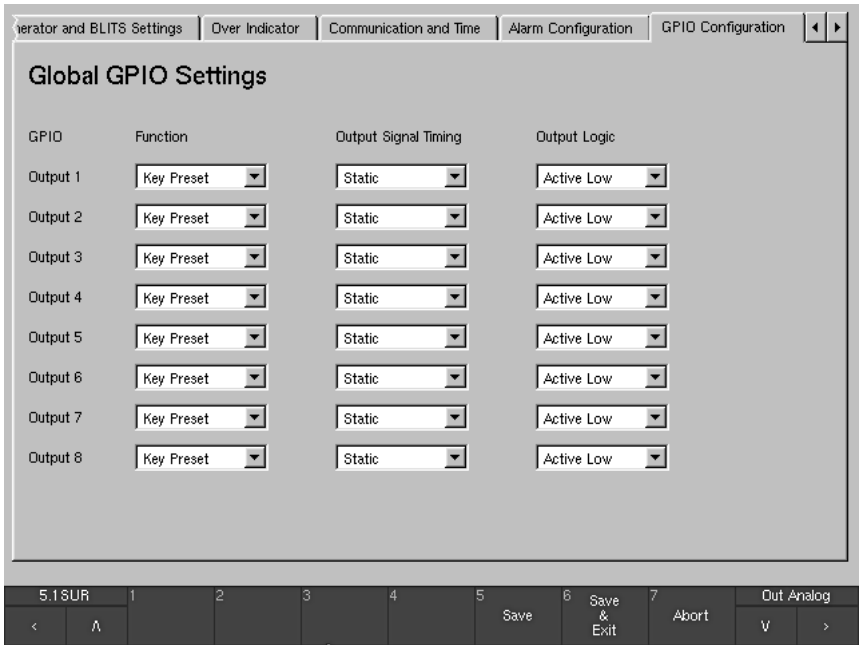


Fig. 6-60: The Global GPIO Settings menu page

Every GPIO output (Output 1 to Output 8) can have one or three combo boxes for selecting the function and depending on this selection the output signal timing and the output logic.

- **Function**
  The combo boxes in this column defines, if the selected output functions as alarm event output (see Chapter 6.11.4) or as Key Preset (see Chapters 4.4.2 and 6.5.2).
  - Alarm: No other combo box is available. The corresponding Alarm-Event Type Selection combo box on the **Global Alarm Setting** menu page is available (see Chapter 6.11.4) resp. the corresponding GPIO 1 to 8 check box on the **Key 1** to **Key 7** menu pages of the **Monitoring Input Routing** is greyed (see Chapter 6.5.2).
  - Key Preset: Two other combo boxes are available (see below). The corresponding Alarm-Event Type Selection combo box on the **Global Alarm Setting** menu page is greyed (see Chapter 6.11.4) resp. the GPIO 1 to 8 check box is available (see Chapter 6.5.2).

See Chapter 4.4.2 and 6.5.2

- **Output Signal Timing**
  (ONLY available, when Key Preset is selected in the Function combo box)
  With the combo boxes in this column the time span for the control signal given out is selected: 0.1 s, 0.5 s, 1 s, 2 s and 4 s. A permanent signal is available with the Static option.

- **Output Logic**
  (ONLY available, when Key Preset is selected in the Function combo box)
  With the combo boxes in this column can be defined, if the switching state of the control signal output is Active Low or Active High.

→ MENU
→ 
→ Key Settings
menu tab

See Chapter 5.1 and 7.3.16

6.13 Key Settings

This menu page contains options for defining which single keys on the Remote Control 30050 (31900 series) or the control panel of the 31960 series, key groups (see Chapter 5.1) or control inputs of the GPIO interface (see Chapter 7.3.16) can be locked or configured with different functions.

Note:
Regardless of these settings all locked functions are still operational using the graphical interface and the mouse.

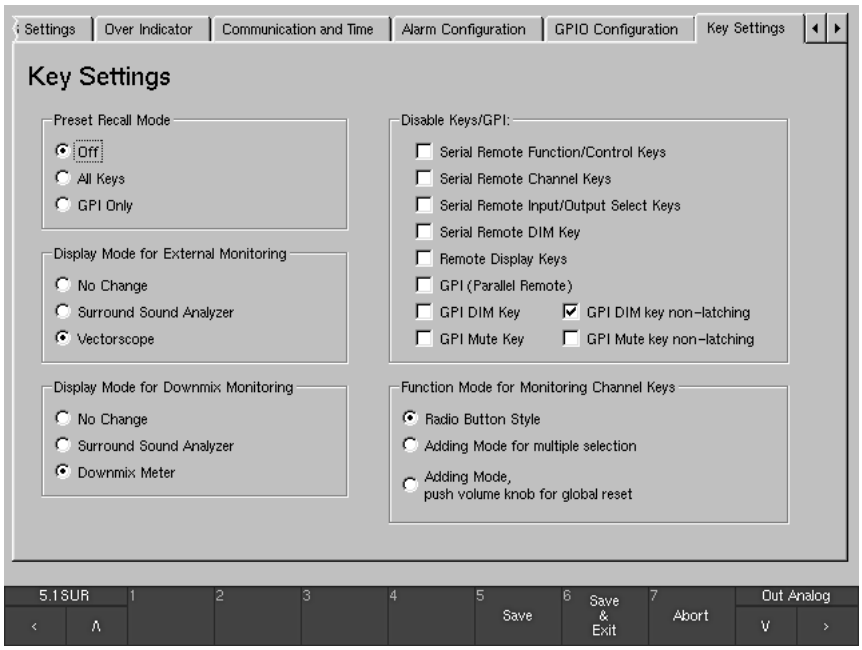


Fig. 6-61: The Key Settings menu page

6.13.1 Preset Recall Mode

Frame

(see Fig. 6-61)

- **Off**

  With this option button selected, all keys and control inputs have normal functions as described in the several Chapters of this operating manual (see Chapters 4 and 5).

See Chapters 4 and 5

- **All Keys**

  With this option button selected, the buttons/keys **1** to **7** (see Chapter 5.1.1) on the Remote Control 30050 (31900 series) or the control panel of the 31960 series and the corresponding control inputs of the GPIO interface (see Chapter 7.3.16) can be used for selecting the User Presets U 1 to U 7. The screen buttons **MODE**, **MORE** and **INSTR** are greyed out and not functional in this mode.

See Chapter 5.1.1

See Chapter 7.3.16

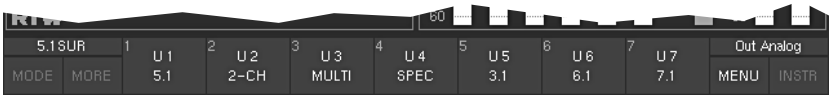


Fig. 6-62: Toolbar with All Keys option in the Key settings menu page activated

- **GPI only**

  With this option button selected, the corresponding control inputs of the GP IO interface (see Chapters 4.4.1 and 7.3.16) can be used only for the User Presets selection U 1 to U 7. The keys on the Remote Control 30050 (31900 series) or the control panel of the 31960 series and the corresponding buttons of the Toolbar retain their normal functions.

See Chapter 4.4.1 and 7.3.16

6.13.2 Display Mode for External Monitoring

Frame

(see Fig. 6-61)

These buttons allow calling a new instrument when using the 2-Ch-External-to-Front function with the **EX** key on the Remote Control 30050 (31900 series) or the control panel of the 31960 series (see Chapter 4.3.7).

See Chapter 4.3.7

- **No Change**

  Pressing the **EX** key (see Chapter 4.3.7) only switches the external channels to the front loudspeakers (2-Ch-External-to-Front); no new instrument is called.

- **Surround Sound Analyzer**

  Pressing the **EX** key (see Chapter 4.3.7) automatically calls the Surround Sound Analyzer instrument (SSA, see Chapter 5.3) in 2-channel mode while switching the external channels to the front loudspeakers. Now this instrument is shown in Window 3 of the display with only the L and R channels active. When the 2-Ch-External-to-Front function (**EX** key) is deselected, the display returns to the previous mode.

- **Vectorscope**
  Pressing the **EX** key (see Chapter 4.3.7) automatically calls the downmix vectorscope instrument (see Chapters 5.4 and 5.7) in 2-channel mode while switching the external channels to the front loudspeakers. Now this vectorscope is shown in Window 3 of the display. When the 2-Ch-Extern-to-Front function (**EX** key) is deselected, the display returns to the previous mode.

6.13.3 Display Mode for Downmix Monitoring

Frame

(see Fig. 6-61)

These buttons allow calling a new instrument when using the 2-Ch-Downmix-to-Front function with the **2C** key on the Remote Control 30050 (31900 series) or the control panel of the 31960 series (see Chapter 4.3.6).

See Chapter 4.3.6

- **No Change**
  Pressing the **2C** key (see Chapter 4.3.6) only switches the downmix channels to the front loudspeakers (2-Ch-downmix-to-Front); no new instrument is called.

- **Surround Sound Analyzer**
  Pressing the **2C** key (see Chapter 4.3.6) automatically calls the Surround Sound Analyzer instrument (SSA, see Chapter 5.3) in 2-channel mode while switching the downmix channels to the front loudspeakers. Now this instrument is shown in Window 3 of the display with only the L and R channels active. When the 2-Ch-downmix-to-front function (**2C** key) is deselected, the display returns to the previous mode.

- **Downmix Meter**
  Pressing the **2C** key (see Chapter 4.3.6) automatically calls the 2-Channel Downmix Meter instrument (see Chapter 5.7, settings with the Two Channel Downmix menu see Chapter 6.5.2.7) while switching the downmix channels to the front loudspeakers. Now this instrument is shown in Window 3 of the display. The settings of the **Peakmeter - Channel Group** menu (see Chapter 6.5.2.8) are used for the peakmeter display. When the 2-Ch-downmix-to-front function (**2C** key) is deselected, the display returns to the previous mode.

6.13.4 Disable Keys/GPI

Frame

(see Fig. 6-61)

Keys, key groups or control inputs of the GP IO interface can be locked individually.

- **Serial Remote Functions/Control Keys**
  Activating this checkbox locks the function and control keys of the Remote Control 30050 (31900 series) and the control panel of the 31960 series (see Chapters 4.3.2 and 4.3.3). The message “Serial Remote function and control keys disabled” is displayed in the Toolbar of the display when using one of the deactivated keys.

See Chapters 4.2.3 and 4.3.3

- **Serial Remote Channel Keys** ☑

  Activating this checkbox locks the channel keys (see Figs. 3-8 and 4-3 and Chapter 4.3.5) of the Remote Control 30050 (31900 series) and the control panel of the 31960 series. In detail, the following keys are locked:
  - 5.1 format: L, C, R, LS, RS, LF, CS and M key
  - 6.1 format: L, C, R, LS, RS, LF, CS and M key
  - 7.1 format: L, 2C, C, EX, R, LS, RS, LF, CS and M key

  The message “Serial Remote channel keys disabled” is displayed in the Toolbar of the display when using one of the deactivated keys.

See Figs. 3-8 and 4-3 and Chapter 4.3.5

- **Serial Remote Input/Output Select Keys** ☑

  Activating this checkbox locks the corresponding keys for the Monitoring (see Figs. 3-8 and 4-3 and Chapters 4.3.12 and 4.3.14) of the Remote Control 30050 (31900 series) and the control panel of the 31960 series. In detail, the following keys are locked:
  - 5.1 format: 2C, EX, Input and Output key
  - 6.1 format: 2C, EX, Input and Output key
  - 7.1 format: Input and Output key

  The message “Serial Remote input select keys disabled” is displayed in the Toolbar of the display when using one of the deactivated keys.

See Figs. 3-8 and 4-3 and Chapters 4.3.12 and 4.3.14

- **Serial Remote DIM Key** ☑

  Activating this checkbox locks the **DIM** key (see Figs. 3-8 and 4-3 and Chapter 4.3.13) of the Remote Control 30050 (31900 series) and the control panel of the 31960 series. The message “Serial Remote DIM key disabled” is displayed in the Toolbar of the display when using the deactivated key.

See Figs. 3-8 and 4-3 and Chapter 4.3.13

- **Remote Display Keys** ☑

  Activating this check box locks the function and control keys of the Remote Display 30010 (see Figs. 4-1 and 5-1). The message “Remote display keys disabled” is displayed in the Toolbar Window 4 of the display when using one of the deactivated keys.

See Figs. 4-1 and 5-1

- **GPI (Parallel Remote)** ☑

  Activating this check box locks the control inputs of the GPIO interface (see Chapter 7.3.16) except the DIM function control input. The message “GPI disabled” is displayed in the Toolbar Window 4 of the display when using one of the deactivated control inputs.

See Chapter 7.3.16

- **GPI DIM Key** ☑

  Activating this check box locks the **DIM** function control input of the GP IO interface (see Chapter 7.3.16). The message “GPI DIM key (parallel remote) disabled” is displayed in the Toolbar of the display when using the deactivated control input.

See Chapter 7.3.16

- **GPI Mute Key** ☑

  Activating this checkbox locks the external **Mute on**/**off** function control input of the GP IO interface (pin 16, see Chapter 7.3.16). The message “GPI Mute key (parallel remote) disabled” is displayed in the Toolbar of the display when using the deactivated control input.

See Chapter 7.3.16

- **GPI DIM Key non-latching** ☑
  Activating this check box switches the external **DIM on**/**off** function control input of the GP IO interface (pin 16, see Chapter 7.3.16) from permanent to non-latching operation. The DIM function only remains active as long as you press the GP IO control input key (pin 16).

See Chapter 7.3.16

- **GPI Mute Key non-latching** ☑
  Activating this check box switches the external **Mute on**/**off** function control input of the GP IO interface (pin 16, see Chapter 7.3.16) from permanent to non-latching operation. The Mute function only remains active as long as you press the GP IO control input key (pin 16).

See Chapter 7.3.16

6.13.5 Function Mode for Monitoring Channel Keys Frame

(see Fig. 6-61)

These buttons modify the operating behavior of the channel keys on the Remote Control 30050 (31900 series) or on the control panel of the 31960 series (see Fig. 4-3 and Chapters 4.3.4 and 4.3.5).

See Fig. 4-3 and Chapters 4.3.4 and 4.3.5

- **Radio Button Style** ◉
  After activating this option, a channel key pressed will deactivate any channel key pressed before. Only one key can be active at a time.

- **Adding Mode for multiple selection** ◉
  After activating this option, several channel keys can be selected one by one. A selected key is reset by pressing it again. The active keys are only reset by pressing one of the keys **2C**, **EX** or **M**.

- **Adding Mode, push volume knob for global reset** ◉
  After activating this option, several channel keys can be selected one by one. All active channel keys can be reset by pressing the volume control of the Remote Control 30050 (31900 series) or the control panel of the 31960 series (see Fig. 4-3 and Chapter 4.3.11).

See Fig. 4-3 and Chapter 4.3.11

→ MENU
→ 
→ Dolby® Settings menu tab

Only available with 31900D, 31960D, 31900SD, 31960SD

6.14. Dolby® Settings

This menu page is only available for D or SD versions with integrated Dolby® decoder option.



Fig. 6-63: The Dolby® Settings menu page

- **Downmix** 
  With this combo box the signals being used for the downmix can be selected. Available options are: Lt/Rt, Lo/Ro, Mono and Mute.

7 Installation

7.1 Safety information

Before installing and configuring the unit, please study the following safety information carefully and observe all the recommendations to avoid injury and prevent damage to this product or any products connected to it.



To prevent possible electrical shock, fire, injuries and malfunctions, use this product only as specified.

- Only qualified personnel should perform service procedures.
- Do not open the housing.
- Do not insert your fingers or any other objects into the housing.
- Do not cover the unit and do not place any objects or anything containing liquids on it.
- Use only the supplied power cord and the certified power supply specified for this product and certified for the country of use.
- Connect and disconnect properly and use only connectors specified for this product and fix them tight before use.
- To avoid fire or shock hazard, observe all ratings and markings on the product. Consult the operating manual for further rating information before making connections to this product.
- Do not apply a potential to any terminal that exceeds the maximum rating of that terminal.
- The power cord of the external power supply disconnects the product from the power source. Do not block the power cord or power supply; it must remain accessible to the user at all times.
- Do not operate this product with cover plates or panels removed.
- Use only fuse type and rating specified for this product.
- Avoid exposed circuitry. Do not touch exposed connections and components when power is present.
- Do not operate with suspected failures. If you suspect there is damage to this product, have it inspected by qualified service personnel.
- Do not operate in wet/damp conditions.
- Do not operate in explosive atmosphere.
- Do not operate in dusty environments.
- Do not operate the unit without adequate ventilation.
- Turn off and disconnect the power supply immediately it the unit produces unusual smells, noises or smoke, or if foreign substances (e. g. liquids) or foreign objects enter the unit.
- Keep product surfaces clean and dry.



There are no user-serviceable parts in the SurroundControl 31900 and 31960 units. Please always have any necessary servicing performed by a properly qualified technician. Never remove any parts from the unit and do not make any modifications to the unit without the express written consent of RTW. Modifications can cause both safety hazards and affect the unit's EMI-CE conformity.



The SurroundControl 31900 and 31960 are designed for indoor use. 31900 may only be operated with a properly-earthed, 3-wire power supply cord.

7.2 Installation and Setup

- **SurroundControl 31900 series:**

The main SurroundControl 31900 units are designed for installation in 19” rack systems. All necessary power supply voltages (including the power for the Remote Control 30050) are supplied by the integrated wide voltage power supply unit. The Remote Control 30050 is connected to the main unit with a cable fitted with a 9-pin Sub-D connector. The SurroundControl 31900 can be operated either with the optional Remote Display 30010 from RTW or with a standard external VGA monitor.

The Remote Display 30010 unit is powered by an external 24V DC power supply unit. A 5-meter VGA connection cable (Bürklin type 13M4240) is included with the display unit. If you need to purchase a replacement VGA connection cable for the Remote Display 30010 please make sure that **all** the pins of the connectors listed in Chapter 7.3.3 are wired as shown.

The other ports and interfaces are connected with the appropriate standard connection cables.

Important information – please read before installing:

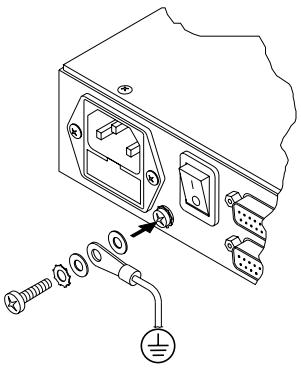
See chapters 7.1, 7.3.1 to 7.3.16
- Before installing the unit please study the safety information in Chapter 7.1 and the information on connections in Chapters 7.3.1 to 7.3.16.
- Make sure that the power supply cord is **not** connected and the power switch on the rear panel is in the OFF position.

See Fig. 7-2 and Chapter 7.3.3
- Connect the Remote Control 30050 unit (included and required for operation) to the **Remote** connector on the rear panel of the main unit.

See Fig. 7-2 and Chapter 7.3.2
- Connect the optional Remote Display 30010 unit to the **VGA Out** connector on the rear panel of the main unit using the VGA connection cable included with the display. Alternatively you can connect a standard VGA monitor to the same output, using a standard VGA connection cable.

See Fig. 7-2 and Chapter 7.3.4 to 7.3.16
- Connect all your other components to the appropriate connectors on the SurroundControl 31900 units, using the correct standard connection cables for the components.

See Chapter 7.3.1
- Then connect the power with an earthed 3-wire power supply cord. **Never operate the unit without a properly earthed power supply cord!**
- **According to EN 61010 standard an additional earth conductor is required, if the unit is mounted into 19’’ racks.** See the figure beside how the additional earth conductor is connected to the rear side of the SurroundControl 31900.



- Switch on the power. The SurroundControl 31900 units will then initiate its system startup sequence. This takes around 50 seconds in which the TCP/IP and the netmask addresses are shown in the lower right edge of the display. After this sequence the unit is ready for use.

- **SurroundControl 31960 series:**

The SurroundControl 31960 half-19''/3U plug-in module is designed for installation in standard 19" rack units as used in video studios. All necessary power supply voltages (including the power for an optional Remote Control 30050) are supplied through the +24 V DC (40 VA) connector using an external power supply unit (such as the optional RTW 1177A-R wide voltage power supply). The SurroundControl 31960 features a 6.5'' VGA display, function keys and control keys. For remote control the optional RTW Remote Control 30050 can be connected to the unit using the fitted 9-pin Sub-D connector.

Optional the RTW Remote Display 30010 or a standard external VGA monitor can be connected for external reading of the display. The Remote Display 30010 unit must be powered by a separate external 24 V DC power supply. A 5-meter VGA connection cable (Bürklin type 13M4240) is included with the display unit. If you need to purchase a replacement VGA connection cable for the Remote Display 30010 please make sure that **all** the pins of the connectors as listed in Chapter 7.3.3 are wired as shown.



See Chapter 7.3.3

The other ports and interfaces are connected with the appropriate standard connection cables.

See chapters 7.1, 7.3.1 to 7.3.16

Important information – please read before installing:

- Before installing the unit please study the safety information in Chapter 7.1 and the information on connections in Chapters 7.3.1 to 7.3.16.
- Make sure that the adapted power supply unit is **not** connected to the SurroundControl 31960 units.
- Screw the two attached mounting bars to the two top bolts on the rear side of the 31960 case.
- Place the unit from the front into the 19'' sub rack. Make sure that the 31960 front panel groove fits precisely with its counterpart of the 19''sub rack.
- Fix the mounting bars on the rear side of the 19'' sub rack with the two enclosed metric screws.

See Fig. 7-2 and Chapter 7.3.3

- Connect an optional Remote Control 30050 unit to the **Remote** connector on the rear panel of the unit.

See Fig. 7-2 and Chapter 7.3.2

- Connect an optional Remote Display 30010 unit to the **VGA Out** connector on the rear panel of the unit using the VGA connection cable included with the display. Alternatively you can connect a standard VGA monitor to the same output, using a standard VGA connection cable.

See Fig. 7-2 and Chapter 7.3.4 to 7.3.16

- Connect all your other components to the appropriate connectors on the SurroundControl 31960 units, using the correct standard connection cables for the components.

See Chapter 7.3.1

- Then connect the locking 4-pin low voltage connector of the external power supply to the +24 V DC (40 VA) connector on the rear. Connect the external power supply to mains.
- The SurroundControl 31960 will initiate its system startup sequence. This takes around 50 seconds in which the TCP/IP and the netmask addresses are shown in the lower right edge of the display. After this sequence the unit is ready for use.

7.3 Connections

All analog audio inputs and audio outputs are electronically balanced.

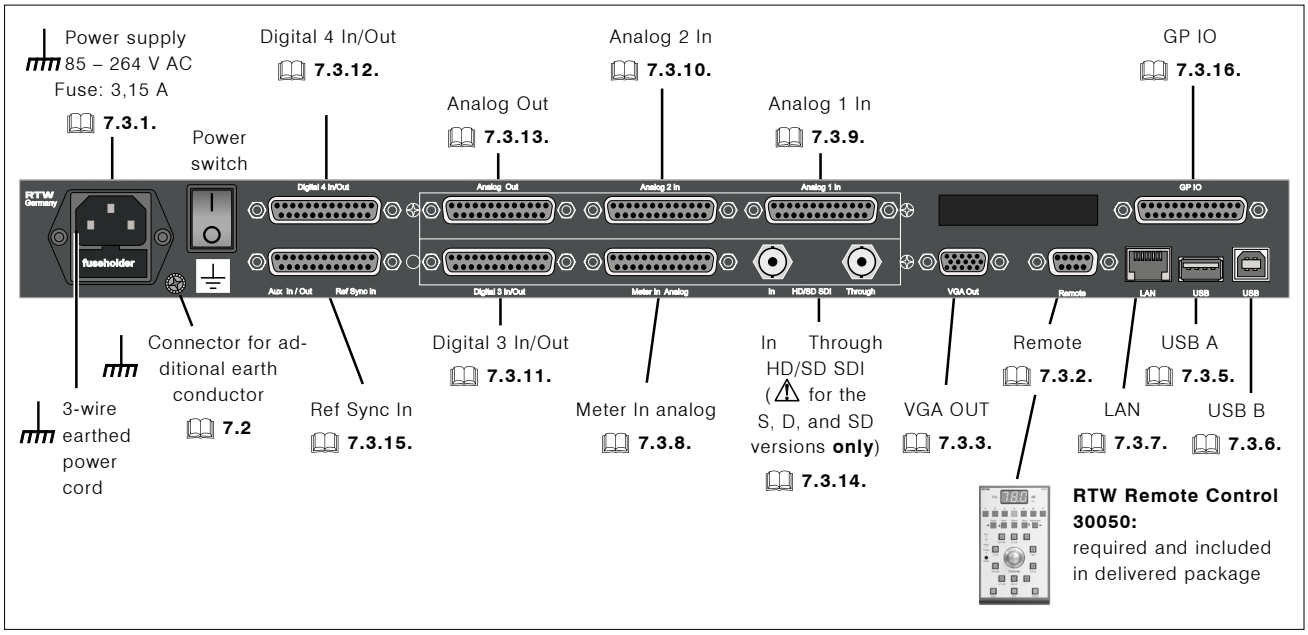


Fig. 7-1: Connectors on the rear panel of the SurroundControl 31900 series

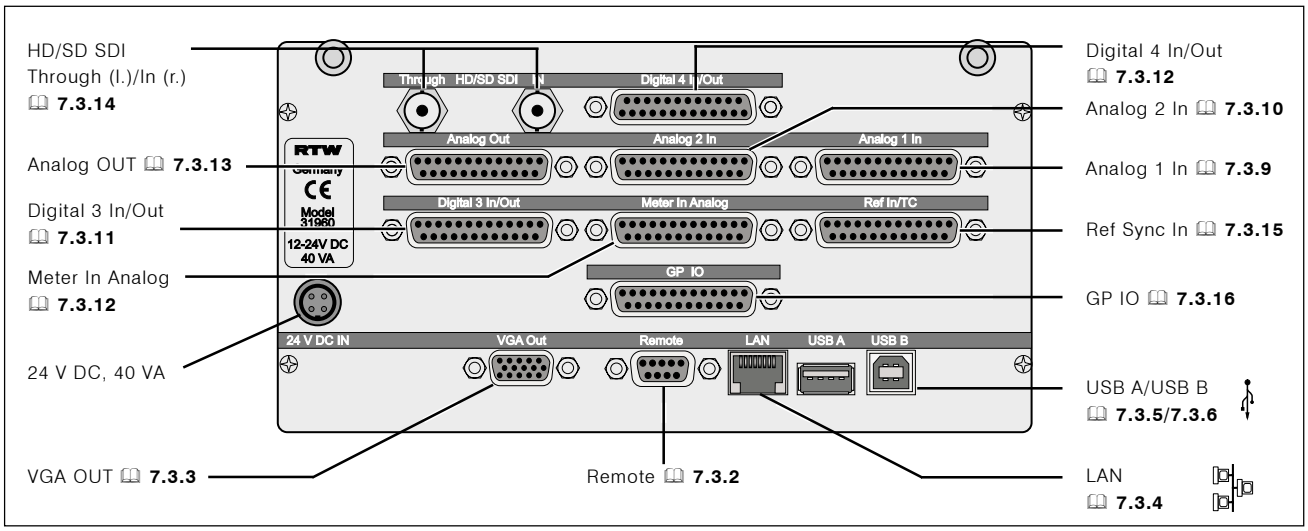


Fig. 7-2: Connectors on the rear panel of the SurroundControl 31960 series

Options:

RTW Accessory:
Measuring microphon XLR-F/Tini-Q-G-M connector on the front side



RTW Accessory:
Remote Display 30010
⚠ **All** pins of the VGA connector cable must be wired!



RTW Accessory:
Remote Control 30050 (up to three/ two can be operated with the units)

Optional:
USB-A mouse

Fig. 7-3: Accessories for SurroundControl 31900 series and 31960 series

7.3.1 Power Supply

- **SurroundControl 31900 series:**

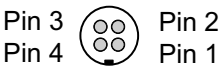
  The SurroundControl 31900's integrated wide voltage power supply unit can be operated on mains voltages between 85 and 264 V AC. The power supply is fitted with a 3.15 A fuse, which is the same irrespective of the mains voltage. **The unit must be connected with a properly-earthed 3-wire power cord.**

- **SurroundControl 31960 series:**

  The SurroundControl 31960 series units need an adapted +24 V DC (40 VA) power supply with a locking 4-pin low voltage connector for operation (a locking 4-pin low voltage connector type Binder 710 is part of delivery). Inside the units a resettable 2.0 A fuse is fitted. A qualified power supply such as the RTW wide voltage power supply 1177A-R is available as an accessory. The connector is wired as follows.

  Locking 4-pin low voltage connector

Pin:	Function:
1	+24 V DC
2	+24 V DC
3	0 V
4	0 V



(External view of the connector)

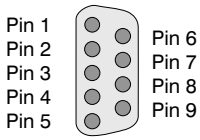
7.3.2 Remote Connector

Remote is an RS-422 port and can only be used to connect the Remote Control 30050. You can connect up to three (31900) resp. up to two (31960) Remote Control 30050 units to this port simultaneously with external Y-adapter cables.

9-pin Sub-D-F female connector

The pins labelled "not used" in the table **must** remain unconnected!

Pin:	Function:
1	Vcc +24 V DC
2	Not used
3	Tx +
4	Rx –
5	GND
6	GND
7	Tx –
8	Rx +
9	Not used



(External view of the connector)

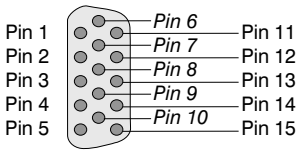
The maximum total cable length for connection of 1 to 3 Remote Control 30050 units is 25 meters.

7.3.3 VGA-OUT Monitor Connector

15-pin female Sub-D-F connector

The pins labelled “not used” in the table **must** remain unconnected!

Pin:	Function:	
1	R	Video signal
2	G	
3	B	
4	Not used	
5	GND	
6	GND	
7	GND	
8	GND	
9	Not used	
10	GND	
11	Tx – Remote Display 30010	
12	Rx – Remote Display 30010	
13	H-sync	
14	V-sync	
15	Not used	



(External view of the connector)

Pins 11 and 12 are used for connection of the signals for the control keys on the optional Remote Display 30010.

7.3.4 LAN Connector

This is a standard network port with an RJ45 connector. It can be connected with a standard RJ45 network cable (not included).

7.3.5 USB A Connector

This is a standard USB 1.1 port for connection of an optional computer mouse (not included).

7.3.6 USB B Connector

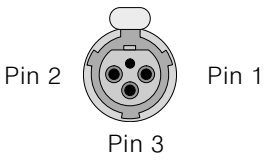
This connector is currently not used.

7.3.7 XLR Connector

This connector is located on the front panel of the 19”/1U SurroundControl 31900 main unit. It is used for connection of a calibration microphone.

3-pin XLR-F connector

Pin:	Function:
1	Shield/Chassis
2	+, hot
3	–, cold



(External view of the connector)

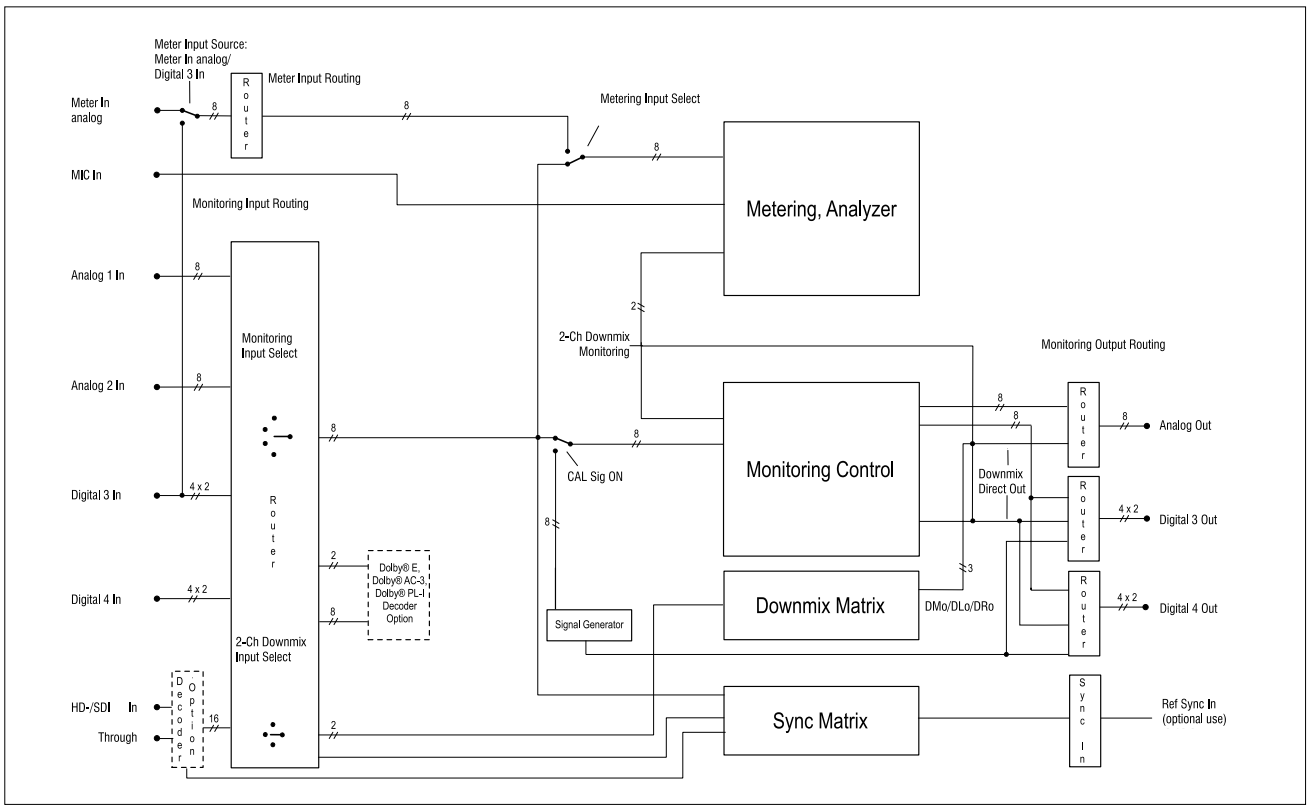


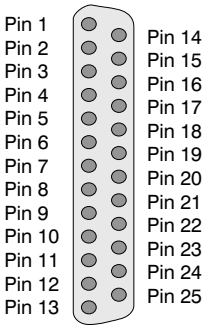
Fig. 7-4: Information flowchart of the SurroundControl 31900 and 31960 series

7.3.8 Meter In Analog Connector

This is an 8-channel analog input for the metering functions.

25-pin female Sub-D-F connector

Pin:	Function:
1	Analog audio input 8 (+, hot)
14	Analog audio input 8 (-, cold)
2	Shield/chassis
15	Analog audio input 7 (+, hot)
3	Analog audio input 7 (-, cold)
16	Shield/chassis
4	Analog audio input 6 (+, hot)
17	Analog audio input 6 (-, cold)
5	Shield/chassis
18	Analog audio input 5 (+, hot)
6	Analog audio input 5 (-, cold)
19	Shield/chassis
7	Analog audio input 4 (+, hot)
20	Analog audio input 4 (-, cold)
8	Shield/chassis
21	Analog audio input 3 (+, hot)
9	Analog audio input 3 (-, cold)
22	Shield/chassis
10	Analog audio input 2 (+, hot)
23	Analog audio input 2 (-, cold)
11	Shield/chassis
24	Analog audio input 1 (+, hot)
12	Analog audio input 1 (-, cold)
25	Shield/chassis



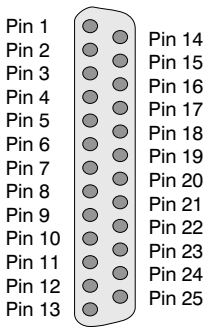
(External view of the connector)

7.3.9 Analog 1 In Connector

This is an 8-channel analog input for the monitoring functions.

25-pin female Sub-D-F connector

Pin:	Function:
1	Analog audio input 8 (+, hot)
14	Analog audio input 8 (-, cold)
2	Shield/chassis
15	Analog audio input 7 (+, hot)
3	Analog audio input 7 (-, cold)
16	Shield/chassis
4	Analog audio input 6 (+, hot)
17	Analog audio input 6 (-, cold)
5	Shield/chassis
18	Analog audio input 5 (+, hot)
6	Analog audio input 5 (-, cold)
19	Shield/chassis
7	Analog audio input 4 (+, hot)
20	Analog audio input 4 (-, cold)
8	Shield/chassis
21	Analog audio input 3 (+, hot)
9	Analog audio input 3 (-, cold)
22	Shield/chassis
10	Analog audio input 2 (+, hot)
23	Analog audio input 2 (-, cold)
11	Shield/chassis
24	Analog audio input 1 (+, hot)
12	Analog audio input 1 (-, cold)
25	Shield/chassis



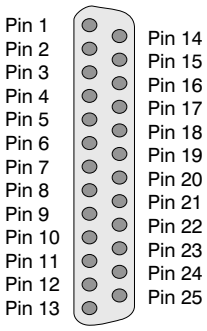
(External view of the connector)

7.3.10 Analog 2 In Connector

This is an 8-channel analog input for the monitoring functions.

25-pin female Sub-D-F connector

Pin:	Function:
1	Analog audio input 8 (+, hot)
14	Analog audio input 8 (-, cold)
2	Shield/chassis
15	Analog audio input 7 (+, hot)
3	Analog audio input 7 (-, cold)
16	Shield/chassis
4	Analog audio input 6 (+, hot)
17	Analog audio input 6 (-, cold)
5	Shield/chassis
18	Analog audio input 5 (+, hot)
6	Analog audio input 5 (-, cold)
19	Shield/chassis
7	Analog audio input 4 (+, hot)
20	Analog audio input 4 (-, cold)
8	Shield/chassis
21	Analog audio input 3 (+, hot)
9	Analog audio input 3 (-, cold)
22	Shield/chassis
10	Analog audio input 2 (+, hot)
23	Analog audio input 2 (-, cold)
11	Shield/chassis
24	Analog audio input 1 (+, hot)
12	Analog audio input 1 (-, cold)
25	Shield/chassis



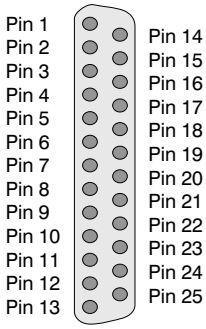
(External view of the connector)

7.3.11 Digital 3 In/Out Connector

This is a 8-fold AES/EBU interface for metering and monitoring with inputs and outputs.

25-pin female Sub-D-F connector:

Pin:	Function:
1	Digital audio output 4 (+, hot)
14	Digital audio output 4 (-, cold)
2	Shield/chassis
15	Digital audio output 3 (+, hot)
3	Digital audio output 3 (-, cold)
16	Shield/chassis
4	Digital audio output 2 (+, hot)
17	Digital audio output 2 (-, cold)
5	Shield/chassis
18	Digital audio output 1 (+, hot)
6	Digital audio output 1 (-, cold)
19	Shield/chassis
7	Digital audio input 4 (+, hot)
20	Digital audio input 4 (-, cold)
8	Shield/chassis
21	Digital audio input 3 (+, hot)
9	Digital audio input 3 (-, cold)
22	Shield/chassis
10	Digital audio input 2 (+, hot)
23	Digital audio input 2 (-, cold)
11	Shield/chassis
24	Digital audio input 1 (+, hot)
12	Digital audio input 1 (-, cold)
25	Shield/chassis



(External view of the connector)

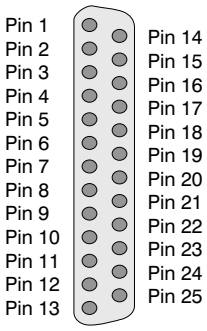
The AES/EBU inputs are permanently terminated with 110 Ω.

7.3.12 Digital 4 In/Out Connector

This is a 8-fold AES/EBU interface for metering and monitoring with inputs and outputs.

25-pin female Sub-D-F connector:

Pin:	Function:
1	Digital audio output 4 (+, hot)
14	Digital audio output 4 (-, cold)
2	Shield/chassis
15	Digital audio output 3 (+, hot)
3	Digital audio output 3 (-, cold)
16	Shield/chassis
4	Digital audio output 2 (+, hot)
17	Digital audio output 2 (-, cold)
5	Shield/chassis
18	Digital audio output 1 (+, hot)
6	Digital audio output 1 (-, cold)
19	Shield/chassis
7	Digital audio input 4 (+, hot)
20	Digital audio input 4 (-, cold)
8	Shield/chassis
21	Digital audio input 3 (+, hot)
9	Digital audio input 3 (-, cold)
22	Shield/chassis
10	Digital audio input 2 (+, hot)
23	Digital audio input 2 (-, cold)
11	Shield/chassis
24	Digital audio input 1 (+, hot)
12	Digital audio input 1 (-, cold)
25	Shield/chassis



(External view of the connector)

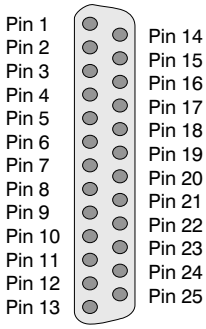
The AES/EBU inputs are permanently terminated with 110 Ω.

7.3.13 Analog Out Connector

This 8-channel analog output is for the monitoring functions and is used to connect the analog monitoring loudspeakers.

25-pin female Sub-D-F connector:

Pin:	Function:
1	Analog audio output 8 (+, hot)
14	Analog audio output 8 (-, cold)
2	Shield/chassis
15	Analog audio output 7 (+, hot)
3	Analog audio output 7 (-, cold)
16	Shield/chassis
4	Analog audio output 6 (+, hot)
17	Analog audio output 6 (-, cold)
5	Shield/chassis
18	Analog audio output 5 (+, hot)
6	Analog audio output 5 (-, cold)
19	Shield/chassis
7	Analog audio output 4 (+, hot)
20	Analog audio output 4 (-, cold)
8	Shield/chassis
21	Analog audio output 3 (+, hot)
9	Analog audio output 3 (-, cold)
22	Shield/chassis
10	Analog audio output 2 (+, hot)
23	Analog audio output 2 (-, cold)
11	Shield/chassis
24	Analog audio output 1 (+, hot)
12	Analog audio output 1 (-, cold)
25	Shield/chassis



(External view of the connector)

7.3.14 HD/SD SDI In/Through Connector

The 2 BNC connectors are used for HD/SD SDI input and active looped output.
The decoded HD/SD SDI signal is used for the monitoring functions.

BNC-F connector:

Pin: Signal
Ring: Shield/chassis



(External view of the connector)

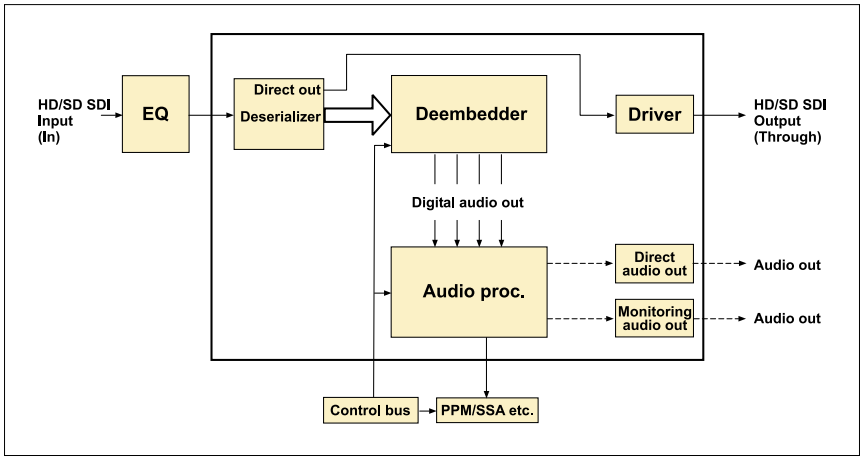


Fig. 7-5: Block diagram of the HD/SD SDI interface

7.3.15 Ref Sync In Connector

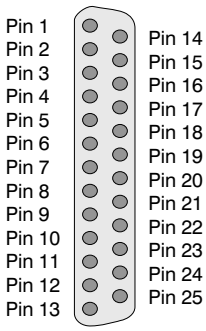
This is an 8-channel connector for external sync signal connection.

25-pin female Sub-D-F connector:

- **SurroundControl 31900 series:**

The pins labelled “not used” in the table **must** remain unconnected!

Pin:	Function:
1	not used
14	not used
2	Shield/chassis
15	not used
3	not used
16	Shield/chassis
4	not used
17	not used
5	Shield/chassis
18	not used
6	not used
19	Shield/chassis
7	not used
20	not used
8	Shield/chassis
21	not used
9	not used
22	Shield/chassis
10	not used
23	not used
11	Shield/chassis
24	Ref IN (AES-3) sync in (+, hot)] Permanently terminated with 110 Ω
12	Ref IN (AES-3) sync in (–, cold)]
25	Shield/chassis



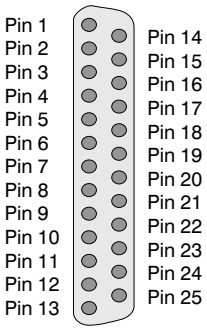
(External view of the connector)

- **SurroundControl 31960 series:**

The pins labelled “not used” in the table **must** remain unconnected!

Pin:	Function:
1	Ref IN (AES-3) sync in (–, cold)
14	Ref IN (AES-3) sync in (+, hot)
2	Shield/chassis
15	not used
3	not used
16	Shield/chassis
4	not used
17	not used
5	Shield/chassis
18	not used
6	not used
19	Shield/chassis
7	not used
20	not used
8	Shield/chassis
21	not used
9	not used
22	Shield/chassis
10	not used
23	not used
11	Shield/chassis
24	not used
12	not used
25	Shield/chassis

Permanently terminated with 110 Ω

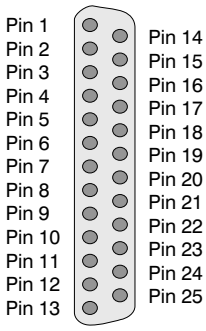


(External view of the connector)

7.3.16 GP IO Connector (General-purpose Input/Output)

This interface can be used for the input and the output of control signals.

25-pin female Sub-D-F connector:



(External view of the connector)

Pin:	Function:	
1	GP IO IN	Function key 1
2	GP IO IN	Function key 2
3	GP IO IN	Function key 3
4	GP IO IN	Function key 4
5	GP IO IN	Function key 5
6	GP IO IN	Function key 6
7	GP IO IN	Function key 7
8	GP IO IN	Control key MODE
9	GP IO IN	Control key MENU
10	GP IO IN	Control key MORE
11	GP IO IN	Control key INSTR(UMENT)
12	GP IO IN	Select key SEL(ECT)
13	GP IO IN	Key Input (parallel to key on 30050 resp. 31960)
14	GP IO IN	Key DIM (parallel to key on 30050 resp. 31960)
15	GP IO IN	Key Output (parallel to key on 30050 resp. 31960)
16	GP IO IN	Mute on/off key (**NOT** on 30050 resp. 31960)
17	GP IO OUT	Output 1
18	GP IO OUT	Output 2
19	GP IO OUT	Output 3
20	GP IO OUT	Output 4
21	GP IO OUT	Output 5
22	GP IO OUT	Output 6
23	GP IO OUT	Output 7
24	GP IO OUT	Output 8
25	Common potential and shield/chassis	

See Chapter 6.13 and Figs. 4-3, 6-61 and 6-62

See Chapter 6.13.4 and Figs. 4-3 and 6-61

See Chapter 6.13.4

See Chapters 6.11.4 and 6.13 and Figs. 6-58 to 6-60

Note:

- All GP IO inputs are active low. The pins each have to be connected with Pin 25 (common potentioal) for switching the corresponding function.
- The logic state of the GP IO outputs is selectable via **Global Alarm Setting** menu page (see Chapter 6.11) resp. the **Global GPIO Settings** menu page (see Chapter 6.12), if there Key Preset is selected as function for the outputs. The pins each have to be connected with Pin 25 (common potential) for switching the corresponding function.
- The described assignments are factory-made standard settings.
  - Using the **Key Setting** menu page (see Chapter 6.12) keys, groups of keys or control inputs (see above) can be locked or can have other functions (e. g. preset call).
  - Using the **Global Alarm Setting** menu page (see Chapter 6.11) different alarm events can be selected to put out via the several control outputs (see above), if Alarm is selected as function with the combo boxes on the **Global GPIO Settings** menu page (see Chapter 6.12).
  - Using the **Global GPIO Settings** menu page (see Chapter 6.12) the GP IO outputs can be assigned to the Sub Presets via the **Key 1** to **Key 7** menu pages of the **Monitoring Input Routing** (see Chapter 6.5.2).

8 Service

In the following chapter is described how you can connect several Remote Control 30050 to the SurroundControl and how you can make software updates using the network interface.

8.1 Connecting several Remote Control 30050

8.1.1 31900 series

Up to **three** Remote Control 30050 can be connected via Y cable to one main unit of a SurroundControl 31900 series(see Fig. 8-1). To assure a safe data transfer the Remote Controls have to be encoded with different addres-ses after the start-up of the system and before starting with work (see Chap-ter 8.1.1.1 and Fig. 8-1). The encoding has no influence on the functionality or the priority of the operating of one Remote Control (priority see Chapter 8.1.1.2).

8.1.1.1 Addressing

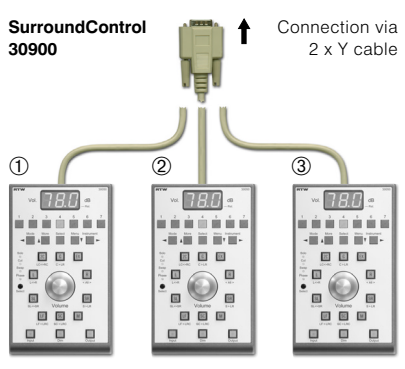
(see Fig. 8-1)

Delivered Remote Control 30050 are encoded to the **address 0** by factory. The address is shown at the display of the Remote Control (– – 0).

The Remote Control delivered with the SurroundControl 31900 series can be connected without any changes.

For the encoding of additional Remote Control 30050 first connect them to the main unit via y cable and then start-up the system.
Please proceed as follows:

- Press the DIM key of the second connected Remote Control and hold it down.
- Press key 2.
- Let off both keys. The second connected Remote Control now is encoded with **address 1** (– – 1 at the display on start-up).
- Press the DIM key of the third connected Remote Control and hold it down.
- Press key 3.
- Let off both keys. The third connected Remote Control now is encoded with **address 2** (– – 2 at the display on start-up).



Addressing of the Remote Control 30050			
Number:	①	②	③
Maximum of **3 x** to 30900	included in delivery, coded to: address **0**	address **1**	address **2**
Short cut:	**DIM + 1**	**DIM + 2**	**DIM + 3**
Note:	The address will be shown on start-up of the system. Delivered Remote Controls are coded to address **0**.		

Fig. 3-31: Connection and addressing of additional Remote Control 30050

8.1.1.2 Operating priority

The encoding has no influence on the priority of the operating sequence. The priority is configured as follows:

- If the same keys of the different Remote Controls are pressed nearly at the same time then the first pressed key takes priority over the other pressed keys.

- If the volume dials of the different Remote Controls are turned nearly at the same time then the first turned volume dial takes priority over the other turned dials. While the dial is moving the entries of the other ones are locked. After the entries are finished the lock is still hold for a short delay time. Then the entries of the other volume dials will be taken into account.

8.1.2 31960 series

Up to **two** Remote Control 30050 can be connected via Y cable to one SurroundControl 31960 series (see Fig. 8-2). To assure a safe data transfer the Remote Controls have to be encoded with different addresses after the start-up of the system and before starting with work (see Chapter 8.1.2.1 and Fig. 8-2). The adress has no influence on the operation priority of the Remote Control (see Chapter 8.1.2.2).

8.1.2.1 Addressing

(see Fig. 8-2)

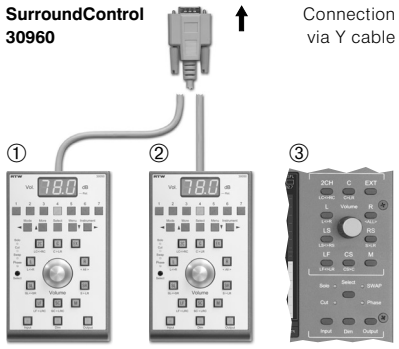
The control panel of the SurroundControl31960 series is fixed by factory preset to the **address 2.**

Optional delivered Remote Control 30050 are preset to **address 0** by factory. The address is shown in the display of the Remote Control (– – 0) during the power on sequence of the SurroundControl 31960 series.

One Remote Control can be connected directly to the Remote connector on the rear side of the SurroundControl 31960 series without any changes. For the use of two Remote Controls connect them via Y cable to the Remote connector on the rear side of the SurroundControl 31960.

The first one can be connected without any changes (**address 0**). The second one has to be encoded as follows:

- Start up the SurroundControl 31960.
- When it is ready for work press the **DIM** key of the second connected Remote Control and hold it down.
- Press key 2.
- Let off both keys. The second connected Remote Control is now encoded with **address 1** (– – 1 in the display on next start-up).



Addressing of the Remote Control 30050			
Number:	①	②	③
Maximum of 2 **x** to 30960	address **0**	address **1**	internal keyboard, coded to: address **2**
Short cut:	**DIM + 1**	**DIM + 2**	**DIM + 3**
Note:	The address will be shown on the Remote Control on start-up. Delivered Remote Controls are coded to address **0**.		

Fig. 3-31: Connection and addressing of additional Remote Control 30050

8.1.2.2 Operating priority

The encoding has no influence on the priority of the operating sequence. The priority is configured as follows:

- If the same keys of the different Remote Controls are pressed nearly at the same time then the first pressed key takes priority over the other pressed keys.

- If the volume dials of the different Remote Controls are turned nearly at the same time then the first turned volume dial takes priority over the other turned dials. While the dial is moving the entries of the other ones are locked. After the entries are finished the lock is still hold for a short delay time. Then the entries of the other volume dials will be taken into account.

8.2 Software Update

8.2.1 General

With the SurroundControl units it is possible to update the operating system and the application by the use of a standard web-browser. It is also possible to import or export user preset data. The required software is available from RTW by request.

Please note:

Basically any software update will delete and replace the user and factory presets by the initial presets predefined from RTW.
Please make a note of all user specific settings you have made to be able to reprogram them after the software update of the Surround-Control units.
The export (Chapter 8.2.3) or the import (Chapter 8.2.4) of user defined settings (User Presets) with the software update program is only possible with an installed software version **V 02.01.00** or higher!

Version number:
→ MENU → General Settings
see Chapter 6.4

Prepare for the software update as follows:

1. Copy all files that you have received into a folder (e. g. C:\31900_update) on your PC that is assigned to be used for the update sequence.

See Chapter 7.3.4 and Figs. 7-1 and 7-2

2. Connect the SurroundControl units by the use of a standard cat-5 LAN network cable with RJ-45 connectors to your network environment.

If you decide to update the software not through the network but by the use of a directly connected PC to the SurroundControl units, a cat-5 crossover cable with RJ-45 connectors must be used. Internet browser software must also be installed and ready to use on the PC.

3. Run the internet browser software and make sure that all necessary settings required for your networking setup are made.

If you decide to update the software not through the network but by the use of a directly connected PC to the SurroundControl units, it is necessary to define the connection settings of your internet browser for not using a proxy server and not using scripts.
- Settings for the Microsoft Internet explorer have to be made in the menu: Extras/Internet options/Connections/LAN settings/Presets
- Settings for Netscape navigator (Mozilla) have to be made in the menu: Edit/Presets/Advanced/Proxy

IP-Adress:→ MENU
→ Communication and Time
See Chapter 6.10

4. Look up the IP address of the SurroundControl units you like to update. This information can be found on the Communications and Time menu page (also see 6.10).

5. Close the menu mode of the SurroundControl units by the use of the Abort function.

8.2.2 Proceeding a Software Update

Please note all user specific settings or make an export with software V 02.01.00 or higher (see Chapter 8.2.3).

Version number:
→ MENU → General Settings
see Chapter 6.4

A complete software update requires **four** files to be replaced in the SurroundControl units. **All four files must be used in the following order.** (xxxxxx represents the current software version code - also see 6.4 for details)

- "p31900_xxxxxx_**BSYS**"
- "p31900_xxxxxx_**FSYS**"
- "p31900_xxxxxx_**RDIS**"
- "p31900_xxxxxx_**CONF**"

After you have updated the first **three** files, the SurroundControl must be restarted.

The following figures show the software update sequence in more detail. **Please proceed them in the order described!**

1. Start your internet browser and enter the IP adress in the address field (e. g.: http://192.168.103.202, see Fig. 8-3) followed by the hit of the return (Enter) key.

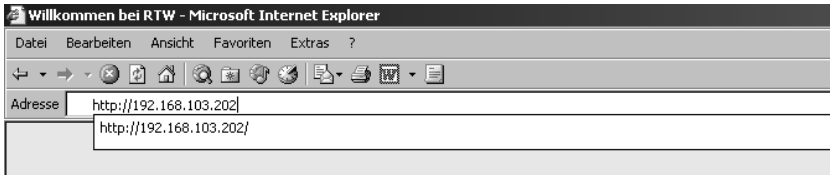


Fig. 8-3: Entering the IP-Adress

2. The SurroundControl should respond with a screen like the one shown in Fig. 8-4. Choose Software update.

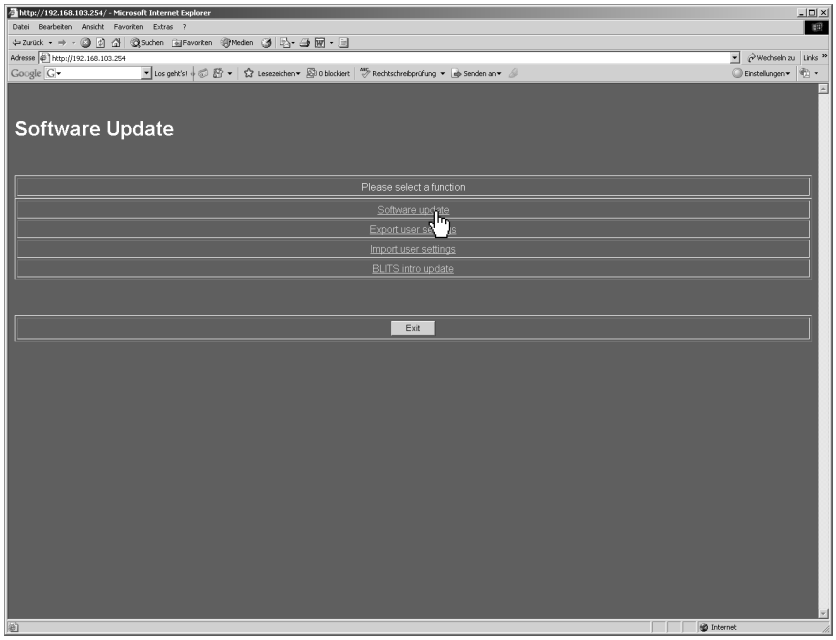


Fig. 8-4: Software Update Program menu in web browser

3. Select “Durchsuchen” (see Fig. 8-5).

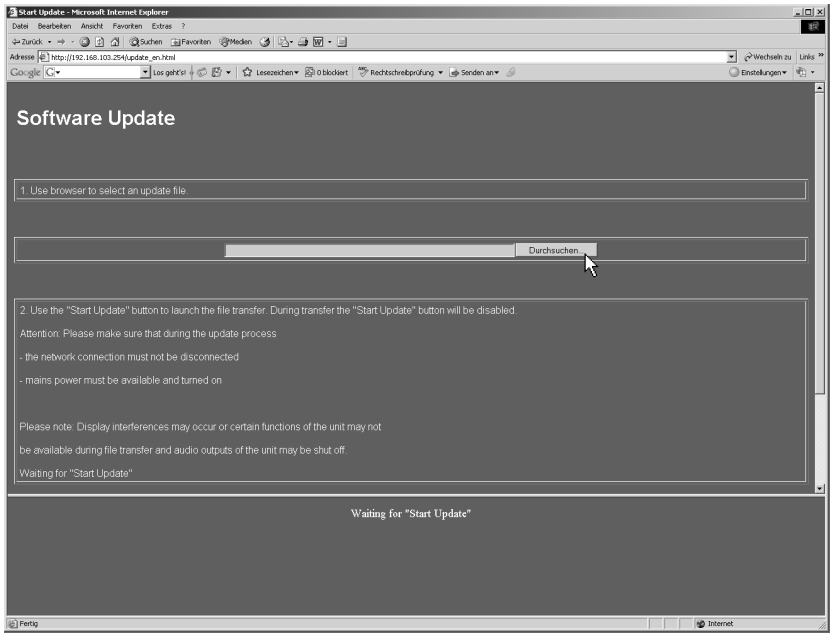


Fig. 8-5: Display of the Software Update menu page („Durchsuchen“)

4. Use the displayed dialog to select the directory path where you have stored the **four** update files. Select the file **p31900_xxxxxx_BSYS** first (see Fig. 8-6). xxxxxx represents the current software version code (also see 6.4 for details).

Version number:
→ MENU → General Settings
see Chapter 6.4

Note:
The use of mixed version codes is not permitted. Malfunctioning of the SurroundControl units may result.

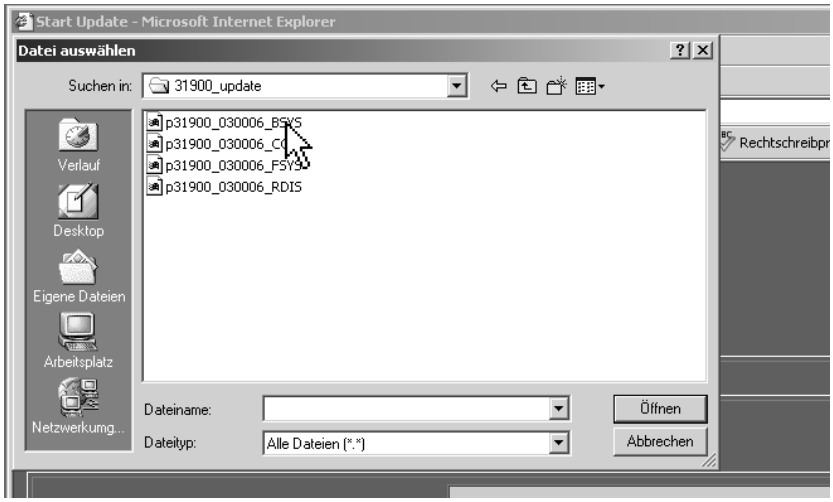


Fig. 8-6: The update file selection dialog box

5. After selecting the update file move the menu page upward by moving downward the grey scrollbar on the right (see mouse pointer in Fig. 8-7).

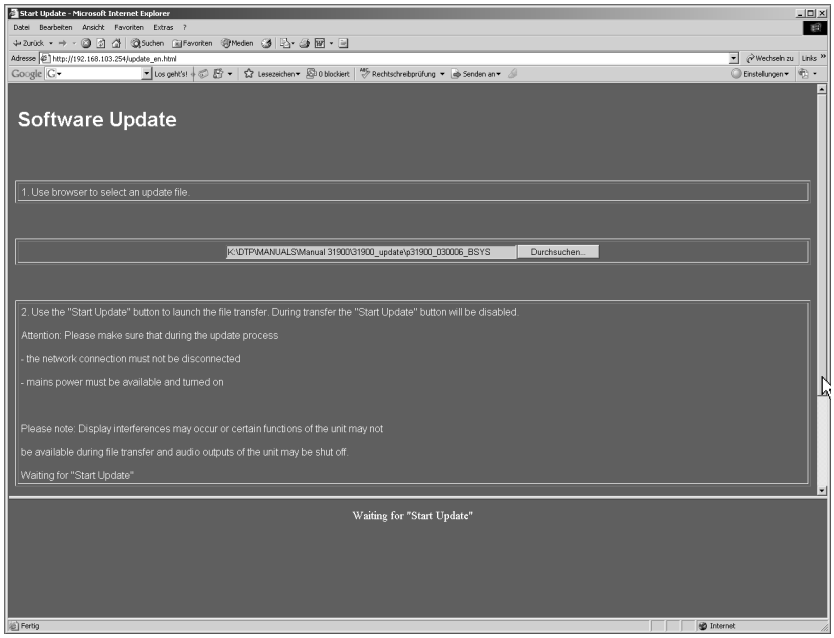


Fig. 8-7: Selection of the update file and moving the menu page with the scrollbar



6. Press Start update to start the update process (see Fig. 8-8). **Please make sure that no interruption of the network access or supply power occurs during the download sequence.**

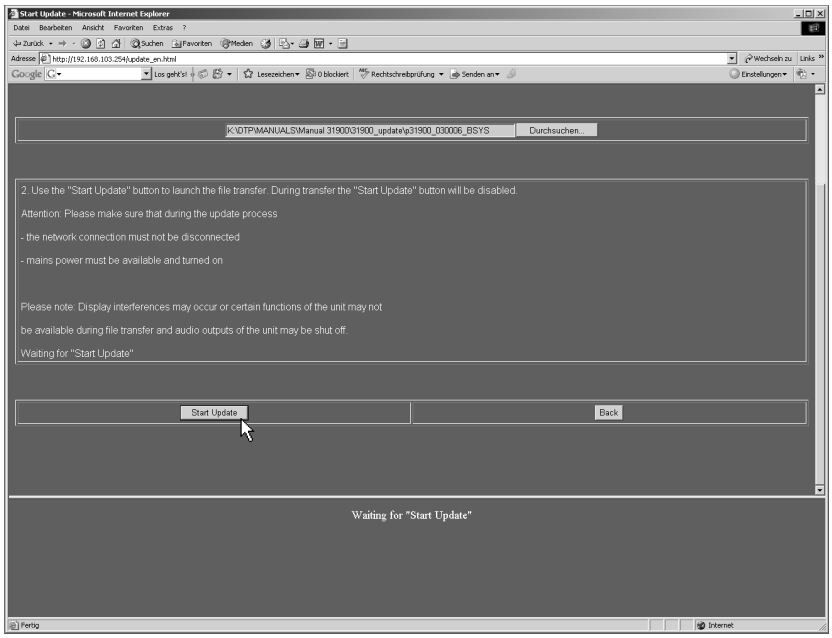


Fig. 8-8: Starting the update process with the selected update file

7. A bar on the lower end of the update window on the PC reads the data transfer progress (see Fig. 8-9).

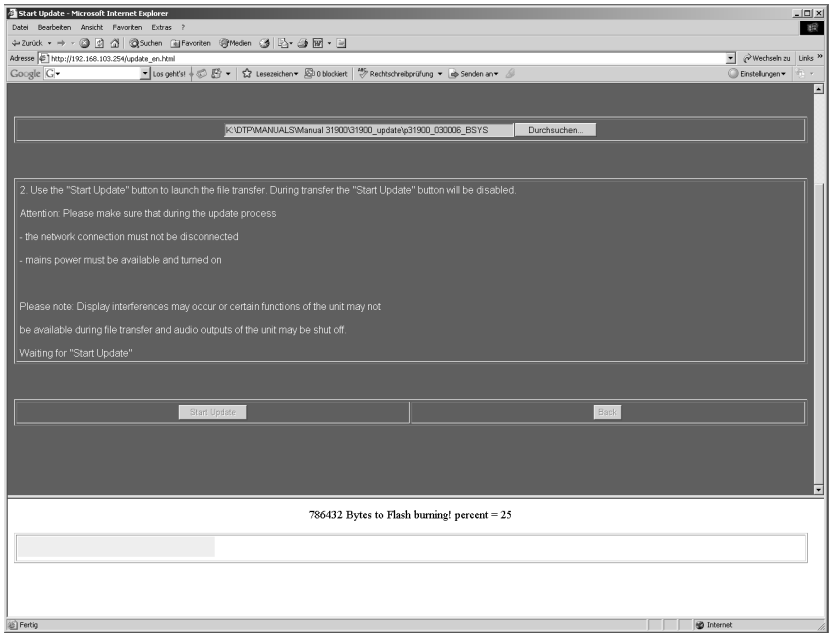


Fig. 8-9: Progress of the data transfer of the selected update file

8. The download is finished when the message “Please make power off after all nessecary files have been transmitted. You can transfer multiple files before power off” is displayed (see Fig. 8-10). Please do **not** switch off the SurroundControl units but proceed with step 9.

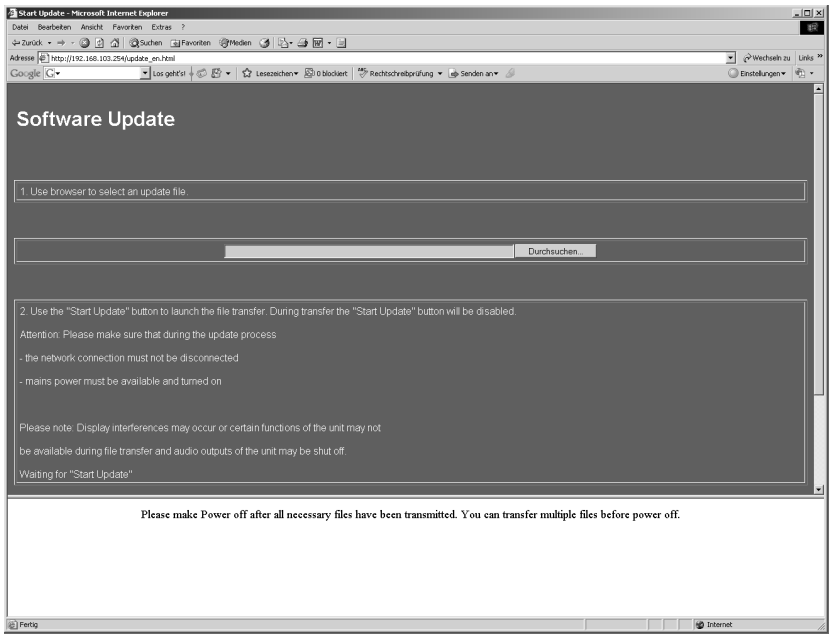


Fig. 8-10: End of the data transfer of the selected file

9. Use the displayed dialog (see Figs. 8-10 and 8-5) to select ("Durchsuchen") the **second** of the four update files.
   Select the file **p31900_xxxxxx_FSYS**. Repeat steps 4 to 8.

10. Use the displayed dialog (see Figs. 8-10 and 8-5) again to select ("Durchsuchen") the **third** of the four update files.
    Select the file **p31900_xxxxxx_RDIS**. Repeat steps 4 to 8.

A restart must be processed after third file transfer!



11. **Now** its time to **restart** the SurroundControl units **before** transferring the fourth update file. Please wait approx. 5 sec. after shut down of the unit before you power it up again.

12. After the SurroundControl units has rebooted re-establish the connection between your web browser and the SurroundControl units as described with steps 1 to 3.

13. Use the displayed dialog (see Fig. 8-5) to select ("Durchsuchen") the **fourth** of the four update files.
    Select the file **p31900_xxxxxx_CONF**. Repeat steps 4 to 8.

14. If the download of the p31900_xxxxxx_CONF file is completed you must **reboot** the SurroundControl units again. Please wait approx. 5 sec. after shut down of the unit before you power it up again.

Version number:
→ MENU → General Settings
see Chapter 6.4



15. After the SurroundControl units has rebooted its ready to use with the new software version. You will find the current used version code of the application in the About-info frame of the General settings menu.

16. If the software update was proceeded to an installed software version **V 02.01.00** and then updated to a **higher** version the exported user settings (see Chapter 8.2.3) now can be **imported**. Therefore please follow the instructions of Chapter 8.2.4!

The export is only possible with an **installed** version **V 02.01.00** or higher!

8.2.3 Proceeding the export of the User Presets

The following figures show the export sequence in more detail.
For the following example sequence we assume that the IP address of your SurroundControl units is 192.168.103.202.

1. Start your internet browser and enter http://192.168.103.202 in the address field (see Fig. 8-11) followed by the hit of the return (Enter) key.

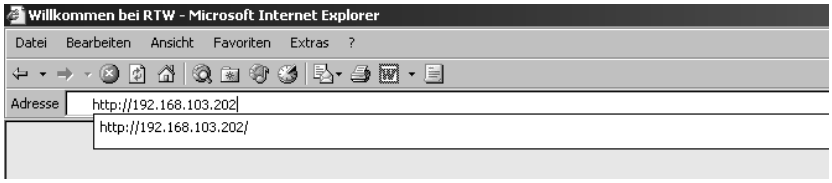


Fig. 8-11: Entering the IP adress

2. The SurroundControl units should respond with a screen like the one shown in Fig. 8-12. Choose Export user settings. **Please note the instructions on the Export menu page** (see Fig. 8-13).

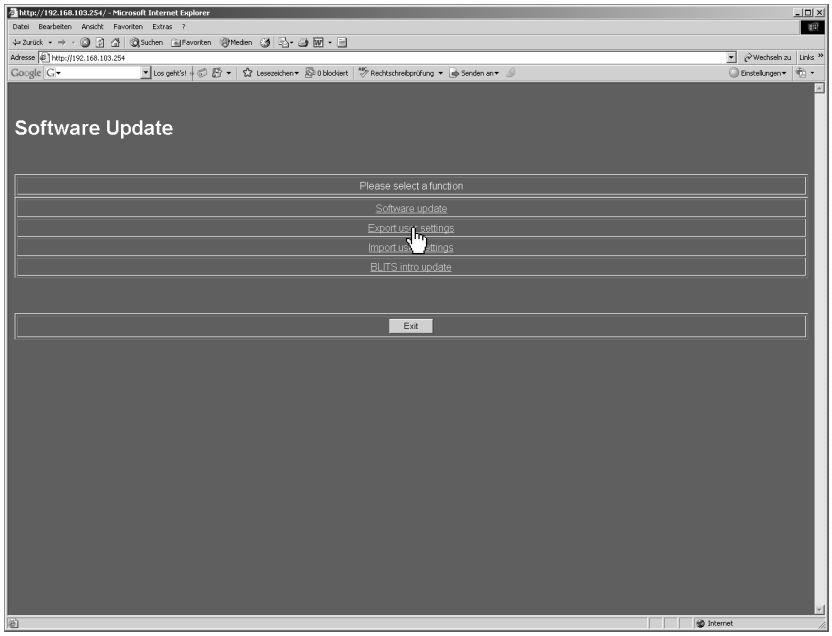


Fig. 8-12: Software Update Program menu in web browser

3. Please click the Export button (see Fig. 8-13).

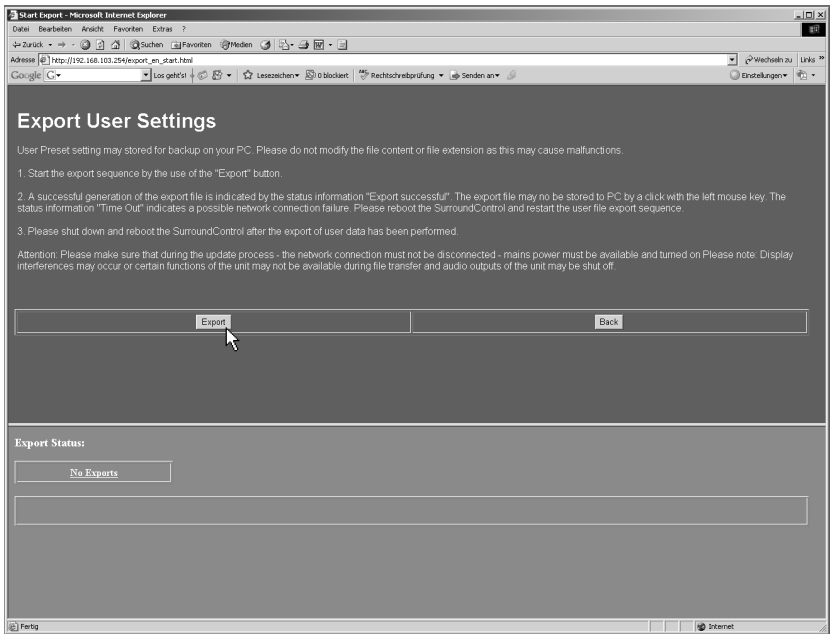


Fig. 8-13: Display of the Export menu page

4. The export of the user setting data starts (see Fig. 8-14). “Generating Export File” is displayed, a starline is showing the progress of the export.

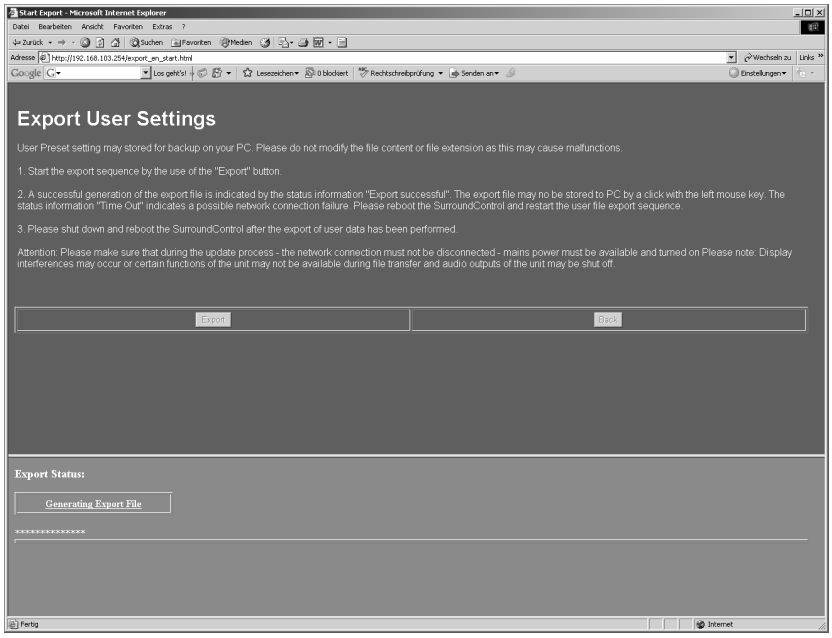


Fig. 8-14: The export is running

5. When the Export Status turns to the blue labelled “Export succesfull” (see Fig. 8-15) the export file can be saved. Please click Export succesfull.

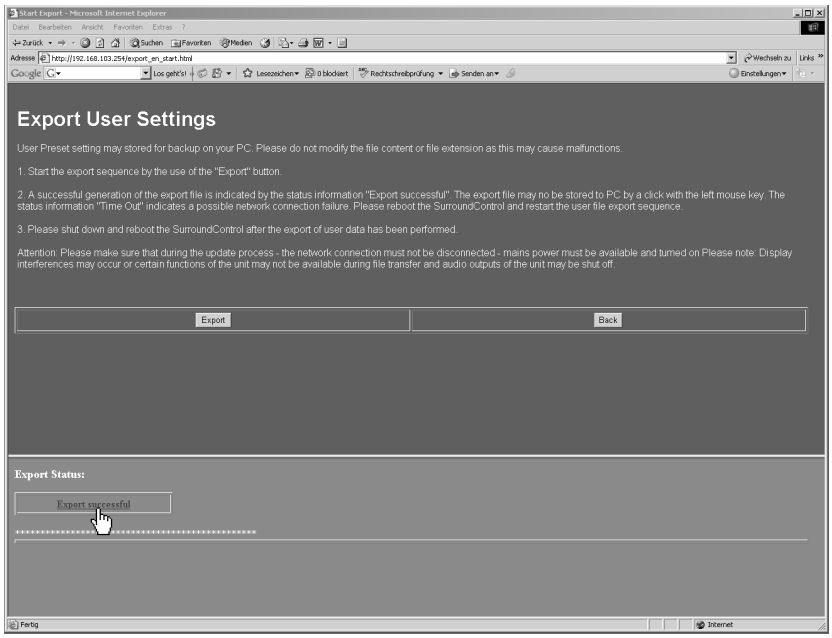


Fig. 8-15: The export file has been generated and can de saved

6. The file download dialog box appears (see Fig. 8-16). Please click Save (“Speichern”).

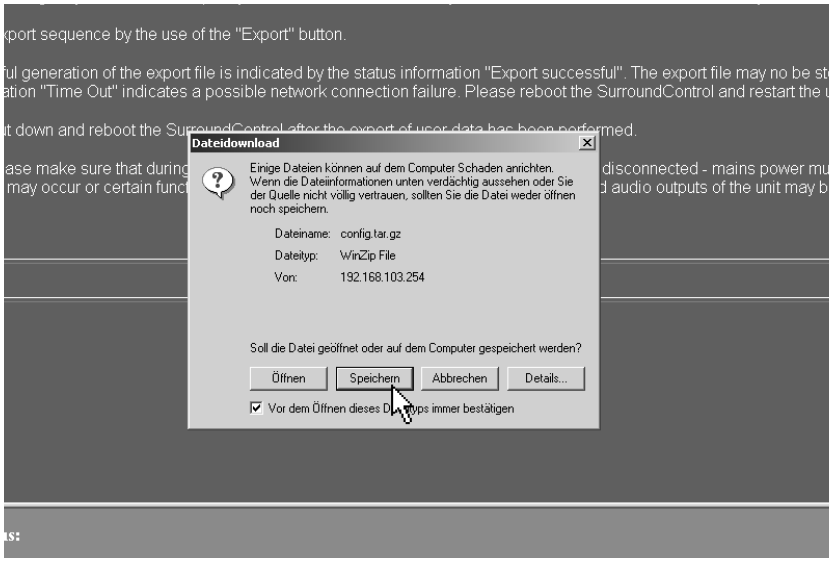


Fig. 8-16: The file download dialog

7. The save file as (“Datei speichern unter”) dialog box is shown. Choose the folder (e. g. C:\31900_Update) for saving the export file config.tar.gz (see Fig. 8-17).

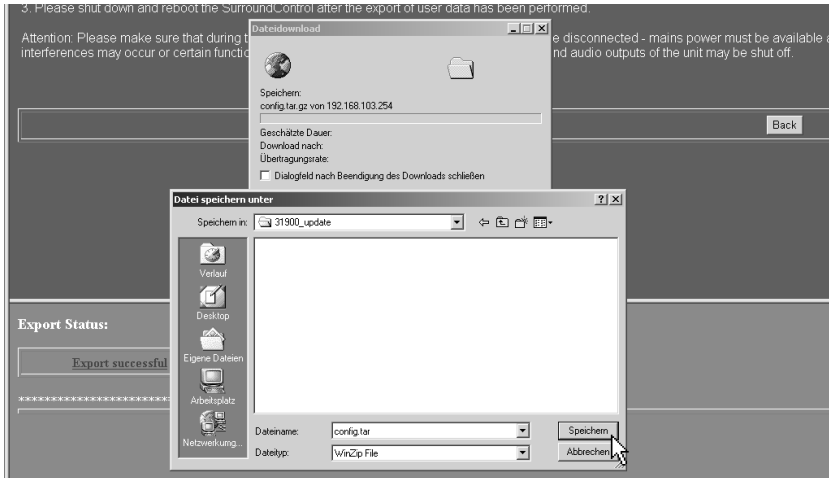


Fig. 8-17: Choose the folder for saving the export file

8. When saving the file was successful please click the Back button (see Fig. 8-18) to get back to the home page (see Fig. 8-12).

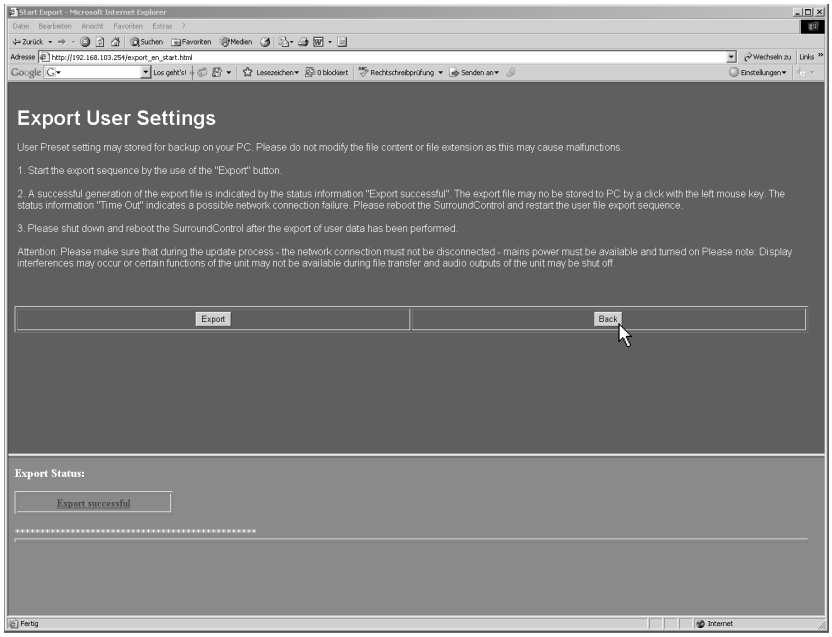


Fig. 8-18: End of the export progress

9. If you want to proceed a software update please click Software Update on the home page. Please follow the instructions in Chapter 8.2.2.

10. If you want to leave the update program please click the Exit button (see Fig. 8-12). The SurroundControl units have to be restarted. Please wait approx. 5 s after shut down of the unit before you power it up again.

The export is **only** possible with an **installed** version **V 02.01.00** or higher!

8.2.4 Proceeding the import of the User Presets

The following figures show the import sequence in more detail.
For the following example sequence we assume that the IP address of your SurroundControl units is 192.168.103.202.

1. Start your internet browser and enter http://192.168.103.202 in the address field (see Fig. 8-19) followed by the hit of the return (Enter) key.

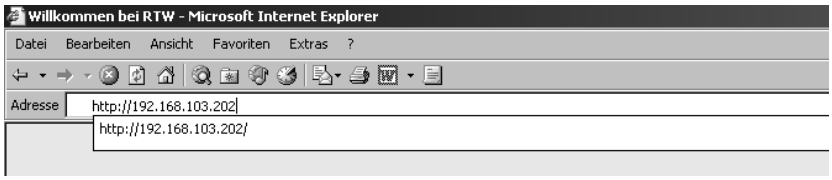


Fig. 8-19: Entering the IP-Adress

2. The SurroundControl units should respond with a screen like the one shown in Fig. 8-20. Choose Import user settings. **Please note the instructions on the Import menu page** (see Fig. 8-21).

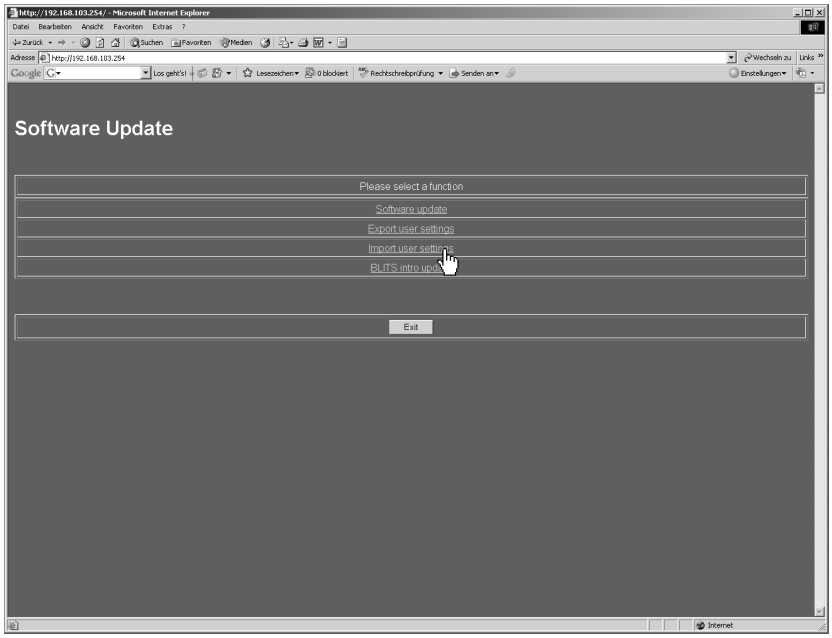


Fig. 8-20: Software Update Program menu in web browser

3. Please click the “Durchsuchen” button (see Fig. 8-21) to browse for the user settings data file.

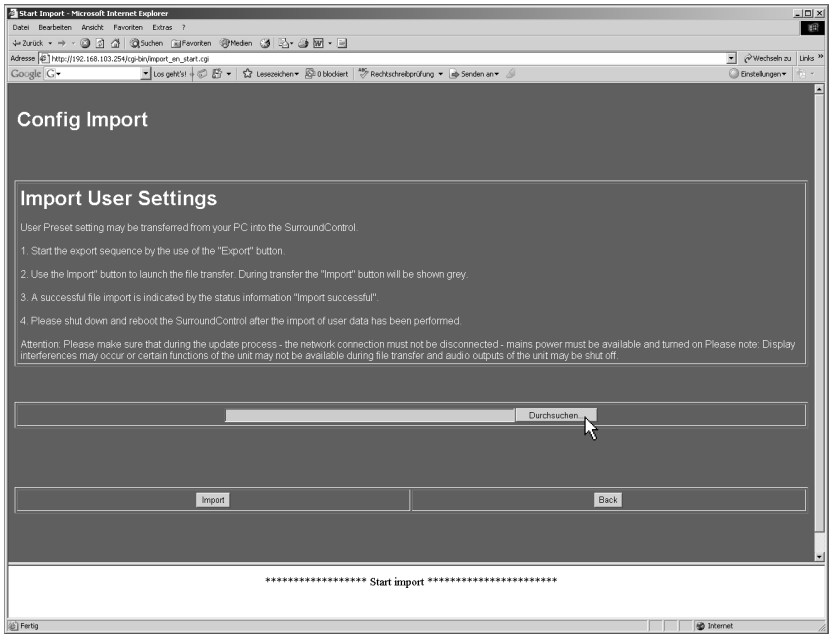


Fig. 8-21: Display of the Import menu page (‘Durchsuchen’)

4. Choose the folder (e. g.: C:\31900_update) with the user settings data file and click the file config.tar.gz (see Fig. 8-22).

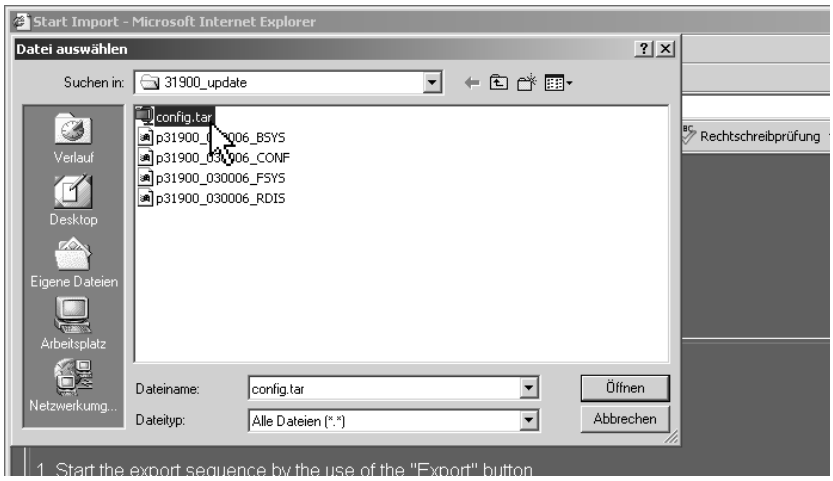


Fig. 8-22: The import file selection dialog box (config.tar.gz)

5. A click to the Import button starts the data transfer to the SurroundControl units (see Fig. 8-23). If the Import button is not visible move the menu page upward by using the scrollbar on the right. **Please make sure that no interruption of the network access or supply power occurs during the download sequence.**

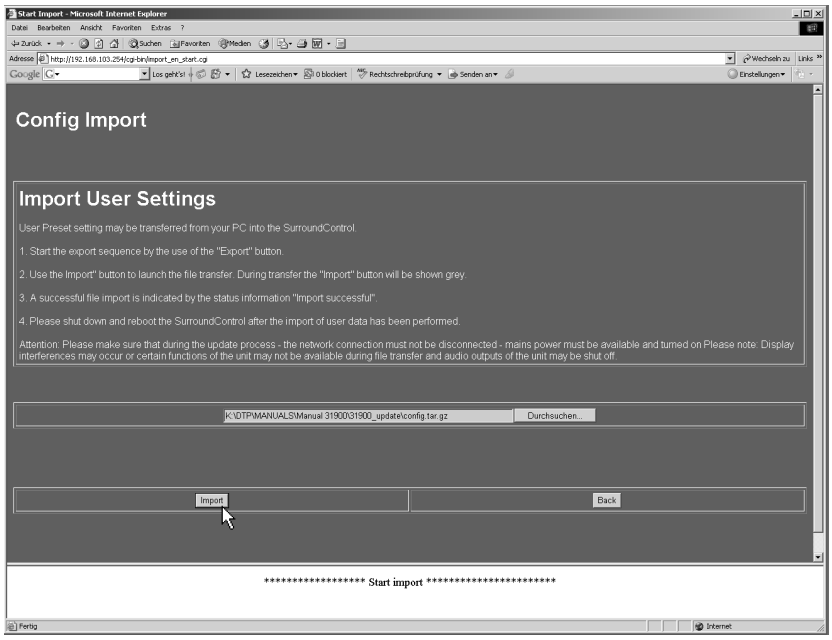


Fig. 8-23: Starting the import

6. "Create config file" is displayed while the transfer is running (see Fig. 8-24).

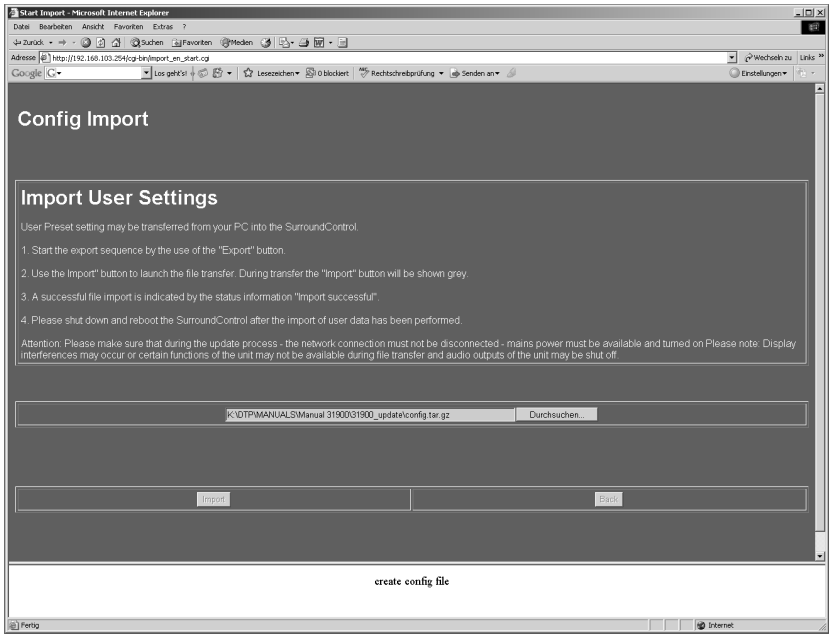


Fig. 8-24: The data transfer of the user settings is running

7. When “Import successful - PLEASE MAKE POWER OFF” is displayed the Import process is finished (see Fig. 8-25). For activating the imported user settings the SurroundControl units have to be restarted.

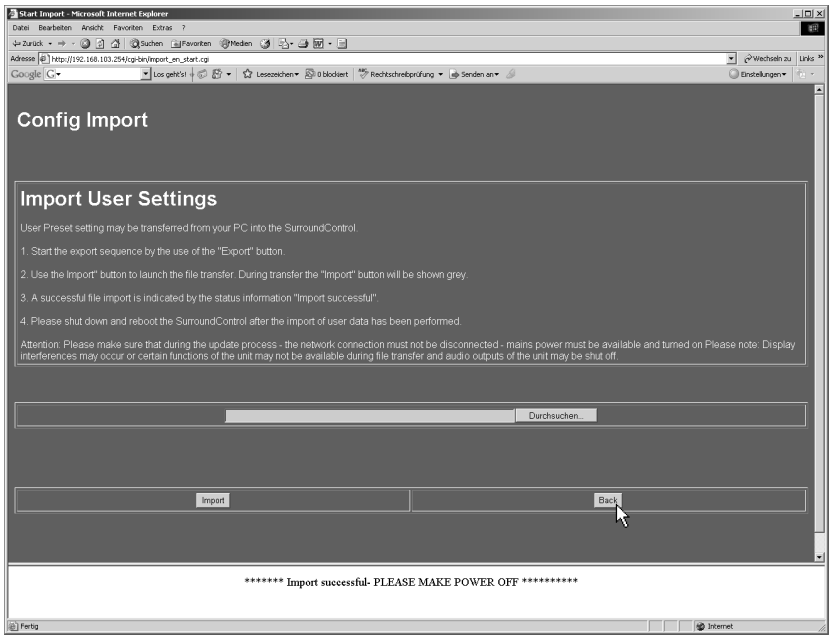


Fig. 8-25: End of the import of the user settiings

8. Click the Back button (see Fig. 8.-25) to get back to the home page (see Fig. 8-20). There please click Finish to leave the software update program.

9. Please wait approx. 5 sec. after shut down of the unit before you power it up again.

10. When the SurroundControl units are rebooting, the imported user settings will be configured und activated. Then it is ready to use.

The BLITS intro update is **only** possible with an **installed** version **V 03.00.06** or higher!

8.2.5 Proceeding a BLITS intro update

The following figures show the import of the BLITS intro in detail. The intro file has to be 8-bit mono and can have a size of up to 1 MB.
For the following example sequence we assume that the IP address of your SurroundControl unit is 192.168.103.202.

1. Start your internet browser and enter http://192.168.103.202 in the address field (see Fig. 8-26) followed by the hit of the return (Enter) key.

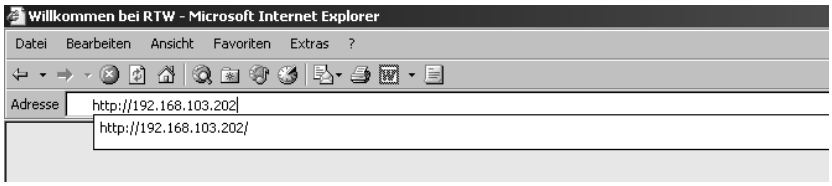


Fig. 8-26: Entering the IP-Adress

2. The SurroundControl units should respond with a screen like the one shown in Fig. 8-27. Choose BLITS intro update. **Please note the instructions on the BLITS intro update menu page** (see Fig. 8-28).

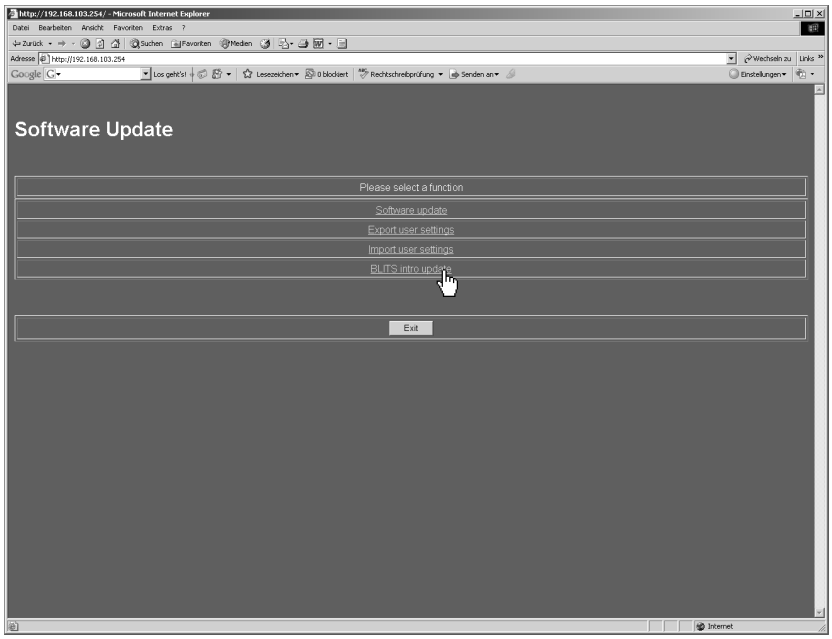


Fig. 8-27: Software Update Program menu in web browser

3. Please click the “Durchsuchen” button (see Fig. 8-28) to browse for the user settings data file.

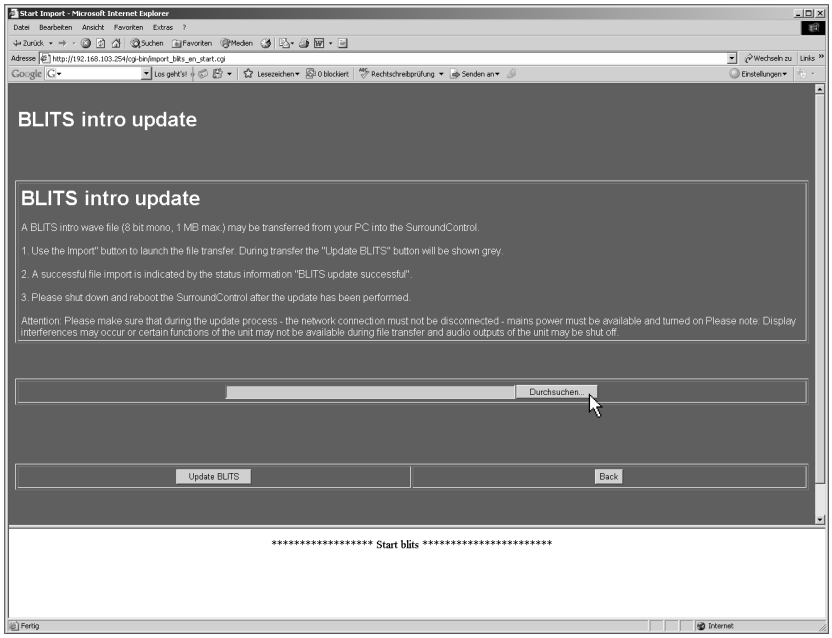


Fig. 8-28: Display of the BLITS menu page (‘Durchsuchen’)

4. Choose the folder (e. g.: C:\31900_BLITS) with the user settings data file and click the file e. g. blitsIntro.wav (see Fig. 8-29).

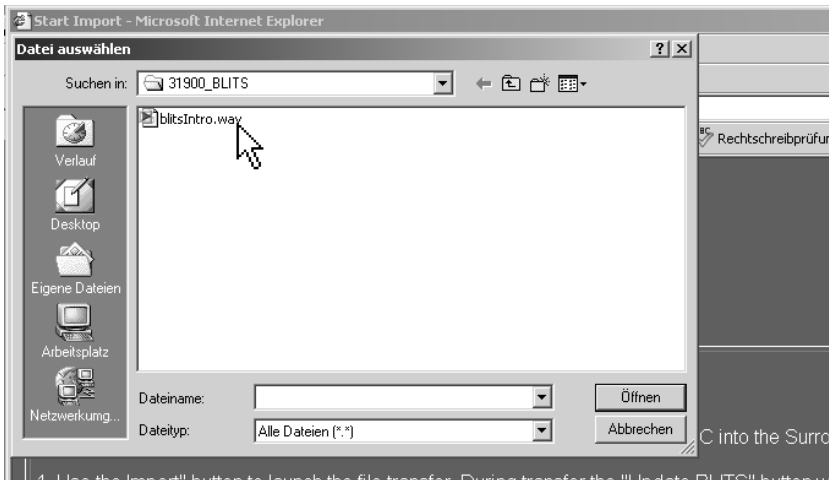


Fig. 8-29: The BLITS file selection dialog box (blitsIntro.wav)

5. A click to the Update BLITS button starts the data transfer to the Surround Control units (see Fig. 8-30). If the Update BLITS button is not visible move the menu page upward by using the scrollbar on the right. **Please make sure that no interruption of the network access or supply power occurs during the download sequence.**

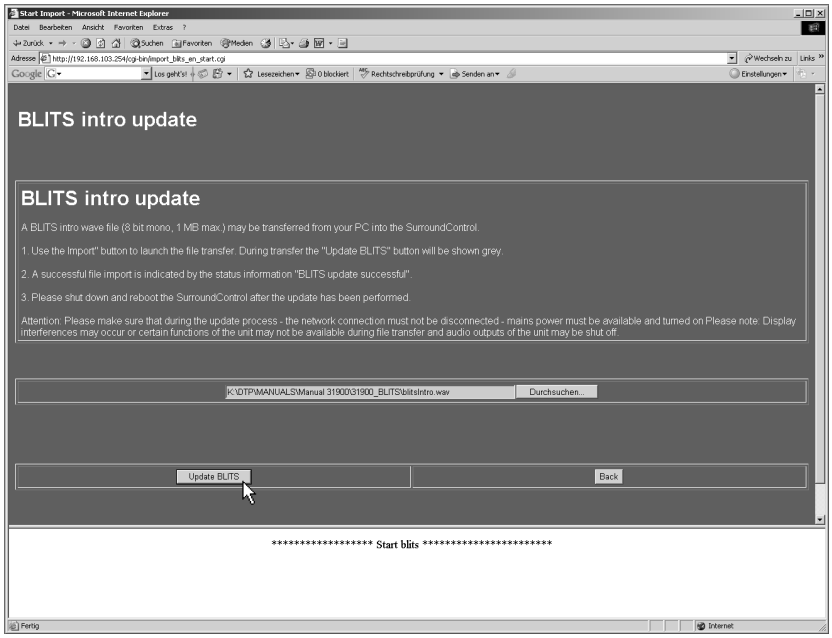


Fig. 8-30: Starting the update

6. When “BLITS update successful – PLEASE MAKE POWER OFF” is displayed the BLITS update process is finished (see Fig. 8-31). For activating the BLITS intro the SurroundControl unit has to be restarted.

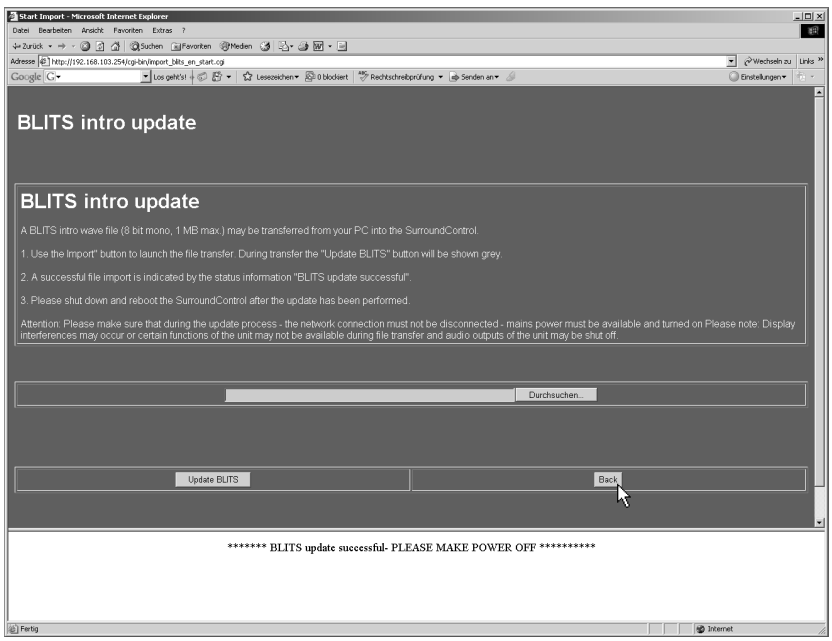


Fig. 8-31: End of the BLITS update

8. Click the Back button (see Fig. 8-31) to get back to the home page (see Fig. 8-27). There please click Finish to leave the software update program.

9. Please wait approx. 5 sec. after shut down of the unit before you power it up again.

10. After the SurroundControl units are rebooted the BLITS intro wave file can be enabled on the **Generator and BLITS** menu page. The BLITS wave intro then will be sent through the channels first.

9 Mechanical Layout

9.1 Dimensions 31900 series

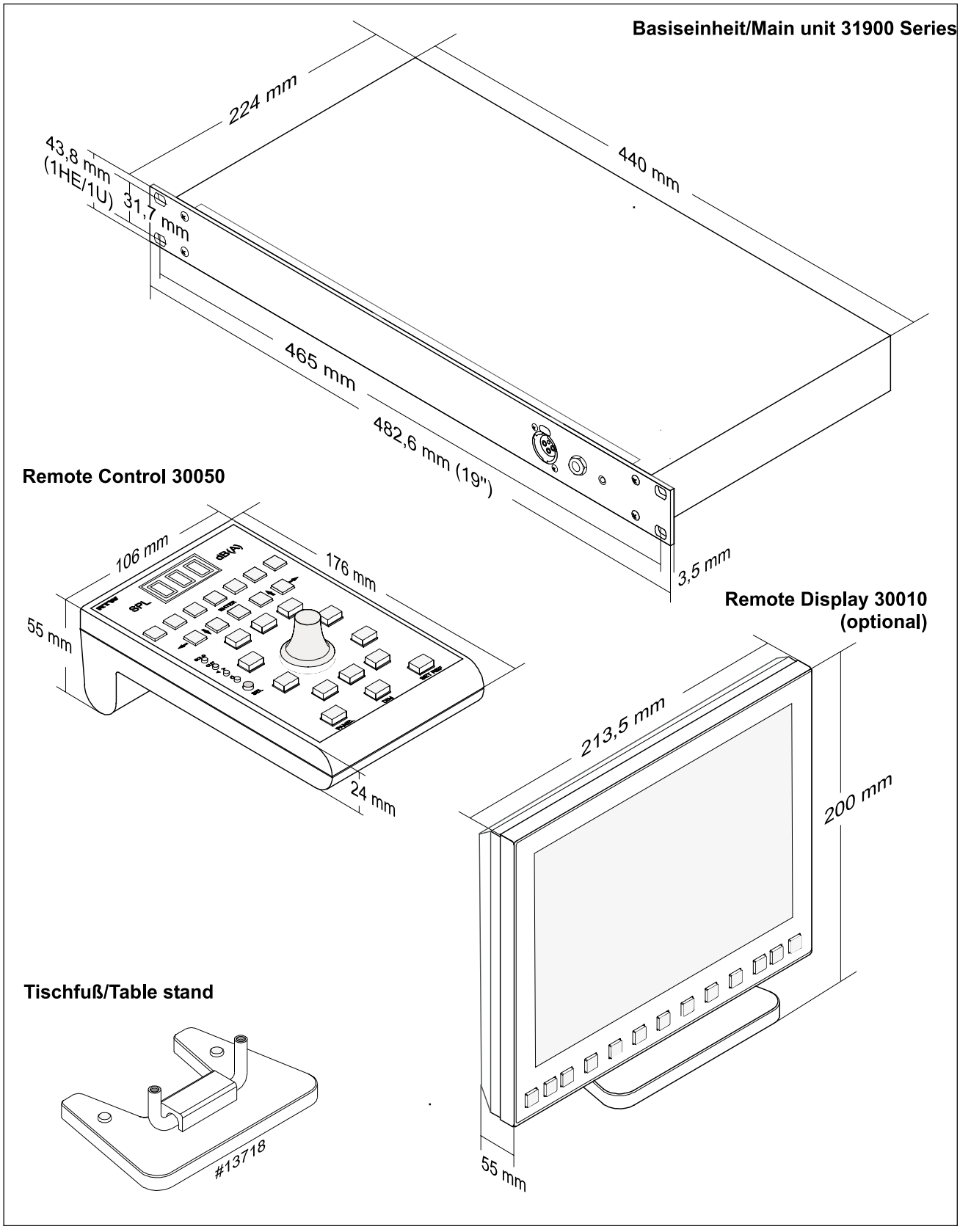


Fig. 9-1: Dimensions of the SurroundControl 31900 series system

9.2 Dimensions 31960 series

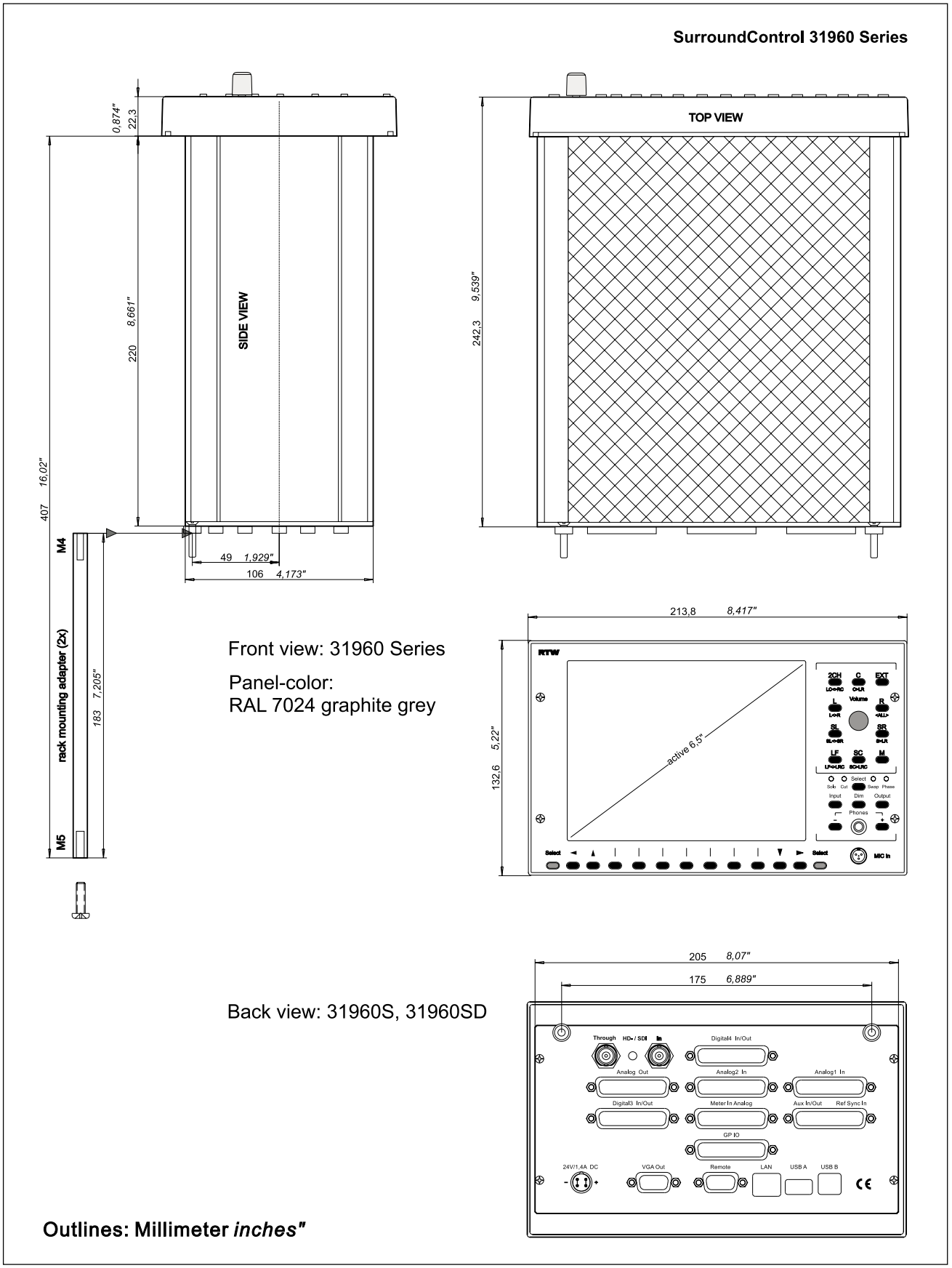


Fig. 9-1: Dimensions of the SurroundControl 31960 series

Appendix A: Presets

General

The parameters of the units are hold in 7 Factory Presets and 7 User Presets. After unpacking the unit, the User Presets named U1 to U7 hold the same content as the Factory Presets named F8 to F14, but they can be overwritten anytime to store individual user settings. To do so please refer to Chapter 3.9. In the Factory Presets and their corresponding Sub Presets the channel configurations for usual applications are stored. The tables on the next pages give a summary of these input and output routing settings.

See Chapter 3.9

Common for all the Presets are the main parameters listed below. For the complete description of the Peakmeter Settings, the Loudness Settings and the corresponding Channel Group Settings please refer to Chapter 6.5.2.

See Chapter 6.5.2

Peakmeter Settings

General PPM Settings

See Chapter 6.5.2.6

- Weighting Filter: Awt+RMS (Leq(A))
- RMS response: fast
- Peak Hold fallback time: 1 s

Main Peakmeter Channel Group Settings

See Chapter 6.5.2.8

- Standard Settings Digtial: Digital
  - Scale: Dig60dB
  - Integration time: Sample
  - PH Integration Time: Integration Time
  - DC-Filter: 5 Hz
  - Headroom: –9 dBFS
  - Operation indicator area: 0 dB
- Standard Settings Analog: Din
  - Scale: Din5dB
  - Integration time: 10 ms
  - PH Integration Time: Integration Time
  - Operation indicator area: 0 dB
- VU-Lead: 0 dB
- Bargraph enabled: all
- SPL Reference indicator: enabled

ITU BS.1771 Loudness Settings

See Chapter 6.5.2.9

General Loudness Settings

- Filter: ITU BS.1770 R2LB
- Scale: ITU BS.1771
- Reference: –10 dBFS

See Chapter 6.5.2.10

Main Loudness Channel Group Settings

- Standard Settings Digtial: Digital
  - Scale: Dig60dB
  - Integration time: Sample
  - DC-Filter: 5 Hz
  - Headroom: –9 dBFS
  - Operation indicator area: 0 dB
- Peak Hold fallback time: 1 s
- Mode: Normal
- PPM Type: Bar
- Loudness
  - Operation indicator area: 0 dB
- PPM bargraphs enabled: all
- Loudness bargraphs enabled: all

See Chapter 6.5.2.11

Main Loudness Sum Group Settings

- General
  - Alarm Threshold: 0.0 dBLU
  - Alarm Hold: 5 s
- Momentary
  - Integration time: 500 ms
- Integrated
  - Weighting time: 20 s
- Long term
  - Use Threshold: enabled
  - Threshold mode: fixed
  - Threshold absolute: –20 dBLU
  - Integration time: 1 Days, 0 Hours
  - Recalc data: disabled
  - Operation indicator area: 0 dB
- M, I, L bargraphs enabled: all
- Numerical enabled: all
- Channel Weighting ITU BS.1771 Format 5.1
  - Left, Right, Center: 0.0 dB
  - Left Surround, Right Surround: 1.5 dB

Factory Preset F8: 5.1 (5.1 Surround) Program Meter: PPM, local routings

Output Key Mode		Output Settings							
Deactivated	Activated	Mode	Chan.	Digital Out 3	Direct Out 3	Digital Out 4	Direct Out 4	Chan.	Analog Out
Analog	Digital 3	5.1	1a	L		L		1	L
			1b	R		R		2	R
			2a	C		C		3	C
			2b	LF		LF		4	LF
			3a	LS		LS		5	LS
			3b	RS		RS		6	RS
			4a	off		off		7	off
			4b	off		off		8	off

Sub Presets of F8

Key 1: 5.1SUR

Default Instrument		Monitor Routing	Decoder	Lext/Rext Routing	Downmix Routing	Peakmeter Settings			
						Ch. Gr. 1	Ch. Gr. 2	Ch. Gr. 3	Ch. Gr. 4
		Source:		Source:	Source:	5.1	Lo/Ro	SPL	–
SSA		Analog 1	disabled	None	Off	Position 1	Position 3	Position 2	–
	L	1							
	R	2							
	C	3							
	LF	4							
	LS	5							
	RS	6							
	–	–							
	–	–							

Key 2: 5.1+EX

Default Instrument		Monitor Routing	Decoder	Lext/Rext Routing	Downmix Routing	Peakmeter Settings			
						Ch. Gr. 1	Ch. Gr. 2	Ch. Gr. 3	Ch. Gr. 4
		Source:		Source:	Source:	5.1	Lext/Rext	SPL	–
SSA		Analog 1	disabled	Analog 1	Off	Position 1	Position 3	Position 2	–
	L	1		7					
	R	2		8					
	C	3							
	LF	4							
	LS	5							
	RS	6							
	–	–							
	–	–							

Key 3: 5.1SUR

Default Instrument		Monitor Routing	Decoder	Lext/Rext Routing	Downmix Routing	Peakmeter Settings			
						Ch. Gr. 1	Ch. Gr. 2	Ch. Gr. 3	Ch. Gr. 4
		Source:		Source:	Source:	5.1	Lo/Ro	SPL	–
SSA		Digital 3	disabled	none	Digital 3 (discrete)	Position 1	Position 3	Position 2	–
	L	1a							
	R	1b							
	C	2a							
	LF	2b							
	LS	3a							
	RS	3b							
	–	–							
	–	–							

Key 4: 5.1+EX

Default Instrument		Monitor Routing	Decoder	Lext/Rext Routing	Downmix Routing	Peakmeter Settings			
						Ch. Gr. 1	Ch. Gr. 2	Ch. Gr. 3	Ch. Gr. 4
		Source:		**Source:**	**Source:**	5.1	Lext/Rext	SPL	–
SSA		Digital 3	disabled	Digital 3	Digital 3 (discrete)	Position 1	Position 3	Position 2	–
	L	1a		4a					
	R	1b		4b					
	C	2a							
	LF	2b							
	LS	3a							
	RS	3b							
	–	–							
	–	–							

Key 5: 5.1G12

Default Instrument		Monitor Routing	Decoder	Lext/Rext Routing	Downmix Routing	Peakmeter Settings			
						Ch. Gr. 1	Ch. Gr. 2	Ch. Gr. 3	Ch. Gr. 4
		Source:		**Source:**	**Source:**	5.1	Lext/Rext	SPL	–
SSA		SDI	disabled	SDI	SDI (discrete)	Position 1	Position 3	Position 2	–
	L	1-1		2-3					
	R	1-2		2-4					
	C	1-3							
	LF	1-4							
	LS	2-1							
	RS	2-2							
	–	–							
	–	–							

Key 6: 5.1G34

Default Instrument		Monitor Routing	Decoder	Lext/Rext Routing	Downmix Routing	Peakmeter Settings			
						Ch. Gr. 1	Ch. Gr. 2	Ch. Gr. 3	Ch. Gr. 4
		Source:		**Source:**	**Source:**	5.1	Lext/Rext	SPL	–
SSA		SDI	disabled	SDI	SDI (discrete)	Position 1	Position 3	Position 2	–
	L	3-1		4-3					
	R	3-2		4-4					
	C	3-3							
	LF	3-4							
	LS	4-1							
	RS	4-2							
	–	–							
	–	–							

Key 7: 5.1D12

Default Instrument		Monitor Routing	Decoder	Lext/Rext Routing	Downmix Routing	Peakmeter Settings			
						Ch. Gr. 1	Ch. Gr. 2	Ch. Gr. 3	Ch. Gr. 4
		Source:	**Dolby® AC-3**	**Source:**	**Source:**	5.1	Lo/Ro	SPL	–
SSA		Decoder	Digital 3	Decoder	Decoder	Position 1	Position 3	Position 2	–
	L	L	1a	Aux-L					
	R	R	1b	Aux-R					
	C	C							
	LF	LF							
	LS	LS							
	RS	RS							
	–	–							
	–	–							

Factory Preset F9: 2-CH (2-Channel Stereo) Program Meter: PPM, local routing

Output Key Mode		Output Settings							
Deactivated	**Activated**	**Mode**	**Chan.**	**Digital Out 3**	**Direct Out 3**	**Digital Out 4**	**Direct Out 4**	**Chan.**	**Analog Out**
Analog	Digital 3	2-ch Stereo	1a	L		L		1	L
			1b	R		R		2	R
			2a	off		off		3	off
			2b	off		off		4	off
			3a	off		off		5	off
			3b	off		off		6	off
			4a	off		off		7	off
			4b	off		off		8	off

Sub Presets of F9

Key 1: 2-CH12

Default Instrument		Monitor Routing	Decoder	Lext/Rext Routing	Downmix Routing	Peakmeter Settings			
						Ch. Gr. 1	**Ch. Gr. 2**	**Ch. Gr. 3**	**Ch. Gr. 4**
		Source:		–	–	2-CH Stereo + SpCor	–	SPL	–
Vectorscope		Analog 1	disabled	–	–	Position 1	Position 3	Position 2	–
	L	1							
	R	2							

Key 2: 2-CH34

Default Instrument		Monitor Routing	Decoder	Lext/Rext Routing	Downmix Routing	Peakmeter Settings			
						Ch. Gr. 1	**Ch. Gr. 2**	**Ch. Gr. 3**	**Ch. Gr. 4**
		Source:		–	–	2-CH Stereo + SpCor	–	SPL	–
Vectorscope		Analog 1	disabled	–	–	Position 1	Position 3	Position 2	–
	L	3							
	R	4							

Key 3: 2-CH12

Default Instrument		Monitor Routing	Decoder	Lext/Rext Routing	Downmix Routing	Peakmeter Settings			
						Ch. Gr. 1	**Ch. Gr. 2**	**Ch. Gr. 3**	**Ch. Gr. 4**
		Source:		–	–	2-CH Stereo + SpCor	–	SPL	–
Vectorscope		Digital 3	disabled	–	–	Position 1	Position 3	Position 2	–
	L	1a							
	R	1b							

Key 4: 2-CH34

Default Instrument		Monitor Routing	Decoder	Lext/Rext Routing	Downmix Routing	Peakmeter Settings			
						Ch. Gr. 1	**Ch. Gr. 2**	**Ch. Gr. 3**	**Ch. Gr. 4**
		Source:		–	–	2-CH Stereo + SpCor	–	SPL	–
Vectorscope		Digital 3	disabled	–	–	Position 1	Position 3	Position 2	–
	L	2a							
	R	2b							

Key 5: 2-CH12

Default Instrument		Monitor Routing	Decoder	Lext/Rext Routing	Downmix Routing	Peakmeter Settings			
						Ch. Gr. 1	**Ch. Gr. 2**	**Ch. Gr. 3**	**Ch. Gr. 4**
		Source:		–	–	2-CH Stereo + SpCor	–	SPL	–
Vectorscope		SDI	disabled	–	–	Position 1	Position 3	Position 2	–
	L	1-1							
	R	1-2							

Key 6: 2-CH34									
Default Instrument		**Monitor Routing**	**Decoder**	**Lext/Rext Routing**	**Downmix Routing**	**Peakmeter Settings**			
						Ch. Gr. 1	**Ch. Gr. 2**	**Ch. Gr. 3**	**Ch. Gr. 4**
		Source:		**–**	**–**	2-CH Stereo + SpCor	–	SPL	–
Vectorscope		SDI	disabled	–	–	Position 1	Position 3	Position 2	–
	L	1-3							
	R	1-4							
Key 7: 2-CH12									
Default Instrument		**Monitor Routing**	**Decoder**	**Lext/Rext Routing**	**Downmix Routing**	**Peakmeter Settings**			
						Ch. Gr. 1	**Ch. Gr. 2**	**Ch. Gr. 3**	**Ch. Gr. 4**
		Source:	**Dolby® E**	**–**	**–**	2-CH Stereo + SpCor	–	SPL	–
Vectorscope		Decoder	Digital 3	–	–	Position 1	–	Position 2	–
	L	L	1a						
	R	R	1b						

Factory Preset F10: MULTI (Multi-Channel) **Program Meter: PPM, local routing**

Output Key Mode		Output Settings							
Deactivated	**Activated**	**Mode**	**Chan.**	**Digital Out 3**	**Direct Out 3**	**Digital Out 4**	**Direct Out 4**	**Chan.**	**Analog Out**
Analog	Digital 3	Multi-Channel	1a	L		L		1	L
			1b	R		R		2	R
			2a	off		off		3	off
			2b	off		off		4	off
			3a	off		off		5	off
			3b	off		off		6	off
			4a	off		off		7	off
			4b	off		off		8	off

Sub Presets of F10

Key 1: 1-8

Default Instrument			Monitor Routing		Decoder	Peakmeter Settings Ch. Gr. 1	Ch. Gr. 2	Ch. Gr. 3	Ch. Gr. 4
						8-CH	–	–	–
RTA 1/3	**Source**	**Channels**		**Stereo**	disabled	Position 1	–	–	–
	Analog 1	8	1	–					
			2						
			3	–					
			4						
			5	–					
			6						
			7	–					
			8						

Key 2: 4x2ST

Default Instrument			Monitor Routing		Decoder	Peakmeter Settings Ch. Gr. 1	Ch. Gr. 2	Ch. Gr. 3	Ch. Gr. 4
						2-CH Stereo + SpCor	2-CH Stereo + SpCor	2-CH Stereo + SpCor	2-CH Stereo + SpCor
Vectorscope	**Source**	**Channels**		**Stereo**	disabled	Position 1	Position 3	Position 2	Position 4
	Analog 1	2	1	yes					
			2						
	Analog 1	2	3	yes					
			4						
	Analog 1	2	5	yes					
			6						
	Analog 1	2	7	yes					
			8						

Key 3: 1x8

Default Instrument			Monitor Routing		Decoder	Peakmeter Settings Ch. Gr. 1	Ch. Gr. 2	Ch. Gr. 3	Ch. Gr. 4
						8-CH	–	–	–
RTA 1/3	**Source**	**Channels**		**Stereo**	disabled	Position 1	–	–	–
	Digital 3	8	1a	–					
			1b						
			2a	–					
			2b						
			3a	–					
			3b						
			4a	–					
			ab						

Key 4: 4x2ST									
Default Instrument			**Monitor Routing**		**Decoder**	**Peakmeter Settings**			
						Ch. Gr. 1	**Ch. Gr. 2**	**Ch. Gr. 3**	**Ch. Gr. 4**
						2-CH Stereo + SpCor	2-CH Stereo + SpCor	2-CH Stereo + SpCor	2-CH Stereo + SpCor
Vectorscope	**Source**	**Channels**		**Stereo**	disabled	Position 1	Position 3	Position 2	Position 4
	Digital 3	2	1a	yes					
			1b						
	Digital 3	2	2a	yes					
			2b						
	Digital 3	2	3a	yes					
			3b						
	Digital 3	2	4a	yes					
			4b						

Key 5: 1x8									
Default Instrument			**Monitor Routing**		**Decoder**	**Peakmeter Settings**			
						Ch. Gr. 1	**Ch. Gr. 2**	**Ch. Gr. 3**	**Ch. Gr. 4**
						8-CH	–	–	–
RTA 1/3	**Source**	**Channels**		**Stereo**	disabled	Position 1	–	–	–
	SDI	8	1-1	–					
			1-2						
			1-3	–					
			1-4						
			2-1	–					
			2-2						
			2-3	–					
			2-4						

Key 6: 4x2ST									
Default Instrument			**Monitor Routing**		**Decoder**	**Peakmeter Settings**			
						Ch. Gr. 1	**Ch. Gr. 2**	**Ch. Gr. 3**	**Ch. Gr. 4**
						2-CH Stereo + SpCor	2-CH Stereo + SpCor	2-CH Stereo + SpCor	2-CH Stereo + SpCor
Vectorscope	**Source**	**Channels**		**Stereo**	disabled	Position 1	Position 3	Position 2	Position 4
	SDI	2	1-1	yes					
			1-2						
	SDI	2	1-3	yes					
			1-4						
	SDI	2	2-1	yes					
			2-2						
	SDI	2	2-3	yes					
			2-4						

Key 7: 1x8									
Default Instrument			**Monitor Routing**		**Decoder**	**Peakmeter Settings**			
						Ch. Gr. 1	**Ch. Gr. 2**	**Ch. Gr. 3**	**Ch. Gr. 4**
Dolby® Meta Data					**Dolby® E**	8-CH	–	–	–
	Source	**Channels**		**Stereo**	Digital 3	Position 1	–	–	–
	Decoder	8	1	–	1a				
			2		1b				
			3	–					
			4						
			5	–					
			6						
			7	–					
			8						

Factory Preset F11: SPEC (Special) **Program Meter: PPM, local routing**

Output Key Mode		Output Settings							
Deactivated	**Activated**	**Mode**	**Chan.**	**Digital Out 3**	**Direct Out 3**	**Digital Out 4**	**Direct Out 4**	**Chan.**	**Analog Out**
Analog	Digital 3	Multi-Channel	1a	L		L		1	L
			1b	R		R		2	R
			2a	off		off		3	off
			2b	off		off		4	off
			3a	off		off		5	off
			3b	off		off		6	off
			4a	off		off		7	off
			4b	off		off		8	off

Sub Presets of F11

Key 1: 3.1+DEX

Default Instrument		Monitor Routing	Decoder	Lext/Rext Routing	Downmix Routing	Peakmeter Settings			
						Ch. Gr. 1	**Ch. Gr. 2**	**Ch. Gr. 3**	**Ch. Gr. 4**
		Source:		**Source:**	**Source:**	3.1	Lext/Rext	SPL	–
SSA		Digital 3	disabled	Analog 1	Digital 3 (Discrete)	Position 1	Position 3	Position 2	–
	L	1a		7					
	R	1b		8					
	C	2a							
	S	2b							

Key 2: 3.1+EEX

Default Instrument		Monitor Routing	Decoder	Lext/Rext Routing	Downmix Routing	Peakmeter Settings			
						Ch. Gr. 1	**Ch. Gr. 2**	**Ch. Gr. 3**	**Ch. Gr. 4**
		Source:	**Dolby® E**	**Source:**	**Source:**	3.1	Lext/Rext	SPL	–
SSA		Decoder	Digital 3	Decoder	Decoder	Position 1	Position 3	Position 2	–
	L	1	1a/1b	7					
	R	2		8					
	C	3							
	S	4							

Key 3: 3.1+SEX

Default Instrument		Monitor Routing	Decoder	Lext/Rext Routing	Downmix Routing	Peakmeter Settings			
						Ch. Gr. 1	**Ch. Gr. 2**	**Ch. Gr. 3**	**Ch. Gr. 4**
		Source:	**Dolby® E**	**Source:**	**Source:**	3.1	Lext/Rext	SPL	–
SSA		Decoder	SDI	Analog 1	Decoder	Position 1	Position 3	Position 2	–
	L	1	1-1	7					
	R	2	1-2	8					
	C	3							
	S	4							

Key 4: 5.1+SEX

Default Instrument		Monitor Routing	Decoder	Lext/Rext Routing	Downmix Routing	Peakmeter Settings			
						Ch. Gr. 1	**Ch. Gr. 2**	**Ch. Gr. 3**	**Ch. Gr. 4**
		Source:	**Dolby® E**	**Source:**	**Source:**	5.1	Lext/Rext	SPL	–
SSA		Decoder	Digital 3	SDI	Off	Position 1	Position 3	Position 2	–
	L	left	1a/1b	2-3					
	R	right		2-4					
	C	center							
	LF	LF							
	LS	LS							
	RS	RS							

Key 5: 5.1+AEX

Default Instrument		Monitor Routing	Decoder	Lext/Rext Routing	Downmix Routing	Peakmeter Settings			
						Ch. Gr. 1	Ch. Gr. 2	Ch. Gr. 3	Ch. Gr. 4
		Source:	**Dolby® E**	**Source:**	**Source:**	5.1	Lext/Rext	SPL	–
SSA		Decoder	Digital 3	Analog 1	Off	Position 1	Position 3	Position 2	–
	L	left	1a/1b	1					
	R	right		2					
	C	center							
	LF	LF							
	LS	LS							
	RS	RS							

Key 6: 4XM+2X2

Default Instrument			Monitor Routing		Decoder	Peakmeter Settings			
						Ch. Gr. 1	Ch. Gr. 2	Ch. Gr. 3	Ch. Gr. 4
						4-CH	2-CH	2-CH	–
RTA 1/3	**Source**	**Channels**		**Stereo**	disabled	Position 1	Position 3	Position 2	–
	Analog 1	4	1	–					
			2						
			3						
			4						
	Digital 3	2	3a	no					
			3b						
	Digital 3	2	4a	no					
			b						

Key 7: 2XST+4XM

Default Instrument			Monitor Routing		Decoder	Peakmeter Settings			
						Ch. Gr. 1	Ch. Gr. 2	Ch. Gr. 3	Ch. Gr. 4
						2-CH Stereo + SpCor	2-CH Stereo + SpCor	2-CH	2-CH
Vectorscope	**Source**	**Channels**		**Stereo**	disabled	Position 1	Position 2	Position 3	Position 4
	Analog 1	2	1	yes					
			2						
	Digital 3	2	2a	yes					
			2b						
	Analog 1	2	5	no					
			6						
	Digital 3	2	4a	no					
			4b						

Factory Preset F12: 3.1 (3.1 Surround) Program Meter: PPM, local routing

Output Key Mode		Output Settings							
Deactivated	Activated	Mode	Chan.	Digital Out 3	Direct Out 3	Digital Out 4	Direct Out 4	Chan.	Analog Out
Analog	Digital 3	7.1	1a	L		L		1	L
			1b	R		R		2	R
			2a	C		C		3	C
			2b	S		S		4	S
			3a	off		off		5	off
			3b	off		off		6	off
			4a	off		off		7	off
			4b	off		off		8	off

Sub Presets of F12

Key 1: 3.1SUR

Default Instrument		Monitor Routing	Decoder	Lext/Rext Routing	Downmix Routing	Peakmeter Settings			
						Ch. Gr. 1	Ch. Gr. 2	Ch. Gr. 3	Ch. Gr. 4
		Source:		Source:	Source:	3.1	Lo/Ro	SPL	–
SSA		Analog 1	disabled	none	Off	Position 1	Position 3	Position 2	–
	L	1							
	R	2							
	C	3							
	S	4							

Key 2: 3.1+EX

Default Instrument		Monitor Routing	Decoder	Lext/Rext Routing	Downmix Routing	Peakmeter Settings			
						Ch. Gr. 1	Ch. Gr. 2	Ch. Gr. 3	Ch. Gr. 4
		Source:		Source:	Source:	3.1	Lext/Rext	SPL	–
SSA		Analog 1	disabled	Analog 1	Off	Position 1	Position 3	Position 2	–
	L	1		7					
	R	2		8					
	C	3							
	S	4							

Key 3: 3.1SUR

Default Instrument		Monitor Routing	Decoder	Lext/Rext Routing	Downmix Routing	Peakmeter Settings			
						Ch. Gr. 1	Ch. Gr. 2	Ch. Gr. 3	Ch. Gr. 4
		Source:		Source:	Source:	3.1	Lo/Ro	SPL	–
SSA		Digital 3	disabled	none	Digital 3 (Discrete)	Position 1	Position 3	Position 2	–
	L	1a							
	R	1b							
	C	2a							
	S	2b							

Key 4: 3.1+EX

Default Instrument		Monitor Routing	Decoder	Lext/Rext Routing	Downmix Routing	Peakmeter Settings			
						Ch. Gr. 1	Ch. Gr. 2	Ch. Gr. 3	Ch. Gr. 4
		Source:		Source:	Source:	3.1	Lext/Rext	SPL	–
SSA		Digital 3	disabled	none	Digital 3 (Discrete)	Position 1	Position 3	Position 2	–
	L	1a		4a					
	R	1b		4b					
	C	2a							
	S	2b							

Key 5: 3.1G12									
Default Instrument		**Monitor Routing**	**Decoder**	**Lext/Rext Routing**	**Downmix Routing**	**Peakmeter Settings**			
						Ch. Gr. 1	**Ch. Gr. 2**	**Ch. Gr. 3**	**Ch. Gr. 4**
		Source:		**Source:**	**Source:**	3.1	Lext/Rext	SPL	–
SSA		SDI	disabled	SDI	SDI (Discrete)	Position 1	Position 3	Position 2	–
	L	1-1		2-3					
	R	1-2		2-4					
	C	1-3							
	S	1-4							

Key 6: 3.1E34									
Default Instrument		**Monitor Routing**	**Decoder**	**Lext/Rext Routing**	**Downmix Routing**	**Peakmeter Settings**			
						Ch. Gr. 1	**Ch. Gr. 2**	**Ch. Gr. 3**	**Ch. Gr. 4**
		Source:	**Dolby® E**	**Source:**	**Source:**	3.1	Lext/Rext	SPL	–
SSA		Decoder	Digital 3	Decoder	Decoder	Position 1	Position 3	Position 2	–
	L	1	1a/1b	7					
	R	2		8					
	C	3							
	S	4							

Key 7: 3.1D12									
Default Instrument		**Monitor Routing**	**Decoder**	**Lext/Rext Routing**	**Downmix Routing**	**Peakmeter Settings**			
						Ch. Gr. 1	**Ch. Gr. 2**	**Ch. Gr. 3**	**Ch. Gr. 4**
		Source:	**ProLogic I**	**Source:**	**Source:**	3.1	Lext/Rext	SPL	–
SSA		Decoder	Digital 3	none	Decoder	Position 1	Position 3	Position 2	–
	L	L	1a/1b						
	R	R							
	C	C							
	S	S							

Factory Preset F13: 6.1 (6.1 Surround) Program Meter: PPM, local routing

Output Key Mode		Output Settings							
Deactivated	Activated	Mode	Chan.	Digital Out 3	Direct Out 3	Digital Out 4	Direct Out 4	Chan.	Analog Out
Analog	Digital 3	6.1	1a	L		L		1	L
			1b	R		R		2	R
			2a	C		C		3	C
			2b	LS		LS		4	LS
			3a	RS		RS		5	RS
			3b	CS		CS		6	CS
			4a	LF		LF		7	LF
			4b	off		off		8	off

Sub Presets of F13

Key 1: 6.1SUR

Default Instrument		Monitor Routing	Decoder	Lext/Rext Routing	Downmix Routing	Peakmeter Settings			
						Ch. Gr. 1	Ch. Gr. 2	Ch. Gr. 3	Ch. Gr. 4
		Source:		–	Source:	6.1	Lo/Ro	SPL	–
SSA		Analog 1	disabled	–	Off	Position 1	Position 2	Position 3	–
	L	1							
	R	2							
	C	3							
	LF	4							
	LS	5							
	CS	6							
	RS	7							
	–	–							

Key 2: 6.1SUR

Default Instrument		Monitor Routing	Decoder	Lext/Rext Routing	Downmix Routing	Peakmeter Settings			
						Ch. Gr. 1	Ch. Gr. 2	Ch. Gr. 3	Ch. Gr. 4
		Source:		–	Source:	6.1	Lo/Ro	SPL	–
SSA		Digital 3	disabled	–	Off	Position 1	Position 2	Position 3	–
	L	1a							
	R	1b							
	C	2a							
	LF	2b							
	LS	3a							
	CS	3b							
	RS	4a							
	–	–							

Key 3: 6.1S12

Default Instrument		Monitor Routing	Decoder	Lext/Rext Routing	Downmix Routing	Peakmeter Settings			
						Ch. Gr. 1	Ch. Gr. 2	Ch. Gr. 3	Ch. Gr. 4
		Source:		–	Source:	6.1	Lo/Ro	SPL	–
SSA		SDI	disabled	–	Off	Position 1	Position 2	Position 3	–
	L	1-1							
	R	1-2							
	C	1-3							
	LF	1-4							
	LS	2-1							
	CS	2-2							
	RS	2-3							
	–	–							

Key 4: 6.1S34

Default Instrument		Monitor Routing	Decoder	Lext/Rext Routing	Downmix Routing	Peakmeter Settings			
						Ch. Gr. 1	Ch. Gr. 2	Ch. Gr. 3	Ch. Gr. 4
		Source:		–	**Source:**	6.1	Lo/Ro	SPL	–
SSA		SDI	disabled	–	Off	Position 1	Position 2	Position 3	–
	L	3-1							
	R	3-2							
	C	3-3							
	LF	3-4							
	LS	4-1							
	CS	4-2							
	RS	4-3							
	–	–							

Key 5: 6.1E12

Default Instrument		Monitor Routing	Decoder	Lext/Rext Routing	Downmix Routing	Peakmeter Settings			
						Ch. Gr. 1	Ch. Gr. 2	Ch. Gr. 3	Ch. Gr. 4
		Source:	**Dolby® E**	–	**Source:**	6.1	Lo/Ro	SPL	–
SSA		Decoder	Digital 3	–	Off	Position 1	Position 2	Position 3	–
	L	1	1a/1b						
	R	2							
	C	3							
	LF	4							
	LS	5							
	CS	6							
	RS	7							
	–	–							

Key 6: 6.1E34

Default Instrument		Monitor Routing	Decoder	Lext/Rext Routing	Downmix Routing	Peakmeter Settings			
						Ch. Gr. 1	Ch. Gr. 2	Ch. Gr. 3	Ch. Gr. 4
		Source:	**Dolby® E**	–	**Source:**	6.1	Lo/Ro	SPL	–
SSA		Decoder	Digital 3	–	Off	Position 1	Position 2	Position 3	–
	L	1	2a/2b						
	R	2							
	C	3							
	LF	4							
	LS	5							
	CS	6							
	RS	7							
	–	–							

Key 7: 6.1S12

Default Instrument		Monitor Routing	Decoder	Lext/Rext Routing	Downmix Routing	Peakmeter Settings			
						Ch. Gr. 1	Ch. Gr. 2	Ch. Gr. 3	Ch. Gr. 4
		Source:	**Dolby® E**	–	**Source:**	6.1	Lo/Ro	SPL	–
SSA		Decoder	SDI	–	Off	Position 1	Position 2	Position 3	–
	L	1	1-1/1-2						
	R	2							
	C	3							
	LF	4							
	LS	5							
	CS	6							
	RS	7							
	–	–							

Factory Preset F14: 7.1 (7.1 Surround) Program Meter: PPM, local routing

Output Key Mode		Output Settings							
Deactivated	**Activated**	**Mode**	**Chan.**	**Digital Out 3**	**Direct Out 3**	**Digital Out 4**	**Direct Out 4**	**Chan.**	**Analog Out**
Analog	Digital 3	7.1	1a	L		L		1	L
			1b	R		R		2	R
			2a	C		C		3	C
			2b	LF		LF		4	LF
			3a	LS		LS		5	LS
			3b	RS		RS		6	RS
			4a	LC		LC		7	LC
			4b	RC		RC		8	RC

Sub Presets of F14

Key 1: 7.1SUR

Default Instrument		Monitor Routing	Decoder	Lext/Rext Routing	Downmix Routing	Peakmeter Settings			
						Ch. Gr. 1	**Ch. Gr. 2**	**Ch. Gr. 3**	**Ch. Gr. 4**
		Source:		**–**	**Source:**	7.1	Lo/Ro	SPL	–
SSA		Analog 1	disabled	–	Off	Position 1	Position 2	Position 3	–
	L	1							
	R	2							
	C	3							
	LF	4							
	LS	5							
	RS	6							
	LC	7							
	RC	8							

Key 2: 7.1SUR

Default Instrument		Monitor Routing	Decoder	Lext/Rext Routing	Downmix Routing	Peakmeter Settings			
						Ch. Gr. 1	**Ch. Gr. 2**	**Ch. Gr. 3**	**Ch. Gr. 4**
		Source:		**–**	**Source:**	7.1	none	SPL	–
SSA		Digital 3	disabled	–	Off	Position 1	Position 2	Position 3	–
	L	1a							
	R	1b							
	C	2a							
	LF	2b							
	LS	3a							
	RS	3b							
	LC	4a							
	RC	4b							

Key 3: 7.1G12

Default Instrument		Monitor Routing	Decoder	Lext/Rext Routing	Downmix Routing	Peakmeter Settings			
						Ch. Gr. 1	**Ch. Gr. 2**	**Ch. Gr. 3**	**Ch. Gr. 4**
		Source:		**–**	**Source:**	7.1	Lo/Ro	SPL	–
SSA		SDI	disabled	–	Off	Position 1	Position 2	Position 3	–
	L	1-1							
	R	1-2							
	C	1-3							
	LF	1-4							
	LS	2-1							
	RS	2-2							
	LC	2-3							
	RC	2-4							

Key 4: 7.1G34

Default Instrument		Monitor Routing	Decoder	Lext/Rext Routing	Downmix Routing	Peakmeter Settings			
						Ch. Gr. 1	Ch. Gr. 2	Ch. Gr. 3	Ch. Gr. 4
		Source:		–	**Source:**	7.1	Lo/Ro	SPL	–
SSA		SDI	disabled	–	Off	Position 1	Position 2	Position 3	–
	L	3-1							
	R	3-2							
	C	3-3							
	LF	3-4							
	LS	4-1							
	RS	4-2							
	LC	4-3							
	RC	4-4							

Key 5: 7.1E12

Default Instrument		Monitor Routing	Decoder	Lext/Rext Routing	Downmix Routing	Peakmeter Settings			
						Ch. Gr. 1	Ch. Gr. 2	Ch. Gr. 3	Ch. Gr. 4
		Source:	**Dolby® E**	–	**Source:**	7.1	Lo/Ro	SPL	–
SSA		Decoder	Digital 3	–	Off	Position 1	Position 2	Position 3	–
	L	1	1a/1b						
	R	2							
	C	3							
	LF	4							
	LS	5							
	RS	6							
	LC	7							
	RC	8							

Key 6: 7.1E34

Default Instrument		Monitor Routing	Decoder	Lext/Rext Routing	Downmix Routing	Peakmeter Settings			
						Ch. Gr. 1	Ch. Gr. 2	Ch. Gr. 3	Ch. Gr. 4
		Source:	**Dolby® E**	–	**Source:**	7.1	Lo/Ro	SPL	–
SSA		Decoder	Digital 3	–	Off	Position 1	Position 2	Position 3	–
	L	1	2a/2b						
	R	2							
	C	3							
	LF	4							
	LS	5							
	RS	6							
	LC	7							
	RC	8							

Key 7: 7.1S12

Default Instrument		Monitor Routing	Decoder	Lext/Rext Routing	Downmix Routing	Peakmeter Settings			
						Ch. Gr. 1	Ch. Gr. 2	Ch. Gr. 3	Ch. Gr. 4
		Source:	**Dolby® E**	–	**Source:**	7.1	Lo/Ro	SPL	–
SSA		Decoder	SDI	–	Off	Position 1	Position 2	Position 3	–
	L	1	1-1/1-2						
	R	2							
	C	3							
	LF	4							
	LS	5							
	RS	6							
	LC	7							
	RC	8							

Appendix B: Specifications

Functions

- multi format surround peakmeter (5.1, 6.1, 7.1)
- 2-channel peakmeter
- Multi-channel peakmeter
- ITU BS.1771 loudness meter
- selectable SPL meter
- Surround Sound Analyzer
- 10-fold multi phase meter display
- 1/3- and 1/6-octave spectrum analyzer
- 2- and 4-channel audio vectorscope
- Dialnorm meter
- Downmix meter
- AES/EBU status monitor
- 8-channel monitoring controller
- Test signal generator
- BLITS analyzer and generator
- HD/SD SDI inputs (319n0S, 319n0SD)
- Dolby® E and Dolby® AC-3 decoder (319n0D, 319n0SD)
- alarm functions

Analog Inputs

- Metering: 8 analog inputs, Sub-D-F connector, 25-pin
- Monitoring/Metering: 2 x 8 analog inputs, one Sub-D-F connector each, 25-pin
  - Adjustment range: Level Offset via software: ±8 dB
  - Maximum input level: +24 dBu
  - Impedance: > 10 kΩ, electr. balanced
  - Frequency response: 20 Hz to 22 kHz, ±0.25 dB @ 48 kHz
  - THD+N: < 105 dB @ 48 kHz
  - Crosstalk: < 105 dB (Frequency range 22 Hz to fs/2)
- Measuring microphone input: balanced, phantom power supply, XLR-F connector for measuring microphones with open circuit voltage of 15 mV/Pa @ 1 kHz

Digital Inputs

- Monitoring/Metering: 2 x 4 AES/EBU inputs, 110 Ω, transformer balanced, Sub-D-F connector, 25-pin, each connector features 4 in- and outputs
- HD/SD SDI (option): 2 x BNC (In, Through), any combination of max. 8 channels
- External clock signal: AES/EBU signal, transformer balanced, Sub-D-F connector, 25-pin
- Sampling rates: 44.1, 48, 96 kHz, synchronisation via digital input signal or Ref Sync input

Analog Outputs

- Monitoring: 8 analog outputs, electronically balanced, Sub-D-F connector, 25-pin
  - Maximum nominal level: for 0 dB FS selectable:
    - EBU RP68 (+18 dBu),
    - ARD (+15 dBu);
    - SMPTE RP155 (+24 dBu)
    - User (+18 .. +24 dBu)
- Frequency range: 20 Hz to 22 kHz, ±0.25 dB @ 48 kHz
  - THD+N: < 100 dB

Digital Outputs

- Monitoring: 2 x 4 AES/EBU outputs, 110 Ω, transformer balanced, Sub-D-F connector, 25-pin, each connector features 4 in- and outputs
- Sampling rates: same as digital inputs or internal, 44.1, 48, 96 kHz

Monitoring Controller

- Volume control: control range > 85 dB, mute, calibration in dB(A) possible
- Channel functions:
  - Solo,
  - Cut,
  - Phase,
  - Mono (Mono-to-Center or Mono-to-LR),
  - Side Swap,
  - Center-to-LR,
  - Rear-to-Front,
  - LF-to-Front,
  - DIM
  - Mute
- Channel level offset, delay (independent for both domains): level: ±10 dB, delay: 0 - 50 ms, respectively selectable for each channel
- Downmix matrix: 2-Channel mix of the monitoring surround signal, 2-channel mix derived from one of the inputs or decoder outputs, mixing coefficients selectable for each channel (if internal downmix matrix is used)

Program Meter: Peak Program Meter (PPM)

General (PPM)

- Input sources: Metering input (analog) or selected monitoring input, switching analog/digital
- Surround peakmeter: 5.1, 6.1 or 7.1 surround, track layout selectable:
  - SMPTE-TV(ITU, SSF),
  - SMPTE-Film,
  - DTS,
  - Film (L, C, R, LF, LS, RS)

- Multi-channel peakmeter: up to 8 single channels or up to 4 x 2-channel stereo pairs
- 2-Channel peakmeter: for the defined stereo channel pair L and R
- additional 2-Ch. peakmeter: selectable, for external signals or internal generated L_0/R_0 signals (2Ch-Downmix),
- SPL meter: selectable, indication of the total sound pressure level calculated from the individual channels
- Indicators:
  - peak level,
  - RMS level (linear, A-, C-, CCIR-, RLB-weighted),
  - peak hold,
  - numerical value of the peak hold level,
  - Digital Over
- Functions:
  - Gain (+20 dB, +40 dB acc. to standard),
  - Peak hold on,
  - RMS on,
  - Memory,
  - Reset,
  - Alarm (threshold over, silence)

Analog Peakmeters (PPM)

- Analog scales:
  - DIN5dB,
  - DIN10dB,
  - Nordic (N9, IEC 268 Type I),
  - British (Type IIa, IEC 268-10A),
  - British (Type IIb, IEC 268-10A),
  - VU,
  - British (Type IIa, IEC 268-10A),
  - British (Type IIa, IEC 268-10A),
  - Zoom +/–10dB,
  - Zoom +/–1dB,
  - SMPTE 24 dB – abs
  - SMPTE 20 dB – rel
  - NHK
- Integration time: according to standard or 300 ms, 20 ms, 10 ms, 1 ms, 0.1 ms
- Reference level (PML): according to standard:
  +6 dBu (DIN, Nordic), +9 dBu (British)
  - NHK: 0 dB @ system reference level
  - SMPTE 24 dB – abs: 0 dB @ 0 dBu
  - SMPTE 20 dB – rel: 0 dB @ +4 dBu

  selectable offset (± 8 dB)

Digital Peakmeters (PPM)

- Word width: 24 bit
- Digital scales:
  - Dig60dB (0 dB FS to –60 dB FS absolute)
  - Dig20dB (0 dB FS to –20 dB FS absolute)
  - Dig+18dB..0dB (18 dB to 0 dB relative, 0 dB @ –18 dB FS)
  - Dig+18dB..0..–18dB (18 dB to –18 dB rel., 0 dB @ –18 dB FS)
  - Dig+20..0..–40dB (20 dB to –40 dB rel., 0 dB @ –20 dB FS)

- ARD +9 dB to –60 dB
  (0 dB @ –9 dB FS)
- <q>DIN5dB,
- <q>DIN10dB,
- <q>Zoom +/–10dB
- <q>Zoom +/–1dB
  (0 dB @ headroom setting)
- <q>Nordic
  (+6 dB @ headroom setting)

• Headroom:	selectable in 1 dB steps from -5 dB FS to -20 dB FS
• Integration time (Attack):	sample or 20 ms, 10 ms, 1 ms, 0.1 ms
• Additional Gain:	40 dB
• High-pass filter:	Off, 5 Hz, 10 Hz, 20 Hz
• Peak Hold indicator:	integration time sample or same as level indication
• Over indicator (Clip):	
- Operating threshold:	FS, FS-1LSB, FS-2LSB, -0.1 dB FS, -0.5 dB FS, -1 dB FS, -2 dB FS, -3 dB FS
- Attack time:	1 to 15 samples
- Word width:	16 to 24 bit selectable

Program Meter: ITU BS.1771 Loudness Meter

ITU BS.1771 Loudness display:	• Bargraphs vertical for each single channel • **M** bargraph (Momentary - summation of momentary loudness values of all channels for a short span of time) • **I** bargraph (Integrated - Loudness value of an adjustable dynamic time frame, summation of Momentary values) • **L** bargraph (Longterm - Loudness value) infinite or manual control
Bargraph display:	• Loudness only • Loudness + PPM
Numeric display:	for integrated (**I**) and longterm (**L**) values
Chart display:	for integrated (**I**) and longterm (**L**) values
Weighting filter:	RLB (K)
Scale:	Loudness scale according to ITU BS.1771: –21 to +9
Reference value for 0:	–24 dB FS, selectable in steps of 1 dB in the range of –30 dB FS to –10 dB FS
Units:	LKFS or dB LU
Headroom:	0 to +9
Alarm threshold:	+8, selectable between 0 and +9
Alarm hold:	1 s, 5 s, or manual reset
Integration time for Momentary:	125 ms (IEC), 250 ms (IRT), 500 ms, 750 ms, 1 s (IEC), 1.5 s, 2 s
Integration time for Integrated:	20 s, time frame selectable between 1 s and 20 s
Integration time for Longterm:	1 hour to 7 days 23 hours

Threshold:	on/off selectable
Threshold mode:	fixed or dynamic
Threshold absolute (if fixed selected for mode):	–20, selectable between 0 and –40
Threshold offset (if dynamic selected for mode):	–12, selectable between 0 and –12
Level adjustment for the summation:	• 0.0 dB (L, R, C), selectable between –3 dB and +3 dB in steps of 0.5 dB • +1.5 dB (LS, RS), selectable between –3 dB and +3 dB in steps of 0.5 dB
Recalc data:	on/off selectable

SPL Meter

• Measuring range:	Low: 50 – 78 dB(SPL) Mid: 70 – 98 dB(SPL) High: 90 – 118 dB(SPL)
• Input sources:	internal (mix of the surround channels), external (measuring input)
• Weighting:	linear, A, C, CCIR, RLB
• Integration time:	F (125 ms), S (1 s)

Surround Sound Analyzer

(available in surround mode only)

• Indicators:	- graphics display indicating the single channel and total program loudness (Total Volume Indicator) - correlation of adjacent channels - position and width of phantom sound sources (PSI) - Dominance indicator (DMI)

Multi-fold Phase Meter

• Surround mode	
- Display mode:	for each channel pair in 5.1 format
- Filter:	low pass filter switchable (300 Hz)
• Multi-channel mode	
- Display mode:	for the defined stereo channel pair
• 2 Channel Stereo mode	
- Display mode:	for the defined stereo channel pair L and R and the external channels L_{ext} and R_{ext}

Audio Vectorscope

- Surround mode
  - Modes: - 2-channel
    - 4-channel (fixed: L-R upper part, LS-RS lower part)
  - Input sources: in 2-channel mode selectable: L-R, LS-RS, L-LS, R-RS, L-C, C-R, L_{ext}-R_{ext}, L_0-R_0
  - Auto Gain: fast/slow
  - Functions: - Indication: Fast - Slow
    - Display: Normal - M/S
  - Phase meter: in 2- and 4-channel mode for displayed channel pairs
- Multi-Channel mode
  - Input sources: defined and selected stereo channel pair
- 2 Channel Stereo mode
  - Input sources: L-R
  - Auto Gain: fast/slow
  - Functions: - indication: Fast - Slow
    - display: Normal - M/S
  - Phase meter: for the defined stereo channel pair L and R and the external channels L_{ext} and R_{ext}

Spectrum Analyzer (RTA)

- Input sources: Selectable: all channels without LF, Rear, L/R, single channels, measuring input
- Frequency range: - Norm: 20 Hz to 20 kHz, add-on band > 20 kHz to fs/2
  - LF: 5 Hz to 5 kHz
- Number of bands: - 1/3-octave: 31 bands, Filter acc. to IEC 225 class 2,
  - 1/6-octave: 61 bands
- Measuring range: 45 dB
- Resolution: 1, 2, 3 dB
- Functions: - Input select
  - Peak hold on
  - Display hold
  - Cursor readout
  - A-, C-weighting
  - Integration time
  - Set reference
  - Scaling
  - Frequency range
- Integration time: I (impulse), F, S, peak (10 ms)

Downmix Meter

(available in surround mode only)

- Input sources: internal generated downmix signals, external 2-channel signals or internal decoded downmix
- Indicators:
  - peak level
  - peak hold
  - RMS
  - audio vector scope
  - phase meter

  for scales and standards see analog/digital peakmeter

Test Signal Generator (1)

- Signals:
  - pink noise: 20 Hz to 20 kHz
    200 Hz to 20 kHz
  - octave-band noise
  - sine wave
- Level:
  - 3 selectable levels:
    -9, -18 , -20 dB FS RMS
  - variable in 1 dB steps:
    from 0 dB FS to -99 dB FS
- Outputs: analog or digital

Test Signal Generator (2)

- Signals: noise/sine wave
- Level: 0 dB FS to –60 dB FS
- Frequency: 20, 25, 50, 100, 250, 500, 1k, 2k, 4k, 8k, 10k
- Outputs: direct out, analog or digital

Test Signal Generator (3) BLITS

- Signals: BLITS, plus optional header from wav-file
- Outputs: direct out, analog or digital

AES/EBU Status Monitor

- Indicators:
  - channel data are displayed as plain text, hex or binary
  - channel selectable
  - audio bit activity
  - hardware status

Dolby® option

- Decoder modes:
  - Dolby® E
  - Dolby® AC-3
  - Dolby® Pro Logic I
- Decoder inputs: analog, digital, HD/SD SDI
- Decoder outputs: to monitoring and metering and/or direct out
- Downmix modes: Lt/Rt, Lo/Ro, Mono, Mute

System

- Remote control: RS-422, for connecting up to three units (31900 series) or up to two (31960 series) of Remote Control 30050.
  Sub-D-F connector, 9-pin
- GP IO (parallel):
  - 16 inputs, functions internal adjustable
  - 8 outputs for indication of alert events (threshold over, silence, Digital Over), or as defined in Sub Presets

  Sub-D-F connector, 25-pin
  - GP IO inputs: active low, pulse or momentary function internal adjustable
  - GP IO outputs: internal adjustable active high or low, (0.1 s, 0.5 s, 1 s, 2 s, manual)
- USB: for connecting a computer mouse, USB 1.1, I_{max} 0.5 A
- Network: software update
- Video: VGA, 640 x 480, 256 colours, 60 Hz, for connecting a CRT or TFT monitor or the optional 8.4-inch Remote Display 30010

General

- Operating temperature range: 0° to +45° C

SurroundControl 31900 series

- Power requirements: 85 to 264 V AC, 60 VA
- Dimensions: 19-inch/1U rack mount housing, depth 225 mm
- Weight: 3,7 kg
- Items supplied:
  - main unit 31900
  - Remote Control 30050
  - mains supply cable
  - operating manual

SurroundControl 31960 series

- Power requirements: +24 V DC, 40 VA (adapted power supply required
- Display: 6.5'' VGA TFT display
- Dimensions: 218.8 x 132.6 x 242.3 mm (W x H x D)
- Weight: approx. 2.5 kg
- Items supplied:
  - Half-19''/3U plug-in module with TFT display and control panel
  - Locking 4-pin low voltage connector type Binder 710 for power supply
  - mounting adaptors for standard 19'' rack mount cabinets for wave form monitors with 407 mm depth
  - operating manual

Remote Control 30050

- Dimensions: 106 x 55 x 176 mm (W x H x D)
- Weight: 600 g with cable
- Type of connection: fixed cable, 5 m, with Sub-D-m connector, 9-pin
- Max. cable length: 25 m

Optional accessories for 31900 series

- Remote Display 30010
- additional Remote Control 30050
- snake cable 1186 (8 x XLR-f connector to Sub-D-m connector, 25-pin, length 4 m)
- snake cable 1163 (8 x XLR-m connector to Sub-D-m connector, 25-pin, length 4 m)
- snake cable 1167 (4 x XLR-m and 4 x XLR-f connector to Sub-D-m connector, 25-pin, length 4 m)

Optional accessories for 31960 series

- Wide voltage power supply 1177A-R (90 to 264 V AC/24 V DC, 3.0 A)
- Remote Display 30010
- additional Remote Control 30050
- snake cable 1186 (8 x XLR-f connector to Sub-D-m connector, 25-pin, length 4 m)
- snake cable 1163 (8 x XLR-m connector to Sub-D-m connector, 25-pin, length 4 m)
- snake cable 1167 (4 x XLR-m and 4 x XLR-f connector to Sub-D-m connector, 25-pin, length 4 m)

Subject to changes without prior notice

Appendix C: Declaration of Conformity

EC Declaration of Conformity
Directive 2004/108/EG and Directive 2006/95/EG

We,

RTW GmbH & Co.KG
Elbeallee 19 · 50765 Köln · Germany

declare under sole responsibility that the product:

RTW SurroundControl 31900 series (inclusive Remote Control 30050)

meet the intend ot the Directive 2004/108/EG and Directive 2006/95/EG. Compliance was demonstrated to the following specifications as listed in the official Journal of the European Communities:

EMC	**2004/108/EG**
EN 61000-6-3: 2007-10-01 Emissions:	EN 55022: 2007-06-01 Class B, radiated EN 55022: 2007-06-01 Class B, conducted
EN 61000-6-1: 2007-12-01 Immunity:	EN 61000-4-2 + A1 + A2: 2002-02-01 EN 61000-4-3: 2007-11-01 EN 61000-4-4: 2005-09-01 EN 61000-4-5: 2007-08-01 EN 61000-4-6 + A1: 2002-02-01 EN 61000-4-11: 2005-04-01
Safety	**2006/95/EG**
EN 61010: 2004	

Tested and documented by the following companies:

SERCO GmbH, Bonn, accredited EMC laboratory
RTW GmbH & Co.KG, Köln

Date and signature of the responsible person:

2008-03-31

EC Declaration of Conformity
Directive 2004/108/EG and Directive 2006/95/EG

We,

RTW GmbH & Co.KG
Elbeallee 19 · 50765 Köln · Germany

declare under sole responsibility that the product:

RTW SurroundControl 31960 series

meet the intend ot the Directive 2004/108/EG and Directive 2006/95/EG. Compliance was demonstrated to the following specifications as listed in the official Journal of the European Communities:

EMC	**2004/108/EG**
EN 61000-6-3: 2007-10-01 Emissions:	EN 55022: 2007-06-01 Class B, radiated EN 55022: 2007-06-01 Class B, conducted
EN 61000-6-1: 2007-12-01 Immunity:	EN 61000-4-2 + A1 + A2: 2002-02-01 EN 61000-4-3: 2007-11-01 EN 61000-4-4: 2005-09-01 EN 61000-4-5: 2007-08-01 EN 61000-4-6 + A1: 2002-02-01 EN 61000-4-11: 2005-04-01
Safety	**2006/95/EG**
EN 61010: 2004	

Tested and documented by the following companies:

SERCO GmbH, Bonn, accredited EMC laboratory
RTW GmbH & Co.KG, Köln

Date and signature of the responsible person:

2008-03-31



Appendix D: Licenses

Information on the licenses that apply to the software supplied with the product

In addition to the hardware the RTW SurroundControl 31900 series products and the RTW SurroundControl 31960 series products also include a software package for which a variety of licenses apply:

A. Software produced by RTW GmbH & Co.KG, which may only be used for the proper operation of the product as described in the documentation (application, DSP programs, boot loader). This software is the property of RTW GmbH & Co.KG and is protected by German and international copyrights.

B. Third-party software (the Qt library from Trolltech AS), which is linked with the software described under A, and which also may only be used for the proper operation of the product. Qt® is a registered trademark of the Norwegian company Trolltech AS.

C. Open source software, released under the GPL (General Public License) of the Free Software Foundation (FSF):

   1. Linux Kernel 2.4.19
   2. TinyLogin 1.4
   3. sl811 USB Host Driver (by Cypress)
   4. Apache web server 1.3.6
   5. Busy Box 1.10

   The original English version of the GPL is included in appendix E. Only the original English version is legally binding, however.

   Some changes have been made to the open-source software packages 1 - 5 listed above. On request you can have the source code of the altered software sent to you within three years of purchasing the product.

Cologne, March 2008

Also see:
www.gnu.org/copyleft/gpl.html

Appendix E: GNU GENERAL PUBLIC LICENSE

Version 3, 29 June 2007

Copyright © 2007 Free Software Foundation, Inc. <http://fsf.org/>

Everyone is permitted to copy and distribute verbatim copies of this license document, but changing it is not allowed.

Preamble

The GNU General Public License is a free, copyleft license for software and other kinds of works.

The licenses for most software and other practical works are designed to take away your freedom to share and change the works. By contrast, the GNU General Public License is intended to guarantee your freedom to share and change all versions of a program--to make sure it remains free software for all its users. We, the Free Software Foundation, use the GNU General Public License for most of our software; it applies also to any other work released this way by its authors. You can apply it to your programs, too.

When we speak of free software, we are referring to freedom, not price. Our General Public Licenses are designed to make sure that you have the freedom to distribute copies of free software (and charge for them if you wish), that you receive source code or can get it if you want it, that you can change the software or use pieces of it in new free programs, and that you know you can do these things.
To protect your rights, we need to prevent others from denying you these rights or asking you to surrender the rights. Therefore, you have certain responsibilities if you distribute copies of the software, or if you modify it: responsibilities to respect the freedom of others.
For example, if you distribute copies of such a program, whether gratis or for a fee, you must pass on to the recipients the same freedoms that you received. You must make sure that they, too, receive or can get the source code. And you must show them these terms so they know their rights.

Developers that use the GNU GPL protect your rights with two steps: (1) assert copyright on the software, and (2) offer you this License giving you legal permission to copy, distribute and/or modify it.

For the developers' and authors' protection, the GPL clearly explains that there is no warranty for this free software. For both users' and authors' sake, the GPL requires that modified versions be marked as changed, so that their problems will not be attributed erroneously to authors of previous versions.

Some devices are designed to deny users access to install or run modified versions of the software inside them, although the manufacturer can do so. This is fundamentally incompatible with the aim of protecting users' freedom to change the software. The systematic pattern of such abuse occurs in the area of products for individuals to use, which is precisely where it is most unacceptable. Therefore, we have designed this version of the GPL to prohibit the practice for those products. If such problems arise substantially in other domains, we stand ready to extend this provision to those domains in future versions of the GPL, as needed to protect the freedom of users.

Finally, every program is threatened constantly by software patents. States should not allow patents to restrict development and use of software on general-purpose computers, but in those that do, we wish to avoid the special danger that patents applied to a free program could make it effectively proprietary. To prevent this, the GPL assures that patents cannot be used to render the program non-free.

The precise terms and conditions for copying, distribution and modification follow.

TERMS AND CONDITIONS

0. Definitions.

"This License" refers to version 3 of the GNU General Public License.

"Copyright" also means copyright-like laws that apply to other kinds of works, such as semiconductor masks.

"The Program" refers to any copyrightable work licensed under this License. Each licensee is addressed as "you". "Licensees" and "recipients" may be individuals or organizations.

To "modify" a work means to copy from or adapt all or part of the work in a fashion requiring copyright permission, other than the making of an exact copy. The resulting work is called a "modified version" of the earlier work or a work "based on" the earlier work.

A "covered work" means either the unmodified Program or a work based on the Program.

To "propagate" a work means to do anything with it that, without permission, would make you directly or secondarily liable for infringement under applicable copyright law, except executing it on a computer or modifying a private copy. Propagation includes copying, distribution (with or without modification), making available to the public, and in some countries other activities as well.

To "convey" a work means any kind of propagation that enables other parties to make or receive copies. Mere interaction with a user through a computer network, with no transfer of a copy, is not conveying.

An interactive user interface displays "Appropriate Legal Notices" to the extent that it includes a convenient and prominently visible feature that (1) displays an appropriate copyright notice, and (2) tells the user that there is no warranty for the work (except to the extent that warranties are provided), that licensees may convey the work under this License, and how to view a copy of this License. If the interface presents a list of user commands or options, such as a menu, a prominent item in the list meets this criterion.

1. Source Code.

The "source code" for a work means the preferred form of the work for making modifications to it. "Object code" means any non-source form of a work.

A "Standard Interface" means an interface that either is an official standard defined by a recognized standards body, or, in the case of interfaces specified for a particular programming language, one that is widely used among developers working in that language.

The "System Libraries" of an executable work include anything, other than the work as a whole, that (a) is included in the normal form of packaging a Major Component, but which is not part of that Major Component, and (b) serves only to enable use of the work with that Major Component, or to implement a Standard Interface for which an implementation is available to the public in source code form. A "Major Component", in this context, means a major essential component (kernel, window system, and so on) of the specific operating system (if any) on which the executable work runs, or a compiler used to produce the work, or an object code interpreter used to run it.

The "Corresponding Source" for a work in object code form means all the source code needed to generate, install, and (for an executable work) run the object code and to modify the work, including scripts to control those activities. However, it does not include the work's System Libraries, or general-purpose tools or

generally available free programs which are used unmodified in performing those activities but which are not part of the work. For example, Corresponding Source includes interface definition files associated with source files for the work, and the source code for shared libraries and dynamically linked subprograms that the work is specifically designed to require, such as by intimate data communication or control flow between those subprograms and other parts of the work.

The Corresponding Source need not include anything that users can regenerate automatically from other parts of the Corresponding Source.

The Corresponding Source for a work in source code form is that same work.

2. Basic Permissions.

All rights granted under this License are granted for the term of copyright on the Program, and are irrevocable provided the stated conditions are met. This License explicitly affirms your unlimited permission to run the unmodified Program. The output from running a covered work is covered by this License only if the output, given its content, constitutes a covered work. This License acknowledges your rights of fair use or other equivalent, as provided by copyright law.

You may make, run and propagate covered works that you do not convey, without conditions so long as your license otherwise remains in force. You may convey covered works to others for the sole purpose of having them make modifications exclusively for you, or provide you with facilities for running those works, provided that you comply with the terms of this License in conveying all material for which you do not control copyright. Those thus making or running the covered works for you must do so exclusively on your behalf, under your direction and control, on terms that prohibit them from making any copies of your copyrighted material outside their relationship with you.

Conveying under any other circumstances is permitted solely under the conditions stated below. Sublicensing is not allowed; section 10 makes it unnecessary.

3. Protecting Users' Legal Rights From Anti-Circumvention Law.

No covered work shall be deemed part of an effective technological measure under any applicable law fulfilling obligations under article 11 of the WIPO copyright treaty adopted on 20 December 1996, or similar laws prohibiting or restricting circumvention of such measures.

When you convey a covered work, you waive any legal power to forbid circumvention of technological measures to the extent such circumvention is effected by exercising rights under this License with respect to the covered work, and you disclaim any intention to limit operation or modification of the work as a means of enforcing, against the work's users, your or third parties' legal rights to forbid circumvention of technological measures.

4. Conveying Verbatim Copies.

You may convey verbatim copies of the Program's source code as you receive it, in any medium, provided that you conspicuously and appropriately publish on each copy an appropriate copyright notice; keep intact all notices stating that this License and any non-permissive terms added in accord with section 7 apply to the code; keep intact all notices of the absence of any warranty; and give all recipients a copy of this License along with the Program.

You may charge any price or no price for each copy that you convey, and you may offer support or warranty protection for a fee.

5. Conveying Modified Source Versions.

You may convey a work based on the Program, or the modifications to produce it from the Program, in the form of source code under the terms of section 4, provided that you also meet all of these conditions:

a) The work must carry prominent notices stating that you modified it, and giving a relevant date.

b) The work must carry prominent notices stating that it is released under this License and any conditions added under section 7. This requirement modifies the requirement in section 4 to “keep intact all notices”.

c) You must license the entire work, as a whole, under this License to anyone who comes into possession of a copy. This License will therefore apply, along with any applicable section 7 additional terms, to the whole of the work, and all its parts, regardless of how they are packaged. This License gives no permission to license the work in any other way, but it does not invalidate such permission if you have separately received it.

d) If the work has interactive user interfaces, each must display Appropriate Legal Notices; however, if the Program has interactive interfaces that do not display Appropriate Legal Notices, your work need not make them do so.

A compilation of a covered work with other separate and independent works, which are not by their nature extensions of the covered work, and which are not combined with it such as to form a larger program, in or on a volume of a storage or distribution medium, is called an “aggregate” if the compilation and its resulting copyright are not used to limit the access or legal rights of the compilation's users beyond what the individual works permit. Inclusion of a covered work in an aggregate does not cause this License to apply to the other parts of the aggregate.

6. Conveying Non-Source Forms.

You may convey a covered work in object code form under the terms of sections 4 and 5, provided that you also convey the machine-readable Corresponding Source under the terms of this License, in one of these ways:

a) Convey the object code in, or embodied in, a physical product (including a physical distribution medium), accompanied by the Corresponding Source fixed on a durable physical medium customarily used for software interchange.

b) Convey the object code in, or embodied in, a physical product (including a physical distribution medium), accompanied by a written offer, valid for at least three years and valid for as long as you offer spare parts or customer support for that product model, to give anyone who possesses the object code either (1) a copy of the Corresponding Source for all the software in the product that is covered by this License, on a durable physical medium customarily used for software interchange, for a price no more than your reasonable cost of physically performing this conveying of source, or (2) access to copy the Corresponding Source from a network server at no charge.

c) Convey individual copies of the object code with a copy of the written offer to provide the Corresponding Source. This alternative is allowed only occasionally and noncommercially, and only if you received the object code with such an offer, in accord with subsection 6b.

d) Convey the object code by offering access from a designated place (gratis or for a charge), and offer equivalent access to the Corresponding Source in the same way through the same place at no further charge. You need not require recipients to copy the Corresponding Source along with the object code. If the place to copy the object code is a network server, the Corresponding Source may be on a different server (operated by you or a third party) that supports equivalent copying facilities, provided you maintain

clear directions next to the object code saying where to find the Corresponding Source. Regardless of what server hosts the Corresponding Source, you remain obligated to ensure that it is available for as long as needed to satisfy these requirements.

e) Convey the object code using peer-to-peer transmission, provided you inform other peers where the object code and Corresponding Source of the work are being offered to the general public at no charge under subsection 6d.

A separable portion of the object code, whose source code is excluded from the Corresponding Source as a System Library, need not be included in conveying the object code work.

A "User Product" is either (1) a "consumer product", which means any tangible personal property which is normally used for personal, family, or household purposes, or (2) anything designed or sold for incorporation into a dwelling. In determining whether a product is a consumer product, doubtful cases shall be resolved in favor of coverage. For a particular product received by a particular user, "normally used" refers to a typical or common use of that class of product, regardless of the status of the particular user or of the way in which the particular user actually uses, or expects or is expected to use, the product. A product is a consumer product regardless of whether the product has substantial commercial, industrial or non-consumer uses, unless such uses represent the only significant mode of use of the product.

"Installation Information" for a User Product means any methods, procedures, authorization keys, or other information required to install and execute modified versions of a covered work in that User Product from a modified version of its Corresponding Source. The information must suffice to ensure that the continued functioning of the modified object code is in no case prevented or interfered with solely because modification has been made.

If you convey an object code work under this section in, or with, or specifically for use in, a User Product, and the conveying occurs as part of a transaction in which the right of possession and use of the User Product is transferred to the recipient in perpetuity or for a fixed term (regardless of how the transaction is characterized), the Corresponding Source conveyed under this section must be accompanied by the Installation Information. But this requirement does not apply if neither you nor any third party retains the ability to install modified object code on the User Product (for example, the work has been installed in ROM).

The requirement to provide Installation Information does not include a requirement to continue to provide support service, warranty, or updates for a work that has been modified or installed by the recipient, or for the User Product in which it has been modified or installed. Access to a network may be denied when the modification itself materially and adversely affects the operation of the network or violates the rules and protocols for communication across the network.

Corresponding Source conveyed, and Installation Information provided, in accord with this section must be in a format that is publicly documented (and with an implementation available to the public in source code form), and must require no special password or key for unpacking, reading or copying.

7. Additional Terms.

"Additional permissions" are terms that supplement the terms of this License by making exceptions from one or more of its conditions. Additional permissions that are applicable to the entire Program shall be treated as though they were included in this License, to the extent that they are valid under applicable law. If additional permissions apply only to part of the Program, that part may be used separately under those permissions, but the entire Program remains governed by this License without regard to the additional permissions.

When you convey a copy of a covered work, you may at your option remove any additional permissions from that copy, or from any part of it. (Additional permissions may be written to require their own removal in certain cases when you modify the work.) You may place additional permissions on material, added by you to a covered work, for which you have or can give appropriate copyright permission.

Notwithstanding any other provision of this License, for material you add to a covered work, you may (if authorized by the copyright holders of that material) supplement the terms of this License with terms:

a) Disclaiming warranty or limiting liability differently from the terms of sections 15 and 16 of this License; or

b) Requiring preservation of specified reasonable legal notices or author attributions in that material or in the Appropriate Legal Notices displayed by works containing it; or

c) Prohibiting misrepresentation of the origin of that material, or requiring that modified versions of such material be marked in reasonable ways as different from the original version; or

d) Limiting the use for publicity purposes of names of licensors or authors of the material; or

e) Declining to grant rights under trademark law for use of some trade names, trademarks, or service marks; or

f) Requiring indemnification of licensors and authors of that material by anyone who conveys the material (or modified versions of it) with contractual assumptions of liability to the recipient, for any liability that these contractual assumptions directly impose on those licensors and authors.

All other non-permissive additional terms are considered “further restrictions” within the meaning of section 10. If the Program as you received it, or any part of it, contains a notice stating that it is governed by this License along with a term that is a further restriction, you may remove that term. If a license document contains a further restriction but permits relicensing or conveying under this License, you may add to a covered work material governed by the terms of that license document, provided that the further restriction does not survive such relicensing or conveying.

If you add terms to a covered work in accord with this section, you must place, in the relevant source files, a statement of the additional terms that apply to those files, or a notice indicating where to find the applicable terms.

Additional terms, permissive or non-permissive, may be stated in the form of a separately written license, or stated as exceptions; the above requirements apply either way.

8. Termination.

You may not propagate or modify a covered work except as expressly provided under this License. Any attempt otherwise to propagate or modify it is void, and will automatically terminate your rights under this License (including any patent licenses granted under the third paragraph of section 11).

However, if you cease all violation of this License, then your license from a particular copyright holder is reinstated (a) provisionally, unless and until the copyright holder explicitly and finally terminates your license, and (b) permanently, if the copyright holder fails to notify you of the violation by some reasonable means prior to 60 days after the cessation.

Moreover, your license from a particular copyright holder is reinstated permanently if the copyright holder notifies you of the violation by some reasonable means, this is the first time you have received notice of violation of this License (for any work) from that copyright holder, and you cure the violation prior to 30 days after your receipt of the notice.

Termination of your rights under this section does not terminate the licenses of parties who have received copies or rights from you under this License. If your rights have been terminated and not permanently reinstated, you do not qualify to receive new licenses for the same material under section 10.

9. Acceptance Not Required for Having Copies.

You are not required to accept this License in order to receive or run a copy of the Program. Ancillary propagation of a covered work occurring solely as a consequence of using peer-to-peer transmission to receive a copy likewise does not require acceptance. However, nothing other than this License grants you permission to propagate or modify any covered work. These actions infringe copyright if you do not accept this License. Therefore, by modifying or propagating a covered work, you indicate your acceptance of this License to do so.

10. Automatic Licensing of Downstream Recipients.

Each time you convey a covered work, the recipient automatically receives a license from the original licensors, to run, modify and propagate that work, subject to this License. You are not responsible for enforcing compliance by third parties with this License.

An “entity transaction” is a transaction transferring control of an organization, or substantially all assets of one, or subdividing an organization, or merging organizations. If propagation of a covered work results from an entity transaction, each party to that transaction who receives a copy of the work also receives whatever licenses to the work the party's predecessor in interest had or could give under the previous paragraph, plus a right to possession of the Corresponding Source of the work from the predecessor in interest, if the predecessor has it or can get it with reasonable efforts.

You may not impose any further restrictions on the exercise of the rights granted or affirmed under this License. For example, you may not impose a license fee, royalty, or other charge for exercise of rights granted under this License, and you may not initiate litigation (including a cross-claim or counterclaim in a lawsuit) alleging that any patent claim is infringed by making, using, selling, offering for sale, or importing the Program or any portion of it.

11. Patents.

A “contributor” is a copyright holder who authorizes use under this License of the Program or a work on which the Program is based. The work thus licensed is called the contributor's “contributor version”.

A contributor's “essential patent claims” are all patent claims owned or controlled by the contributor, whether already acquired or hereafter acquired, that would be infringed by some manner, permitted by this License, of making, using, or selling its contributor version, but do not include claims that would be infringed only as a consequence of further modification of the contributor version. For purposes of this definition, “control” includes the right to grant patent sublicenses in a manner consistent with the requirements of this License.

Each contributor grants you a non-exclusive, worldwide, royalty-free patent license under the contributor's essential patent claims, to make, use, sell, offer for sale, import and otherwise run, modify and propagate the contents of its contributor version.

In the following three paragraphs, a “patent license” is any express agreement or commitment, however denominated, not to enforce a patent (such as an express permission to practice a patent or covenant not to sue for patent infringement). To “grant” such a patent license to a party means to make such an agreement or commitment not to enforce a patent against the party.

If you convey a covered work, knowingly relying on a patent license, and the Corresponding Source of the work is not available for anyone to copy, free of charge and under the terms of this License, through a publicly available network server or other readily accessible means, then you must either (1) cause the Corresponding Source to be so available, or (2) arrange to deprive yourself of the benefit of the patent license for this particular work, or (3) arrange, in a manner consistent with the requirements of this License, to extend the patent license to downstream recipients. “Knowingly relying” means you have actual knowledge that, but for the patent license, your conveying the covered work in a country, or your recipient's use of the covered work in a country, would infringe one or more identifiable patents in that country that you have reason to believe are valid.

If, pursuant to or in connection with a single transaction or arrangement, you convey, or propagate by procuring conveyance of, a covered work, and grant a patent license to some of the parties receiving the covered work authorizing them to use, propagate, modify or convey a specific copy of the covered work, then the patent license you grant is automatically extended to all recipients of the covered work and works based on it.

A patent license is “discriminatory” if it does not include within the scope of its coverage, prohibits the exercise of, or is conditioned on the non-exercise of one or more of the rights that are specifically granted under this License. You may not convey a covered work if you are a party to an arrangement with a third party that is in the business of distributing software, under which you make payment to the third party based on the extent of your activity of conveying the work, and under which the third party grants, to any of the parties who would receive the covered work from you, a discriminatory patent license (a) in connection with copies of the covered work conveyed by you (or copies made from those copies), or (b) primarily for and in connection with specific products or compilations that contain the covered work, unless you entered into that arrangement, or that patent license was granted, prior to 28 March 2007.

Nothing in this License shall be construed as excluding or limiting any implied license or other defenses to infringement that may otherwise be available to you under applicable patent law.

12. No Surrender of Others' Freedom.

If conditions are imposed on you (whether by court order, agreement or otherwise) that contradict the conditions of this License, they do not excuse you from the conditions of this License. If you cannot convey a covered work so as to satisfy simultaneously your obligations under this License and any other pertinent obligations, then as a consequence you may not convey it at all. For example, if you agree to terms that obligate you to collect a royalty for further conveying from those to whom you convey the Program, the only way you could satisfy both those terms and this License would be to refrain entirely from conveying the Program.

13. Use with the GNU Affero General Public License.

Notwithstanding any other provision of this License, you have permission to link or combine any covered work with a work licensed under version 3 of the GNU Affero General Public License into a single combined work, and to convey the resulting work. The terms of this License will continue to apply to the part which is the covered work, but the special requirements of the GNU Affero General Public License, section 13, concerning interaction through a network will apply to the combination as such.

14. Revised Versions of this License.

The Free Software Foundation may publish revised and/or new versions of the GNU General Public License from time to time. Such new versions will be similar in spirit to the present version, but may differ in detail to address new problems or concerns.

Each version is given a distinguishing version number. If the Program specifies that a certain numbered version of the GNU General Public License "or any later version" applies to it, you have the option of following the terms and conditions either of that numbered version or of any later version published by the Free Software Foundation. If the Program does not specify a version number of the GNU General Public License, you may choose any version ever published by the Free Software Foundation.

If the Program specifies that a proxy can decide which future versions of the GNU General Public License can be used, that proxy's public statement of acceptance of a version permanently authorizes you to choose that version for the Program.

Later license versions may give you additional or different permissions. However, no additional obligations are imposed on any author or copyright holder as a result of your choosing to follow a later version.

15. Disclaimer of Warranty.

THERE IS NO WARRANTY FOR THE PROGRAM, TO THE EXTENT PERMITTED BY APPLICABLE LAW. EXCEPT WHEN OTHERWISE STATED IN WRITING THE COPYRIGHT HOLDERS AND/OR OTHER PARTIES PROVIDE THE PROGRAM "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE ENTIRE RISK AS TO THE QUALITY AND PERFORMANCE OF THE PROGRAM IS WITH YOU. SHOULD THE PROGRAM PROVE DEFECTIVE, YOU ASSUME THE COST OF ALL NECESSARY SERVICING, REPAIR OR CORRECTION.

16. Limitation of Liability.

IN NO EVENT UNLESS REQUIRED BY APPLICABLE LAW OR AGREED TO IN WRITING WILL ANY COPYRIGHT HOLDER, OR ANY OTHER PARTY WHO MODIFIES AND/OR CONVEYS THE PROGRAM AS PERMITTED ABOVE, BE LIABLE TO YOU FOR DAMAGES, INCLUDING ANY GENERAL, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THE PROGRAM (INCLUDING BUT NOT LIMITED TO LOSS OF DATA OR DATA BEING RENDERED INACCURATE OR LOSSES SUSTAINED BY YOU OR THIRD PARTIES OR A FAILURE OF THE PROGRAM TO OPERATE WITH ANY OTHER PROGRAMS), EVEN IF SUCH HOLDER OR OTHER PARTY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

17. Interpretation of Sections 15 and 16.

If the disclaimer of warranty and limitation of liability provided above cannot be given local legal effect according to their terms, reviewing courts shall apply local law that most closely approximates an absolute waiver of all civil liability in connection with the Program, unless a warranty or assumption of liability accompanies a copy of the Program in return for a fee.

END OF TERMS AND CONDITIONS

How to Apply These Terms to Your New Programs

If you develop a new program, and you want it to be of the greatest possible use to the public, the best way to achieve this is to make it free software which everyone can redistribute and change under these terms.

To do so, attach the following notices to the program. It is safest to attach them to the start of each source file to most effectively state the exclusion of warranty; and each file should have at least the “copyright” line and a pointer to where the full notice is found.

> <one line to give the program's name and a brief idea of what it does.>
> Copyright (C) <year> <name of author>
>
> This program is free software: you can redistribute it and/or modify
> it under the terms of the GNU General Public License as published by
> the Free Software Foundation, either version 3 of the License, or
> (at your option) any later version.
>
> This program is distributed in the hope that it will be useful,
> but WITHOUT ANY WARRANTY; without even the implied warranty of
> MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the
> GNU General Public License for more details.
>
> You should have received a copy of the GNU General Public License
> along with this program. If not, see <http://www.gnu.org/licenses/>.

Also add information on how to contact you by electronic and paper mail.

If the program does terminal interaction, make it output a short notice like this when it starts in an interactive mode:

> <program> Copyright (C) <year> <name of author>
> This program comes with ABSOLUTELY NO WARRANTY; for details type `show w'.
> This is free software, and you are welcome to redistribute it
> under certain conditions; type `show c' for details.

The hypothetical commands `show w' and `show c' should show the appropriate parts of the General Public License. Of course, your program's commands might be different; for a GUI interface, you would use an “about box”.

You should also get your employer (if you work as a programmer) or school, if any, to sign a “copyright disclaimer” for the program, if necessary. For more information on this, and how to apply and follow the GNU GPL, see <http://www.gnu.org/licenses/>.

The GNU General Public License does not permit incorporating your program into proprietary programs. If your program is a subroutine library, you may consider it more useful to permit linking proprietary applications with the library. If this is what you want to do, use the GNU Lesser General Public License instead of this License. But first, please read <http://www.gnu.org/philosophy/why-not-lgpl.html>.

Appendix F: Index

Symbole

2C key 71

A

About-Info 187
Addressing (30050) 285
AES/EBU STATUS 29, 145
AES/EBU Status Monitor 29, 145
AGC 218
Alarm 253
Alarm threshold 329
Analog Silence 255
Analog Trim 244
Attack Time 256
Audio System 241
Audio Vectorscope 22, 101

B

BLITS 35, 162
BLITS 5.1 Surround Identification 35
BLITS background 163
BLITS functions 166
BLITS generator 164
BLITS intro update 303
BLITS outputs 164
BLITS parameters 164
BIITS Settings 248
BLITS wave intro 165

C

CAL 28, 133
CAL Instrument 129
CAL instrument functions 134
calibration instrument 129
Calibration Reference Level 246
Channel Group
85, 214, 218, 219, 231, 309, 310
Channel Group (ITU Loudness) 90
channel keys 70, 71
Channel Mode 200
channels 206, 207
Chart 94
clocking reference 41
Control 30050 (31900 series) 82
control functions 82
Control Keys 82
control keys 63, 67, 69, 81
control panel (31960 series)
63, 66, 82
Copy sub preset 199
CORR 23, 99, 100, 108, 109
CORR functions 110
correlation level 95
Correlation meter 95
Correlator 23, 99, 100, 108, 109
CS Channel key 73
Cut 50, 70

D

DC-Filter 225, 232
Decoder 202
Decoder parameters 153
decoder source 202
decoder type 203
Default Instrument 199
Delay 135, 244
DIALNORM 34, 158
Dialnorm background 159
DIALNORM functions 160
Dialnorm Meter 34
Dialnorm meter 158
Digital Silence 256
Digital Threshold Over 256
Digital Trim 244
DIM key 75
DIM Level 131
Direct Out 240
Disable GPI 263
Disable Keys 263
DLo/DRo 122
DMI 95, 99, 100
DOLBY® META DATA 33, 152
DOLBY® META DATA functions 155
Dolby® Meta Data Monitor 33
Dolby® Settings 266
Dominance Indicator 99, 100
Dominance Vector 95
DOWNMIX 121
Downmix 26
DOWNMIX functions 126
Downmix Matrix background 122
Downmix Meter 26, 121
Downmix Monitoring 263
downmix parameter 217
DOWNMIX parameters 124
Downmix Routing 211
Downmix Settings 212, 217
downmix source 212

E

Edit selected preset 179
EX key 72
external control 78
External Monitoring 262

F

Factory Presets 309
factory presets 179
Force reference source to SDI 243
function keys 66, 67, 69
Function Select 83

G

Gain 89
Gateway 252
General Preset Settings 180
General Settings 186
Generator Settings 248
Global Alarm Setting 253
Global Audio Settings 241
Global Communication Settings 251
Global General Settings 186
Global GPIO Settings 259
Global Meter Input Routing 190
global parameters 40
Global Routing Settings 188
Global Settings 169
Global Time Settings 251
GP IO 78
GP IO inputs 78
GP IO outputs 79

H

HARDWARE STATUS 32, 150
Hardware Status Monitor 32
HD/SD SDI 150
Headroom 225, 232, 256, 328

I

Input key 74
Input Routing 190
Input Sources, Switching 45
Input/Output Routing 188
INSTR 69
INSTRUMENT 69
Instrument Select 83
Instrument Settings 179
Instruments 81
Integrated 328
Integration time 225, 226, 231
IP Address 251
ITU BS. 1771 parameters 92
ITU BS.1771 328
ITU BS.1771 Loudness 229, 235
ITU BS.1771 Loudness background 91
ITU BS.1771 Loudness Meter 20, 84, 90
ITU BS.1771 Loudness Meter functions 93
ITU BS.1771 Loudness Settings 310

K

Key menu tabs 192
Key Settings 261

L

Level adjustment 329
Lext/Rext 210
Lext/Rext channels 122
Lext/Rext Routing 209
Lext/Rext source 210
LF Channel key 73
LF-Test 141
Lissajous 22, 101
Listening Group 76, 77, 106, 115, 208
Lo/Ro channels 122
Local Input/Output Routing 182
local parameters 40
Local Settings 169
Loudness Display 60
Loudness meter 328
Loudness Parameters 231, 235
Loudness Settings 206, 229, 231, 235
Loudspeaker Monitoring 48
low frequency test 141
Low Pass Filter 110
low pass filter 95
LPF 99, 110

M

Maximum SPL 244
Memory 88, 93
MENU 69
Menu 168
Menu Access 51
Menu lock 186
Menu Structure Reference 173
MODE 69
Momentary 328
Monitor Digital Out 240
MONITORING 27, 128, 144
Monitoring Controller 27, 128
MONITORING functions 130
Monitoring Input Routing 192

monitoring outputs, switching 49
MONITORING parameters 129
Monitoring Routing 204
monitoring source 206
Mono key 73
Mono Mode 130
MORE 69
Multi Channel mode 205
Mute 50

N

Nameserver 252
Netmask 251
NHK 226
NTP Server 252
Numeric 94

O

operating priority (30050) 286, 289
operation indicator
225, 227, 232, 237
Output key 76, 106, 115
Output Routing 239
Over Indicator 250
Over Samples 250
Over Sensitivity 250

P

parameters, change ref sync 151
peak hold 85, 89
Peak Hold fallback time
184, 213, 232
Peak Program Meter 19, 84, 85
Peak Program Meter functions 88
Peak Program Meter parameters 87
peakmeter parameters 219
Peakmeter Settings
206, 209, 212, 213, 217, 219, 309
PH Integration Time 225, 227
Phantom Source Indicator 95, 99
Phase 50, 70
Phase Meter 109
PML 255
polarity 50
Power On Preset 57
Power-On SPL 244
Power-On State 186
PPM 84, 85
PPM Input Source 196
preset volume 49
Presets 43, 309
Program Meter 18, 84, 201
PSI 95, 99

R

Real Time Analyzer 24, 25
Real Time Analzyer 111
Recalling Factory Presets 44
reference level 85, 86
Reference Level Offset 247
Reference Levels 246
reference sync signal 241
Remote Control 30050 285, 287
Remote Control 30050 (31900
series) 63, 66
Reset global settings 187
Reset working settings 187
response time 111
RMS response 213
Routing 54
RTA 184
RTA 1/3 24, 111
RTA 1/6 25, 111, 136
RTA functions 113, 115, 118
RTA parameters 112

S

Safety information 267
Safety Summary 12, 267
Safety Symbols 12
sample rate 41
sampling rates 241
Saving Presets 53
scale, analog 226
scale, digital 224, 231
SDI Channel Status Monitor 30
SDI INTERFACE 31, 149
SDI Interface Status Monitor 31
SDI STATUS 30, 147
SDI Status Monitor 147
SELECT 69
Select key 69
Selected Instruments 18
Service 285
Settings Analog 225
Settings Digital 224, 231
Signal Routing 172
Signal Select (CAL instrument) 138
Sine 143
sine wave 143
Software Update 289, 290
Solo 49, 70
Solo Mode 132
Sound Pressure Level 67
SPL 67
SPL bargraph 85
SPL Meter 144

SPL Meter functions 144
SPL sum 85, 86
SSA 21, 95
SSA background 96
SSA functions 99
Startup 39
Status Box 18
Stereo 208
Stereo Sound Analyzer 95
Sub Presets 45, 79, 171, 309
sub presets 192
Sum Group 235, 310
Sum Group (ITU Loudness) 90
Surround Sound Analyzer 21, 95
Swap 50, 70
Swap functions 70
Swapping channels 50
system clocking 241

T

Test Signal Limiter 247
Toolbar 18, 82
Toolbar Modes 83
Total Volume Indicator 95
Trim 134
TVI 95

U

Use Local Routing Settings 180
Use Preset 179
User Presets 309
User Presets export 295
User Presets import 299

V

Vectorscope 183
vectorscope functions 103, 106, 107
VLo/VRo 123
Vol Sens 133
volume control 49, 74
VSC 22, 101
VSC functions 103, 106, 107
VSC parameters 102
VU Lead 227

W

weighting filter 213