Operating manual

Peakmeter 1352 APH

RTW
RADIO-TECHNISCHE WERKSTÄTTEN GmbH & Co.KG
INSTRUMENTS FOR STUDIO APPLICATIONS

CE

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Scope of this manual

This manual is the operating handbook for the RTW Peakmeter 1352 APH. Features and functionality of the instruments are described in detail.

Chapter one contains a basic description of the instruments.

📖 **This symbol is used in the manual to draw your attention to related topics.**

Chapter two explains the setup of the Peakmeter. This would be the right point to start immediatly before operating the unit. This chapter also contains important information about safety.

Informations about setup for your specific installation needs and hints for troubleshooting can be found in chapter three.

Chapter four contains mechanical drawings.

The appendix covers all specifications and declarations of conformity.

Safety symbols

The following symbols may be marked on the panels or covers of equipment or modules, and are used in this manual:



WARNING! - This symbols 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 symbols allerts you to important operating considerations or a potential operating condition that could damage equipment. If you see this marked on equipment, consult the User´s manual or Operator 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.

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1. Introduction

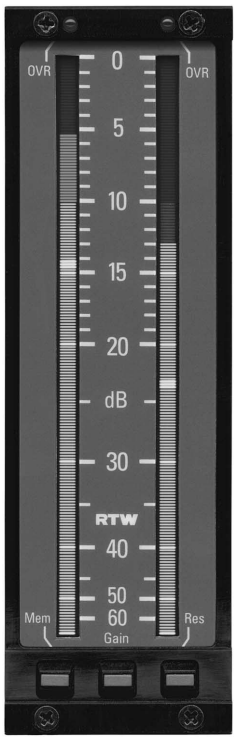


Fig 1-1: Peakmeter 1352 APH

The 1352 APH peakmeter are housed in a compact metal case and feature digital XLR in- and outputs. They support a couple of different operation modes.

Functions:

- Peak level display
- Memory
- Gain
- Overload indication

The 1352 APH peakmeters comprise a high resolution gas plasma display with 201 segments per channel.

The overload LED's will be lit once if the predefined values for digital overload are reached. Threshold and number of consecutive samples that lead to an overload flag can be adjusted in a wide range. The word width is fixed at 16 bit.

The instruments will be delivered with a digital scale and red filter starting at -10 dB (equals -10 dB FS) and an integration time of 10 msec.

2. Getting started

2.1. First time operation

The 1352 APH peakmeter are designed for built-in mounting in 3U standard rack.

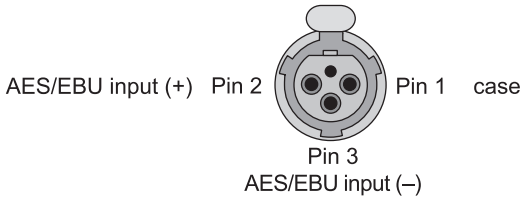
2.2. Connecting

A feature of the 1352 APH peakmeter are the built in XLR I/O connectors as well as a built in DC connector.

These are wired as follows:

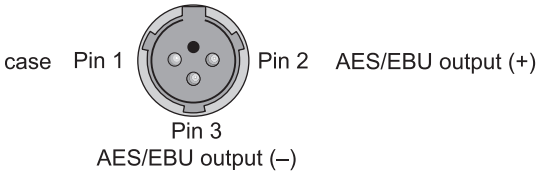
Digital input:

XLR-F connector (balanced)



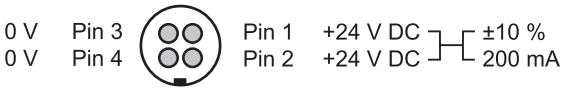
Digital output:

XLR-M connector (balanced)



Power supply:

DC connector



2.3. Safety symbols

The following symbols may be marked on the panels or covers of equipment or modules, and are used in this manual:



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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.

2.4. Safety information

Please read this safety information before using the instrument:

Do not service or repair this product unless properly qualified. Servicing should be peformed only by a qualified technician.



There are no user servicable parts inside the unit. Do not open the case while the unit is connected to power. High voltage exists inside the instrument.

The device has been designed for indoor use only.

Do not substitute parts or make any modifications without the written approval of RTW. Doing so may create safety and EMI hazards.

2.5. Connecting to a power supply

📖 **Connections: Page 2-1.**



The 1352 APH peakmeter requires a single voltage supply (+24 V DC/200 mA) for operation.

2.6. In- and output

📖 **Connections: Page 2-1.**

📖 **Setup changes: Page 3-1.**

The digital in- and outputs of the1352 APH peakmeter are balanced and floating. They are internally terminated with 110 Ω. The termination can be changed to High-Z by the use of an internal jumper.

2.7. Mode switches and LED functions

- GAIN KEY - The use of this pushbutton or its equivalent external function control boosts the input sensitivity by +40 dB.
- MEMO-KEY - The use of this pushbutton or its equivalent external function recalls the highest level value, since the last time a memory reset has been proceeded. Please keep attention to the fact that memory accuracy can be affected by interferenced signals (ESD- or Burst). This may cause misreadings from the memory or meter if you are using the instrument in an interferenced environment. A specific measurement of maximum level should be repeated if interference is suspected.
- RESET-KEY- The use of this pushbutton or its equivalent external function resets the memory.
- LED: OVR - The overload LED`s will be lit once the predefined values for digital overload are reached. Threshold and number of consecutive samples that lead to an overload flag can be adjusted in a wide range. The word width for assessment is fixed at 16 bit.



3. Calibration and Troubleshooting

3.1. Calibration

The PPM uses state of the art DSP technology. Scale and ballistics are defined in software. Based on this facts long term stability is guaranteed. Adjustment and calibration are not required.

3.2. Input impedance change

The peakmeter will be set to 110 Ω input resistance in the factory. This can be modified if necessary by setting a jumper to High-Z:

The peakmeter will be set to 110 Ω input resistance in the factory.

Other factory settings:

- **Headroom: -10 dB FS (fixed)**
- **Word width: 16 bit**
- **Number of oversamples: 4**
- **Overload threshold: fullscale**
- **Mode: bargraph**
- **Integration: 10 msec (fixed)**

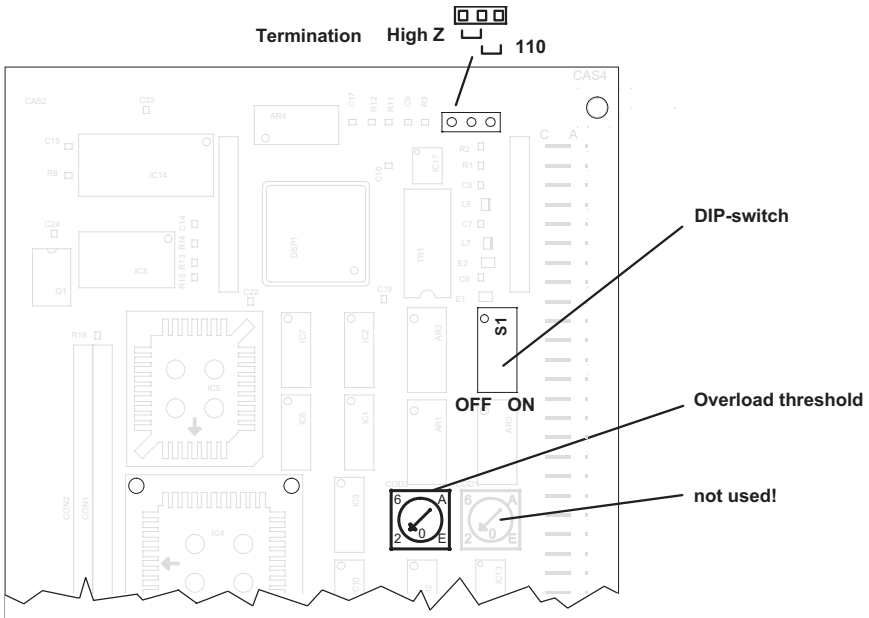


Fig 3-1 Partitial view of the basic board

Modification inside the unit must be carried out by qualified service personal with appropriate SMD-tools only. Power must have been shut down. When servicing it is very important to observe all stan-dard ESD (electrostatic discharge) protection procedures.

3.3. Setup changes

Setup changes for overload detection can be achieved by the use of the hex-switches displayed in fig. 3-1. The selection of the operation mode must be defined by the adjustment of the DIP switch 2. Other DIP switches give also control about settings for the peakhold time, HP-filter and standby-mode.

3.4. Hex switch functions

Hex switch position and meaning:

Switch-position:	Threshold Overload:	Headroom fixed -10 dB FS
0	Fullscale	
1	FS -1 LSB	
2	FS -2 LSB	
3	-0.1 dB FS	
4	-0.2 dB FS	
5	-0.5 dB FS	
6	-1.0 dB FS	
7	-2.0 dB FS	
8	-3.0 dB FS	
9	-4.0 dB FS	
A	-5.0 dB FS	
B	-6.0 dB FS	
C	-7.0 dB FS	
D	-8.0 dB FS	
E	-9.0 dB FS	
F	-10 dB FS	

3.5. DIP switch function

DIP switch position and functions:

Switchposition: **Function:**
Value: 0 corresponds to switch position OFF and 1 to switch position ON

Switch	**1**	**switch**	**2**	**scale type in use:**
Value:	0		0	bargraph only (factory preset)
	0		1	peakhold plus spot
	1		0	for service only
	1		1	for service only
Switch	**3**	**switch**	**4**	**Peakhold time** (only in SPOT mode)**:**
Value:	0		0	1 s
	0		1	4.0 s
	1		0	2.5 s (factory preset)
	1		1	manual
Switch	**5**	**switch**	**6**	**number of oversamples:**
Value:	0		0	3
	1		0	4 (factory preset)
	0		1	6
	1		1	8
Switch	**7**			**DC(HP)-Filter**
Value:	0			on (factory preset)
	1			off
Switch	**8**			**standby**
Value:	0			on (factory preset)
	1			off

3.6. Troubleshooting

Important: This description is not intended to be used as a service manual. These are guidelines for an expierenced service engineer to proceed a basic check up of our meter. However, we strongly recommend repair of faulty meters in our factory.

Please refer to the safety instruction before continuing.

If there is the assumption of a fault in our meter please proceed the following steps:

1. Open the upper meter cover. Store screws and metal plate.

2. Supply power and signal to the unit.

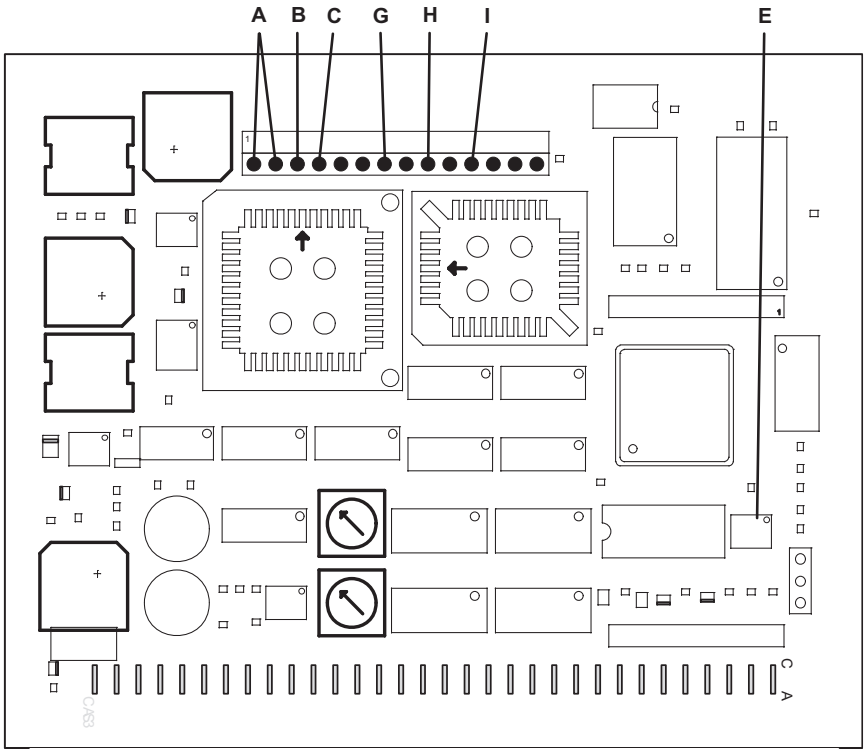


Fig. 3-2 Testpoints on main pcb (component side)

3. Measure for +18.3 V DC between point A (reference) and point B. If this voltage is missing the power supply on the main circuit board is broken. We recommend repair at the factory or exchange of the main pcb.

4. Measure for +5 V DC between point A (reference) and point C. If this voltage is missing the power supply on the main circuit board is broken. We recommend repair at the factory or exchange of the main pcb.

5. Use a scope to monitor the digital input datastream between point A (reference) and point E (IC-10 pin 2). If this waveform is faulty the input circuitry on the main circuit board is broken. We recommend repair at the factory or exchange of the main pcb.

6. Use a scope to monitor a waveform between point A (reference) and point G (left channel) and H (right channel). The waveform should show a pulse width modulation of the incomming signal. If this waveform is faulty the processing on the main circuit board is broken. We recommend repair at the factory or exchange of the main pcb.

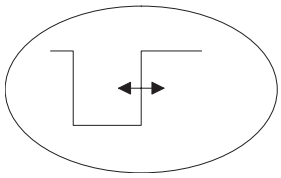


Fig. 3-3 Example of pulse width modulation waveform

7. Use a scope to monitor a waveform between point A (reference) and point I. The waveform should show a periodic pulse train. If this waveform is faulty the processing on the main circuit board is broken. We recommend repair at the factory or exchange of the main pcb.

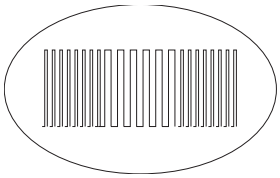


Fig. 3-4 Example of a periodic pulse train

8. If all the above mentioned test are ok the main pcb is working proper. Check for +130 to +150 V DC between point K (reference) and L (high voltage) on the display driver PCB. If this voltage is faulty the display driver circuit board is broken. We recommend repair at the factory or exchange of the complete display panel.

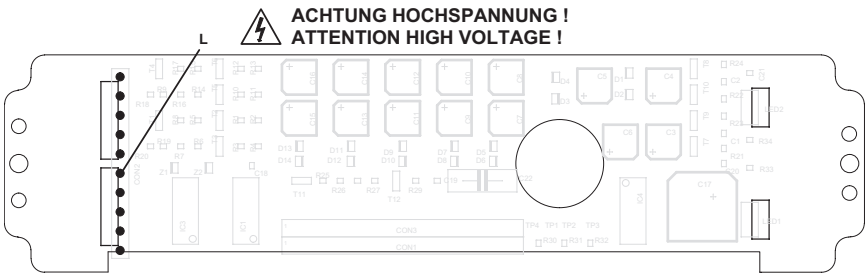
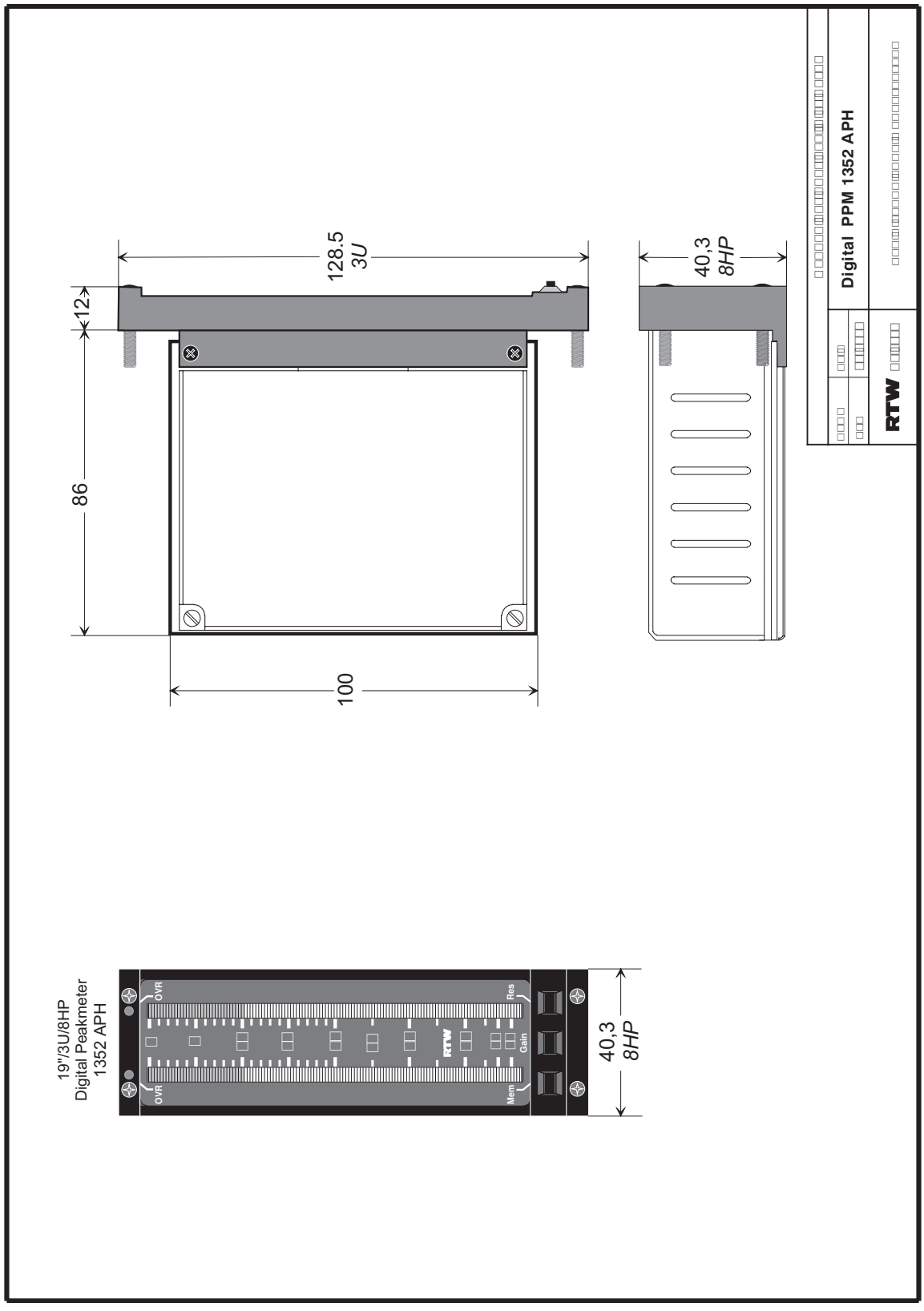


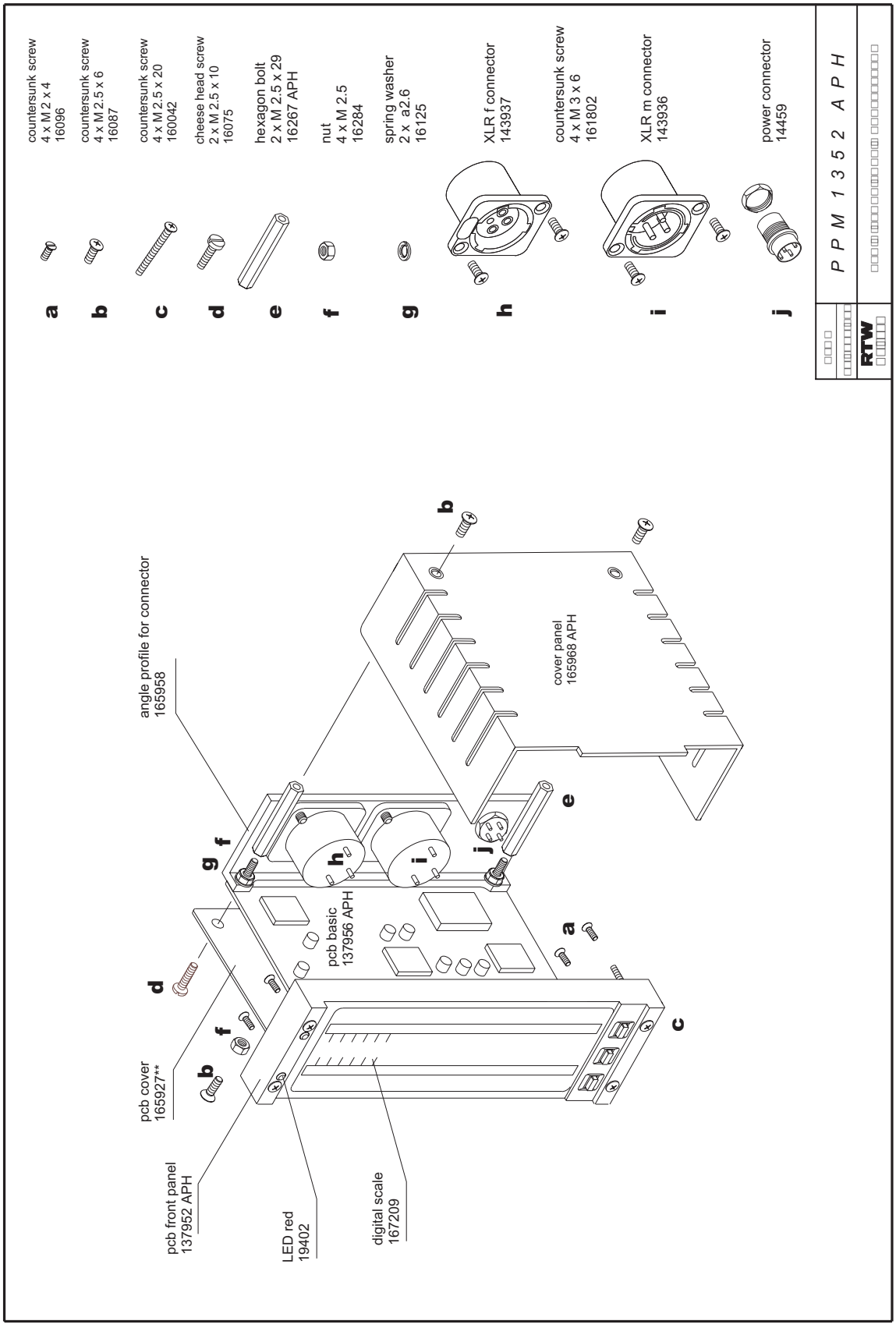
Fig. 3-5 Display driver pcb (component side)

4. Drawings

4.1. Mechanical outlines



4.2. Exploded view



4.3. Part list

4.3.1. Common parts

Part No.	Description	Type
Mechanical parts		
166599**	isolation cap	
160042	screw, countersunk M 2.5 x 20	
16096	screw, countersunk M 2 x 4	
16087	screw, countersunk M 2.5 x 6	
16075	screw, cylinder head M 2.5 x 10	
161802	screw, countersunk M 3 x 6 (for connector)	
16284	nut M 2,5	
16125	washer 2.6	
165968 APH	cover sheet (case)	APH
165958	angle profile (for connector)	APH
16267 APH	hexagon bolt M 2.5 x 29	
165927**	pcb cover, shielded	
Common electronical parts		
14318	jumper	
175614	bargraph display	SP-410-003
19402	LED red	
14610	AES/EBU transformer	double
143936	XLR-m connector	
143937	XLR-f connector	
14459	power connector	
PCB's		
137956 APH	main pcb	
137954	display driver pcb	
137958	pushbutton pcb	

4.3.2. Display and scale

Part No.	Description
137952 APH	frontpanel 1352 APH including display driver pcb
167209	digital scale vertical

Appendix A: Specifications

General

Supply voltage:	24 V DC ±10 %
Current drain:	max. 200 mA
Operating temperature range:	0° to +50° celsius
Scale length:	102 mm (5 inch)
Number of display segments:	201 segments/channel
Type of display:	Neon-plasma-bargraph display
Colour of display:	up to -10 dB point orange, above -10 dB point red
In- and output:	x-former-balanced, floating according AES standard
Input impedance:	110 Ω or High Z
Sample rate:	27 kHz to 100 kHz
Overload indicator:	one LED per channel
Overload detector:	adjustable number of samples and threshold
DC-filter:	OFF or 5 Hz
Memory accuracy (Memo):	±1 segment
Weight:	approx. 260 g net
Dimensions:	3U/8HP
Depth 1352 APH:	86 mm
Connector:	XLR f, XLR m, DC flange connector type 710

Digital scale

Scale range:	-60 dB to 0 dB
Brighter scale marks:	-50, -40, -30, -20, -15 dB
Brighter scale range:	starting with begin of headroom
Integration time:	10 msec.
Peakhold:	bar
Peakhold reset time:	auto (approx. 2.5 s) or manual

Controls and additional display elements

Keys:	Gain Memo: Memory recall Reset: memory reset
LED´s:	OVL: Overload

Items delivered

- Peakmeter
- DC-connector counter plug
- Operating manual

Subject to technical changes without prior notice

EC-Declaration of Conformity Directive 89/336/EEC

and Directive 73/23/EEC

We,

RTW GmbH & Co.KG
Elbeallee 19 • 50765 Köln • Germany

declare under sole responsibility that the product:

RTW peakmeter based on hardware E504 incl. all options

meets the intend of the Directive 89/336/EEC and Directive 73/23/ECC. Compliance was demonstrated to the following specifications as listed in the official journal of the European Communities:

EMC	**89/336/EEC**
EN 50081-1 Emissions (march 1993):	EN 55022 Radiated, Class B EN 55022 Conducted, Class B
EN 50082-1 Immunity:	EN 61000-4-2 EN 61000-4-3 EN 61000-4-4 EN 61000-4-5 EN 61000-4-6
Safety	**73/23/EEC**
EN 60950 (1992 + A1/1993)	

Tested and documented by the following companies:

ELEKLUFT GmbH, Bonn, accredited EMC laboratory
RTW GmbH & Co.KG, Köln

Date and signature of the responsible person:

20.02.2001

