Data Sheet

TouchMonitor TMR7 | TMR7OEM

RTW
EYES ON YOUR AUDIO
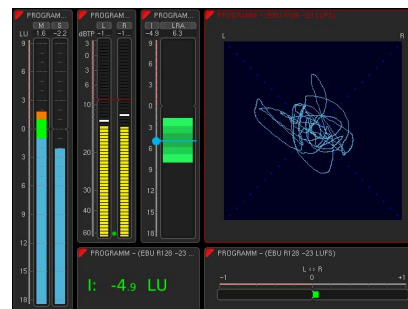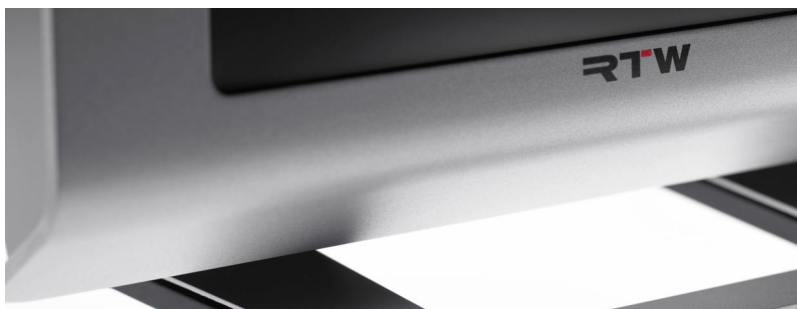
TouchMonitor TMR7 Series

Modular Software ▪ **Touch Screen** ▪ **AES3 I/O via XLR** ▪ **Highly Flexible Screen-Layout** ▪ **2- to 4-ch. PPM/True Peak**
Audio Vectorscope ▪ **EBU, ITU, ATSC, ARIB Loudness** ▪ **Logging** ▪ **LRA** ▪ **SPL-Meter** ▪ **RTA** ▪ **Premium PPM**

The four audio inputs provided by the two AES3 XLR ports are flexibly configurable for mono, stereo, or multichannel sources, providing separate instruments for each source. This allows e. g. in radio broadcast the parallel monitoring of the on-air signal and a separate source.

Beside the AES3 interfaces the GPIO interface for overall control, the Ethernet port, and the VGA output for external display units offer even more functional options for flexible integration of TMR7 into individual studio environments.

Graphical User Interface
The graphical user interface used in the TouchMonitor range is controlled simply by using your finger. Instruments can be scaled, randomly positioned and combined for optimized use of available screen space. Multiple instruments of the same type, assigned to different input channels and configurations, can be displayed simultaneously. A comprehensive on-screen help feature supports the user to make setup changes with ease.

Licences
A totally modular software concept means that you only have to purchase features that you actually require. This puts you in control, defining the functionality of an individual TouchMonitor that suits your needs best. At any time new instruments and functions can be added to the device as software modules simply by purchasing and activating a corresponding licence.

Hardware

Common Configuration

- 7" touch screen 16 : 9 TFT (800 x 480 pixel)
- 4-channel audio interfaces (2 x AES3 inputs and 2 x AES3 outputs via XLR)
- Connectors for Ethernet, VGA, 2 x USB 2.0, GPIO, 24 V DC
- Fully scalable, modular software approach for flexible   configuration and easy on-site upgrades
- Highly flexible screen layout options with scalable instruments
- Basic PPM software (2-ch. Stereo, 2 x 2-ch. Stereo, Single, Multichannel up to 4 ch.): Peak, True Peak, Audio Vectorscope, Phase Meter, Global Keyboard

- Available software licences (see below):
  - Loudness (EBU R128, ITU, ATSC A/85, ARIB, OP-59, AGCOM, CALM, LEQ(M), TASA, SAWA) and SPL
  - RTA - Real Time Analyzer,
  - Premium PPM (with Moving Coil and second Audio Vectorscope),
  - Timecode Reader,
  - Logging Data Server (external logging or chart)

Main Units with Interfaces

TMR7

TouchMonitor TMR7 in a sturdy table-top frame with movable table-stand and power supply.

TMR7OEM

TouchMonitor TMR7 without table-top frame, without table-stand and without power supply, for mounting into front panels, e. g. mixing consoles.

Hardware (continued)

Additional Hardware Options

With the mounting adapters available as additional hardware options, the TMR7 units can be adapted to different environments such like standard 19" sub-racks or standard 19" rack-mount cabinets for video racks.

TM7-MA3U (3U Mounting Adapter for TMR7OEM)

Mounting kit including a 19"/3U/42HP rack-mount panel (half-19"/3U) and fastening material for mounting TMR7OEM into standard 19" sub-racks (e. g. RTW 1647831).

TM7-MAVID (VID Mounting Adapter for TMR7OEM)

Mounting kit including a half-19"/3U plug-in panel and fastening material for mounting TMR7OEM into standard 19" rack-mount cabinets for video racks.

TM7-MADT (Table-top Mounting Adapter for TMR7OEM)

Mounting kit including a table-top frame, robust swivel-mounted table-stand, housing cover, and mounting material for remodelling TMR7OEM to a table-top unit.

1647831 (19"/3U rack frame)

for mounting up to 2 TMR7OEM in conjunction with TM7-MA3U mounting kit. Includes a blank panel to cover unused space.

Software

Standard Software

Each TouchMonitor comes with a basic software package. Beside the signal processing and the control functions this software includes a PPMs for up to 4 channels with digital scales (0 to -60 dB, +3 to -60 dB TruePeak, DIN5, Nordic, British IIa and IIb), peak hold, peak memory, Over indicators, audio vectorscope, phase correlation meter, gain reduction, and a global keyboard for simultaneous control of defined functions in multiple instruments, and for preset recall. It also allows the external control with the integrated GP IO interface. Optionally, different software modules are available as licences.

Software Modules (Licences)

Software modules can be ordered as licences either together with the order of the unit or at a later point in time.
Together with the order of the unit the licence will be activated at delivery.
When a licence is needed at a later point in time, the order process is started from the "Licences" menu of the TMR7 unit. A device-specific file for forwarding to RTW is created by the unit. RTW will give back a corresponding file with the activated licence for exactly this unit.

SW20002: Loudness and SPL Display

Expands the basic PPMs with Loudness functions (EBU R128, ITU-R BS.1770-3/1771-1, ATSC A/85, ARIB, and OP-59), SPL functions, and Loudness Range instrument (LRA).

SW20003: RTA - Real Time Analyzer

Provides on 31 or 61 bands a spectral distribution display of the frequency range of single channels, channel pairs or groups. Additional HP HF band available.

SW20006: RTW Premium PPM

High resolution Multistandard-PPM display with advanced scales, additional PPM and VU moving coil instruments, and second audio vectorscope.

SW20008: Timecode Reader

Decoding of SDI embedded or LTC timecode. Timecode display. Licence SW20002 is required for the possibility of recalculating loudness (approx. available at first quarter 2014).

SW20014: Logging Data Server

Export of measured data via IP connection or USB flash drive. Advanced graphical presentation and two-stage definition of thresholds. Communication with RTW LQL PC software.
--- Precondition: Licence SW20002! ---

Software (Fortsetzung)

![LQL] PC Software: LQL - Loudness Quality Logger

Logging console for Windows® OS to collect and store timecode or realtime based Loudness and True Peak data via IP connetion or USB stick of multiple TM7, TMR7, and TM9 with LQL licence SW20014 activated. Two-stage definition of limits to generate various alarms, status overview, reports, and data export. The basic version is available for free to registered users. Please see members area of RTW's web site (Sales & Support/Manuals & Software) under „PC Software/LQL - Loudness Quality Logger" (please log in).
--- Precondition: Licence SW20014 must be installed on each connected TouchMonitor ---
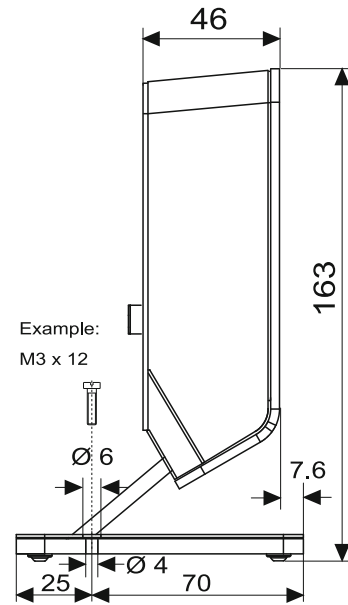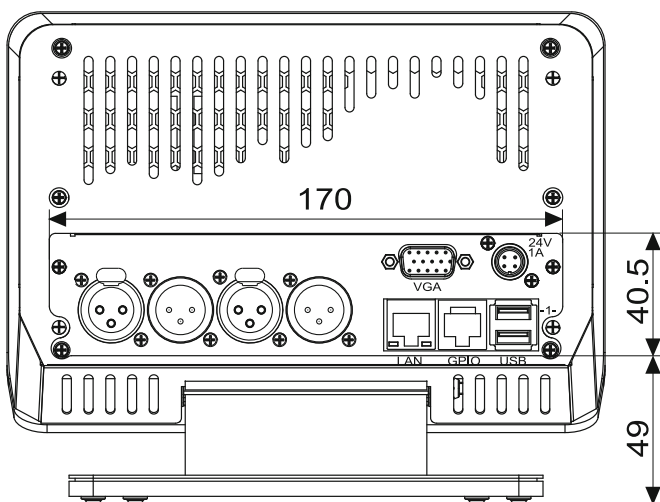
Dimensions

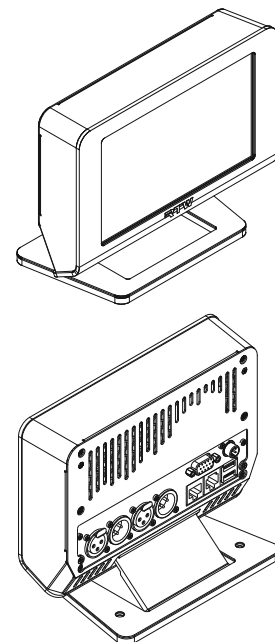**TouchMonitor TMR7 Table-top unit** (also TMR7OEM with TM7-MADT)
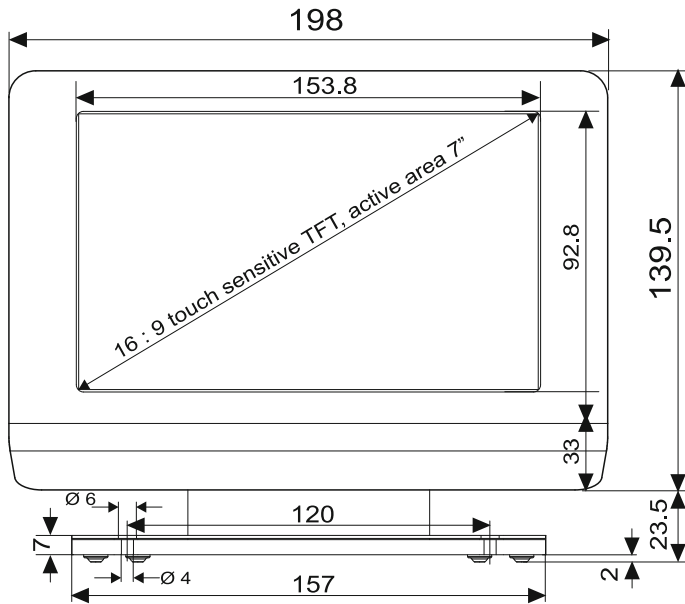
1 | Front view (dimensions in mm)

2 | Side view (dimensions in mm)

3 | Rear view (dimensions in mm)

TouchMonitor TMR7OEM Main unit for panel-mounting
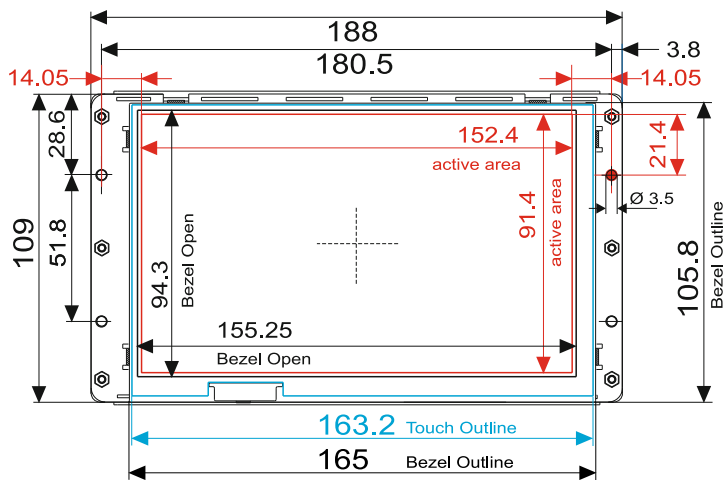
1 | Front view (dimensions in mm, tolerance: ±0.2 mm)
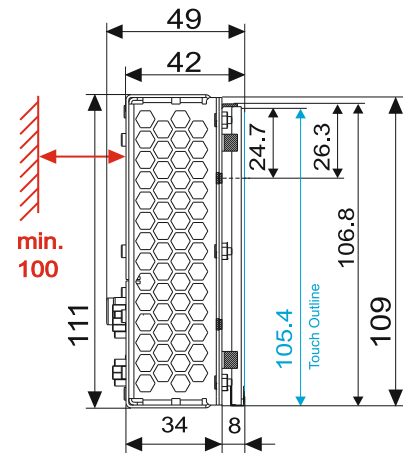
2 | Side view (dimensions in mm, tolerance: ±0.5 mm)
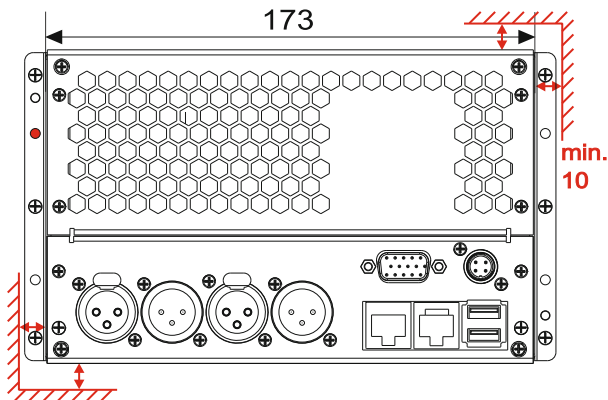
3 | Rear view (dimensions in mm, tolerance: ±0.5 mm)

⚠ For adequate ventilation a minimum space is required: min. 10 mm at all sides and min. 100 mm on the rear side!
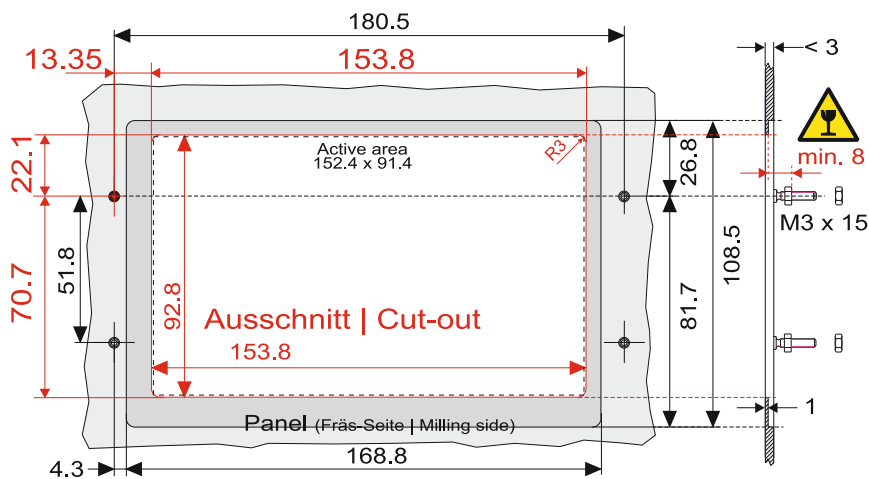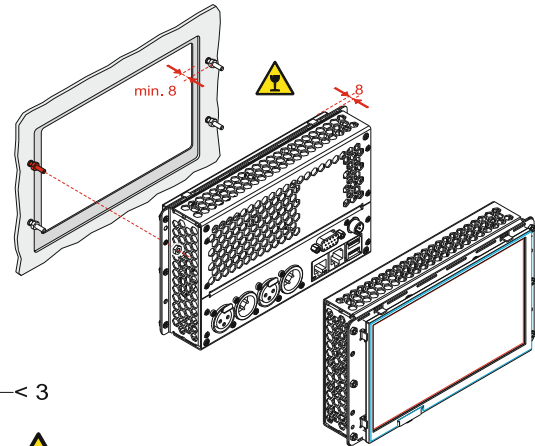
4 | Front panel cut-out (dimensions in mm, tolerance: ±0.2 mm)

5 | Vertical mounting orientation ▶

Optional TM7-MA3U Mounting Adapter for Mounting TMR7OEM into Standard Racks

212.8

129

16 : 9 touch sensitive TFT, active area 7"

RTW

1 | Front view (dimensions in mm)

44.4

8.7

122.5

2 | Side view (dimensions in mm)

198.12
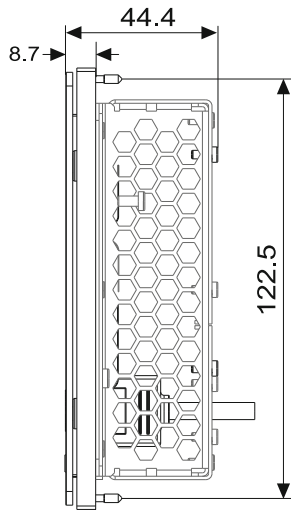
3 | Top view (dimensions in mm)

Optional TM7-MA3U with TMR7OEM fits to standard 19"/3U sub racks
(DIN EN 60297-3-101:2004 19"/3U/84HP)

TMR7OEM and sub rack are not part
of TM7-MA3U delivery

112.2
122.5
129.4
132.4

RTW
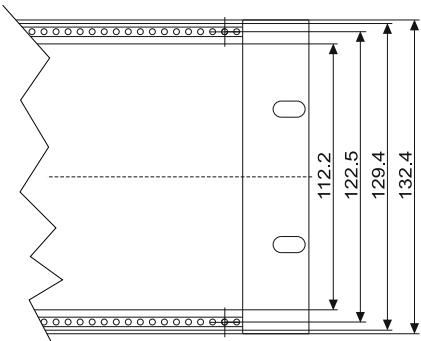
4 | Heights (mm) of standard 19"/3U sub racks
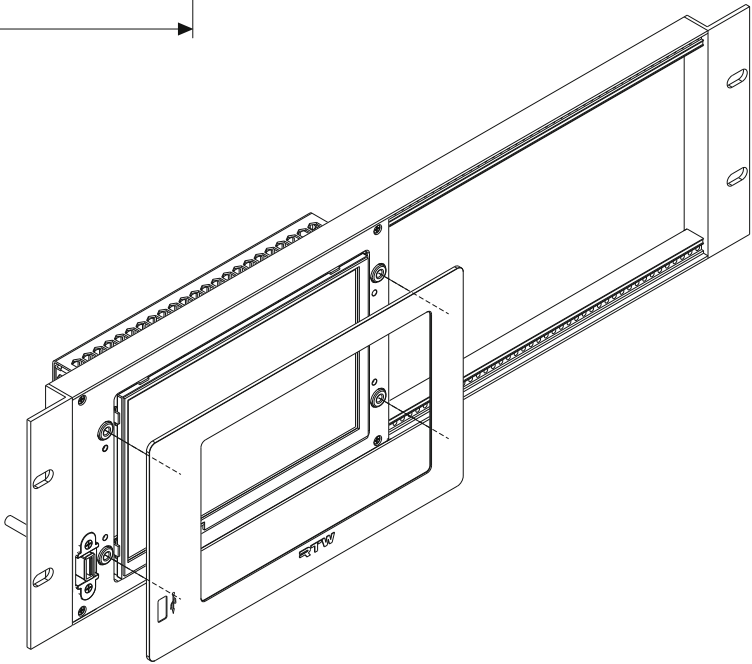
5 | Mounting into standard 19"/3U sub rack

Optional TM7-MAVID Mounting Adapter for Mounting TMR7OEM into Video Racks

22

132.6

132.6

214.1

19.28

91.44

21.88

16 : 9 touch sensitive TFT, active area 7"

37.4

152.4

24.3
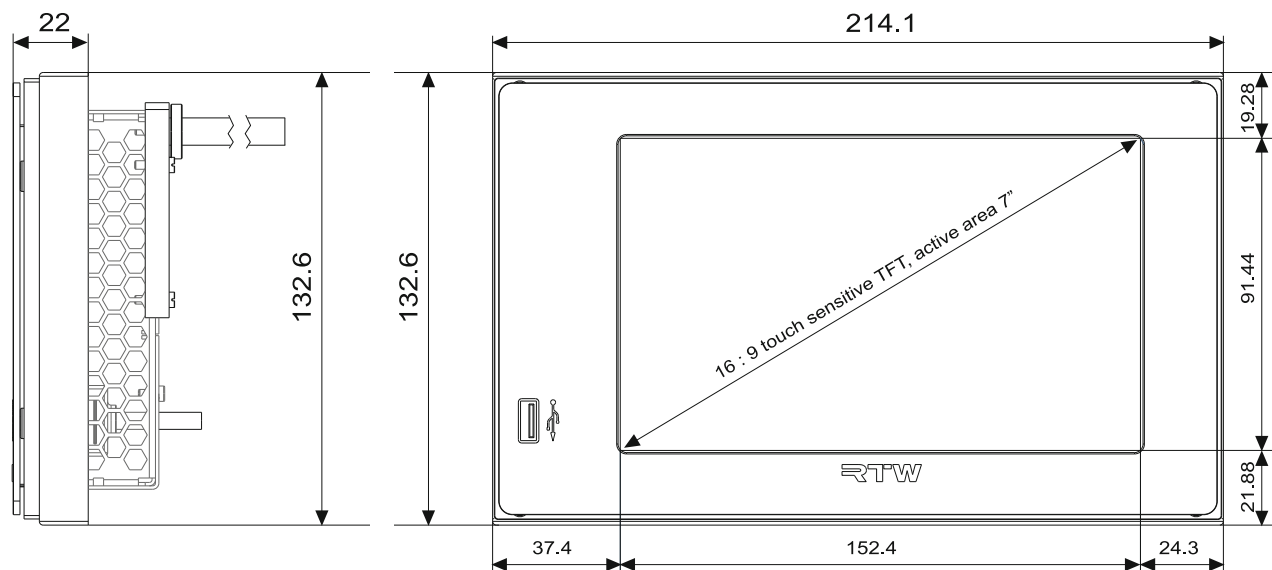
1 | Side view (dimensions in mm)

2 | Front view (dimensions in mm)

407

M 5

49

Adapterstangen (2 x)
Mounting adapters (2 x)

42.7

49.5

175
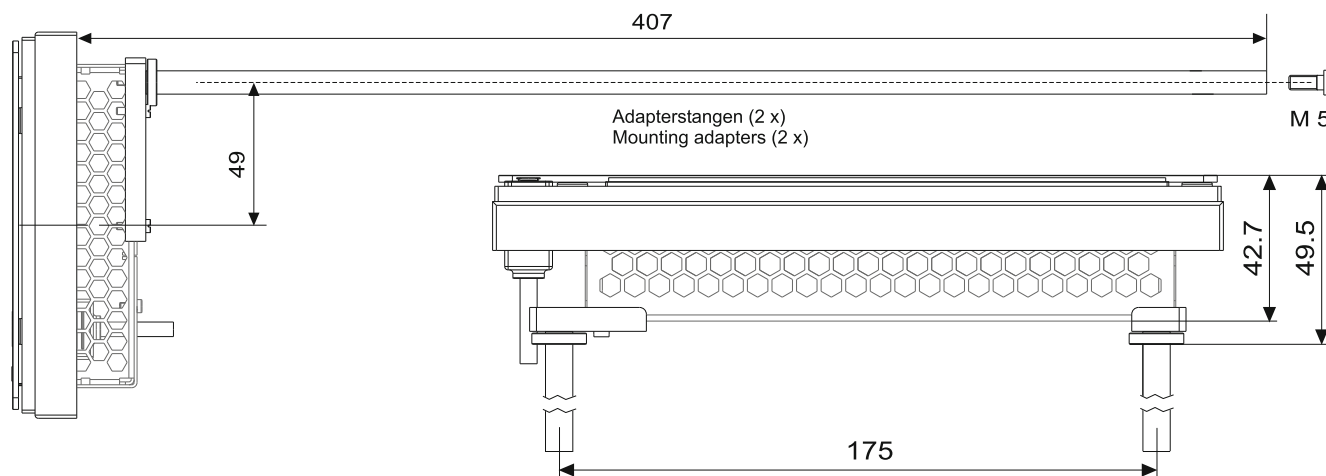
3 | Mounting depth (side view
with adapters, dimensions in mm)

4 | Top view (dimensions in mm)

Optional TM7-MAVID with TMR7OEM
fits into standard 19" rack-mount
cabinets for waveform monitors
in video studios

TMR7OEM and rack-mount cabinet
are not part of TM7-MAVID delivery
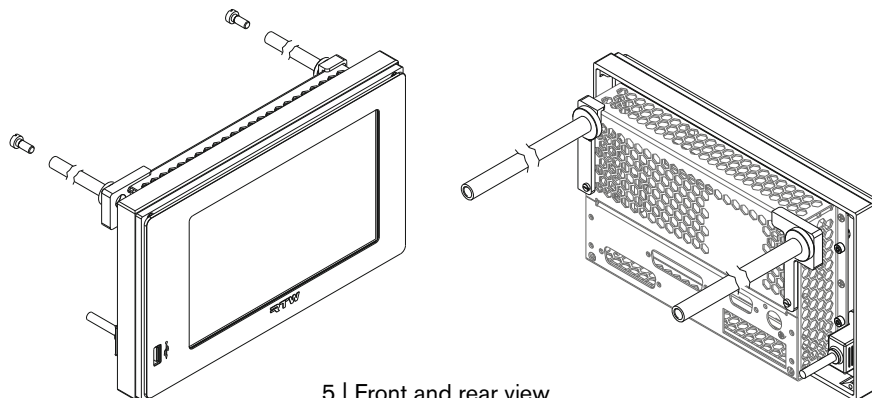
5 | Front and rear view

Connection

Connectors

⚠ **ATTENTION! - For operating the TMR7OEM an adapted mains adapter is required. RTW recommends the use of the RTW wide voltage power supply 1168-R (100 - 240 V AC/24 V DC, 2.7 A) approved for TouchMonitor and available as an accessory.**
This power supply is included in the TMR7 table-top package.

External:
Standard VGA
monitor 16 : 9

4-pin locking low
voltage connector

VGA   24 V DC, 1 A

AES3 In 1   AES3 Out 1   AES3 In 2   AES3 Out 2   LAN   GP IO   USB A 2.0
(XLR-F)   (XLR-M)   (XLR-F)   (XLR-M)   (RJ-45)   (RJ-11)   (Full Speed)

External:
USB mouse
Wacom® graphics tablet
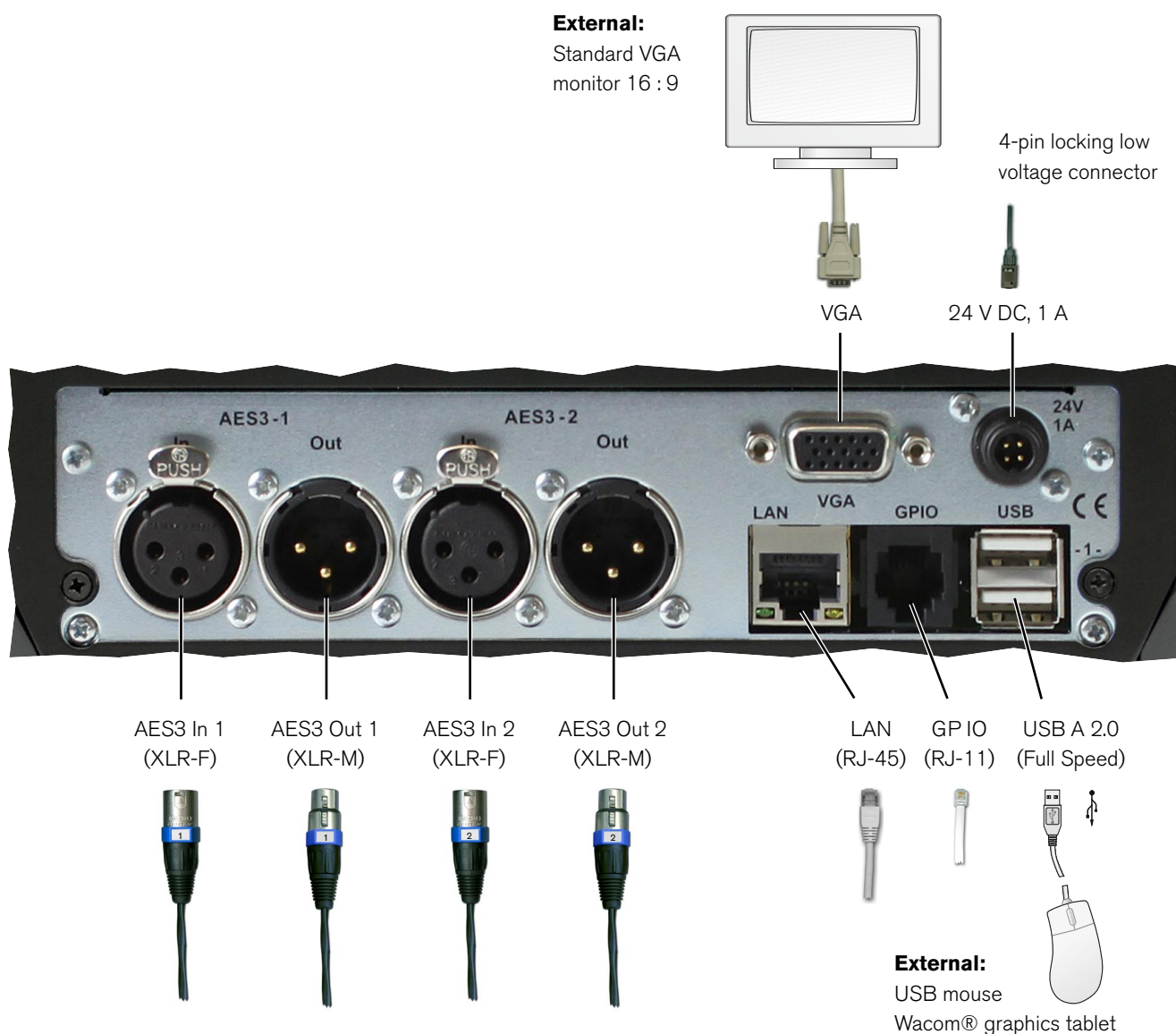
Pin Assignment

AES3 In 1, AES3 In 2 (transformer-balanced, 3-pin XLR-F)

Pin: Function:

1   Shield/case
2   +, hot
3   –, cold

Pin 2   Pin 1

Pin 3

(External view of the connector)
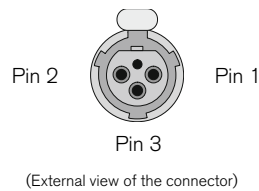
⚠ **NOTE -** The AES3 inputs are permanently terminated with110 Ω.

AES3 Out 1, AES3 Out 2 (transformer-balanced, 3-pin XLR-M)

Pin: Function:

1   Shield/case
2   +, hot
3   –, cold

Pin 1   Pin 2

Pin 3

(External view of the connector)
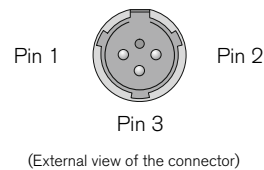
VGA (15-pin Sub-D-F)

Pin: Function:

1   R | Video signal
2   G |
3   B |
4   GND
5   GND
6   GND
7   GND
8   GND
9   +5 V
10   GND
11   GND
12   SDA
13   H-sync
14   V-sync
15   SCI

Pin 1   Pin 6   Pin 11
Pin 2   Pin 7   Pin 12
Pin 3   Pin 8   Pin 13
Pin 4   Pin 9   Pin 14
Pin 5   Pin 10   Pin 15

(External view of the connector)
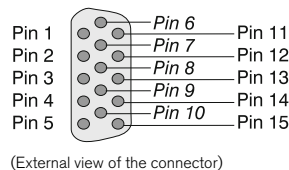
⚠ **NOTE -** The VGA cable shell not exceed 15 m lenght!

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24 V - 1 A (4-pin locking low voltage, type Binder 710)

Pin: Function:

1   +24 V DC
2   +24 V DC
3   0 V
4   0 V

Pin 3   Pin 2
Pin 4   Pin 1

(External view of the connector)
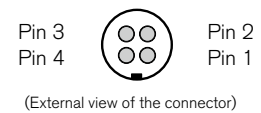
⚠ **NOTE -** An external overcurrent protective device (2 A max.) shall be installed when using an external 24 V DC power supply!

LAN

RJ-45 standard network connector (10/100 MBit)

GP IO (RJ-12 6P6C socket)

External control of functions and presets recall as defined in the Global Keyboard menu. The inputs defined as „active low" have to be switched against 0 V (Pin 1).

Pin: Function:

1   GND
2 - 6   Function acc. to definition in the menu

6 5 4 3 2 1

(External view of the connector)

Block diagram of the GPIO interface
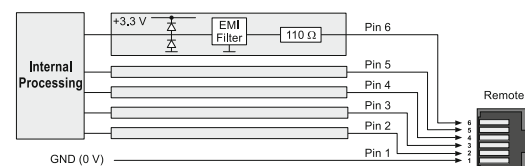
USB-A

2 Full Speed USB 2.0 interfaces for connecting USB memory sticks (for licence handling, presets, et. al.), external mouse or Wacom® tablet

Specifications

System

General

Power requirements:	+24 V DC (external 2 A max. overcurrent protective device shall be installed!)
Current drain:	1 A nominal, 2.5 A power-up current (10 µsec.)
Power dissipation:	approx. 8,5 W
Display:	7" TFT touch screen 16 : 9 (800 x 480 pixel)
Connectors:	1 x 15-pin Sub-D-F; VGA output with 800 x 480 pixel, 65.536 colors, 60 Hz, for connection of an optional external 16 : 9 VGA monitor, selectable 4 : 3 mode
	1 x 4-pin locking low voltage connector type Binder 710 (DC)
	2 x USB A; USB 2.0 Full Speed connectors for:
	▪ USB memory sticks (licence handling, preset export and import, software updates)
	▪ external computer mouse for operating
	▪ external Wacom® graphics tablet
	1 x GPIO (RJ-12-6P6C) for defined functions or preset recall
	1 x LAN (RJ-45)
	2 x XLR-F (2 x AES3 In)
	2 x XLR-M (2 x AES3 Out)

Dimensions (W x H x D):
- TMR7: 198 x 139.5 (163) x 46 (95) mm (with table-stand)
- TMR7OEM: 188 x 109 x 45 mm

Weight:
- TMR7: approx. 2.7 kg (w/o power supply)
- TMR7OEM: approx. 1.2 kg

Operating temperature: +5° to +40° C

Functions (with all licences activated)

- Operation with one finger (touch sensitive display) or a computer mouse
- Instruments can be scaled and freely positioned
- Multiformat 4-ch. PPM (2-ch. Stereo, 2 x 2-ch. Stereo, single ch., multichannel up to 4 ch.)
- Loudness-Meter: ITU-R BS.1770-4/1771, EBU R128, ATSC A/85, ARIB, OP-59, AGCOM, CALM Act, LEQ(M), TASA, SAWA, custom mode
- Loudness Test Time Control
- Logging Data Server
- Loudness Chart instrument
- Loudness Range instrument (LRA)
- SPL meter
- Timecode Reader
- Moving Coil (BR, VU, Loudness, BBC mode)
- Gain Reduction instrument
- Stereo Correlator
- 1/3-, 1/6-, 1/12-octave spectrum analyzer
- 2-channel Audio Vectorscope (2 instances)
- AES3 status monitor
- Numerical displays

Digital Inputs

Inputs:	2 AES3 inputs (transformer balanced, 110 Ω), 2 x XLR-F connector, 3-pin
Sampling rates:	44.1, 48, 96 kHz, synchronisation to digital input signal or internal clock

Digital Outputs

Outputs:	2 AES3 outputs, 2 x XLR-M connector, 3-pin
Sampling rates:	referenced to digital inputs or internal clock

Basic PPM (Standard Software)

General

Input sources:	digital via XLR audio interface (AES3)
4-channel Peakmeter:	2-ch. Stereo, 2 x 2-ch. Stereo, single channel, multichannel for up to 4 channels
Display:	▪ Peak level
	▪ Peak hold
	▪ Numerical value of the display
Functions:	▪ Gain (+20 dB, +40 dB acc. to standard)
	▪ Peak hold on/off
	▪ Memory
	▪ Reset

Digital Peakmeter

Word width:	24 bit
Digital scales:	▪ TP60: +3 .. −60 dB
	▪ Dig60: 0 .. −60 dB
	▪ DIN5: +5 .. -50 dB
	▪ Nordic: +12 .. -42 dB
	▪ BR IIa: 7 .. 1, BRIIa ext: 7 .. 1,
	▪ BR IIb: +12 .. −12 dB, BR IIb +12 .. −12 dB,
Headroom/Headroom Ref:	adjustable in the range from 0 to −20 dB in steps of 1 dB
Operation field:	adjustable in the range from 0 to −20 dB in steps of 1 dB
Integration time (Attack):	acc. to corresponding standard or selectable: Sample, 20 ms, 10 ms, 1 ms, 0.1 ms, additional 150 ms for British scales
Gain:	+20 dB, +40 dB (acc. to standard)
High-pass filter:	Off, 5 Hz, 10 Hz, 20 Hz
Peak hold indicator:	1 s, 2 s, 4 s, 10 s, 20 s, 30 s, manual reset or off
Over indicator hold time:	1 s or manual
Over indicator PPM	
- Threshold:	Full Scale, Full Scale -1LSB, Full Scale -2LSB, −0.1 dBFS, −0.5 dBFS, −1 dBFS, −2 dBFS, −3 dBFS
- Attack time:	1 to 15 samples
- Word width:	16 to 24 bit, selectable
Over indicator True Peak	
- Threshold:	adjustable

Specifications (continued)

Stereo Correlator

Display:	Bargraph, additional spot indicator between PPM bargraphs
Scale range:	-1 r to 0 to +1 r
Standard color setting:	▪ red: -1 r to -0.1 r
	▪ white: 0 r (-0.1 r to +0.1 r)
	▪ green: +0.1 r to +1 r
Attack/release time:	1.0 s/2.5 s

Audio Vectorscope

Display mode:	2-channel
Inputs:	L/R (Stereo signal with the input channels of the selected audio group)
AGC:	fast/slow
Grid:	L/R or M/S

AES3 Status Monitor

Display:	▪ channel data are displayed as plain text, hex or binary
	▪ Channel selectable
	▪ Audio bit activity
	▪ Hardware status

Global Keyboard

The Global Keyboard is used for simultaneous control of defined functions in multiple instruments, and for preset recall. It also allows the external control with the integrated GP IO interface.

Gain Reduction

Display:	1 bargraph for Mono and Stereo formats, up to 4 bargraphs in multi-channel mode
Input:	Data stream via TCP/IP and LAN (ethernet) interface
Input routing:	external featured streams selectable
Marker:	adjustable threshold for the definition of upper and lower display section
Colors:	32 colors for each bargraph section

SW20002: Loudness and SPL Display (Software Licence)

Expands the Basic Stereo-PPM with functions for loudness measurement as well as for SPL display and summed SPL value calculation

EBU R128 Loudness Mode

ITU BS.1771 Loudness Mode

ATSC A/85 Loudness Mode

ARIB Loudness Mode

OP-59 Loudness Mode

AGCOM Loudness Mode

CALM Loudness Mode

LEQ(M) Loudness Mode

TASA Loudness Mode

SAWA Loudness Mode

Customer Specific Loudness Mode

Display:	▪ Bargraphs for each single channel (can be combined with PPM bargraphs)
	▪ M bargraph (Momentary - summation of momentary loudness values of all channels for a short span of time)
	▪ S bargraph (Short - loudness summation value of an adjustable dynamic time frame)
	▪ I-Bargraph (Integrated - long term loudness value infinite or manual control)
	▪ adjustable tolerance range for M, S, I
Numerical display:	▪ for M, S, I values (labelling adjustable)
	▪ for LRA, TPmax, Mmax, Smax, I-time values
Scales:	Loudness scale:
	▪ EBU+9: +9 .. −18 LU
	▪ EBU+3: +3 .. −18 LU
	▪ EBU+18: +18 .. −36 LU
	▪ EBU+9a: 14 .. −41 LUFS
	▪ EBU+18a: −5 .. −59 LUFS
	▪ EBU0: 0 .. −60 LUFS
	▪ ITU+9: +9 .. −18 LU (Loudness Units)
	▪ ITU0: 0 .. −30 LKFS
	▪ ATSC0: 0 .. −60 LKFS
	▪ ATSC0a: 0 .. −30 LKFS
Weighting filter:	K filter acc. to ITU BS.1770
Target Level: *)	▪ −23 LUFS; adjustable in the range from −10 to −30 LUFS in steps of 1 LUFS
	▪ −24 LKFS; adjustable in the range from −10 to −30 LKFS in steps of 1 LKFS

Time & Gate Momentary: *)

- Window Time (SQR):	adjustable from 200 ms to 1000 ms in steps of 100 ms
- Integration (IIR):	IEC 125 ms Fast, 250 ms (IRT), 500 ms, 750 ms, IEC 1000 ms Slow, 1500 ms, 2000 ms selectable

Time & Gate Short: *)

- Integration Time:	3 s; time window adjustable from 1 to 20 s in steps of 1 s

Time & Gate Integrated: *)

- Silence Gate:	−70.0 LUFS/LKFS; adjustable from −80.0 to −40.0 LUFS/LKFS in steps of 0.5 LUFS/LKFS, switchable
- Relative Gate:	−10.0 LU; adjustable from −40.0 LU to 0 LU in steps of 0.5 LUFS, switchable
Level adjustment for the summation: *)	0.0 dB (L, R, C), adjustable between −3 and +3 dB in steps of 0.5 dB

*) Depending on the used loudness standard not all or no one of the listed settings are available.

Tolerance Levels:

- TP Headroom:	−9.0 dB; adjustable from 0 to −20 dB in steps of 0.1 dB
- TP Over Sensitivity:	0.0 dB; adjustable from 0 to −20 dB in steps of 0.1 dB
- M High:	+1.0 LU; M tolerance above Target Level adjustable from 0 to 10 LU in steps of 0.1 LU
- M Low:	−1.0 LU; M tolerance below Target Level adjustable from 0 to −12 LU in steps of 0.1 LU
- S High:	+1.0 LU; S tolerance above Target Level adjustable from 0 to 10 LU in steps of 0.1 LU
- S Low:	−1.0 LU; S tolerance below Target Level adjustable from 0 to −12 LU in steps of 0.1 LU

Specifications (continued)

- I High:	+1.0 LU; I tolerance above Target Level adjustable from 0 to 10 LU in steps of 0.1 LU
- I Low:	−1.0 LU; I tolerance below Target Level adjustable from 0 to −12 LU in steps of 0.1 LU

Loudness Test Time Control
Settings for operating automatic, semi-automatic or manual loudness measurements.
Start:

- Functions:	Autostart after preset load, autostart with gate, autostart with gate and autoreset, manually via keys or GPI
- Level for gate:	−70,0 LUFS/LKFS; adjustable from −85 to −10 LUFS/LKFS in steps of 0.5 LUFS/LKFS

Stop:

- Functions:	manually via keys or GPI, autostop with gate, autostop with gate and time
- Level for gate:	−70,0 LUFS/LKFS; adjustable from −85 to −10 LUFS/LKFS in steps of 0.5 LUFS/LKFS
- Time for gate:	1 s; adjustable from 1 to 15 s in steps of 1 s

Loudness Range Instrument (LRA)

Display:	Graphical display of the Loudness Range
Mode:	selectable: LRA Bar, MagicLRA, MagicLRA + I, MagicLRA + I + Num
Scale range:	selectable: 6 LU, 10 LU, 20 LU, 30 LU
LRA low range:	2 LU; adjustable from 1 to 20 LU in steps of 1 LU
Comfort zone:	4 LU; adjustable from 1 to 20 LU in steps of 1 LU
LRA high range:	depends on the selected scale range and the spread of the comfort zone
Colors:	selectable for each range

SPL Meter Mode

Display:	▪ Bargraphs for each single channel (can be combined with PPM bargraphs) ▪ Summation bargraph
Reference point:	adjustable in the range from 68 dB to 88 dB in steps of 1 dB
Weighting:	Linear, A (Leq(A)), C, CCIR (Leq(M)), k
Integration time:	Fast (125 ms), Slow (1 s)

SW20003: RTA - Real Time Analyzer (Software Licence)
Spectral distribution display of the frequency range of single channels, channel pairs or groups.

Spectrum Analyzer (RTA)

Input sources:	selectable: single channels, Stereo pairs, depending on selected mode
Frequency range:	▪ Norm: 20 Hz to 20 kHz, additional band > 20 kHz switchable ▪ 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 ▪ 1/12-octave: 120 bands
Weighting filter:	Linear; Linear, A, C selectable
Peak hold indicator:	1 s, 2 s, 4 s, 10 s, 20 s, 30 s, manual reset or off
Measuring range:	45 dB max.
Scaling:	3, 6, 9 dB
Functions:	▪ Input selection ▪ Peak hold on/off ▪ A, C weighting, Linear

	▪ Integration time ▪ Set reference ▪ Scaling ▪ Frequency range ▪ Bargraph arrangement ▪ Display-Hold
Integration time (ballistics):	Impulse, Fast, Slow, Peak (10 ms)

SW20006: RTW Premium PPM (Software Licence)
High resolution Multistandard-PPM display with advanced scales, PPM and VU Moving Coil instruments, and second audio vectorscope.

General

Input sources:	digital via XLR audio interface (AES3)
Display:	▪ Peak level ▪ Peak hold ▪ Numerical value of the display ▪ Digital Over
Functions:	▪ Gain (+20 dB, +40 dB acc. to standard) ▪ Peak hold on/off ▪ Memory ▪ Reset

Digital Peakmeter Extension

Word width:	24 bit
Digital scales:	▪ TP20: +3 .. −20 dB ▪ Dig20: 0 .. −20 dB ▪ Dig0: +18 .. 0 dB ▪ Dig18: +18 .. −18 dB ▪ Dig40: +20 .. −40 dB ▪ ARD9: +9 .. −60 dB ▪ DIN10: +10 .. -50 dB, ▪ Zoom10: +10 .. −10, ▪ Zoom1: +1 .. −1,
Headroom/Headroom Ref:	adjustable in the range from 0 to −20 dB in steps of 1 dB
Operation field:	adjustable in the range from 0 to −20 dB in steps of 1 dB
Integration time (Attack):	acc. to corresponding standard or selectable: Sample, 20 ms, 10 ms, 1 ms, 0.1 ms
Gain:	+20 dB, +40 dB (acc. to standard)
High-pass filter:	Off, 5 Hz, 10 Hz, 20 Hz
Peak hold indicator:	1 s, 2 s, 4 s, 10 s, 20 s, 30 s, manual reset or off
Over indicator hold time:	1 s or manual
Over indicator PPM	
- Threshold:	Full Scale, Full Scale -1LSB, Full Scale -2LSB, −0.1 dBFS, −0.5 dBFS, −1 dBFS, −2 dBFS, −3 dBFS
- Attack time:	1 to 15 samples
- Word width:	16 to 24 bit, selectable
Over indicator True Peak	
- Threshold:	adjustable

Moving Coil Instrument
(available in stereo mode only)

Type:	PPM (L/R), PPM (M/S), VU, Loudness, PPM + Loudness (L/R; M, S, or I), selectable
PPM:	
- Ch. arrangement:	Dual, Dual + M/S horizontal, Dual + M/S vertical, Stereo horizontal, Stereo vertical

- Scales:	▪ BR IIa: 7..1, BR IIa ext: 7..1
	▪ BR IIb: +12..−12 dB, BR IIb ext: +12..−12 dB
- Integration time:	Sample (digital only), 0.1 ms, 1 ms, 10 ms, 20 ms, 150 ms
- Headroom Ref:	available with digital sources only: −10 dB; adjustable from 0 to −20 dB in steps of 1 dB
- S mode:	only available, if M/S type is selected: M3, M6
- Peak indicator:	Off, Peak, True Peak, BR Peak
- BR Peak Threshold:	6 dB,
	▪ BR IIa: adjustable from 4 to 7 dB in steps of 1 dB
	▪ BR IIb: adjustable from 0 to 12 dB in steps of 1 dB

VU:

- Ch. arrangement:	Stereo horizontal, Stereo vertical
- Scale digital:	VU Digital (−20 to + 3 dB)
- Lead:	0 dB, adjustable from 0 to 12 dB in steps of 1 dB
- Peak indicator:	Off, Peak, True Peak

Loudness:

- Ch. arrangement:	Dual, Stereo horizontal, Stereo vertical
- Scales:	acc. to Loudness settings
- Integration time:	acc. to standard
- Peak indicator:	Off, no selectable option available

PPM + Loudness:

- Ch. arrangement:	Dual-PPM (as described above) with additional Loudness display (BBC mode) for M, S, or I (selectable) in one instrument
- Scales:	▪ PPM: see above
	▪ Loudness: +9 to −9 LU fixed (mid of scale corresponds to Target Level)
Numerical display:	switchable

SW20008: TCR - Timecode Reader (Software Licence)

Decoding of LTC timecode. Timecode display.
With an activated licence SW20002 the timecode can be used for loudness and logging applications.

Timecode Reader (TCR)

Display:	numerical display of LTC from digital sources
Mode:	"Timecode" selectable when creating an audio group (constitutes a separate audio group)
Input:	one digital channel selectable
Colors:	selectable, 32 colors

Loud. Recal. (Loudness Recalculation)

Settings for operating automatic, semi-automatic or manual loudness measurements (Loudness Test Time Control).

Display:	numerical display of
	▪ current timecode
	▪ start time < current timecode < stop time with recalculation

Start:

- Functions:	Autostart after preset load, autostart with gate, autostart with gate and autoreset, manually via keys or GPI. With Timecode Reader licence (SW20008) activated additional control via timecode resp. timecode with recalculation.
- Level for gate:	−70,0 LUFS/LKFS; adjustable from −85 to −10 LUFS/LKFS in steps of 0.5 LUFS/LKFS

Stop:

- Functions:	manually via keys or GPI, autostop with gate, autostop with gate and time. The stop function is automatically set and fixed to timecode, if the start function has been set to a timecode option.
- Level for gate:	−70,0 LUFS/LKFS; adjustable from −85 to −10 LUFS/LKFS in steps of 0.5 LUFS/LKFS
- Time for gate:	1 s; adjustable from 1 to 15 s in steps of 1 s

SW20014: Logging Data Server (Software Licence)

Export of measured data via IP connection or USB flash drive. Advanced graphical presentation and two-stage definition of thresholds. Communication with RTW LQL PC software. Loudness Chart instrument
--- Precondition: Licence SW20002! ---

Logging Instrument

Functions:	▪ Logging of Loudness and TruePeak data of two audio groups
	▪ Storing of data on USB flash drive or via IP with LQL - Loudness Quality Logger PC software
	▪ Definition of main and secondary limits (individual markers) for Mmax, Smax, I and TPmax to monitor the adherence of e. g. legal regulations, current standards or in-house regulations
	▪ Data collection control automatically via LQL (IP mode) or manually via control key (USB mode)
Mode:	selectable: off, USB, IP
Display:	Status display in the top line of the instrument placed on the screen:
	▪ in IP mode: LQL access
	▪ in USB mode: Disk space, running processes, storing
	▪ if logging functionality is turned off
Identification for network:	Device name and password definable
Key function (USB):	▪ USB run: Start logging
	▪ USB close: Stops logging and creates a logfile on the USB flash drive

Loudness Chart Instrument

Functions:	▪ Horizontal running bargraphs with individually definable colors evaluate the common quality of Loudness values TP, M, S, I
	▪ Progress of a measurement (value over time) of up to four values can be drawn as graph(s) on a coordinate system
	▪ Position of the Relative Gate switchable, color adjustable
	▪ Adjustable time ranges
	▪ Selectable time periods for evaluation
	▪ Vertical Integrated bargraph switchable
	▪ Tolerance levels and its display adjustable
Display:	▪ Bargraph: Color change of the running bargraph indicates the section the loudness value is moving in: normal, operation range, Headroom, Over, invalid (availability depending on selected value)
	▪ Chart-Graph: Continuously drawn graph (value over time) either of one value as line or rectangle with colored filling corresponding to the color

Specifications (continued)

	selection of the horzontal bargraphs or of up to four values as line, dots, or rectangles without filling with individual color selection; added with Tolerance Indicator or position of Relative Gate (if selected)
Color:	▪ Bargraph: Individual selectable colors (32) for Normal (bargraph color), Operation Range, Headroom (TP only), TP Over (TP only), Over (M, S, I only), Invalid (M, S, I only) ▪ Chart graph: For each value individual selectable colors (32) for display modes without filling, bei Darstellung ohne Füllung, otherwise adoption of corresponding bargraph colors, additional selectable colors for Tolerance Indicator and position of Relative Gate
Time Range:	Time grid adjustment for the coordinate system and the horizontal bargraphs: ▪ Increase or decrease of the preset time period in steps of one unit or ten units ▪ Magnification of the measured course to the available width of the instrument's window
Time Range presets:	
- Auto stretch:	Automatic stretch of a stopped loudness measurement to the available width of the instrument's window, switchable (except when controlled via timecode)
- Hours:	0 h; adjustable from 0 to 3 h in steps of 1 h
- Minutes:	1 m; adjustable from 1 to 59 m in steps of 1 m
Time Select:	▪ Selection of current time period (marker) ▪ Increase or decrease of the marker in step sizes corresponding to the current time grid ▪ Shift of the marker and magnification of the content
Tolerance Levels:	
- TP Headroom:	−9.0 dB; adjustable from 0 to −20 dB in steps of 0.1 dB
- TP Over Sensitivity:	0.0 dB; adjustable from 0 to −20 dB in steps of 0.1 dB
- M High:	+1.0 LU; M tolerance above Target Level adjustable from 0 to 10 LU in steps of 0.1 LU
- M Low:	−1.0 LU; M tolerance below Target Level adjustable from 0 to −12 LU in steps of 0.1 LU
- S High:	+1.0 LU; S tolerance above Target Level adjustable from 0 to 10 LU in steps of 0.1 LU
- S Low:	−1.0 LU; S tolerance below Target Level adjustable from 0 to −12 LU in steps of 0.1 LU
- I High:	+1.0 LU; I tolerance above Target Level adjustable from 0 to 10 LU in steps of 0.1 LU
- I Low:	−1.0 LU; I tolerance below Target Level adjustable from 0 to −12 LU in steps of 0.1 LU

Items of Delivery

TouchMonitor TMR7:	▪ TMR7 unit in a table-top frame ▪ XLR audio interface ▪ Basic software (system/4-ch. PPM) ▪ Table-stand, mains adapter, manual **Order no.: TMR7**

TouchMonitor TMR7OEM:	▪ TMR7 unit without table-top frame, for panel-mounting ▪ XLR audio interface ▪ Basic software (system/4-ch. PPM) ▪ Manual **Order no.: TMR7OEM**

Additional Hardware Options

- ▪ 3U mounting adapter **TM7-MA3U**, mounting kit including a 19"/3U/42HP rack-mount panel (half-19"/3U) and fastening material for mounting TMR7OEM into standard 19" sub-racks

- ▪ VID mounting adapter **TM7-MAVID**, mounting kit including a half-19"/3U plug-in panel and fastening material for mounting TMR7OEM into standard 19" rack-mount cabinets for video racks

- ▪ Table-top mounting adapter **TM7-MADT**, mounting kit including a table-top frame, robust swivel-mounted table-stand, housing cover, and mounting material for remodelling TMR7OEM to a table-top unit.

- ▪ 19"/3U rack frame **1647831** for mounting up to 2 TM7-Mount or 20700OEM in conjunction with TM7-MA3U mounting kit. Includes a blank panel to cover unused space.

Optional Software Licences for TMR7 and TMR7OEM

- ▪ Software licence **SW20002: Loudness and SPL Display** for Loudness, SPL and LRA measurements.

- ▪ Software licence **SW20003: RTA - Real Time Analyzer** for the display of the spectral frequency distribution.

- ▪ Software licence **SW20006: RTW Premium PPM** (Moving Coil) for the display of further PPM-scales, Moving Coil instruments and up to 4 audio vectorscope.

- ▪ Software licence **SW20008: Timecode Reader** for the display of SDI embedded or LTC timecodes.
--- Precondition: Licence SW20002! ---

- ▪ Software licence **SW20014: Logging Data Server** for the export of measured data via IP or USB flash drive, advanced graphical presentation and two-stage definition of thresholds. Communication with RTW LQL PC software. Loudness Chart instrument
--- Precondition: Licence SW20002! ---

Accessory

- ▪ Wide voltage power supply **1178-R** (100 - 240 V AC/24 V DC 2,7 A, table-top unit with corresponding mains cable for different power systems)

Product Line-up

TouchMonitor TMR7 table-top unit

7" touch screen 16 : 9 TFT, main unit with table-top frame, table-stand, power supply. Audio interface included!
Order number: **TMR7**

TouchMonitor TMR7 OEM unit

7" touch screen 16 : 9 TFT, main unit w/o table-top frame, w/o power supply for panel-mounting. Audio interface included!
Order number: **TMR7OEM**

Audio Interface (I/O)	Max. Channel Count (Hardware)	Inputs Digital (balanced)	Outputs Digital
integrated	4-channel digital In and 4-channel digital Out	2 x XLR-F (2 x AES3 in)	2 x XLR-M (2 x AES3 out)

Standard Hardware: Table-top unit with easy-to-use graphical interface, integrated audio interface, Ethernet, 2 x USB, GPIO, VGA Out, table-stand, mains adapter.
OEM-unit for panel-mounting with easy-to-use graphical interface, integrated audio interface, Ethernet, 2 x USB, GPIO, VGA Out.

Standard Software: Basic PPM for up to 4 channels with digital scales (0 to -60 dB, +3 to -60 dB True Peak, DIN, Nordic, British IIa and IIb), audio vectorscope, phase meter, gain reduction, global keyboard. Other software modules available as licences.

Additional Hardware Options

3U Mounting Adapter **TM7-MA3U**
Mounting kit including a 19"/3U/42HP rack-mount panel (half-19"/3U) and fastening material for mounting TMR7OEM into standard 19" sub-racks.
Order number: **TM7-MA3U**

VID Mounting Adapter **TM7-MAVID**
Mounting kit including a half-19"/3U plug-in panel and fastening material for mounting TMR7OEM into standard 19" rack-mount cabinets for video racks.
Order number: **TM7-MAVID**

Table-top Mounting Adapter **TM7-MADT**
Mounting kit including a table-top frame, robust swivel-mounted table-stand, housing cover, and material for remodelling TMR7OEM to a table-top unit.
Order number: **TM7-MADT**

Licences (Software Modules)   Further information on http://www.rtw.de/en/produkte/audio-monitore/touchmonitor-tmr7.html --> Options

Loudness and SPL Display	RTA - Real Time Analyzer	Premium PPM (with Moving Coil and second Audio Vectorscope)	Timecode Reader	Logging Data Server (with Chart)
Order Number: **SW20002**	Order Number: **SW20003**	Order Number: **SW20006**	Order Number: **SW20008** Precondition: installed SW20002!	Order Number: **SW20014** Precondition: installed SW20002!

Dimensions: W x H x D in mm (with table-stand)

TMR7 (table-top unit):   198 x 139.5 (163) x 46 (95)

TMR7OEM (panel-mount unit):   188 x 109 x 45

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