Data Sheet
TouchMonitor TM3-3G | TM3-3GS

TouchMonitor TM3-3G | TM3-3GS

Flexible touch screen layout ▪ Loudness: EBU, ITU, ATSC, ARIB ▪ Loudness Range (LRA) ▪ PPM/True Peak ▪ SPL Stereo/8-ch. operation ▪ Dialnorm ▪ 3G-SDI deembedder ▪ Modular software ▪ Monitoring/AES3 out/Moving Coil/Timecode

The TouchMonitor TM3-3G is a compact and versatile solution for metering, deembedding and monitoring of 3G-SDI audio signals using a 4.3" touch screen for vertical or horizontal use. With its integrated 3G-SDI interface, it displays level and loudness of any eight 3G-SDI audio channels. Independently, the deembedder supplies up to 16 3G-SDI audio channels on eight AES3 outputs (optional licence). The flexible user interface allows for quick and simple preset selection as well as setting the monitoring level (optional licence). Presets can be configured in detail using the Devicer DC1 for Mac OS X® or Windows®.

TM3. Loudness Simplified.

The Devicer's GUI lets you select, configure and position the instruments you need in a convenient way. The screen layout can be previewed at any time to see how your preset will look like on the TM3. Besides PPM and True Peak instruments, the units feature comprehensive loudness measuring features conforming to all relevant international standards (EBU R128, ITU BS.1770-3/1771-1, ATSC A/85, ARIB, OP-59, AGCOM, and CALM). Loudness instruments include single-channel and summing bargraphs, loudness range, loudness chart and numerical displays. With the Moving Coil option, stereo signals can also be displayed on needle instruments.

Hardware

TM3-3G | TM3-3G Smart (TM3-3GS)

- 8-channel 3G-SDI version for Peak, TruePeak, correlation and Loudness measurements
- Table-top unit with display unit and remote 3G-SDI interface box (cable length 2 m), with mains adapter
- 4.3" touch screen (272 x 480 pixel)
- Loudness metering acc. to EBU R128, ITU-R BS.1770-3/ 1771-1, ATSC A/85, ARIB, OP-59, AGCOM, CALM, or customer specific
- Single channel and summing loudness bargraphs
- Loudness Test Time Control
- Loudness Range (LRA) with MagicLRA mode
- PPM & True Peak
- SPL
- Dialnorm measurement
- Correlation
- Numerical display
- Stereo headphone out

- Integrated 16-channel 3G-SDI deembedder for the SDI formats
  - SD (525i, 625i),
  - HD (720p, 1035i, 1080i, 1080p, 1080SF)
  - 3G (1080p),
  with optional licence also output of the signals as 8 x AES3 (Bal.Out)
- 3G-SDI input (BNC In) and output (BNC Through, signal looped through without processing)
- Analog Stereo Monitor output (Line Out, 2 x RCA) and headphone output (Phones, 3.5 mm jack)
- Analog input (Aux In, 1 x RCA), e. g. for external timecode
- USB 2.0, GPIO, 24 V DC connectors
- Comprehensive set of presets
- Personalizing with **Devicer DC1** (Device Configurator software for Windows® and Mac OS X®)

Licence options for TM3-3G (already included in TM3-3GS):
- Monitoring controller with onscreen level fader
- Moving Coil instruments
- Timecode Reader
- Loudness Chart instrument

Software

Basic Software

Every TM3-3G comes with a basic software package. Beside the signal processing and the control functions this software includes a multi-channel Program Meter for measuring peak level, True Peak and Loudness (digital scales, peak hold, peak memory, Over indicators), the Loudness Sum instrument for measuring the summed loudness (M, S, I values), the LRA instrument for the graphical display of the Loudness Range, numerical displays of all relevant loudness values, a phase correlation meter, a Dialnorm meter, 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 for TM3-3G. Model TM3-3G Smart (TM3-3GS) is fully equipped with these licences already.

Devicer DC1

By default, the TM3-3G unit's preset memory contains a comprehensive set of factory presets covering many common applications. The Devicer DC 1 used to personalize the presets is available free of charge on the RTW web site. The Devicer's GUI lets you select, configure and position the instruments you need in a convenient way. The screen layout can be previewed at any time to see how your preset will look like on the TM3-3G resp. TM3-3G Smart (TM3-3GS). After having installed this Device Configurator software on your Mac OS X® (10.6. to10.9.) or Windows® (7/8) computer, the TM3-3G is connected to it using an USB cable (Mini-B / A). After all edits are performed and saved in the Devicer DC1, the respective presets can be uploaded to the TM3-3G.

Windows is either registered trademark or trademark of Microsoft Corporation in the United States and/or other countries.
Mac OS is trademark of Apple Inc., registered in the U. S. and other coutries.

Software (continued)

Software Modules (Licences)

Current software modules for TM3-3G can be ordered as licences either together with the ordered 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, a device-specific file for forwarding to RTW is created by the unit. RTW will send back a corresponding file with the activated licence for exactly this unit.
On TM3-3G Smart, these licences are completely activated.

- **TM3-SWMON: Monitoring**
  This option expands the feature set of the TM3-3G by a Monitoring Control function which enables monitoring of displayed audio signals.
  Functions: Monitor level control with onscreen level fader (can be calibrated), DIM, Mute, Solo, internal Downmix for multichannel monitoring, audio output of monitoring signals via RCA-, and 3.5 mm jack (analog).
  (On TM3-3G Smart already active).

- **TM3-SWDEEM: Deembedded out**
  This option expands the feature set of the TM3-3G by an output routing for deembedded audio signals.
  Functions: Deembedded output of up to 16 audio channels via the 8 x AES3 outputs of the 25-pin Sub-D connector.
  (On TM3-3G Smart already active).

- **TM3-SWMC: Moving Coil (Software Licence)**
  This option expands the feature set of the TM3-3G with the Moving Coil instrument for the display of needle instru-ments for up to 2-channel Stereo with different scales.
  Functions: L/R and M/S PPM modes (BR IIa/BR IIb scales), VU mode, Loudness mode, dual or single (stereo) displays horizontal or vertical, a combined mode with Dual-PPM and Loudness sum display (BBC) is also available.
  (On TM3-3G Smart already active).

- **TM3-SWTCR: Timecode reader**
  This option expands the feature set of the TM3-3G to allow external or SDI Timecode signals to be decoded, displayed and used for additional functions.
  Functions: Timecode reader and display of an external analog source via Aux In (RCA) or via 3G-SDI.
  (On TM3-3G Smart already active).

- **TM3-SWB: Software Bundle (Licence Upgrade)**
  This option (TM3-SWB3 for TM3-3G) expands the feature set of the TM3 resp. TM3-6CH with the licences TM3-SW6UPG, TM3-SWMC, and TM3-SWTCR, and with the Loudness Chart instrument for displaying the course over time of a loudness measurement. If the corresponding licence upgrade (software bundle) has been installed, upcoming instruments and functions can easily be added via firmware update.
 Upgrade functions: completely equate to the licences described on the left.
  Loudness Chart instrument functions: graph with course over time of one of the measured loudness values TP, M, S, or I, switchable Relative Gate view, adjustable time ranges, switchable Integrated bargraph, adjustable tolerance levels.
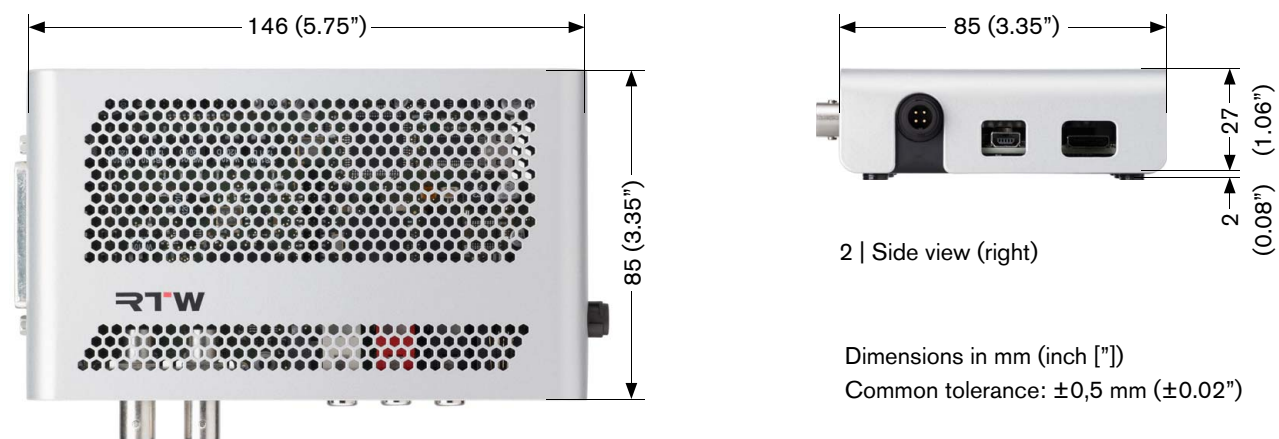 (On TM3-3G Smart already active).

Dimensions
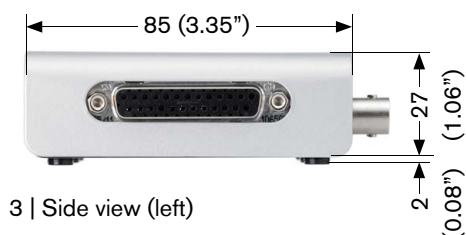
Display Unit TouchMonitor TM3-3G, TM3-3G Smart (TM3-3GS)

82.5 (3.25")
53.86 (2.12")
Active Area
4.3 inch
95.04 (3.74")
138 (5.43")

21 (0.83")
15°
50 (1.97")
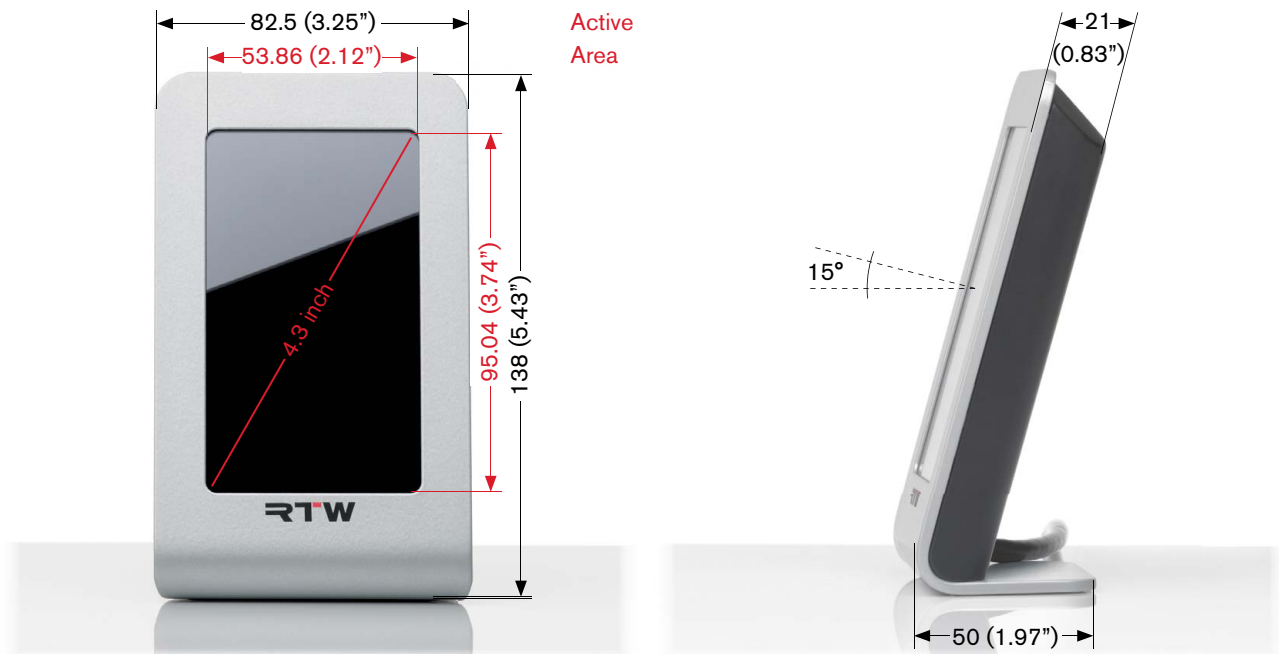
1 | Front view

2 | Side view

Interface Box TouchMonitor TM3-3G, TM3-3G Smart (TM3-3GS)

146 (5.75")
85 (3.35")
RTW

1 | Top view

85 (3.35")
27 (1.06")
2 (0.08")

2 | Side view (right)

Dimensions in mm (inch ["])
Common tolerance: ±0,5 mm (±0.02")

85 (3.35")
27 (1.06")
2 (0.08")

3 | Side view (left)

146 (5.75")
In – 3G - SDI – Through   Phones   L – Line Out – R   Aux In   GPIO   24V=
Bal.Out   USB
                                                                             Displ
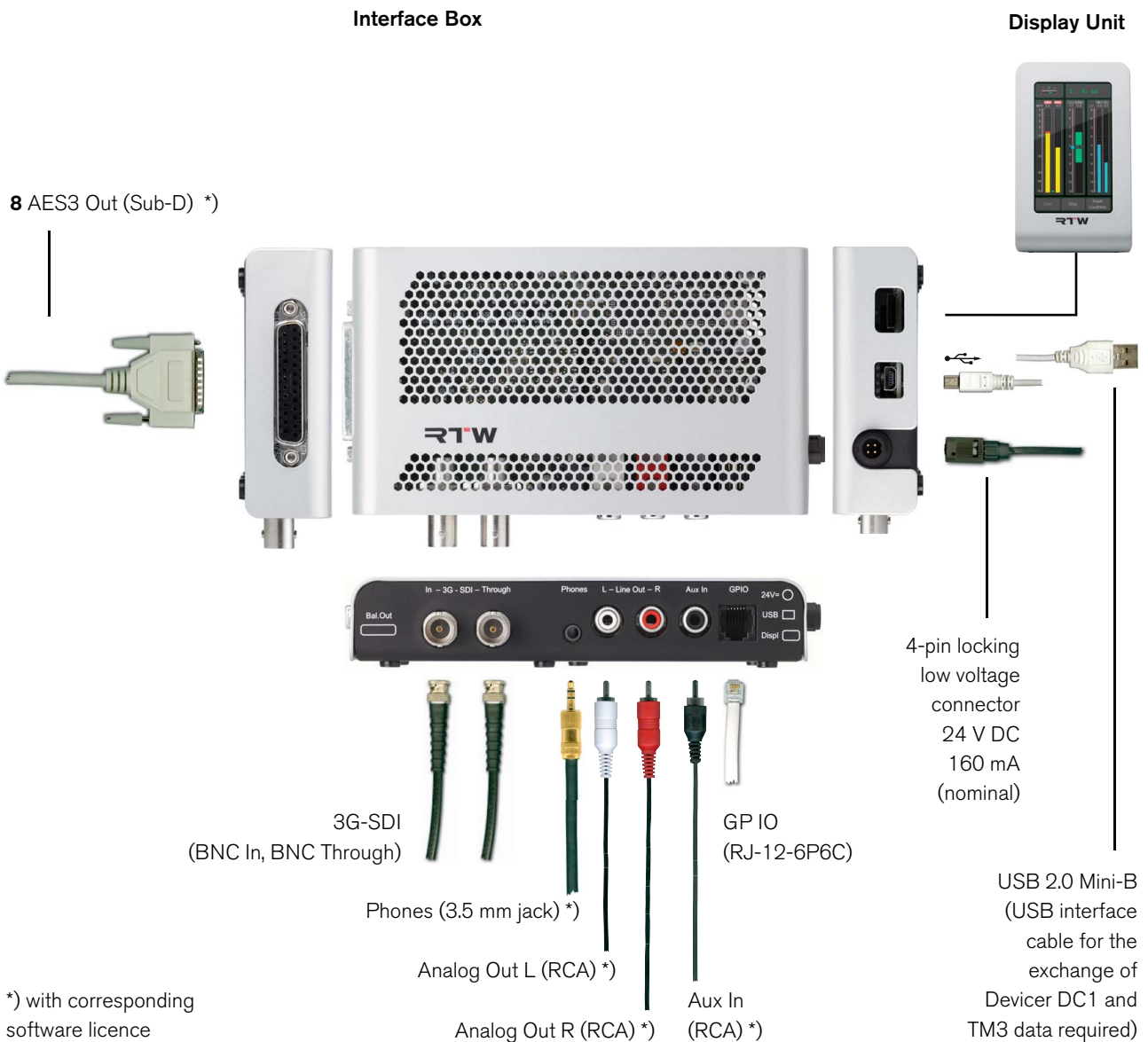27 (1.06")
2 (0.08")

4 | Rear view

Connection

Connectors

⚠️ **ATTENTION! - For operating the TM3-3G units an appropriate 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. This power supply is included in the TM3-3G resp. TM3-3G Smart (TM3-3GS) package.**
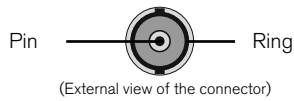
Interface Box

Display Unit

8 AES3 Out (Sub-D) *)

3G-SDI
(BNC In, BNC Through)

Phones (3.5 mm jack) *)

Analog Out L (RCA) *)

Analog Out R (RCA) *)

GP IO
(RJ-12-6P6C)

Aux In
(RCA) *)

4-pin locking
low voltage
connector
24 V DC
160 mA
(nominal)

USB 2.0 Mini-B
(USB interface
cable for the
exchange of
Devicer DC1 and
TM3 data required)

*) with corresponding
software licence

Pin Assignment

3G-SDI In, 3G-SDI Through (unbalanced, BNC-F)

Pin: Function:

Pin: Signal
Ring: Shield/chassis

Pin ———— Ring

(External view of the connector)

⚠ **NOTE -** The input signals are looped through without processing

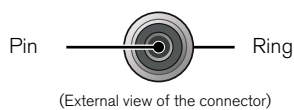**Block diagram of the 3G-SDI deembedder interface**
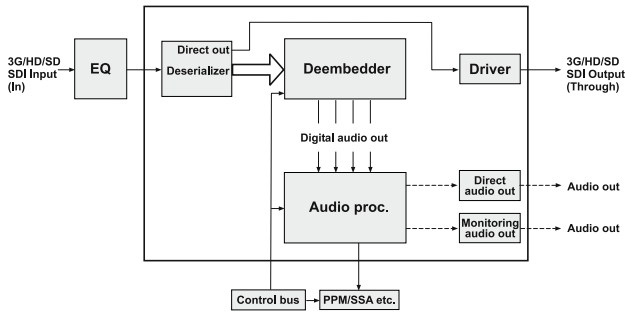
Line Out L, Line Out R (unbalanced, RCA-F)

Pin: Function:

Pin: Signal
Ring: Shield/chassis

Pin ———— Ring
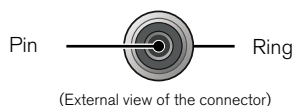
(External view of the connector)

⚠ **NOTE -** The analog signal outputs of the RCA connectors are in parallel with the corresponding output signals of the phones connector.
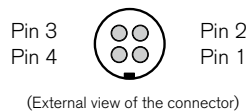
Aux In (unbalanced, RCA-F)

Pin: Function:

Pin: Signal
Ring: Shield/chassis

Pin ———— Ring

(External view of the connector)

24 V DC (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!
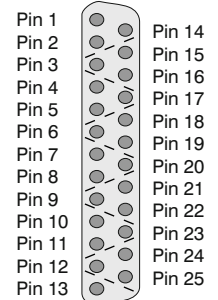
Phones (3.5 mm phones jack)

Standard 3.5 mm jack for monitoring deembedded audio signals included in 3G-SDI data streams with a headphone.

Bal.Out (25-pin Sub-D-F)

Pin: Function:

Pin	Function
1	Digital output 8 (+, hot)
14	Digital output 8 (−, cold)
2	Shield/chassis
15	Digital output 7 (+, hot)
3	Digital output 7 (−, cold)
16	Shield/chassis
4	Digital output 6 (+, hot)
17	Digital output 6 (−, cold)
5	Shield/chassis
18	Digital output 5 (+, hot)
6	Digital output 5 (−, cold)
19	Shield/chassis
7	Digital output 4 (+, hot)
20	Digital output 4 (−, cold)
8	Shield/chassis
21	Digital output 3 (+, hot)
9	Digital output 3 (−, cold)
22	Shield/chassis
10	Digital output 2 (+, hot)
23	Digital output 2 (−, cold)
11	Shield/chassis
24	Digital output 1 (+, hot)
12	Digital output 1 (−, cold)
25	Shield/chassis
13	not used

Pin 1   Pin 14
Pin 2   Pin 15
Pin 3   Pin 16
Pin 4   Pin 17
Pin 5   Pin 18
Pin 6   Pin 19
Pin 7   Pin 20
Pin 8   Pin 21
Pin 9   Pin 22
Pin 10   Pin 23
Pin 11   Pin 24
Pin 12   Pin 25
Pin 13

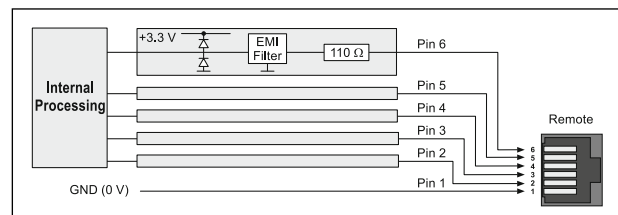(External view of the connector)

GPIO (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 (Mini-B)

Full Speed USB 2.0 interface for connecting the TM3 unit to the computer using a standard USB data cable. The USB interface is used for the data exchange between Device Configurator software Devicer DC1 and TM3.

Specifications

System

General

Power requirements:	+24 V DC (external 2 A max. overcurrent protective device shall be installed!)
Current drain:	160 mA nominal, power-up current is much higher
Display:	4.3" touch screen (272 x 480 pixel)
Connectors:	1 x 4-pin locking low voltage connector type Binder 710 (DC)
	1 x USB Mini-B; USB 2.0 Full Speed connectors for data exchange between Device Configurator computer software Devicer DC1 and TM3-3G
	1 x GPIO (RJ-12-6P6C) for defined functions or preset recall
	2 x BNC-F, 3G-SDI In, Through (unbal., digital)
	2 x RCA-F, Line Out (unbal., analog)
	1 x RCA-F, Aux In (unbal., analog)
	1 x 25-pin Sub-D-F, Bal.Out (bal., 8 x AES3 out)
	1 x 3.5 mm jack, Phones (unbal., analog)
Dimensions (W x H x D):	Display unit: 82.5 x 138 x 50 mm
	3G-SDI interface box: 146 x 29 x 85 mm
Weight:	Display unit approx. 320 g, interface box approx. 460 g, w/o mains adapter
Operating temperature:	+5° to +40° C

Functions (range depending on the specific unit type)

- Instruments can be scaled and freely positioned
- PPM up to 8 channels
- Loudness-Meter: ITU-R BS.1770-3/1771-1, EBU R128, ATSC A/85, ARIB, OP-59, AGCOM, CALM, custom mode
- Loudness Test Time Control
- Loudness Range instrument (LRA)
- Loudness Chart instrument, SPL meter
- Stereo Correlator
- Dialnorm (w/o speech intelligence)
- SDI status monitor
- Numerical displays
- 16-ch. 3G/HD/SD-SDI deembedder
- Routing of deembedded audio signals to AES3 outputs (optional licence)
- Monitoring Controller with onscreen level fader (optional licence)
- Moving Coil (optional licence)
- Timecode Reader (optional licence)

Digital Inputs

Inputs:	1 x 3G-SDI In (unbalanced), BNC-F
Outputs:	1 x 3G-SDI Through (unbalanced), BNC-F, input signals are active looped through without processing
Functions:	• Detection of validity of the applied SDI signal
	• Detection of frequency (SD/HD/3G)
	• Detection of contained format
	• Detection of validity of the contained and applied audio groups and deembedding
Deembedding:	• Single link (SD/HD/3G): max. 4 audio groups with 4 audio channels each
	• Dual link (3G): max. 8 audio groups with 4 audio channels each
	• 3G: max. 4 audio groups with 4 audio ch. each

SDI formats:

- SD:	525i, 625i
- HD:	720p (23.98, 24, 25, 29.97, 30, 50, 59.94, 60 Hz)
	1035i (59.94, 60 Hz)
	1080i (50, 59.94, 60 Hz)
	1080p (23.98, 24, 25, 29.97, 30 Hz)
	1080SF (23.98, 24, 25, 29.97 Hz)
- 3G:	1080p (23.98, 24, 25, 29.97, 30, 50, 59.94, 60 Hz)

PPM/True Peak Display

General

Input sources:	digital (3G/HD/SD-SDI)
Peakmeter:	2-channel Stereo up to 8 channels
Display:	• Peak level
	• Peak hold (selectable color)
	• Numerical value of the display
Functions:	• Gain (+20 dB, +40 dB acc. to standard)
	• Peak hold on/off
	• Memory
	• Reset

Specifications (continued)

Digital Peakmeter

Word width:	24 bit
Digital scales:	• TP60: +3 .. −60 dB
	• TP20: +3 .. −20 dB
	• Dig60: 0 .. −60 dB
	• Dig20: 0 .. −20 dB
	• Dig0: +18 .. 0 dB
	• Dig18: +18 .. −18 dB
	• Dig40: +20 .. −40 dB
	• ARD9: +9 .. −60 dB
	• DIN5: +5 .. -50 dB,
	• DIN10: +10 .. -50 dB,
	• Nordic: +12 .. -42 dB,
	• BR IIa: 7 .. 1 (British),
	• BR IIb: +12 .. -12 dB (British),
	• Zoom10: +10 .. −10,
	• Zoom1: +1 .. −1,
Headroom/Headroom Ref:	adjustable, 1 dB steps from 0 to −20 dB
Operation field:	adjustable, 1 dB steps from 0 to −20 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

SDI 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 control of defined functions in multiple instruments, and for preset recall. It also allows the external control with the integrated GP IO interface.

Loudness and SPL Display

EBU R128 Loudness Mode

ITU-R BS.1771 Loudness Mode

ATSC A/85 Loudness Mode

ARIB Loudness Mode

OP-59 Loudness Mode programmable

AGCOM Loudness Mode programmable

Customer Specific Loudness Mode

Display:	• Bargraphs for each single channel (can be combined with PPM bargraphs)
	• M bargraph (Momentary value)
	• S bargraph (Short - shortterm value)
	• I-Bargraph (Integrated - long term value)
	• Red scale markers for 0 LU thresholds
Numerical display:	• Short, Integrated, Momentary, LRA values
	• Maximum values for True Peak (TPmax), Momentary (Mmax), Short (Smax)
	• Duration of Integrated measurment (I-time)
Scales: *)	Loudness scales:
	• EBU+9: +9 .. −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
	• ITU0: 0 .. −30 LKFS
	• ATSC0: 0 .. −60 LKFS
	• ATSC0a: 0 .. −30 LKFS
Weighting filter:	K filter acc. to ITU-R BS.1770
Target Level: *)	−23 LUFS; adjustable from −10 to −30 LUFS
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

Specifications (continued)

Time & Gate Integrated: *)
- Silence Gate: −70.0 LUFS; adjustable from −80.0 LUFS to −40.0 LUFS in steps of 0.5 LUFS, 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
- +1.5 dB (LS, RS), adjustable between −3 dB and +3 dB in steps of 0.5 dB
- Off (LFE), selectable: Off, 0 dB, 10 dB

Upper tolerance: acc. to standard; tolerance above the Target Level, adjustable from 0 to +10 LU in steps of 0.1 LU

Lower tolerance: acc. to standard; tolerance below the Target Level, adjustable from 0 to −12 LU in steps of 0.1 LU

*) Depending on the used loudness standard not all of the listed settings are available.

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)

TM3-SWMON: Monitoring (Software Licence, included in TM3-3G Smart)
This option expands the feature set by a Monitoring Control function which enables monitoring of displayed audio signals.

Functions: Monitor level control with onscreen level fader (can be calibrated), DIM, Mute, Solo, internal Downmix for multichannel monitoring, audio output of monitoring signals via Line Out and Phones connector.
Outputs:
- Analog 2-ch. Stereo (unbal.), 2 x RCA
- Analog 2-ch. Stereo headphone (unbal.), 3.5 mm jack

TM3-SWDEEM: Deembedded out (Software Licence, included in TM3-3G Smart)
This option expands the feature set by an output routing for deembedded audio signals.

Functions: Deembedded output of up to 16 audio channels via 8 x AES3 outputs
Outputs: 8 x AES3 (bal.), 25-pin Sub-D connector

TM3-SWTCR: Timecode Reader (Software Licence, included in TM3-3G Smart)
This option expands the feature set to allow external or SDI Timecode signals to be decoded, displayed and used for additional functions.

Display: numerical display of
- LTC (from analog source via Aux In)
- VITC (via SDI data stream via 3G-SDI In)
Mode: LTC, VITC; instrument selectable when creating a Non-Audio group
Input: one analog or SDI channel selectable
Colors: selectable, 32 colors

Specifications (continued)

TM3-SWMC: Moving Coil (Software Licence, included in TM3-3G Smart)
Expands the function set of TM3-3G with the Moving Coil instrument for the display of needle instruments for up to 2-channel Stereo with different scales.

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 analog:	VU (−20 to +3 dB)
- 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) 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

TM3-SWB: Software Bundle (Licence upgrade, included in TM3-3G Smart)
Licence upgrade for expanding TM3-3G with all licences (details see **Optional Software Licences**) and for expanding the completed feature set with the Chart instrument. When a software bundle has been installed, upcoming instruments and functions can be added via firmware update.

Display:	acc. to TM3-SWMON, TM3-SWDEEM, TM3-SWMC, TM3-SWTCR, and Chart instrument

Chart

Description:	Loudness Chart instrument for displaying and analyzing the course over time of a loudness measurement directly on the display.

Loudness Chart Instrument

Functions:	▪ Coordinate system displaying a graph with the course over time of one of the measured values TP, M, S, or I
	▪ Relative Gate view switchable
	▪ Adjustable time ranges
	▪ Vertical Integrated bargraph switchable
	▪ Adjustable tolerance levels
Display:	▪ Course over time of the selected value with color filling or as line
	▪ Tolerance Marker
	▪ Position of the Relative Gate (doubled horizontal line)
	▪ Vertical I bargraph
Colors:	▪ Fill: Adoption of the corresponding colors of the Loudness Sum instrument
	▪ Line: cyan (M), light red (S), green (I), yellow (TP)
	▪ Tolerance Marker: coordinate system turns to light grey except the corridor defined by the tolerance settings
	▪ Relative Gate: white
Time range presets:	1 m; 1 m, 5 m, 1 h selectable
Time range select:	via preset or onscreen during normal operation
Upper tolerance:	as defined in the Loudness/Tolerance menu of each audio group; tolerance above the Target Level
Lower tolerance:	as defined in the Loudness/Tolerance menu of each audio group; tolerance below the Target Level

Specifications (continued)

Items of Delivery

TouchMonitor TM3-3G: 2-channel Stereo up to 8-channel
- TM3 display unit with 4.3" touch screen in a table-top case with fixed connector cable (approx. 2 m)
- 3G-SDI interface box, connected to display unit
- Mains adapter, manual

Order no.: TM3-3G

TM3-3G Smart: 2-channel Stereo up to 8-channel
- Extended software including all available licences and Chart instrument
- TM3 display unit with 4.3" touch screen in a table-top case with fixed connector cable (approx. 2 m)
- Interface box, connected with display unit
- Mains adapter, manual

Order no.: TM3-3GS

Optional Software Licences
(for TM3-3G, included in TM3-3G Smart)
- Software licence **TM3-SWMON** for the upgrade with a Monitoring Control function to monitor the displayed audio signals
- Software licence **TM3-SWDEEM** for the upgrade with a AES3 output routing of the deembedded audio signals
- Software licence **TM3-SWMC** for the upgrade of TM3-3G with the Moving Coil instrument
- Software licence **TM3-SWTCR** for the upgrade with a timecode reader displaying timecodes from external analog sources or 3G-SDI data stream
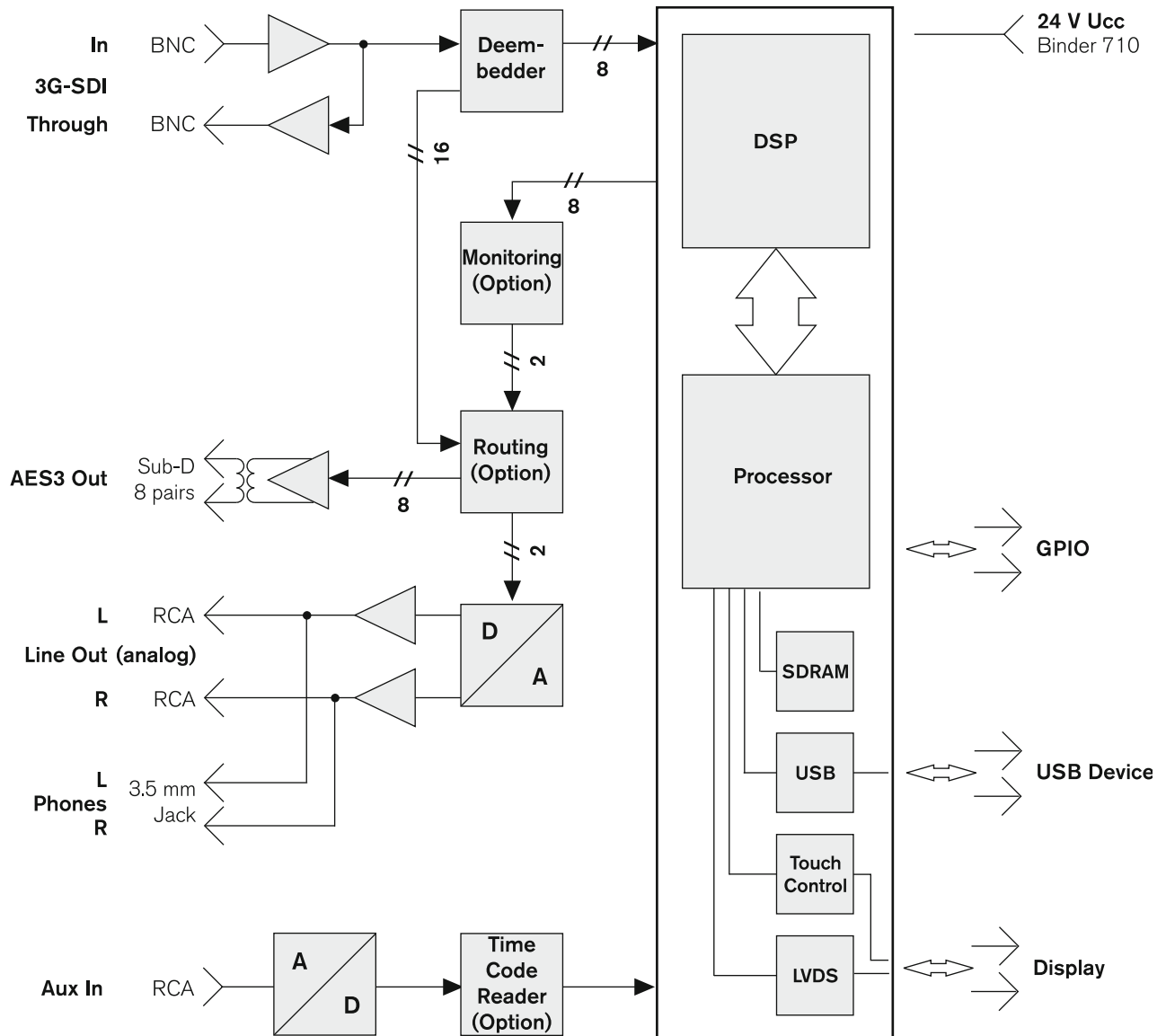
- Software bundle **TM3-SWB3**, licence upgrade for expanding TM3-3G with licences TM3-SWMON, TM3-SWDEEM, TM3-SWMC, and TM3-SWTCR, and with the Loudness Chart instrument for displaying the course over time of a loudness measurement.

When a software bundle has been installed, upcoming instruments and functions can be added via firmware update.

Optional Accessories
- Extension cable **1161** for TM3 interface box, 10 m, to enlarge the distance between TM3 display unit and TM3 interface box up to 12 m. Set includes required f-f adapter
- Snake cable **1163** (2 m) for 3G-SDI interface box, distributes 25-pin. Sub-D-M to 8 x XLR-M (AES3 outputs)
- Metal mounting plate **1166** for TM3 display unit to be mounted with 3/8" holds (e. g. gooseneck, mic stand)
- Wide voltage power supply **1168-R** (100 - 240 V AC/24 V DC 2,7 A, table-top unit with corresponding mains cable for different power systems)

Block Diagram

In BNC
3G-SDI
Through BNC

Deem-bedder

// 8

DSP

24 V Ucc
Binder 710

// 16

Monitoring (Option)

// 8

// 2

AES3 Out Sub-D 8 pairs

Routing (Option)

// 8

Processor

GPIO

// 2

L RCA
Line Out (analog)
R RCA

D / A

SDRAM

L 3.5 mm
Phones Jack
R

USB

USB Device

Touch Control

Aux In RCA

A / D

Time Code Reader (Option)

LVDS

Display

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RTW