

Data Sheet (preliminary) TouchMonitor TM3-3G



TouchMonitor TM3-3G



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/Time Code option

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®. 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 TM3-3G features comprehensive loudness measuring features conforming to all relevant international standards (EBU R128, ITU-R BS.1770-2/1771, ATSC A/85, and ARIB). Loudness instruments include single-channel and summing bargraphs, loudness range and numerical displays.

TM3. Loudness Simplified.

Hardware

TM3-3G

- 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.1770-2/1771, ATSC A/85, ARIB or customer specific
- Single channel and summing loudness bargraphs
- Loudness Range (LRA) with MagicLRA mode
- PPM & True Peak
- SPL
- Dialnorm measurement
- Correlation
- Numerical display
- Monitoring controller with onscreen level fader (optional licence)
- 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)
- Timecode reader (optional licence)
- 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®)



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.

Software Modules (Licences)

Current and future software modules can be ordered as licences either together with the ordered TM3-3G version 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.

▪ 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).

▪ 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.

▪ 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.

Devicer DC1

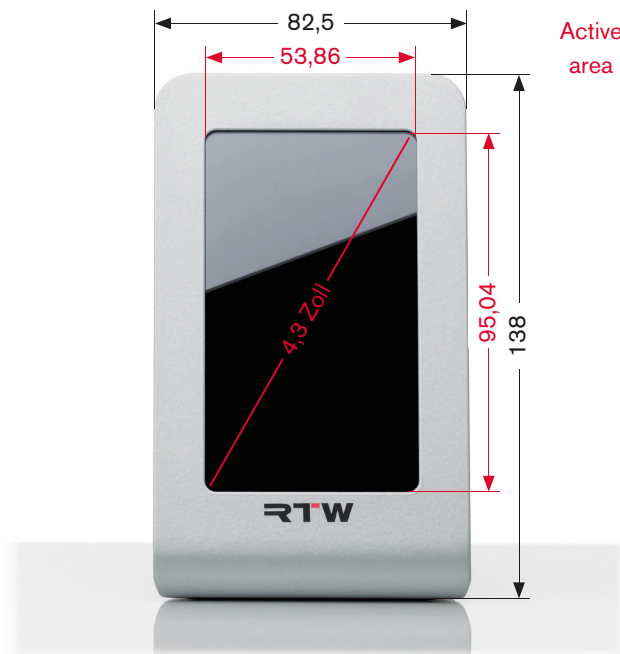
By default, the TM3-3G's preset memory contains a comprehensive set of factory presets covering many common applications. The Devicer DC 1 used to personalize the presets is available free of charge on the RTW web site. The Devicer's GUI lets you select, configure and position the instruments you need in a convenient way. The screen layout can be previewed at any time to see how your preset will look like on the TM3. After having installed this Device Configurator software on your Mac OS X® (10.6 or higher) or Windows® (XP, Vista, 7) computer, the TM3-3G is connected to it using a 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.



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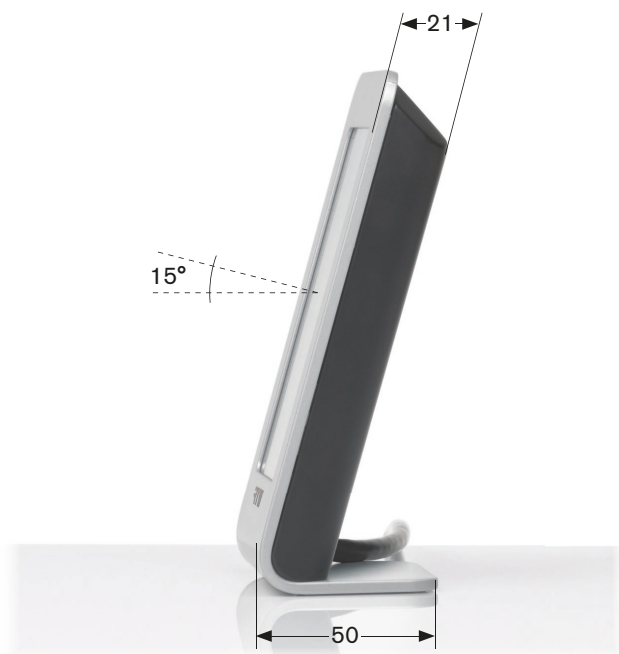
Dimensions

Display Unit TouchMonitor TM3-3G



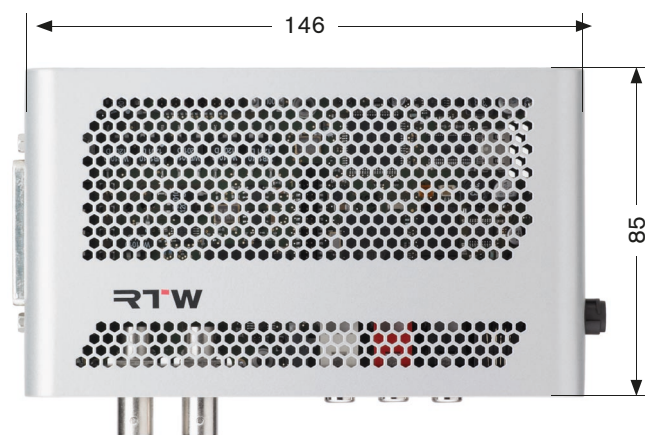
1 | Front view

Active area

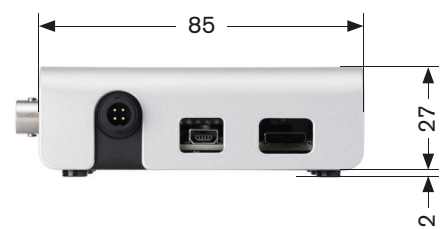


2 | Side view

Interface Box TouchMonitor TM3-3G

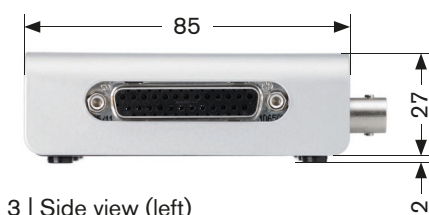


1 | Top view



2 | Side view (right)

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



3 | Side view (left)



4 | Rear view

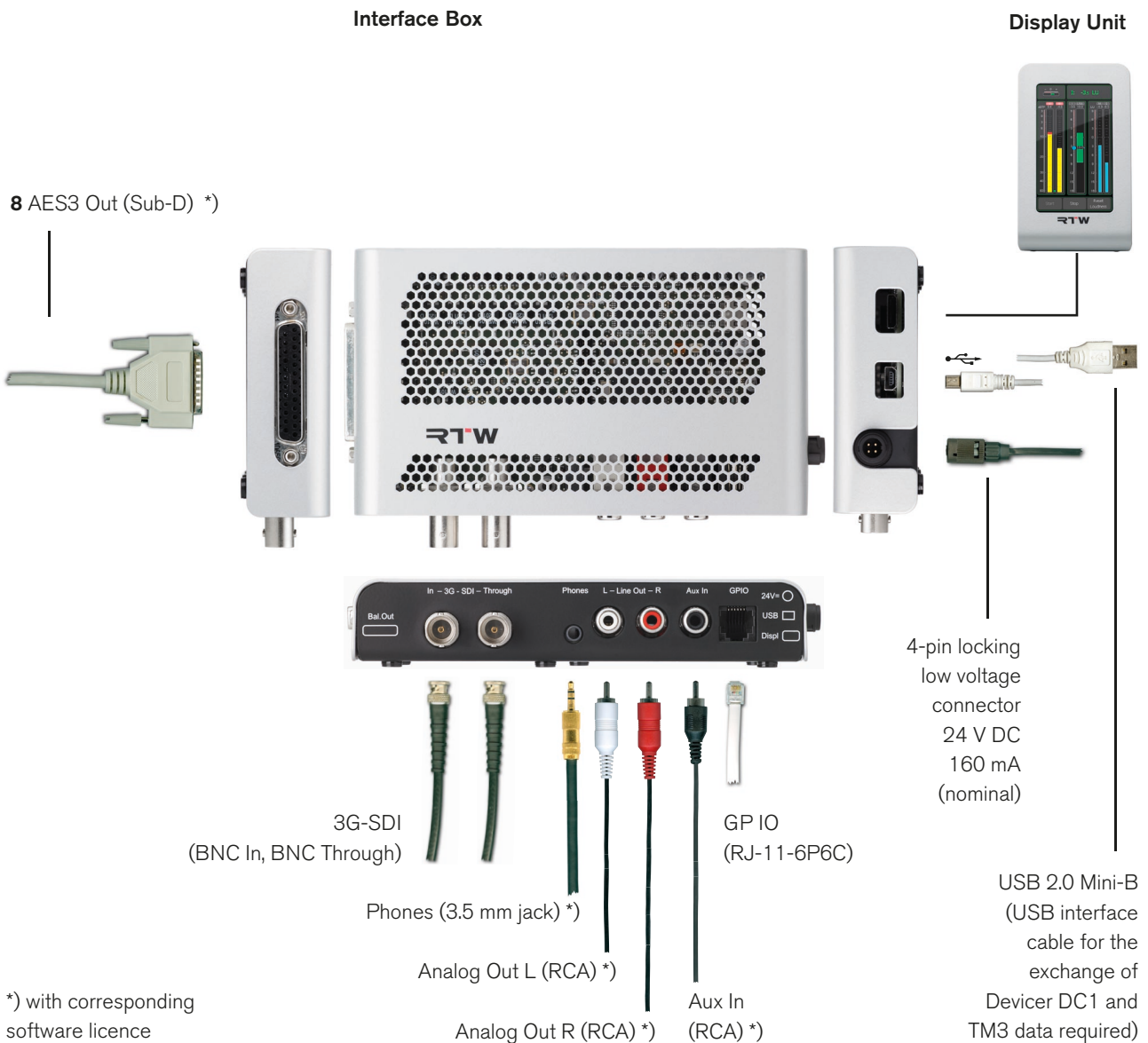
Connection

Connectors



ATTENTION! - For operating the TM3-3G 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 package.

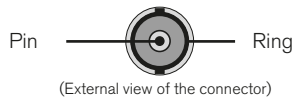


Pin Assignment

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

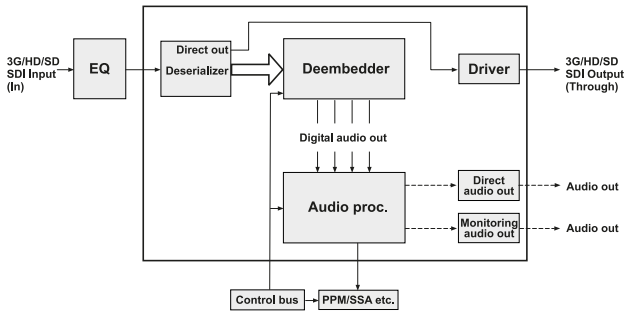
Pin: Function:

Pin: Signal
Ring: Shield/chassis



NOTE - The input signals are looped through without processing

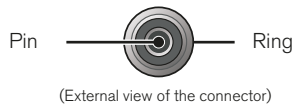
Block diagram of the 3G-SDI deembedder interface



Line Out L, Line Out R (unbalanced, RCA-F)

Pin: Function:

Pin: Signal
Ring: Shield/chassis

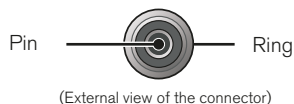


NOTE - The analog signal outputs of the RCA connectors are in parallel with the corresponding output signals of the phones connector.

Aux In (unbalanced, RCA-F)

Pin: Function:

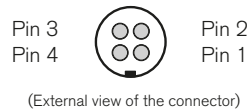
Pin: Signal
Ring: Shield/chassis



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



NOTE - An external overcurrent protective device (2 A max.) shall be installed when using an external 24 V DC power supply!

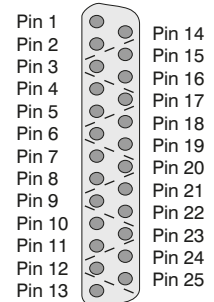
Phones (3,5 mm phones jack)

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:

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



GPIO (RJ-11-6P6C socket)

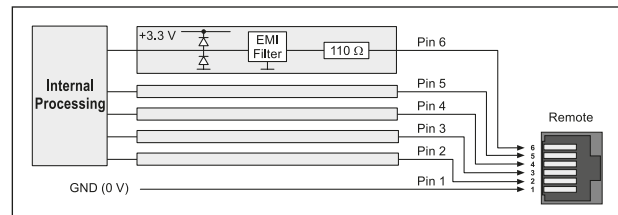
External control of functions and presets recall as defined in the Global Keyboard menu. The inputs defined as „active low“ have to be switched against 0 V (Pin 1).

Pin: Function:

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



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-11-6P6C) 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 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

- Instruments can be scaled and freely positioned
- PPM up to 8 channels
- Loudness-Meter: ITU-R BS.1770-2/1771, EBU R128, ATSC A/85, ARIB, custom mode
- Loudness Range instrument (LRA)
- 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)
- 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:	<ul style="list-style-type: none">• 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• Display of up to 32 channels
Deembedding:	<ul style="list-style-type: none">• 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. 8 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:	<ul style="list-style-type: none">• Peak level• Peak hold• Numerical value of the display
Functions:	<ul style="list-style-type: none">• Gain (+20 dB, +40 dB acc. to standard)• Peak hold on/off• Memory• Reset

Digital Peakmeter

Word width:	24 bit
Digital scales:	<ul style="list-style-type: none">• 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:	<ul style="list-style-type: none">• channel data are displayed as plain text, hex or binary• Channel selectable• Audio bit activity• Hardware status
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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 I/O interface.

Loudness and SPL Display

EBU R128 Loudness Mode

ITU-R BS.1771 Loudness Mode

ATSC A/85 Loudness Mode



Specifications (continued)

ARIB Loudness Mode

Customer Specific Loudness Mode

Display:	<ul style="list-style-type: none">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)
Numerical display:	<ul style="list-style-type: none">Short, Integrated, Momentary, LRA valuesMaximum values for True Peak (TPmax), Momentary (Mmax), Short (Smax)
Scales: *)	Loudness scales: <ul style="list-style-type: none">EBU+9: +9 .. -18 LUEBU+18: +18 .. -36 LUEBU+9a: 14 .. -41 LUFSEBU+18a: -5 .. -59 LUFSEBU0: 0 .. -60 LUFSITU+9: +9 .. -18 LUITU0: 0 .. -30 LKFSATSC0: 0 .. -60 LKFSATSC0a: 0 .. -30 LKFS
Weighting filter:	K filter acc. to ITU-R BS.1770
Target Level: *)	-23 LUFS; adjustable in the range from -10 to -30 LUFS
Time & Gate Momentary: *)	
- Window Time (SOR):	adjustable in the range 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 in the range from 1 to 20 s in steps of 1 s
Time & Gate Integrated: *)	
- Silence Gate:	-70.0 LUFS; adjustable in the range from -80.0 LUFS to -40.0 LUFS in steps of 0.5 LUFS, switchable
- Relative Gate:	-10.0 LU; adjustable in the range from -40.0 LU to 0 LU in steps of 0.5 LUFS, switchable
Level adjustment for the summation: *)	<ul style="list-style-type: none">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 and +3 dB in steps of 0.5 dBOff (LFE), selectable: Off, 0 dB, 10 dB

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

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, 1 LU steps from 1 to 20 LU
Comfort zone:	4 LU; adjustable, 1 LU steps from 1 to 20 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:	<ul style="list-style-type: none">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 (optional licence)

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:	<ul style="list-style-type: none">Analog 2-ch. Stereo (unbal.), 2 x RCAAnalog 2-ch. Stereo headphone (unbal.), 3.5 mm jack

TM3-SWDEEM: Deembedded out (optional licence)

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 (optional licence)

This option expands the feature set 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
Input:	<ul style="list-style-type: none">Aux In (analog, unbal.), 1 x RCAInternal from 3G-SDI data stream (3G-SDI In)

Items of Delivery

TouchMonitor TM3-3G:	2-channel Stereo up to 8-channel <ul style="list-style-type: none">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 unitMains adapter, manual
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Order no.: TM3-3G

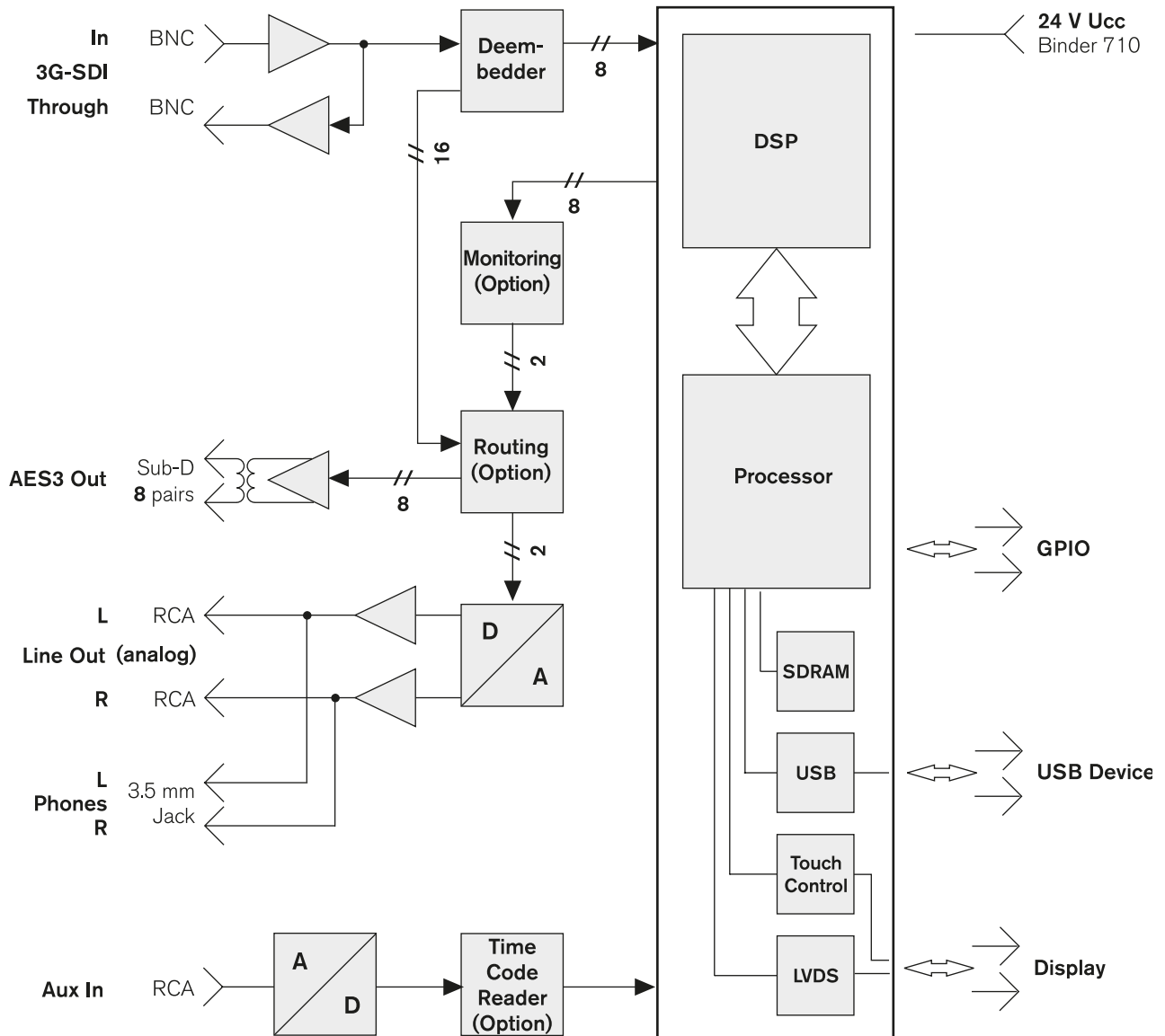
Optional Software Licence

- 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-SWTCR** for the upgrade with a timecode reader displaying timecodes from external analog sources or 3G-SDI data stream

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



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