

Data Sheet

TouchMonitor TM3-3G Smart



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Flexible touch screen layout • Loudness: EBU, ITU, ATSC, ARIB, OP-59, AGCOM, CALM • LRA • PPM/True Peak • SPL Stereo/8-ch. operation • 3G-SDI Audio • Dialnorm • 3G-SDI Deembedder • Monitoring • AES3 out • Moving Coil • Timecode

The TouchMonitor TM3-3G Smart (TM3-3GS) is a compact and ver-satile 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. 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 TM3-3GS. Besides PPM and True Peak instruments, the units feature comprehensive loudness measuring features conforming to all relevant international standards (EBU R128, ITU BS.1770-4/1771-1, ATSC A/85, ARIB, OP-59, AGCOM, and CALM). Loudness instruments include single-channel and summing bar-graphs, loudness range, loudness chart and numerical displays. Stereo signals can also be displayed on needle instruments (Moving Coil).

TM3. Loudness Simplified.

Hardware

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.1770-4/1771-1, ATSC A/85, ARIB, OP-59, AGCOM, CALM, or customer specific, SPL display
- Single channel and summing loudness bargraphs
- Loudness Test Time Control, Dialnorm measurement
- Loudness Range (LRA) with MagicLRA mode
- PPM & True Peak, Correlation
- Numerical display
- Integrated 16-channel 3G-SDI deembedder for the SDI formats
 - SD (525i, 625i),
 - HD (720p, 1035i, 1080i, 1080p, 1080SF)
 - 3G (1080p),Output of deembedded signals via 8 AES3 Out (Bal.Out)
- Monitoring controller with onscreen level fader
- Moving Coil instruments
- Timecode Reader
- Loudness Chart instrument
- 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®)



Additional Hardware Options

TM3-2U (option for 2U rack mounting)

Option for mounting TM3-3GS into rack frame TM3-MA2U or into other appropriate mechanical environments. It can only be ordered together with TM3-3GS devices. Then, a display with mounting frame, mounting material, and an USB extension cable is part of delivery.

TM3-MA2U (2U rack carrier for TM3-3GS with TM3-2U)

19"/2U rack carrier/mounting frame to be fitted with up to two TM3 series units which must feature the TM3-2U option.

Software

Smart Software Package

With the integrated Smart software package, TM3-3G Smart (TM3-3GS) is fully equipped. It provides the wide range of RTW's approved loudness and audio metering tools to meet the demands of a wide variety of applications. Beside the signal processing and the control functions this software includes the following instruments and functions:



PPM and TruePeak meter for up to 8 channels with comprehensive set of digital scales, Peak Hold, Peak Memory, Over indicator, numerical display, additional Loudness bargraphs switchable. Additional control keys for positioning on the display.



2-channel stereo needle instruments with PPM display (British), VU display, Loudness display, and combined PPM and Loudness display (BBC mode). Additional control keys for positioning on the display.



Loudness Sum instrument for displaying the summed loudness values M, S, and I of a loudness measurement acc. to EBU R128, ITU BS.1770-4/1771-1, ARIB, ATSC A/85, OP-59, AGCOM, CALM Act or customer specific on bargraphs, or an SPL meter. Additional control keys for positioning on the display.



Loudness Numeric instrument for the numerical display of all relevant values of a Loudness measurement: M, S, I, LRA, TPmax, Mmax, Smax, I-time. Additional control keys for positioning on the display.



Loudness Range instrument with MagicLRA mode for a graphical representation of loudness variances with additional display of the I value. Adjustable ranges with different colors. Additional control keys for positioning on the display.



Loudness Chart instrument for displaying and analyzing the course over time of one selectable value of a loudness measurement directly on the display. Additional control keys for positioning on the display.



The Dialnorm instrument is used to calculate and to show numerical Dialnorm values (w/o speech intelligence) from digital surround signals. Additional control keys for positioning on the display.



Stereo Correlator for displaying the phase relationship between the two channels of a stereo signal and thus its mono compatibility. Additional control keys for positioning on the display.



Smart Software Package (continued)



The Timecode Reader instrument is used to decode and to display the SDI timecode or an LTC timecode of an external analog source for the use with Loudness applications.



Matrix for the routing of 16 deembedded audio channels to 8 AES3 outputs via 25-pin Sub-D.



Monitoring instrument with control function for monitoring of displayed audio signals, monitor level control (onscreen level fader can be calibrated), DIM/Mute function, internal Downmix for multi-channel monitoring. Audio output of monitored signals via RCA or 3.5 mm jack (analog).



AES Status monitor for displaying various parameters of AES3 digital audio signals in plain text. Additional control keys for positioning on the display.



Instrument for displaying the status of the 3G/HD/SD-SDI deembedder interface showing the SDI and video format, and a list with the included and available audio signals and audio groups.



Global Keyboard with definable on-screen keys for simultaneous control of defined functions in multiple instruments, and for preset recall. It also allows external control via GP IO interface.

Upcoming instruments and functions can be added via firmware update, which will be available from the download area of our website (<https://www.rtw.com/en/support/manuals-software.html>). Read the **Specifications** section to learn more about the listed instruments.

Devicer DC1

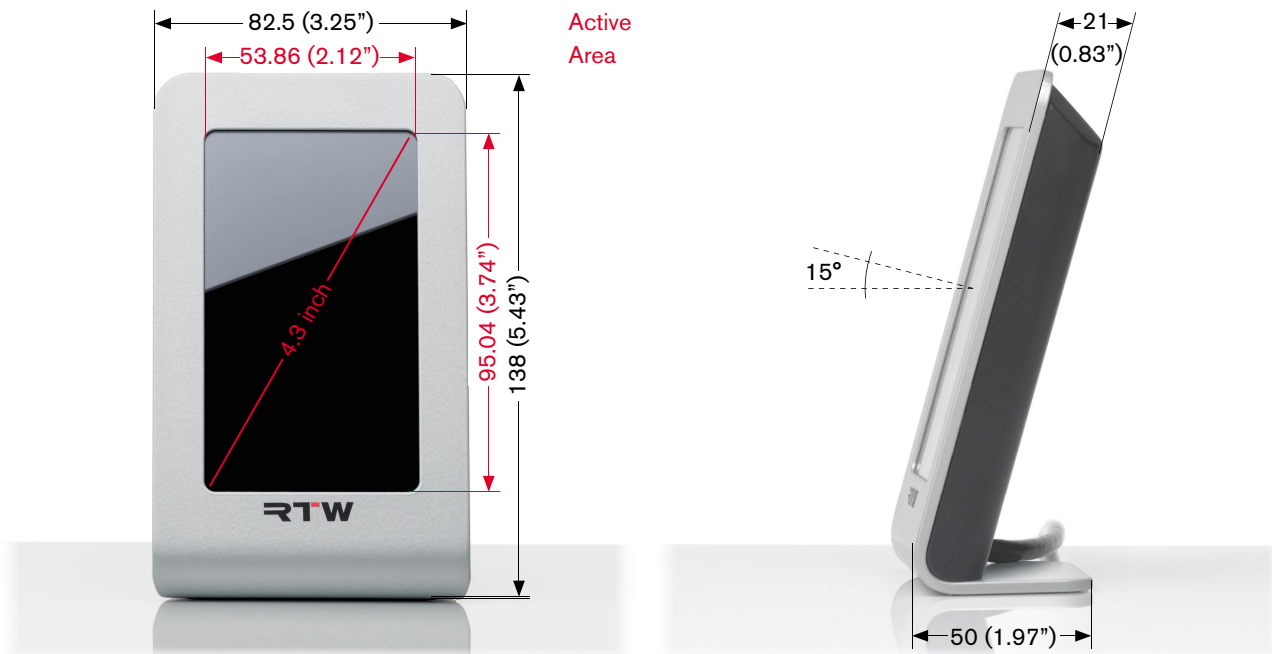
By default, the TM3-3GS 's preset memories contain comprehensive sets of factory presets covering many common applications. The Devicer DC1 used to personalize the presets is available free of charge from the download area of the RTW web site (<https://www.rtw.com/en/support/manuals-software-downloads.html>). 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 Smart (TM3-3GS). After having installed this Device Configurator software on your Mac OS X® (10.6. to 10.9.) or Windows® (7/8) computer, the TM3-3GS 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 TM3-3GS.



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 countries.

Dimensions

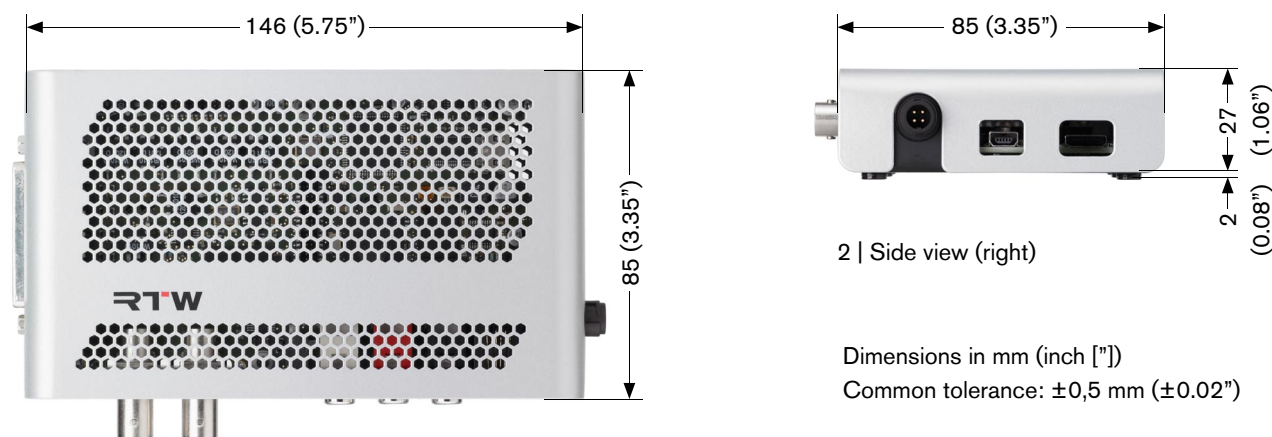
Display Unit TouchMonitor TM3-3G Smart (TM3-3GS)



1 | Front view

2 | Side view

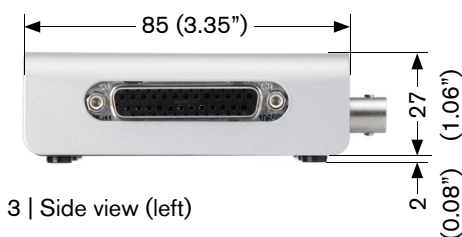
Interface Box TouchMonitor TM3-3G Smart (TM3-3GS)



1 | Top view

2 | Side view (right)

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



3 | Side view (left)



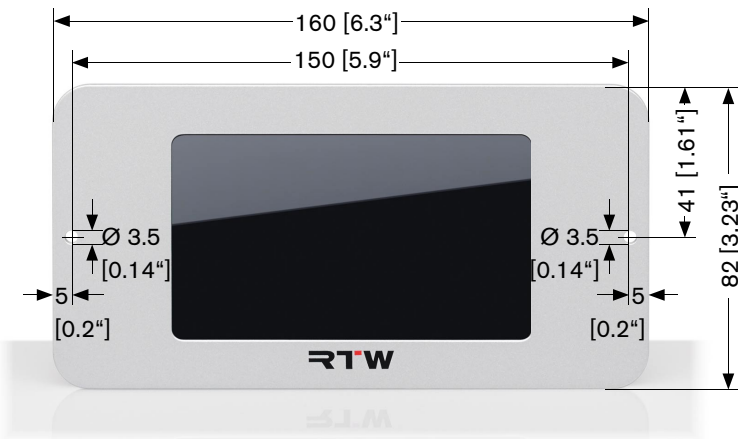
4 | Rear view



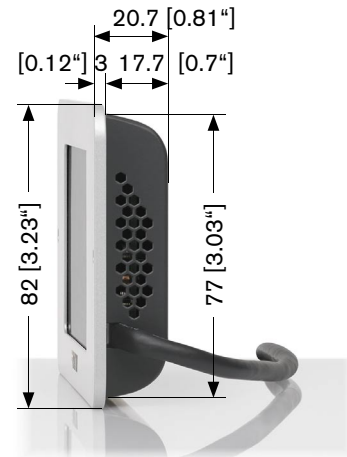
Dimensions (continued)

Option TM3-2U

(can only be ordered together with a TM3-3GS – allows mounting into front panels/mounting plates or into optional 19"/2U rack carrier/mounting frame TM3-MA2U)



1 | Front view

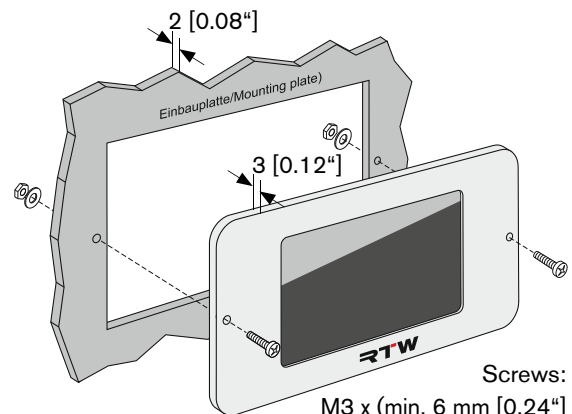


2 | Side view

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

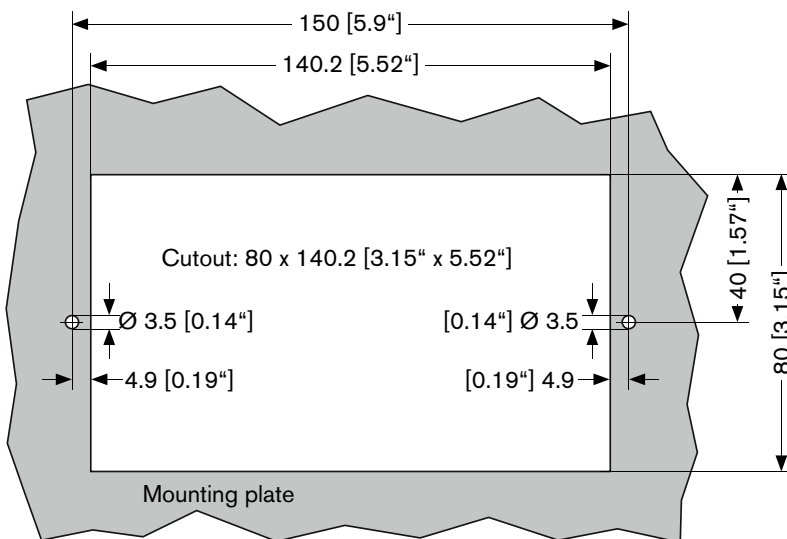


3 | Rear view




Screws:
M3 x (min. 6 mm [0.24"]
+ thickness of mounting plate)

5 | Mounting



4 | Cutout of mounting plate

 For adequate ventilation of the device after mounting, the mounting plate should have a maximum thickness of 2 mm [0.08"]

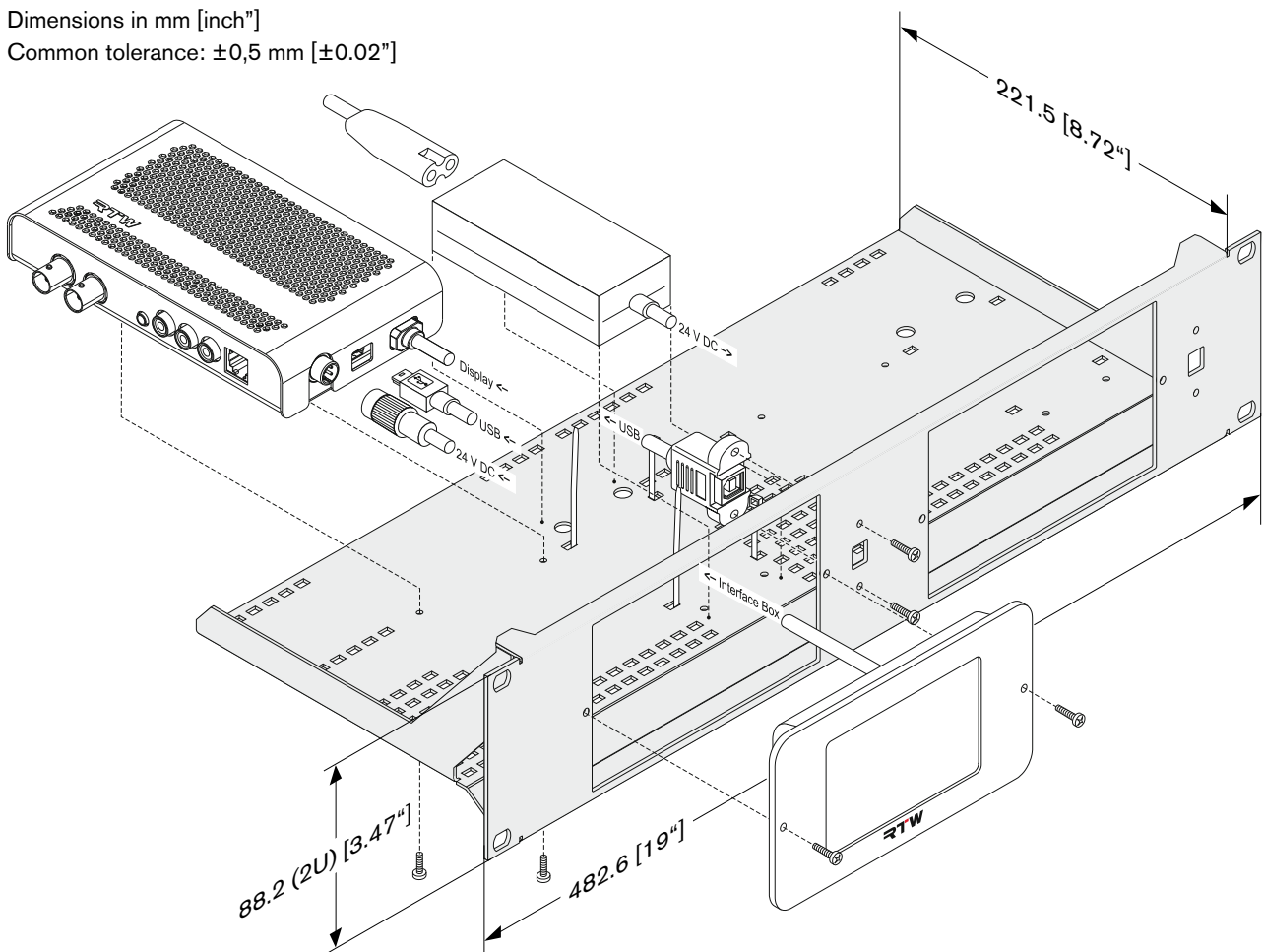
Dimensions (continued)

Option TM3-MA2U

(separate available 19"/2U rack carrier/mounting frame for mounting up to two TM3-3GS equipped with TM3-2U option)

Dimensions in mm [inch"]

Common tolerance: $\pm 0,5$ mm [± 0.02 "]



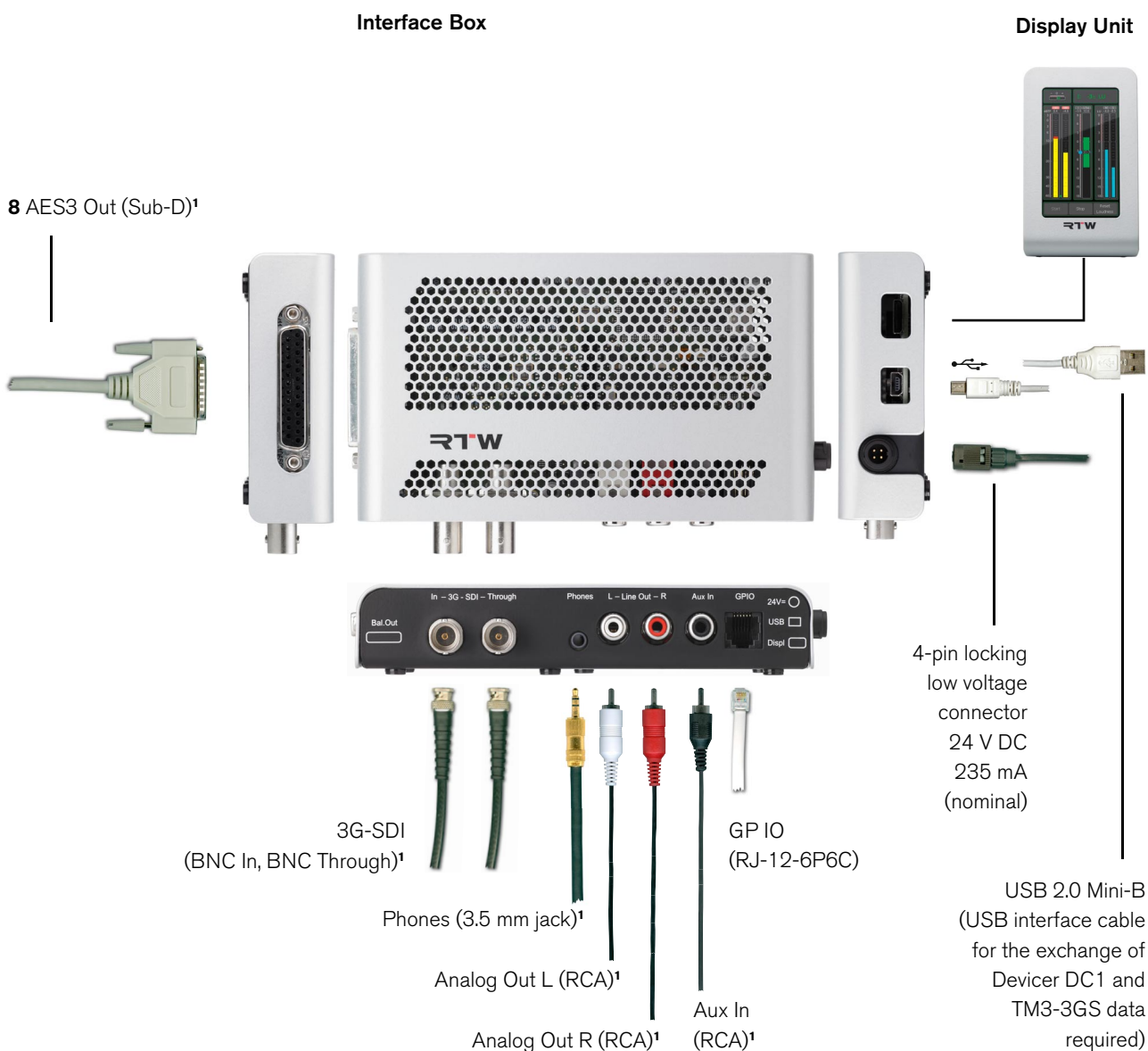
1 | Schematic diagram of mounting a TM3-3GS with option TM3-2U into 19"/2U rack carrier TM3-MA2U

Connection

Connectors



ATTENTION! - For operating the TM3-3G Smart (TM3-3GS) an appropriate mains adapter is required. RTW recommends the use of the RTW wide voltage power supply 1178-R (100 - 240 V AC/24 V DC, 2.71 A) approved for TouchMonitor. This power supply is included in the TM3-3G Smart (TM3-3GS) package.



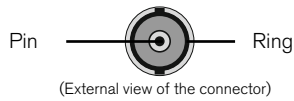
¹ The length of each connected signal cable must not exceed 3 m!

Pin Assignment

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

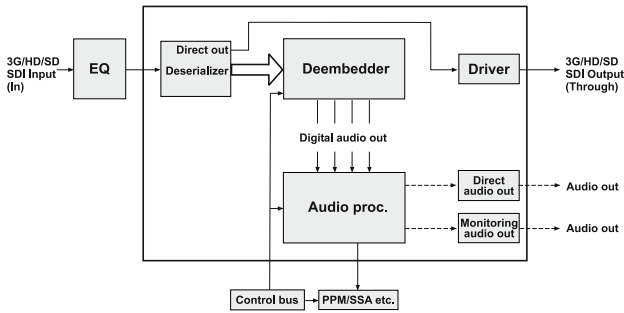
Pin: Function:

Pin: Signal
Ring: Shield/chassis



NOTE - The input signals are looped through without processing

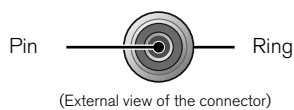
Block diagram of the 3G-SDI deembedder interface



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

Pin: Function:

Pin: Signal
Ring: Shield/chassis

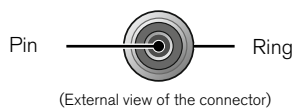


NOTE - The analog signal outputs of the RCA connectors are in parallel with the corresponding output signals of the phones connector.

Aux In (unbalanced, RCA-F)

Pin: Function:

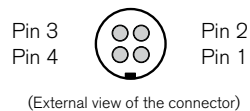
Pin: Signal
Ring: Shield/chassis



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!

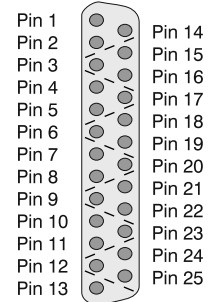
Phones (3,5 mm phones jack)

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-12-6P6C socket)

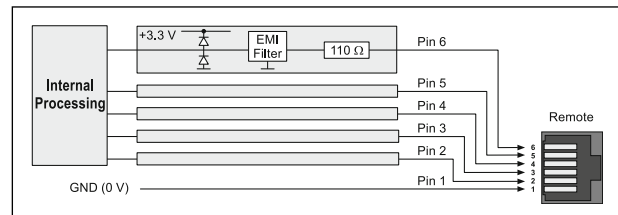
External control of functions and presets recall as defined in the Global Keyboard menu. The inputs defined as „active low“ have to be switched against 0 V (Pin 1).

Pin: Function:

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



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 TM3-3GS.

Specifications

System

General

Power requirements:	+24 V DC (external 2 A max. overcurrent protective device shall be installed!)
Current drain:	235 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 TM3-3GS 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.1770-4/1771-1, 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
- Monitoring Controller with onscreen level fader
- Moving Coil
- Timecode Reader

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
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. 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:	<ul style="list-style-type: none">▪ 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:	<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 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:	<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) ▪ Red scale markers for 0 LU thresholds
Numerical display:	<ul style="list-style-type: none"> ▪ Short, Integrated, Momentary, LRA values ▪ Maximum values for True Peak (TPmax), Momentary (Mmax), Short (Smax) ▪ Duration of Integrated measurement (I-time)
Scales: *)	<p>Loudness scales:</p> <ul style="list-style-type: none"> ▪ 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 adjustable in the range from 68 dB to 88 dB in steps of 1 dB

Reference point: Linear, A (Leq(A)), C, CCIR (Leq(M)), k
Weighting: Linear, A (Leq(A)), C, CCIR (Leq(M)), k
Integration time: Fast (125 ms), Slow (1 s)

Monitoring

Monitoring Control function enabling 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

Deembedded out

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

Timecode Reader

Decoding and displaying of external or SDI Timecode signals to be 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)

Moving Coil

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:	<ul style="list-style-type: none"> 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, <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> PPM: see above Loudness: +9 to -9 LU fixed (mid of scale corresponds to Target Level)
- Scales:	
Numerical display:	switchable

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:	<ul style="list-style-type: none"> 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:	<ul style="list-style-type: none"> 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:	<ul style="list-style-type: none"> 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

TM3-3G Smart

(Table-top unit):

- 2-channel Stereo up to 8-channel
- Smart Software Package with all instruments as described in Software section
- 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
- Mains adapter, manual

Order no.: TM3-3GS

TM3-3G Smart

(Panel-mount unit):

- Order of the additional hardware option TM3-2U at the same time necessary
- 2-channel Stereo up to 8-channel
- Smart Software Package with all instruments as described in Software section
- TM3 display with mounting frame, 4.3" touch screen and fixed connector cable (approx. 2 m)
- 3G-SDI interface box, connected to display
- Mains adapter, manual

Order no.: TM3-3GS + TM3-2U

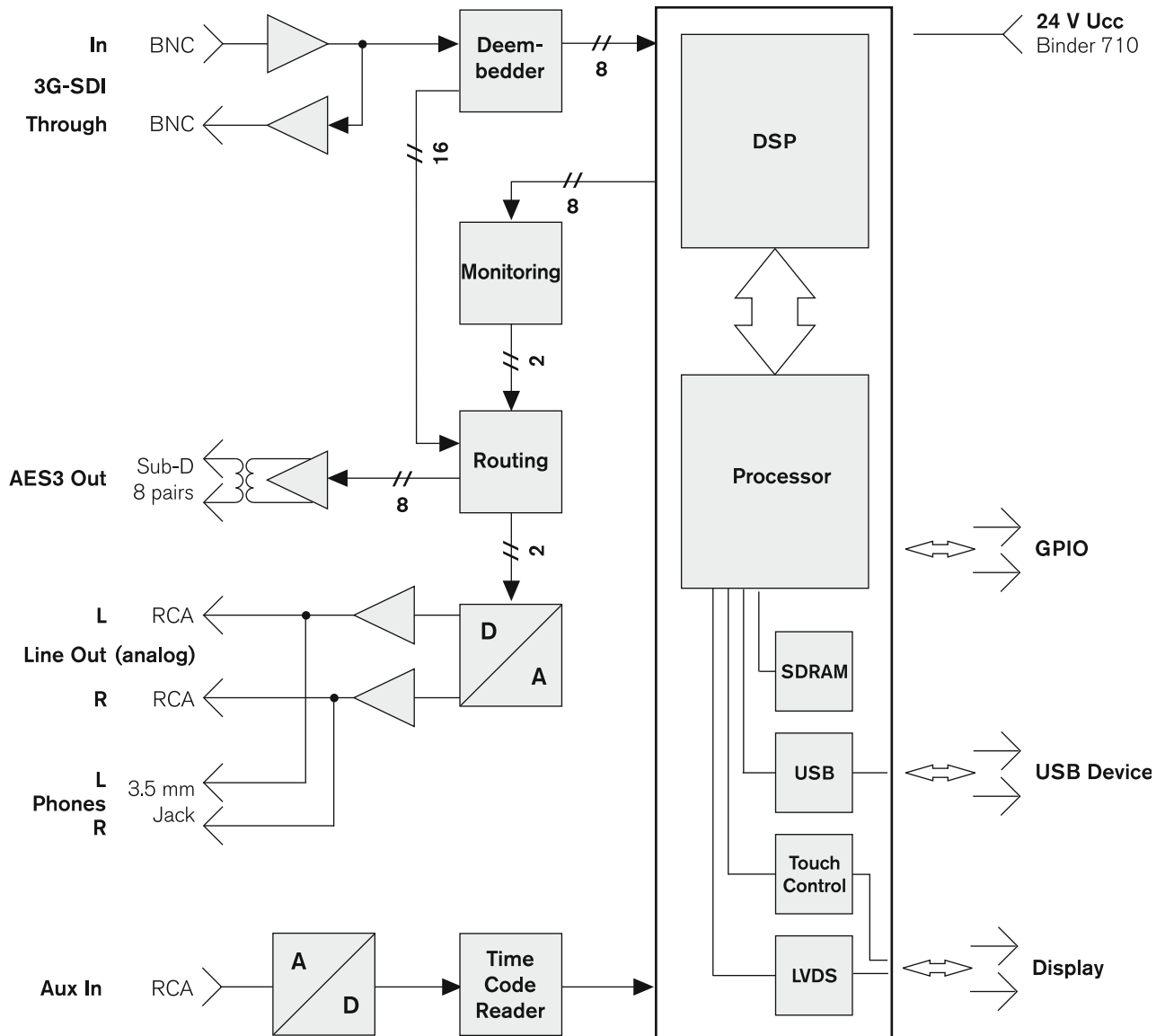
Additional Hardware Options

- Option for 2U rack mounting **TM3-2U**, allows mounting TM3-3GS into rack frame TM3-MA2U or into other appropriate mechanical environments. It can only be ordered together with a TM3, or TM3S device. Then, a display with mounting frame, mounting material, and an USB extension cable is part of delivery instead of the TM3 display unit in a table-top frame.
- 2U rack carrier **TM3-MA2U**, 19"/2U rack carrier/mounting frame to be fitted with up to two TM3 series units which must feature the TM3-2U option.

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 **1178-R** (100 - 240 V AC/24 V DC 2,71 A, table-top unit with corresponding mains cable for different power systems)

Block Diagram



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