Data Sheet

TouchMonitor TM3

TouchMonitor TM3

Flexible touch screen layout ▪ Loudness: EBU, ITU, ATSC, ARIB ▪ Loudness Range (LRA) ▪ PPM/True Peak ▪ SPL Stereo/6-channel operation ▪ Dialnorm ▪ Analog, S/PDIF, AES3 ▪ Modular software ▪ Moving Coil, Timecode option

TouchMonitor TM3 is an exceptionally budget-friendly metering solution for applications including editorial working environments, edit suites and smaller control rooms, to name but a few. It consists of a display unit with 4.3“ touch screen that can be used either vertically or horizontally and a separate interface box.

TM3 features PPM and true peak measurements as well as comprehensive loudness measurement functions such as single-channel and summing bargraphs, loudness range and numerical displays that conform to all relevant global standards such as EBU R128, ITU BS.1770-3/1771-1, ATSC A/85, and ARIB.

The straightforward user interface allows for quick and simple preset selection. Presets can be configured in detail using the Devicer DC1 software 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.

While the stereo version works with analog or digital signals, the model TM3-6CH also processes six digital input channels in parallel. This feature can be retrofitted to stereo versions any time. With the Moving Coil licence option, stereo signals can also be displayed on needle instruments.

TM3. Loudness Simplified.

Hardware

TM3

- Stereo version for Peak, TruePeak, correlation and Loudness measurements
- Table-top unit with display unit and remote interface box (cable length 2 m), with mains adapter
- 4.3“ touch screen (272 x 480 pixel)
- Analog stereo input via RCA (unbalanced, with potentiometer adjustable in the range from 150 mV to 30 V) **or** via 25 pin Sub-D (balanced, +4/+6 dBu, with software adjustable in the range from 0 to +10 dBu)
- Digital Stereo in- and output via RCA (S/PDIF) or via 25 pin Sub-D (balanced, AES3)
- USB 2.0, GPIO, 24 V DC connectors
- Loudness metering acc. to EBU R128, ITU-R BS.1770-3/ 1771-1, ATSC A/85, ARIB or customer specific
- Loudness Test Time Control
- Loudness Range (LRA) and SPL display
- Comprehensive set of presets, easy recall
- Personalizing with **Devicer DC1** (Device Configurator software for Windows® and Mac OS X®)

TM3-6CH

- 6-channel version for Peak, TruePeak, correlation and Loudness measurements
- Table-top unit with display unit and remote interface box (cable length 2 m), with mains adapter
- 4.3“ touch screen (272 x 480 pixel)
- Analog stereo input via RCA (unbalanced, with potentiometer adjustable in the range from 150 mV to 30 V) **or** via 25 pin Sub-D (balanced, +4/+6 dBu, with software adjustable in the range from 0 to +10 dBu)
- Digital Stereo in- and output via RCA (S/PDIF)
- Three digital Stereo in- and output via RCA (S/PDIF) or via 25 pin Sub-D (balanced, 3 x AES3)
- USB 2.0, GPIO, 24 V DC connectors
- Loudness metering acc. to EBU R128, ITU-R BS.1770-3/ 1771-1, ATSC A/85, ARIB or customer specific
- Loudness Test Time Control
- Loudness Range (LRA) and SPL display
- Dialnorm measurement
- Comprehensive set of presets, easy recall
- Personalizing with **Devicer DC1** (Device Configurator software for Windows® and Mac OS X®)

Software

Basic Software

Every TM3 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.

Devicer DC1

By default, the TM3'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 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.

Software (continued)

Software Modules (Licences)

Current and future software modules can be ordered as licences either together with the ordered TM3 version or at a later point in time.
Together with the order of the unit the licence will be activated at delivery.

When a licences 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.

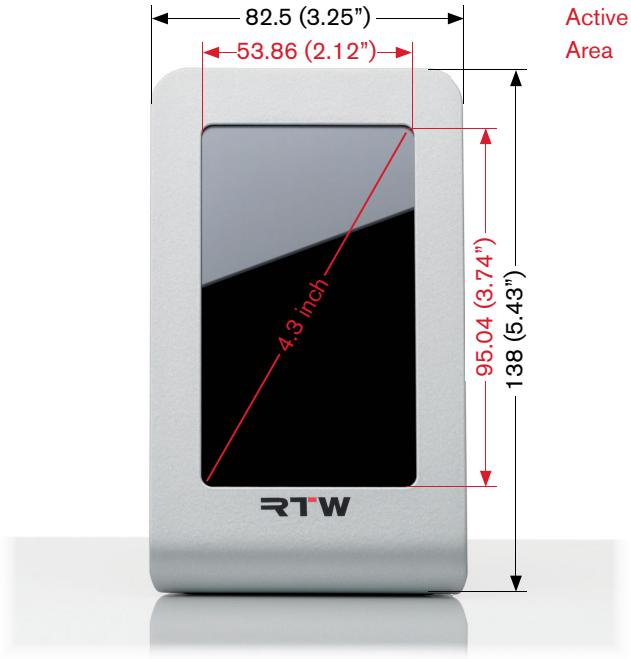
- **TM3-SW6UPG (6-channel upgrade)**
  This software licence is used to upgrade the TM3 for 6-channel signal processing. After activating the licence, the features are identical to the TM3-6CH version.

- **TM3-SWTCR: Timecode reader**
  This option expands the feature set of the TM3 and TM3-6CH to allow external timecode signals to be decoded, displayed and used for additional functions.
  Functions: Timecode reader and display of an external analog or digital source.

- **TM3-SWMC: Moving Coil**
  This option expands the feature set of the TM3 resp. TM3-6CH with the Moving Coil instrument for the display of needle instruments 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.

Dimensions

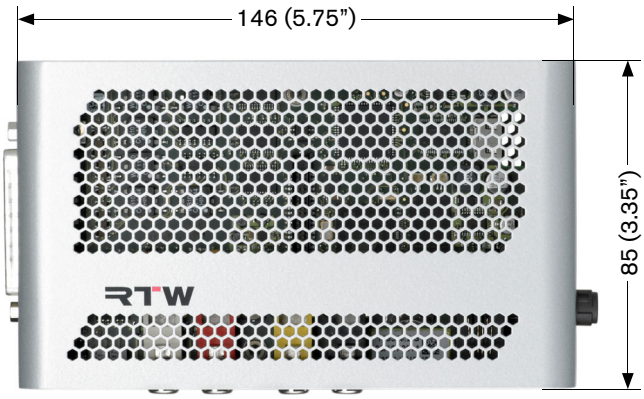
Display Unit TouchMonitor TM3, TM3-6CH



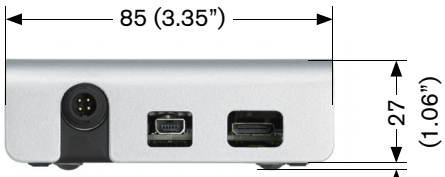
1 | Front view

2 | Side view

Interface Box TouchMonitor TM3, TM3-6CH

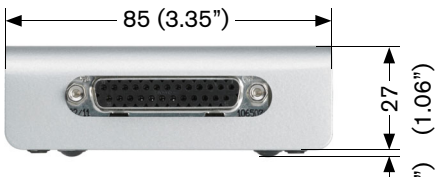


1 | Top view



2 | Side view (right)

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



3 | Side view (left)

4 | Rear view

Connection

Connectors

ATTENTION! - For operating the TM3 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 and TM3-6CH package.

Interface Box

Display Unit

TM3: Analog In L/R (Sub-D) *)
only **1** AES3 In/Out (Sub-D) for each preset selectable

TM3-6CH: Analog In L/R (Sub-D) *)
3 AES3 In/Out (1 - 3, Sub-D) for each preset selectable

Potentiometers for adjustment of the input sensitivity of 0 dB reading (150 mV to 30 V)

Analog In L (RCA) *)

Analog In R (RCA) *)

S/PDIF In (RCA)

S/PDIF Out (RCA)

GP IO (RJ-11-6P6C)

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

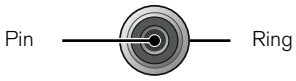
USB 2.0 Mini-B (USB interface cable for the exchange of Devicer DC1 and TM3 data required)

*) **Analog In** via RCA and **Analog In** via Sub-D **cannot** be used in parallel!

Pin Assignment

Analog In L, Analog In R (unbalanced, RCA-F)

Pin:	Function:
Pin:	Signal
Ring:	Shield/chassis

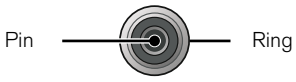


(External view of the connector)

⚠ **NOTE -** The input sensitivity for 0 dB reading is adjustable in the range from 150 mV to 30 V.
While using the RCA connectors, the corresponding inputs of the Sub-D connector cannot be used.

Digital In, Digital Out (S/PDIF, unbalanced, RCA-F)

Pin:	Function:
Pin:	Signal
Ring:	Shield/chassis

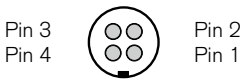


(External view of the connector)

⚠ **NOTE -** The S/PDIF input is permanently terminated with 75 Ω.

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



(External view of the connector)

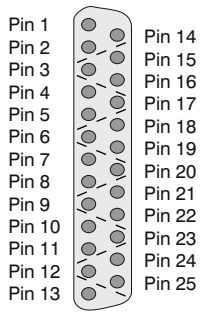
⚠ **NOTE -** An external overcurrent protective device (2 A max.) shall be installed when using an external 24 V DC power supply!

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.

Sub-D connector (25-pin Sub-D-F)

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



(External view of the connector)

⚠ **NOTE -** The AES3 inputs are permanently terminated with 110 Ω.
While using the **analog** inputs of the Sub-D connector, the corresponding **analog** RCA input connectors **cannot** be used.

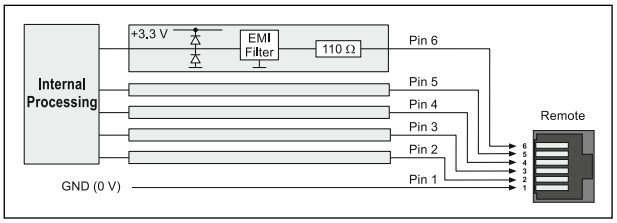
GPIO (RJ-11-6P6C socket)

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

(External view of the connector)

Block diagram of the GPIO interface



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 Devicer DC1 computer software and TM3 1 x GPIO (RJ-11-6P6C) for defined functions or preset recall 2 x RCA-F (unbalanced, analog inputs) 2 x RCA-F (unbalanced, S/PDIF in-/output) 1 x 25-pin Sub-D-F (balanced, alternative analog, up to 3 x AES3 in-/outputs)
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 6 channels
- Loudness-Meter: ITU-R BS.1770-3/1771, EBU R128, ATSC A/85, ARIB, custom mode
- Loudness Test Time Control
- Loudness Range instrument (LRA)
- SPL meter
- Stereo Correlator
- Dialnorm (w/o speech intelligence)
- AES3 status monitor
- Numerical displays
- Moving Coil, Timecode (licence options)

Analog Inputs

2 analog inputs, 2 x RCA or alternativ via 25-pin Sub-D-F connector

- RCA
  - Input sensitivity for 0 dB reading RCA: via potentiometer adjustable from 150 mV to 30 V
  - Impedance: > 10 kOhm
- Sub-D
  - Input sensitivity for 0 dB reading Sub-D: +6 dBu (1,55 V)
  - Reference level: via software adjustable from 0 to +10 dBu
  - Max. input level: +24 dBu
  - Impedance: > 10 kOhm, electronically balanced

Digital Inputs/Outputs

1 digital S/PDIF input, RCA, unbalanced, 75 Ω
1 digital S/PDIF ouput, RCA

- TM3:
  1 AES3 input, transformer balanced, 110 Ω, Sub-D-F connector, 25-pin (in-/output)
- TM3-6CH:
  3 AES3 inputs, transformer balanced, 110 Ω, Sub-D-F connector, 25-pin (in-/output)

Sampling rates: 44.1, 48, 96 kHz, synchronisation to digital input signal

PPM/True Peak Display

General

Input sources:	analog and/or digital
Peakmeter:	▪ TM3: 2-channel Stereo for the defined Stereo channel pair L/R ▪ TM3-6CH: 2-channel Stereo up to 6 channels, 5.1
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

Analog Peakmeter

Analog scales:	▪ DIN5: +5 .. -50 dB, ▪ Nordic: +12 .. -42 dB, ▪ BR IIa: 7 .. 1 (British), ▪ BR IIb: +12 .. -12 dB (British), ▪ Zoom10: +10 .. –10, ▪ Zoom1: +1 .. –1, ▪ SMPTE24: +24 .. –30 ▪ SMPTE20: +20 .. –40 ▪ NHK
Integration time:	acc. to standard or 20 ms, 10 ms, 1 ms, 0,1 ms
Peak hold indicator:	1, 2, 4, 10, 20, 30 s, manual reset or off

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 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

Specifications (continued)

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 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)

Numerical display:
- Short, Integrated, Momentary, LRA values
- Maximum values for True Peak (TPmax), Momentary (Mmax), Short (Smax)

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 in the range from –10 to –30 LUFS

Time & Gate Momentary: *)
- Window Time (SQR): 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: *)
- 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 dB
- Off (LFE), selectable: Off, 0 dB, 10 dB

*) 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 in the range from 1 to 20 LU in steps of 1 LU

Comfort zone: 4 LU; adjustable in the range 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-SW6UPG

Software licence to upgrade the 2-channel versions TM3 for 6-channel signal processing (2-channel Stereo, 1- to 6-channel, 5.1).
When purchasing the licence, send in the internal generated licence request file. After the transmission of the returned licence file to TM3 the features of the 6-channel version can be permanently activated.

TM3-SWMC: Moving Coil (Software Licence)

Expands the function set of TM3 or TM3-6CH with the Moving Coil instrument for the display of needle instruments for up to 2-channel Stereo with different scales.

Specifications (continued)

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: –9 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-SWTCR: Timecode Reader (Software Licence)

Decoding and display of LTC timecode.

Display:	numerical display of LTC (from analog or digital sources)
Mode:	LTC (fixed), instrument selectable when creating a Non-Audio group
Input:	one analog or digital channel selectable
Colors:	selectable, 32 colors

Items of Delivery

TouchMonitor TM3 :

- 2-channel Stereo version
- 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

TouchMonitor TM3-6CH :

- 6-channel version (2-ch. Stereo, 1- to 6-channel, 5.1)
- 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.: TM3-6CH

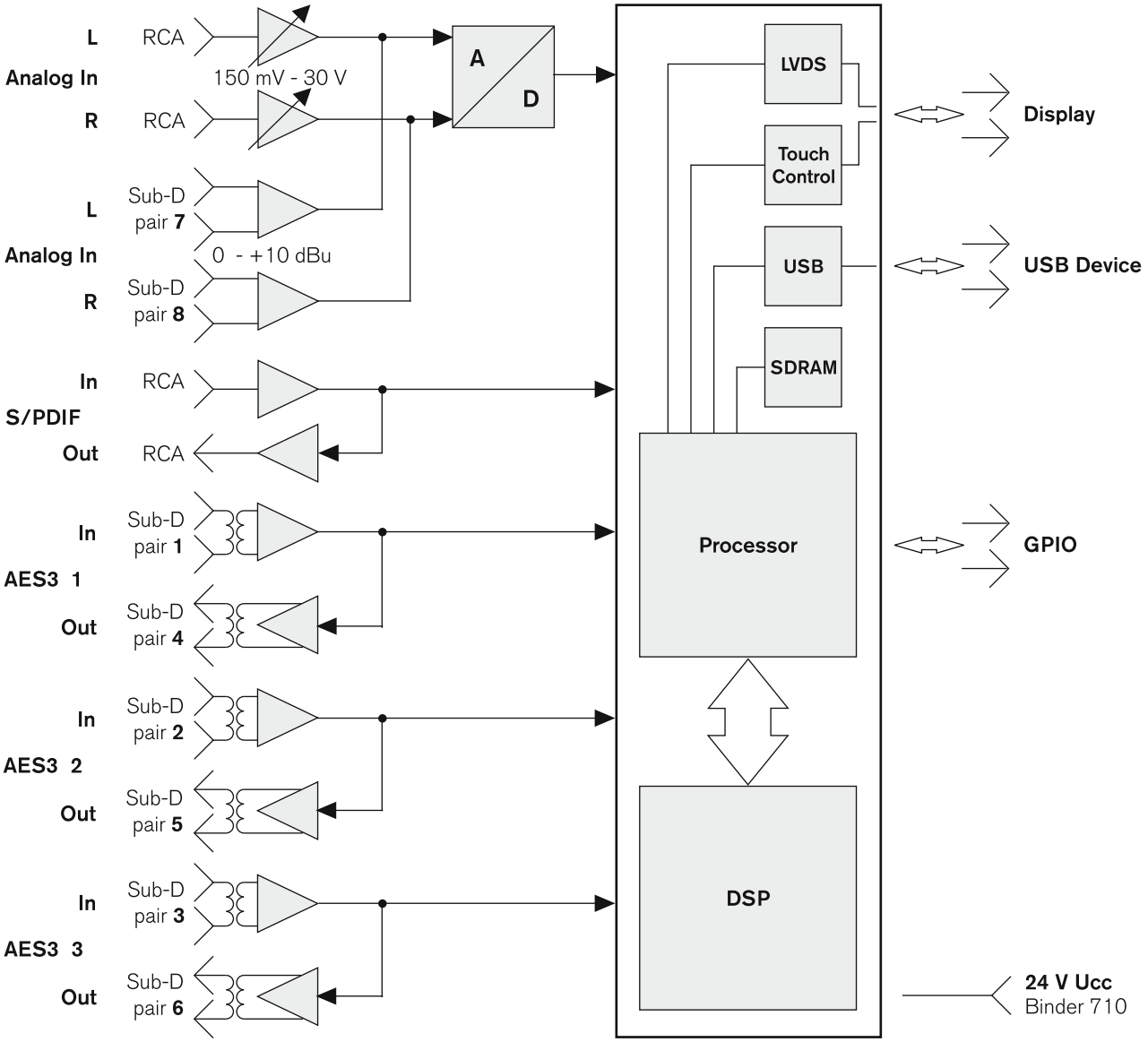
Optional Software Licence

- Software licence **TM3-SW6UPG** for the upgrade of TM3 units to the functional range of TM3-6CH
- Software licence **TM3-SWMC** for the upgrade of TM3 or TM3-6CH with the Moving Coil instrument
- Software licence **TM3-SWTCR** for the upgrade of TM3 or TM3-6CH with the Timecode Reader instrument for decoding and displaying LTC timecode

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 **1162** (2 m) for TM3 interface box, distributes 25-pin. Sub-D-M to 2 x XLR-F (analog inputs), 3 x XLR-F (AES3 inputs), and 3 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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