## Data Sheet TouchMonitor TM7 Series





# TouchMonitor TM7 Series





Modular Software • Touch Screen • I/O Options: Analog, AES3, AES3id, 3G SDI, AoIP • Highly Flexible Screen Layout • 2-ch. PPM/True Peak • Multichannel • Loudness • LRA • Logging • Chart • Timecode • SPL • RTA • SSA • Radar • Premium PPM • BLITS

> The TouchMonitor TM7 range enters a new level of professional audio metering in terms of precision, performance, efficiency and flexibility. The units are equipped with high-grade 7" touch screens, an easy-to-use graphical user interface, and several audio interfaces.

Graphical User Interface

The graphical user interface used in the Touch-Monitor range is controlled simply by using your finger. Instruments can be scaled, randomly positioned and combined for optimized use of available screen space. Multiple instruments of the same type, assigned to different input channels and configurations, can be displayed simultaneously. A comprehensive on-screen help feature supports the user to make setup changes with ease. TouchMonitor TM7 handles audio signals using different audio interfaces: analog, AES3, AES3id, 3G-SDI, and AoIP. The mixed use of the analog and digital audio interfaces allows the display of up to 16 (24) input channels simultaneously. The AoIP interfaces provide up to 32 channels.

#### Licences

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

Gefördert durch:



# Hardware

#### **Common Configuration**

- 7" touch screen 16 : 9 TFT (800 x 480 pixel)
- 16-, 24-, or 32-channel audio interfaces (analog, AES3, AES3id, 3G-SDI, AoIP, selection required)
- Connectors for Ethernet, VGA, 2 x USB 2.0, GPIO, (12) 24 V DC
- Fully scalable, modular software approach for flexible configuration and easy on-site upgrades
- Highly flexible screen layout options with scalable instruments
- Basic 4-channel PPM software: Peak, True Peak, Phase Meter, Global Keyboard
- Table-top unit, OEM version, or preconfigured models
- Mounting kits for mounting into 19"/3U racks resp. 19" video racks available

- Available software licences (see Software section):
   Multichannel
  - Loudness (EBU R128, ITU, ATSC A/85, ARIB, OP-59, AGCOM, CALM, LEQ(M), TASA, SAWA) und SPL
  - RTA Real Time Analyzer
  - SSA Surround Sound Analyzer
  - Radar Display,
  - Premium PPM plus Vectorscope
  - Timecode Reader (reader and recalculation)
  - BLITS (analyzer and generator)
  - Logging Data Server (external logging or chart)
  - ISA Immersive Sound Analyzer

#### Main Units

#### 20700

TouchMonitor TM7 main unit in a sturdy table-top frame with movable table-stand and power supply. Additionally, the selection of an audio interface is required.

#### 207000EM

TouchMonitor TM7 main unit without table-top frame, without table-stand and without power supply, for mounting into front panels, e. g. mixing consoles. Additionally, the selection of an audio interface is required.





### Audio Interfaces (I/O Options)

Each main unit comes with an audio interface, which will be fitted to a new unit by factory. On the next page you will find the available audio interfaces. Select the interface suited to your needs and tell us its additional order number when ordering a new main unit.

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#### HW20711



16-channel audio interface with:

- 8-channel analog inputs (electronically balanced, Sub-D)
- 8-channel digital inputs and outputs (transformer balanced, 110 Ohm, 4 x AES3 In/Out, Sub-D)

#### HW20714



8-channel audio interface and 3G-SDI interface with:

- 8-channel digital inputs and outputs (transformer balanced, 4 x AES3 In/Out, Sub-D)
- 3G/HD/SD-SDI interface (unbalanced, 75 Ohm, 3G-SDI In, 3G-SDI Through, 2 x BNC)

#### HW20717



32-channel audio interface with:

• 32 Dante® AoIP network channels (2 x RJ-45, Primary/Secondary)

### HW20712



16-channel audio interface with:

- 8-channel analog inputs (electronically balanced, Sub-D)
- 8-channel digital inputs and outputs (unbalanced, 75 Ohm, 4 x AES3id In, 4 x AES3id Out, 8 x BNC)

### HW20715



16-channel audio interface with:

 16-channel digital inputs and outputs (transformer balanced, 110 Ohm, 8 x AES3 In/Out, 2 x Sub-D)

#### HW20718



32-channel audio interface with:

 32 Ravenna/AES67/ST 2110 AoIP network channels (2 x RJ-45, Primary/Secondary)

### **Additional Hardware Options**

| TM7-MA3U (3U Mounting Adapter for 207000EM)  | TM7-MAVID (VID Mounting Adapter for 207000EM)  |
|--|--|
| Mounting kit including a 19"/3U/42HP rack-mount panel (half-<br>19"/3U) and fastening material for mounting 207000EM into<br>standard 19" sub-racks.                 | Mounting kit including a half-19"/3U plug-in panel and fastening material for mounting 207000EM into standard 19" rack-mount cabinets for video racks. |
| TM7-MADT (Table-top Mounting Adapter for 207000EM)   | <b>1647831</b> (19"/3U rack frame)   |
| Mounting kit including a table-top frame, robust swivel-mounted table-stand, housing cover, and mounting material for remodel-<br>ling 207000EM to a table-top unit. | for mounting up to 2 TM7-Mount or 207000EM in conjunc-<br>tion with TM7-MA3U mounting kit. Includes a blank panel to<br>cover unused space.            |

### Hardware (continued)

### **Preconfigured Models**

The models are already preconfigured for typical application fields and equipped with a corresponding audio interface. As the previously described devices, they can be expanded with software modules (licences). We recommend licences SW20001 for multi-channel operation, SW20002 for loudness measurements and SPL display, SW20004 for the use of the Surround Sound Analyzer, and SW20006 for up to four audio vectorscopes, Multistandard PPM/VU moving coil emulations as basic configuration for the following units. Further licences can be found in the **Software** section.

#### TM7-RAV





7" table-top unit for AoIP network-based post production, TV broadcast and video editing

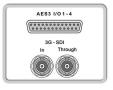
- 32 Ravenna AoIP network channels (2 x RJ-45, Prim./Sec.)
- Power supply 12 24 V DC, 24 VA



TM7-Dante

7" table-top unit for AoIP network-based post production, TV broadcast and video editing

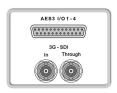
- 32 Dante® AoIP network channels (2 x RJ-45, Prim./Sec.)
- Power supply 12 24 V DC, 24 VA



7" table-top unit for post production, TV broadcast, video editing

- 8-ch. digital inputs and outputs (4 x AES3 In/Out, Sub-D)
- 3G-/HD-/SD-SDI In/Through (2 x BNC)

### TM7-Rack





7" rack-mount unit for TV broadcast, post production

- 8-ch. digital inputs and outputs (4 x AES3 In/Out, Sub-D)
- 3G-/HD-/SD-SDI In/Through (2 x BNC)

### TM7-Studio



7" table-top unit for audio production, post production

- 8-ch. analog inputs (Sub-D)
- 8-ch. digital inputs and outputs (4 x AES3 In/Out, Sub-D)

### TM7-Mount



7" panel-mount unit for TV broadcast, post production

- 8-ch. analog inputs (Sub-D)
- 8-ch. digital inputs and outputs (4 x AES3 In/Out, Sub-D)

#### 5

## TM7-Video

# Software

#### **Standard Software**

Every TouchMonitor comes with a basic software package. Beside the control functions, this software is able to process the signals of up to 4 routed channels in a maximum count of 4 groups at a time (up to 4 x Mono, 2 x 2-channel Stereo, 1 x 2-channel Stereo and up to 2 x Mono; no 3.1). Available for display are: 4-channel PPM with analog scales (DIN5, Nordic, British IIa, British IIb) and digital scales (0 to -60 dB, +3 to -60 dB TruePeak, DIN5, Nordic, British IIa and IIb), peak hold, peak memory, Over indicators, phase correlation 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. Optional licences expand the feature set with a multichannel option and other software modules.

#### Software Modules (Licences)

Software modules can be ordered as licences either together with the order of the main unit and the selected audio interface or at a later point in time. Together with the order of the main unit the licence will be activated at delivery. When a licences is needed at a later point in time, the order process is started from the "Licences" menu of the TM7 unit. 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.

#### SW20001: Multichannel Mode

Expands the signal routing to the simultaneous display of more than 4 channels or channel groups. Additional formats: 3.1 Surround, 5.0 Surround, 5.1 Surround, 7.1 Cinema Surround, 7.1 DD+ Surround, and Multichannel (2 to 8 channels in one block, up to 4 blocks with 3G SDI option).

#### SW20002: Loudness and SPL Display

Expands the basic Stereo-PPM with Loudness functions (EBU R128, ITU-R BS.1770-4/1771-1, ATSC A/85, ARIB, OP-59, AGCOM, CALM, LEQ (M), TASA, SAWA), SPL functions, and Loudness Range instrument (LRA). For the display of more than 4 ch. Licence SW20001 is required. Then, Dialnorm is available.

| SW20003: RTA - Real Time Analyzer   | SW20004: SSA - Surround Sound Analyzer   |
|---|--|
| Provides on 31, 61 or 120 bands a spectral distribution dis-<br>play of the frequency range of single channels, channel pairs<br>or groups. Additional HP HF band available.<br>Licence SW20001 is required for the display of more than<br>4 channels. | Dynamic display for visualizing the interaction of all technical<br>and subjective surround sound parameter corresponding to<br>the subjective listening impression.<br>Precondition: Licences SW20001, SW20002! |
| SW20005: Radar Display  | SW20006: RTW Premium PPM + Vectorscope   |

High resolution circular Loudness display corresponding to the Loudness Radar Meter of TC electronic<sup>®</sup>. Licence SW20001 is required for the display of more than 4 channels.

--- Precondition: Licence SW20002! ---

High resolution Multistandard-PPM display with advanced scales, moving coil instruments (PPM, VU, Loudness, BBC mode), and with Audio Vectorscope (4 instances). Expands licence SW20001 with Multi-Correlator, if activated. Licence SW20002 is required for the display of Loudness.

#### Software (continued)

#### SW20008: Timecode Reader

Decoding of SDI embedded or LTC timecode. Timecode display. Licence SW20002 is required for the possibility of recalculating loudness.

#### SW20013: BLITS

Tool to generate line test signals according to EBU 3304, GLITS and BLITS definition. Automatic and significant analysis of channel allocation, level, phase and delay, and polarity of received BLITS 5.1 test signals.

--- Precondition: Licence SW20001! ---

#### SW20014: Logging Data Server

Export of measured data via IP connection or USB flash drive. Two-stage definition of thresholds. Advanced graphical presentation with RTW LQL PC software. Chart instrument for the display of the course of a measurement directly on the TM. --- Precondition: Licence SW20002! ---

#### SW20015: ISA - Immersive Sound Analyzer

Visualisation of the dynamic behaviour and interaction of all relevant technical and subjective parameters of immersive surround signals across two layers. Intuitive evaluation of the spatial balance at a glance.

---- Precondition: Licences SW20001, SW20002, SW20004! ---

#### SW20021: TC-RTW

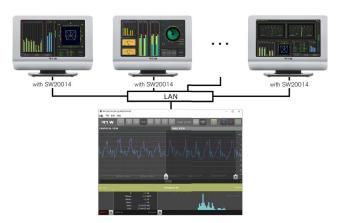
Licence to convert TouchMonitor devices of TC electronic<sup>®</sup> to RTW units to allow the installation of upcoming licences with new product functionalities.

---- Precondition: TouchMonitor devices of TC electronic®! ----

### PC Software: LQL - Loudness Quality Logger

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

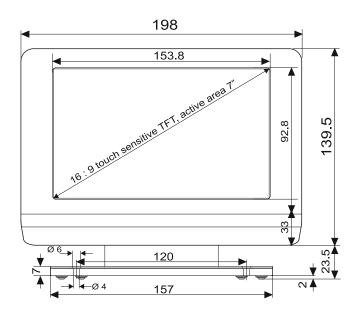
---- Precondition: Licence SW20014 must be installed on each connected TouchMonitor ---



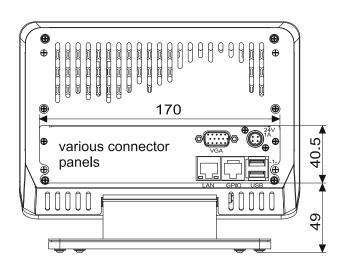
The Loudness Radar Meter is trademark or registerd trademark of TC Electronic A/S, 8240 Risskov, Denmark

# Dimensions

**TouchMonitor TM7 20700 Table-Top Unit** (20700 + HW2071n, also 207000EM + HW2071n with TM7-MADT, TM7-RAV, TM7-Dante, TM7-Video, TM7-Studio)

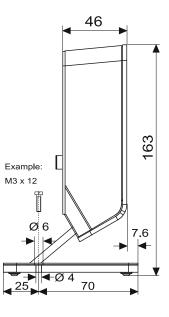


1 | Front view (dimensions in mm)

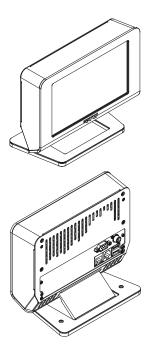


3 | Rear view (dimensions in mm)

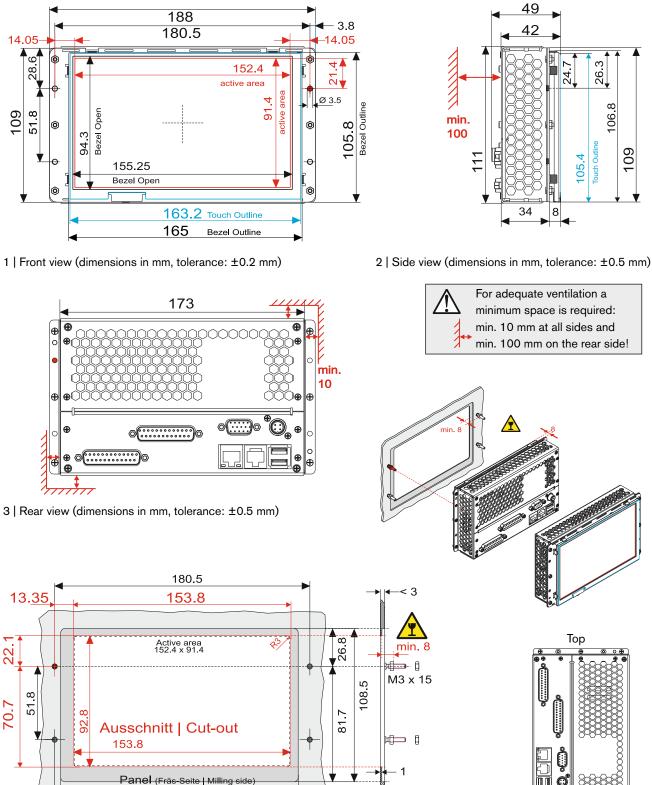
Common tolerance: ±0.5 mm



2 | Side view (dimensions in mm)



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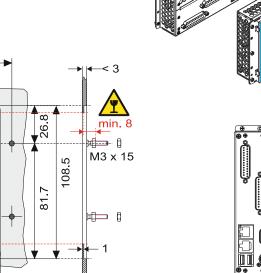
#### TouchMonitor TM7 207000EM OEM Mounting Version (207000EM + HW2071n, also TM7-Mount)

4 | Front panel cut-out (dimensions in mm, tolerance: ±0.2 mm)

4.3

168.8

For adequate ventilation a minimum space is required: min. 10 mm at all sides and min. 100 mm on the rear side!



Top

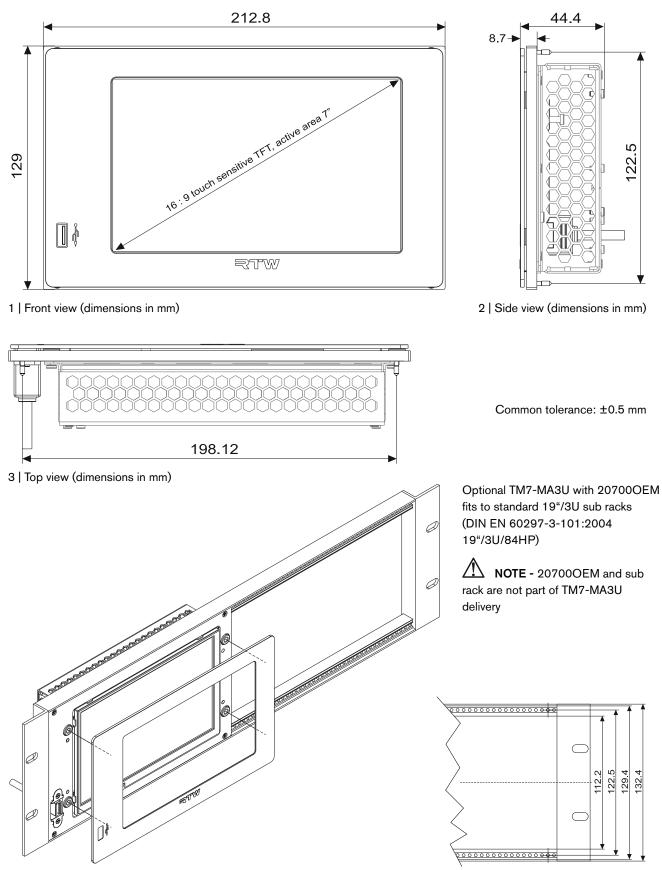
26.3

Fouch (

106.8

109

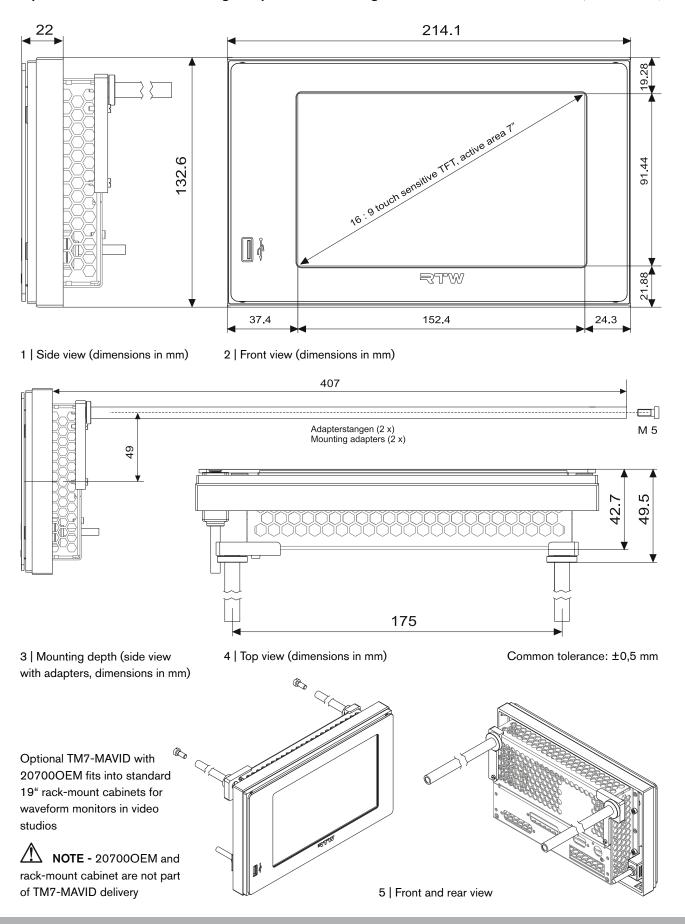
5 | Vertical mounting orientation **D** 



## Optional TM7-MA3U Mounting Adapter for Mounting 207000EM into Standard Racks

4 | Mounting into standard 19"/3U sub rack

5 | Heights (mm) of standard 19"/3U sub racks



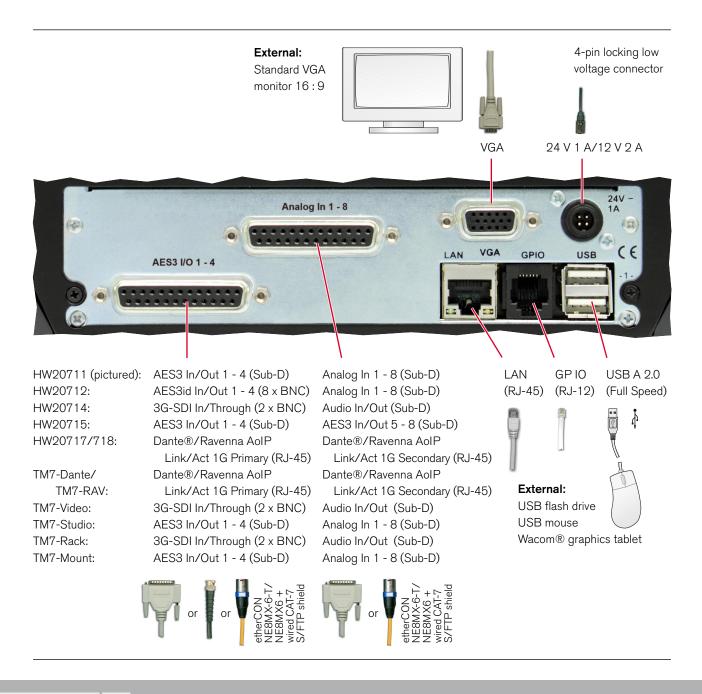
#### Optional TM7-MAVID Mounting Adapter for Mounting 207000EM into Video Racks (also TM7-Rack)

# Connection

#### Connectors

ATTENTION! - For operating the 207000EM version or models TM7-Rack and TM7-Mount, an adapted 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 and available as an accessory. For 207000EM and its combinations with mounting adapters TM7-MA3U, TM7-MAVID, or TM7-MADT, or for TM7-Rack and TM7-Mount it has to be ordered separately. This power supply is already included in the 20700, TM7-RAV, TM7-Dante, TM7-Video and TM7-Studio packages.

**NOTE** - Some devices may have a DC input connector marked +12 V DC. These units may be operated with a nominal DC voltage in the range of +12 V to +24 V DC.



Analog In 1 -8 (electr. bal., 25-pin Sub-D-F)

Pin: Function:

| 1<br>14        | Analog input 8 resp. 16 (+, hot)<br>Analog input 8 resp. 16 (–, cold) | Pin 1<br>Pin 2 |
|----------------|---|----------------|
| 2<br>15        | Shield/chassis  | Pin 3          |
| 15             | Analog input 7 resp. 15 (+, hot)                                      | Pin 4          |
| 3              | Analog input 7 resp. 15 (–, cold)                                     | Pin 5          |
| 16             | Shield/chassis  | Pin 6          |
| 4              | Analog input 6 resp. 14 (+, hot)                                      | Pin 7<br>Pin 8 |
| 17             | Analog input 6 resp. 14 (–, cold)                                     | Pin 9          |
| <u>5</u><br>18 | Shield/chassis  | Pin 10         |
| 18             | Analog input 5 resp. 13 (+, hot)                                      | Pin 11         |
| 6              | Analog input 5 resp. 13 (–, cold)                                     | Pin 12         |
| 19             | Shield/chassis  | Pin 13         |
| 7              | Analog input 4 resp. 12 (+, hot)                                      | (Externa       |
| 20             | Analog input 4 resp. 12 (–, cold)                                     | nector)        |
| <u>8</u><br>21 | Shield/chassis  | ,              |
| 21             | Analog input 3 resp. 11 (+, hot)                                      |                |
| 9              | Analog input 3 resp. 11 (–, cold)                                     |                |
| 22             | Shield/chassis  |                |
| 10             | Analog input 2 resp. 10 (+, hot)                                      |                |
| 23             | Analog input 2 resp. 10 (–, cold)                                     |                |
| 11             | Shield/chassis  |                |
| 24             | Analog input 1 resp. 9 (+, hot)                                       |                |
| 12             | Analog input 1 resp. 9 (–, cold)                                      |                |
| 25             | Shield/chassis  |                |
| 13             | not used  |                |

| า 1  | $\left( \circ \right)$ | Pin 14 |
|------|------------------------|--------|
| 12   | 0-6                    |        |
| n 3  |                        | Pin 15 |
| א ר  |                        | Pin 16 |
|      | i o                    | Pin 17 |
| า 5  | 0-6                    | Pin 18 |
| ۱6   |                        |        |
| 17   |                        | Pin 19 |
|      | ŭ Ĉ                    | Pin 20 |
| א ו  | 0-6                    | Pin 21 |
| ו 9  |                        | = .    |
| 10 1 |                        | Pin 22 |
|      | - Õ                    | Pin 23 |
| n 11 | 0-6                    | ==     |
| า 12 | 0                      | Pin 24 |
| 13   |                        | Pin 25 |
|      |                        |        |

al view of the con-

AES3 I/O 1 - 4, AES3 I/O 5 - 8, Audio I/O (transf.-bal., 25-pin Sub-D-F) Pin: Function: Digital output 4 resp. 8 (+, hot) 1 Pin 1 0 Pin 14  $\bigcirc$ 14 Digital output 4 resp. 8 (-, cold) Pin 2 0. Ó Pin 15 Shield/chassis 2 Pin 3 Pin 16 15 Digital output 3 resp. 7 (+, hot) Pin 4 Ì Pin 17 Digital output 3 resp. 7 (-, cold) Pin 5 0, 3 Ó Pin 18 ()Pin 6 16 Shield/chassis Pin 19 Pin 7 4 Digital output 2 resp. 6 (+, hot) Ì Pin 20 Pin 8 0, Ó 17 Digital output 2 resp. 6 (-, cold) Pin 21 Pin 9 (). Pin 22 Shield/chassis 5 Pin 10 Ò Pin 23 18 Digital output 1 resp. 5 (+, hot) 0. Pin 11 Ó Pin 24 6 Digital output 1 resp. 5 (-, cold) Pin 12 Pin 25 Pin 13 19 Shield/chassis 7 Digital input 4 resp. 8 (+, hot) (External view of the con-20 Digital input 4 resp. 8 (-, cold) nector) 8 Shield/chassis 21 Digital input 3 resp. 7 (+, hot) 9 Digital input 3 resp. 7 (-, cold) 22 Shield/chassis 10 Digital input 2 resp. 6 (+, hot) Digital input 2 resp. 6 (-, cold) 23 11 Shield/chassis 24 Digital input 1 resp. 5 (+, hot) 12 Digital input 1 resp. 5 (-, cold) 25 Shield/chassis 13 not used **NOTE** - The AES3 inputs are permanently terminated with 110  $\Phi$ . Link/Act 1G (RJ-45 NE8FBV-C5-LED1-S connector)



RJ-45 AoIP network connection (Primary/Secondary)

NOTE - etherCON NE8MX-6-T/NE8MX6 connector with CAT-7-S/FTP cable and wired shield shall be used!

#### AES3id In/Out 1 - 4, 3G-SDI (unbal., BNC-F)

Shield/chassis

Pin: Function:

Pin: Signal

Ring:



AES3id connector)

(External view of the

3G-SDI connector)

NOTE - The AES3id inputs and the 3G-SDI inputs are permanently terminated with 75  $\Omega$ .

#### 24 V - 1 A, 12 V - 2 A

(4-pin locking low voltage connector, Typ Binder 710)

Pin: Function:





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

#### USB-A

2 Full Speed USB 2.0 connectors for USB sticks (Licence handling, presets, updates) and external mouse or Wacom® tablet.

#### GP IO (RJ-12 6P6C socket)

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

| Pin:   | Function:   |                  |                |  |           |  |
|--|---|------------------|----------------|--|-----------|--|
| 1<br>2 - 6                                       | GND (0 V)<br>Function ac  | c. to def        | inition in     | the m  | enu       |  |
| Internal<br>Processing<br>GND (I                 |   | EMI<br>Filter    | <u>[110 Ω]</u> | Pin 6<br>Pin 5<br>Pin 4<br>Pin 3<br>Pin 2<br>Pin 1 | Re        | (External view of<br>the connector)  |
| <b>VGA</b> (1                                    | 5-pin Sub-D   | -F)              |                |  |           |  |
| Pin:   | Function:   |                  |                |  |           |  |
| 1<br>2<br>3<br>4 - 8<br>9<br>10 - 11<br>12<br>13 | R   Video si<br>G  <br>B  <br>GND<br>+5 V<br>GND<br>SDA<br>H-sync | gnal<br>14<br>15 | V-sync<br>SCI  | Pin 1<br>Pin 2<br>Pin 3<br>Pin 4<br>Pin 5          |           | Pin 6         Pin 11           Pin 7         Pin 12           Pin 8         Pin 13           Pin 9         Pin 13           Pin 10         Pin 14           Pin 10         Pin 15           of the connector)         Pin 15 |
| <u> </u>   | NOTE - The  | VGA cal          | ble shall      | not ex   | ceed 15 m | lenght!  |

LAN

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

# Specifications

#### System

| Vertication         24 V D C (destand 2 A max. overcomet pro-<br>tocket devices that be installed)         5           Some devices may have a DC input connector<br>marked + 12 V D C. These units may be paper-<br>ted with a normal DC voltage in the range of<br>+12 V to 2 A voltage in the range of<br>+12 V to 2 A voltage in the range of<br>+12 V in 5 Mound Sound Analyzer (tor 5.12, 5.1.4,<br>7.1.2, 7.1.4) and bala Usarian (tor 5.1.2, 5.1.4,<br>7.1.2, 7.1.4) and bala Usarian<br>set expend and import, shale the<br>work market of the 1.0 GPO (tor 1.2, 5.1.4,<br>7.1.2, 7.1.4) and bala Usarian<br>set expend and import, shale the<br>market of the 1.0 GPO (tor 1.2, 5.1.4,<br>7.1.2, 7.1.4) and bala Usarian<br>set expend and import, shale the<br>market of the 1.0 GPO (tor 1.2, 5.1.4,<br>7.1.2, 7.1.4) and bala Usarian<br>set expend and import, shale the<br>market of the 1.0 GPO (tor 1.2, 5.1.4,<br>7.1.2, 7.1.4) and bala Usarian<br>set (4.2, 9000 for defined import)<br>with HW20711;<br>1.2, 6.2, 900 sub-PC (analysis)<br>1.1, 6.4000 (tor 1.1.2, 6.1.2, 5.1.4,<br>7.1.2, 7.1.4, 1.1.2020, and 3.1.2, 7.1.4,<br>7.1.4, 900 kHz           with HW20711;<br>1.2, 7.1.4, 1.1.1.2020, and 3.2, 800-FC (Goreb<br>In, Intrough)         1.1.1.1.2020, and 3.2, 800-FC (Goreb<br>In, Intrough)         1.1.1.1.2020, and 3.2, 800-FC (Goreb 2, 5.1.4, 5.1.4, 7.1.2, 7.1.4, 8.1.2, 8.1.4, 8.1.2, 9.2.4, 1.4.2, 9.2.4, 1.4.2, 9.2.4, 1.4.2, 9.2.4, 1.4.2, 9.2.4, 1.4.2, 9.2.4, 1.4.2, 9.2.4, 1.4.2, 1.4.2, 1.4.2, 1.4.2, 1.4.2, 1.4.2, 1.4.2, 1.4.2, 1.4.2, 1.4.2, 1.4.2, 1.4.2, 1.4.2, 1.4.2, 1.4.2, 1.4. | General                     |   | I                 | <ul> <li>Moving Coil (BR, VU, Loudness, BBC mode)</li> </ul>  |
|---|-----------------------------|---|-------------------|---|
| <ul> <li>Suroud Sound Analyzer (go to 7.1 DD-)</li> <li>Connectors:</li> <li>1 A Formina (25 A proverup current (10 µacc))</li> <li>To the duration and protocol (go to 4.8 µacc)</li> <li>Suroud Sound Analyzer (go to 7.1 DD-)</li> <li>Sur</li></ul>  |                             | +24 V DC (external 2 A max, overcurrent pro-  |                   |   |
| Some devices may have a DC input connector<br>marked + 12 V DC. These units may be opera-<br>ted with a nominal DC voltage in the range of<br>+12 V to +24 V DC.<br>approx. 65 505 colors, 60 Lr,<br>for connection of an optional acternal 16:9<br>Web and South With Teuch screen 16:9 (800 x 480 pixel)<br>Connectors:   |                             |   |                   |   |
| <ul> <li>marked +12 VDC. These units may be operated with anomial 25 A power-up current (10 µscc).</li> <li>Current drain:</li> <li>1 A nominal 25 A power-up current (10 µscc).</li> <li>Power dissipation:</li> <li>approx. 8,5 W (Av SDI), approx. 11 W (with SD).</li> <li>Dipoley:</li> <li>Connectors:</li> <li>1 × 15-pin Sub-D-F: VGA output with 800 × 480 pixel, 65:55 colors, 60 Hz, for connection of an optional external 16 :9</li> <li>VGA monter, selectable 4 : 3 mode 1 × 4-pin locking low voltage connector type Brieford? 10 (C) C)</li> <li>2 × USB A USB 2.0 Full Speed connectors for use for external (Wacom® graphics tablet 1 × (APH GO, RE-1) Connector, 25-pin 4 meand import, software updates)</li> <li>external (Macom® graphics tablet 1 × (APH GO, RE-1) Connector, 25-pin 4 meand a output 3 with HW20711:</li> <li>2 × 25-pin Sub-D-F (analog and digita)</li> <li>with HW20711:</li> <li>2 × 25-pin Sub-D-F (aligita)</li> <li>with HW20711:</li></ul>  |                             |   |                   |   |
| <ul> <li>+12 V to +24 V DC.</li> <li>2-channel Audio Vectorscope (4 instances)</li> <li>2-channel Audio Vecto</li></ul>  |                             |   |                   | <ul> <li>10-fold Multi-Correlator with LFE mode</li> </ul>    |
| Current drain:         1 A nominal, 25 A power-up current (10 µsec.)         Diahom           Power dissipation:         approx. 85 W (vol 500) approx. 11 W (vilts 10)         EILTS analyzer and generator           Connectors:         1 x 15-pin Sub-D-F (value connector from 0 not point advernal 16 : 9         Wood X (Vol 20 µsec)           VGA monitor, salectable 4 : 3 mode         1 x 4-pin locking low voltage connector         Numerical displays           1 x 4-pin locking low voltage connector         1 x 4-pin locking low voltage connectors for         Banaleg inputs, Sub-D-F connector, 25-pin           - USB memory ticks (lience handing, pre-<br>set export and import software update)         e- external computer mouse for operating         HW20711:         B analeg inputs, Sub-D-F connector, 25-pin           - uSB memory ticks (lience handing, pre-<br>set export and import software update)         e- external Waccom <sup>10</sup> graphics table         HW20711:         B analeg inputs, Sub-D-F connector, 25-pin           - usth HW20711:         2 x 25-pin Sub-D-F (relating an digitab)         HW20711:         4 AES3 inputs (mansformer balanced, 110 0),           with HW20711:         2 x 25-pin Sub-D-F (relating and digitab)         HW20711:         4 AES3 inputs (mansformer balanced, 110 0),           with HW20711:         2 x 25-pin Sub-D-F (relating and digitab)         HW20711:         4 AES3 inputs (mansformer balanced, 110 0),           with HW20711:         2 x RD-F (digitab)         HW20711:  |                             | ted with a nominal DC voltage in the range of |                   | <ul> <li>1/3-, 1/6-, 1/12-octave spectrum analyzer</li> </ul> |
| Power dissipation:         approx. 8,5 W (w/s SDI), approx. 11 W (with SDD)         Connectors:         Full Status monitor           Connectors:         1 x 15-pin Sub-D-F; VSA output with<br>800 x 400 pixel, RSS disclorers, RO Hz,<br>for connection of an optional external 16 :9<br>WAR monitor, selectuble 4 :3 mode<br>type Binder 71 (OC)         - AESS atabs: monitor         - Numericul displays<br>immersive Sound Analyzer (6r 5.12, 5.1.4,<br>7.1.2, 7.1.4) and total Loudness           VEX.B A: USB A:  |                             | +12 V to +24 V DC.                            |                   | <ul> <li>2-channel Audio Vectorscope (4 instances)</li> </ul> |
| Display:       7 <sup>1</sup> TT Touch screen 15: 9 (900 x 480 pixel)         Connectors:       1 x 15p Sub-DF-1X 0 autput with         Row Connection of an optical estimal 16: 9       WAR monitor, selectable 4: 3 mode         1 x 4 pin locking sourcestape       1 warman tables connectors for an optical estimal 16: 9         V/2A monitor, selectable 4: 3 mode       1 warman tables connectors for a mode for operation with anyor (for 51.2, 51.4, 7, 7, 14) and total Loudness         2 x USB A; USB A; USB A; USB A; Guada and Jing, program and anyor (for 51.2, 51.4, 7, 7, 14) and total Loudness       Mainton anyor (for 51.2, 51.4, 7, 7, 14) and total Loudness         9 web and computer mouse for operation with anyors, stubiet       - wetaral computer mouse for operation with anyors, stubiet       B analog inputs, Sub-D-F connector, 25-pin         1 x LAR (PL45)       - wetaral computer mouse for operation with analyzers, bab-F-f (analog, and digital)       HW20711:       4 AES3 inputs (fransformer balanced, 110 Ω), with HW20711:         with HW20711:       2 x 25-pin Sub-D-F (digital), 2 x BN-F (GGS), In, TM7-MARU: 24 PH P x 30 x 445 mm       - with TM7-MARU: 24 PH P x 30 x 445 mm         - with TM7-MARU: 24 PH P x 30 x 445 mm       - with TM7-MARU: 24 PH P x 30 x 445 mm       - with TM7-MARU: 24 PH P x 30 x 445 mm         - with TM7-MARU: 24 PH P x 30 x 445 mm       - with TM7-MARU: 24 PH P x 30 x 445 mm       - with TM7-MARU: 24 PH P x 30 x 445 mm         - with TM7-MARU: 24 PH P x 30 x 445 mm       - with TM7-MARU: 24 PH P x 30 x 445 mm       -  | Current drain:              |   |                   |   |
| Connectors:       1 × 15-pin Sub-D-F; VGA output with<br>80:0 × 480 pixel 658 doors, 60 Lr,<br>for connection of an optional external 16 : 9<br>VGA monitor, salectable 4 : 3 mode<br>1 × 4-pin locking low values connector<br>yee Binder 710 (CD)       - Numerake Sound Analyzer (for 51.2, 51.4,<br>7.12, 71.4) and total Loudness<br>with Biodard jow values connectors for<br>yes export and import, software update<br>external computer mouse for operating<br>external Vaccomite graphics table<br>1 × LGPIO (R-J-2-6PBC) for defined functions<br>or preser recall       - Naniog Inputs,<br>HV20711:       B analog inputs, Sub-D-F connector, 25-pin<br>adjustable in the range from 0 dBu to + 10 dBu<br>+ 42 d dBu         with HW20711:       2 × 25-pin Sub-D-F (analog, and digta)<br>with HW20711:       1 × LAN (R)-450<br>In, fitnough)       Numerake Sound Analyzer (for 52.6, 11.4,<br>7.12, 7.1.4) and total Loudness         with HW20711:       2 × 25-pin Sub-D-F (analog, and digta)<br>with HW20711:       1 × 25-pin Sub-D-F (analog, and digta)<br>with W20711:       1 × 25-pin Sub-D-F (analog, and digta)<br>with HW20711:       1 × 25-pin Sub-D-F (analog, and digta)<br>with W20711:       1 × 25-pin Sub-D-F (analog, and digta)<br>with W20711:  | •                           |   |                   |   |
| 800 x 480 pixel, 65.39 colors, 60 Hz.       • Immezer Sound Analyzer (for 5.12, 5.1.4, for connection of an optical section) 16 (a - 2, 7.1.4) and total Loudness         V6A monitor, selectable 4 :3 mode       • Aralog Inputs         1 : 4 - βrin locking low valtage connector type Binder 710 (DC)       2 x USB memory sticks (licence handling, prist stablet       8 analog inputs, Sub-D-F connector, 25-pin         . USB memory sticks (licence handling, prist stablet       8 analog inputs, Sub-D-F connector, 25-pin       8 analog inputs, Sub-D-F connector, 25-pin         . external Wacom/B graphics tablet       1 & GPIO (Rel-12-6POC) or defined functions or preset recall       9 analog inputs, Sub-D-F connector, 25-pin         with HW20711:       2 x 25-pin Sub-D-F (analog and digital)       9 analog inputs, Sub-D-F connector, 25-pin         with HW20711:       1 x 25-pin Sub-D-F (analog, 3 x BNC-F (digital)       9 analog inputs, Sub-D-F connector, 25-pin, 4 in-and 4 outputs         with HW20711:       2 x 25-pin Sub-D-F (digital), 2 x BNC-F (digital)       9 analog inputs, Sub-D-F (digital)         with HW20711:       1 x 25-pin Sub-D-F (digital), 2 x BNC-F (digital)       9 analog inputs, 2 x BNC-F (digital)         with HW20711:       1 x 25-pin Sub-D-F (digital), 2 x BNC-F (digital)       9 analog inputs, 2 x BNC-F connector, 25-pin, 4 in-and 4 outputs         with HW20711:       1 x 25-fin 4.90 C       9 x H3 x 44 from digital ontor         with HW20701:       2 x R-145 (Gmemon AcKB97/ST 110 A0/P) <t< td=""><td></td><td></td><td></td><td></td></t<>   |                             |   |                   |   |
| for connection of an optional external 16 :9       7.12, 7.1.4) and total Loudness         VEA Monitor, Selectable 4 :3 mode<br>type Binder 710 (DC)       8 malagi inputs, Sub-D-F connector, 25-pin         4 Natiog Inputs       8 malagi inputs, Sub-D-F connector, 25-pin         - USB memory stick (licence handling, pre-<br>set export and input, stow-D-F connector, 25-pin       4 malagi inputs, Sub-D-F connector, 25-pin         - external Roomby graphic status       - external Roomby graphic status       - 20 Hz to 22 Hz do 24 Hz (do 24 H   | Connectors:                 |   |                   |   |
| VGA monitor, selectable 4: 3 modeAnalog Inputs1 × 4-pin locking low voltage connector<br>type Binder 710 (DC)Analog Inputs2 × USB 2x USB 2x Full Speed connectors for<br>uset export and import, software updates)Banalog inputs, Sub-D-F connector, 25-pin<br>adjustable in the range from 0.04b to + 10.04b<br>adjustable in the range from 0.04b to + 10.04b<br>Maximum input level:<br>In 2 × USB (RE-102 For Menton<br>or preset recall. v Lord (RL-12-PEC) for defined function<br>or preset recallFrequence range:<br>VOT 11:> 10 kC, 40 ectronically balanced<br>Frequence range:<br>VOT 12:. v Lord (RL-12-PEC) for defined function<br>or preset recallAES3 inputs (transformer balanced, 110.0,<br>Sub-D-F connector, 25-pin, 4 in-and 4 outputs<br>4 AES3 inputs (transformer balanced, 110.0,<br>Sub-D-F connector, 25-pin, 4 in-and 4 outputs. with HW20711:<br>with HW20715:<br>with HW20715:<br>2 × 25-pin Sub-D-F (digital)<br>with HW207171:<br>2 × 27-46 (Rateman, AES57/ST 2110 AoIP)<br>bimensions (W X H X D)<br>2 007000:<br>with HW20715:<br>2 × 270000 HB × 163 × 46 mm<br>- with 17Mr-MAUL 2445 (Ravenan, AES57/ST 2110 AoIP)<br>bimensions (W X H X D)<br>2 007000:<br>with HW20715:<br>2 × 207000:<br>2 × 207000 HB × 163 × 46 mm<br>- with 17Mr-MAUL 2445 (Ravenan, AES57/ST 2110 AoIP)<br>bimensions (W X H X D)<br>2 00700:<br>2 × 207000 HB × 163 × 46 mm<br>- with 17Mr-MAUL 2445 mm<br>- with 17Mr-MAUL 2445 mm<br>- 207000:<br>with HW20715:<br>2 × 207000:<br>1 Pass 24 × 64 mm<br>- with 17Mr-MAUL 2445 mm<br>- 207000:<br>1 Pass 24 × 64 mm<br>- with 17Mr-MAUL 2445 mm<br>- 207000:<br>with HW20715:<br>2 × 20700:<br>2 × 207000:<br>2   |                             |   |                   | -   |
| 1 x 4-pin locking low voltage connector<br>type Binder 710 (OC)Analog Inputs2 x USB A; USB 2.0 Full Speed connectors for<br>. USB memory sticks (licence handling, pre-<br>set export and import, software updates)<br>external Wacomily graphics table<br>external   |                             | I I   |                   |   |
| type Binder 710 (DC)       2       2       2       2       8       analog inputs, Sub-D-F connector, 25-pin, adjustable in the range from 0 dBu to + 10 dBu to +  |                             |   | Analog Inputs     |   |
| <ul> <li>USB memory sticks (licence handling, pro-<br/>set export and import, software updates)         <ul> <li>external computer mouse for operating<br/>external computer mouse for operating<br/>external wacomit graphics tablet<br/>1x GPIO (R2-12-6PEC) for defined functions<br/>or preserver analle<br/>x LAN (RJ-45)</li> </ul> </li> <li>with HW20711: 2x 25-pin Sub-D-F (analog, 8 x BNC-F (digital)<br/>with HW20711: 1x 25-pin Sub-D-F (analog, 8 x BNC-F (digital)<br/>with HW20711: 1x 25-pin Sub-D-F (analog, 8 x BNC-F (digital)<br/>with HW20711: 1x 25-pin Sub-D-F (digital)<br/>with HW20711: 2x RJ-45 (Guante® AoIP)<br/>with TW7-MAUD: 2141 x 1325 x 495 mm<br/>- with TW7-MAUD: 2141 x 1325 x 495 mm<br/>- with TW7-MAUD: 2141 x 1325 x 495 mm<br/>- with TW7-MAUD: 2141 x 1325 x 495 mm<br/>with TW7-MAUD: 2141 x 1325 x 495 mm<br/>- with TW7-MAUD: 2141 x 1325 x 495 mm<br/>with TW7-MAUD:</li></ul>   |                             |   |                   | 8 analog inputs, Sub-D-F connector, 25-pin                    |
| set export and import, software updates)<br>external Owner operating<br>external Wacom® graphics tablet<br>1, CPIO (RJ-12-GPEC) for defined functions<br>or preset recall<br>1, LAN (RJ-45)Maximum input lewell<br>impedance:<br>Frequence range:<br>20 Hz to 22 kHz @ 48 kHz         with HW20711:<br>1x 25-pin Sub-D-F (analog and digital)<br>th x 25-pin Sub-D-F (analog, 8 x BNC-F (digital)<br>th x 25-pin Sub-D-F (analog, 8 x BNC-F (digital)<br>th x 25-pin Sub-D-F (analog, 8 x BNC-F (digital)<br>th Through)<br>th HW20711:<br>1x 25-pin Sub-D-F (analog, 8 x BNC-F (digital)<br>xut HW20711:<br>2 x RJ-45 (Dante® AoIP)<br>with HW20711:<br>2 x RJ-45 (Ravenna/AES87/ST 2110 AoIP)<br>with HW20711:<br>2 x RJ-45 (Ravenna/AES87/ST 2110 AoIP)<br>with TM7-MAVID: 214.1 x 1326 x 495 mm<br>- with TM7-MAVID: 214.1 x 1326 x 495 mm<br>with TM7-MAVID: 214.1 x  |                             | 2 x USB A; USB 2.0 Full Speed connectors for: | HW20712:          | 8 analog inputs, Sub-D-F connector, 25-pin                    |
| <ul> <li>external xoomputer mouse for operating<br/><ul> <li>external xoomputer mouse for operating<br/>ix GPIO (RJ-12-6P6C) for defined functions<br/>or preserve tecal</li> <li>INGAPIO (RJ-12-6P6C) for defined functions<br/>or preserve tecal</li> </ul> </li> <li>with HW20711: 2 x 28-pin Sub-D-F (analog) 8 x NBC-F (digital)<br/>with HW207112: 1 x 25-pin Sub-D-F (digital) 2 x BNC-F (digital)<br/>with HW207112: 2 x 82-pin Sub-D-F (digital) 2 x BNC-F (digital)<br/>with HW207115: 2 x 82-bit Sub-D-F (digital) 2 x BNC-F (Gigtal)<br/>with HW207115: 2 x 82-bit Sub-D-F (digital)<br/>with HW207115: 2 x RJ-45 (Dante® AoIP)<br/>with HW207115: 2 x Sub-D-F connector, 25-pin, 4 in-and 4 outputs<br/>ad 3G-SDI interface with 2 x BNC-F connectors, 25-pin, 4 in-and 4 outputs<br/>ad 3G-SDI interface with 2 x BNC-F connector, 25-pin, 4 in-and 4 outputs<br/>ad 3G-SDI interface with 2 x BNC-F connectors, 25-pin, 4 in-and 4 outputs<br/>ad 3G-SDI interface with 2 x BNC-F connectors, 25-pin, 4 in-and 4 outputs<br/>ad 3G-SDI interface with 2 x BNC-F connectors, 25-pin, 4 in-and 4 outputs<br/>ad 3G-SDI interface with 2 x BNC-F connectors, 25-pin, 4 in-and 4 outputs<br/>ad 3G-SDI interface with 2 x BNC-F connectors, 25-pin, 4 in-and 4 outputs<br/>ad 3G-SDI interface with 2 x BNC-F connectors, 25-pin, 4 in-and 4 outputs<br/>ad 3G-SDI interface with 2 x BNC-F connectors, 25-pin, 4 in-and 4 outputs<br/>ad 4 outputs and 3G-SDI interface with 2 x BNC-F connectors, 25-</li></ul>   |                             |   | Reference level:  | ,                       |
| <ul> <li>external Wacom® graphics tablet         <ul> <li>ix GPIO (RJ-12-6PGC) for defined functions                  ar orgeset recall                 1x LAN (RJ-45)</li> <li>ix LAN (RJ-45)</li> </ul> </li> <li>with HW20711:         <ul> <li>ix 25-pin Sub-D-F (analog and digital)</li> <li>with HW20712:                 1x 25-pin Sub-D-F (analog and digital)</li> <li>with HW20711:                  1x 25-pin Sub-D-F (analog and digital)</li> <li>with HW20711:                  1x 25-pin Sub-D-F (analog and digital)</li> <li>with HW20711:                  2x 25-pin Sub-D-F (analog and digital)</li> <li>with HW20711:                  2x 25-pin Sub-D-F (angleg and digital)</li> <li>with HW20711:                  2x RJ-45 (Banetma/AES67/ST 2110 AoIP)</li> <li>W207000E M:                  188 x 109 x 45 mm                 - with TM7-MA3U:                  421+P x 3U x 445 mm                 - with TM7-MA3U:                  421+P x 3U x 445 mm                 - with TM7-MA3U:                  421+P x 3U x 445 mm                 - with TM7-MA3U:                  421+P x 3U x 445 mm                   video rack cabinets with 407 mm depth                  video rack cabinets with 407 mm depth                  video rack cabinets with 407 mm depth                        video rack cabinets with 407 mm depth</li></ul></li></ul>   |                             |   |                   |   |
| 1 x GPI0 (RJ-12-6P6C) for defined functions<br>or preset recail       Digital Inputs         with HW20711:       2 x 25-pin Sub-D-F (analog, as BNC-F (ajglad)<br>with HW20712:       4 AES3 inputs (transformer balanced, 110 Ω),<br>Sub-D-F connector, 25-pin, 4 in-and 4 outputs         with HW20712:       1 x 25-pin Sub-D-F (digital),<br>2 x 25-pin Sub-D-F (digital),<br>with HW20717:       2 x RJ-45 (Dante® AoIP)         with HW20717:       2 x RJ-45 (Dante® AoIP)       HW20712:       4 AES3 inputs (transformer balanced, 110 Ω),<br>Sub-D-F connector, 25-pin, 4 in-and 4 outputs         with HW20717:       2 x RJ-45 (Dante® AoIP)       HW20713:       2 x RJ-45 (Dante® AoIP)         with HW20717:       2 x RJ-45 (Ravenna/AES67/ST 2110 AoIP)       HW20715:       8 AES3 inputs (transformer balanced, 110 Ω),<br>Sub-D-F connector, 25-pin, 4 in-and 4 outputs<br>and 3G-SDI interface with 2 x BNC-F connector,<br>25-pin, 4 in-and 4         Dimensions (W x H x D):       207000CEM:       188 x 109 x 45 mm<br>- with TW7-MAND: 2141 x 1326 x 495 mm<br>(429 mm depth with adapter rows), for<br>video rack cabinets with 407 mm depth       HW20715:       8 AES3 inputs (transformer balanced, 110 Ω),<br>2 x Sub-D-F connector, 25-pin, 4 in-and 4<br>outputs each         Functions (with all licences activated)       Operation with one finger (touch sensitive<br>display) or a computer mouse       HW20711:       4 AES3 outputs, Sub-D-F connector, 25-pin,<br>with 4 inputs and 4 outputs         1 Totmerar, 1 TD CH,<br>2 -ch, and multichannel peakmeter       Operation with one finger (touch sensitive<br>display) or a computer mouse       HW20715: <t< td=""><td></td><td></td><td></td><td></td></t<>  |                             |   |                   |   |
| 1 x LÅN (RJ-45)       HW20711:       2 x 25-pin Sub-D-F (anlog), 8 x BNC-F (digital)         with HW20712:       1 x 25-pin Sub-D-F (anlog), 8 x BNC-F (digital)       HW20712:       4 AES3 inputs (transformer balanced, 110 Ω), Sub-D-F connector, 25-pin, 4 in-and 4 outputs         with HW20714:       1 x 25-pin Sub-D-F (digital)       2 x BD-F (digital)       HW20712:       4 AES3 inputs (transformer balanced, 110 Ω), Sub-D-F connector, 25-pin, 4 in-and 4 outputs         with HW20715:       2 x RJ-45 (Dante® AoIP)       HW20714:       4 AES3 inputs (transformer balanced, 110 Ω), Sub-D-F connector, 25-pin, 4 in-and 4 outputs         with HW20717:       2 x RJ-45 (Dante® AoIP)       HW20714:       4 AES3 inputs (transformer balanced, 110 Ω), Sub-D-F connector, 25-pin, 4 in-and 4 outputs         Dimensions (W x H x D):       2 007000       188 x 109 x 45 mm       HW20715:       8 AES3 inputs (transformer balanced, 110 Ω), 2 x Sub-D-F connector, 25-pin, 4 in-and 4         Veight:       2 007000C M:       188 x 109 x 45 mm       HW20715:       8 AES3 outputs, Sub-D-F connector, 25-pin, 4 in-and 4         Veight:       2 007000C M:       188 x 109 x 45 mm       Sampling rates:       44.1, 48, 96 kHz, synchronisation to digital input signal         Operating temperature:       +5° to +40° C       HW20711:       4 AES3 outputs, Sub-D-F connector, 25-pin, 4 in-and 4 outputs         Nutliformat Surround PPM (31, 50, 51, 7, 7, 10 mer)       -0 perating with andapter rows), for       <   |                             |   | Frequence range:  | 20 Hz to 22 kHz @ 48 kHz                                      |
| with HW20711:2 x 25-pin Sub-D-F (analog), 8 x BNC-F (digtal)<br>with HW20712:Sub-D-F connector, 25-pin, 4 in-and 4 outputswith HW20713:2 x 25-pin Sub-D-F (digtal)<br>(n, Through)WHW20715:2 x 25-pin Sub-D-F (digtal)<br>(digtal)<br>with HW20717:2 x RJ-45 (Ravenna/AES67/ST 2110 AoIP)With HW20718:2 x RJ-45 (Ravenna/AES67/ST 2110 AoIP)HW20715:2 x RJ-45 (Ravenna/AES67/ST 2110 AoIP)Dimensions (W x H x D):2 07000 EM:188 x 109 x 45 mm<br>- with TM7-MA3U: 241.1 x 132.6 x 445 mm<br>- with 100 paprox. 27. k (g (v/o power supply))<br>- 20700 EM: approx. 1.2 kgDigital OutputsWeight:207000 EM: approx. 1.2 kgDigital OutputsPunctions (with all licences activated)Operation with one finger (touch sensitive<br>display) or a computer mouse<br>- Instruments can be scaled and freely positioned<br>- Mutiformat Surround PPM (3.1, 5.0, 5.1,<br>7.1 Cinema, 7.1 DP)Digital OutputsHW20715:8 AES3 outputs, Sub-D-F connector, 25-pin,<br>with 4 inputs and 4 outputs<br>- Sampling rates:Loudness Meter: ITU-R BS (T70-4/1771,<br>EBU R128, ATSC A/85, ARIB, OP-59,<br>AGCOM, CALM Act, LEQ(M), TASA, SAWA,<br>custom modeSampling rates:Loudness Meter (TC electronic®)- Sampling rates:Loudness Meter (TC electronic®)<br>- L   |                             |   | •••               |   |
| with HW20712:1 x 25-pin Sub-D-F (analog), 8 x B/C-F (digital)<br>t x 25-pin Sub-D-F (digital), 2 x B/C-F (digital)<br>t x 2 x S/D-F (digital), 2 x B/C-F (digital), 2                                   |                             |   | HW20711:          |   |
| with HW20714:1 x 25-pin Sub-D-F (digital) 2 x BNC-F (3G-SDI<br>In, Through)connectors, 4 inputs and 4 outputswith HW20715:2 x 25-pin Sub-D-F (digital)4 AES3 inputs (transformer balanced, 110 Ω),with HW20717:2 x RJ-45 (Dante® AoIP)HW20718:2 x RJ-45 (Ravenna/AES67/ST 2110 AoIP)Dimensions (W x H x D):207000 EM:188 x 109 x 45 mmHW20715:8 AES3 inputs (transformer balanced, 110 Ω),2 x dJ-45 (Ravenna/AES67/ST 2110 AoIP).0000 EM:188 x 109 x 45 mmHW20715:8 AES3 inputs (transformer balanced, 110 Ω),2 x dJ-45 (Ravenna/AES67/ST 2110 AoIP).0000 EM:188 x 109 x 45 mm.0000 EM:2 x Sub-D-F connector, 25-pin, 4 in-and 4. with TM7-MA3U:214.1 x 132.6 x 49.5 mm.0000 EM:.0000 EM:.0000 EM:. with TM7-MAVID:214.1 x 132.6 x 49.5 mm.0000 EM:.0000 EM:.0000 EM:. operating temperature:+5° to +40° C.0000 EM:.0000 EM:.0000 EM:. Purctions (with all licences activated).0000 EM:.0000 EM:.0000 EM:.0000 EM:. Instruments can be scaled and freely positioned.1000 EM:.1000 EM:.1000 EM:. Instruments can be scaled and freely positioned.1000 EM:.0000 EM:.1000 EM:. Loudness Faet Time Control.1000 EM:.0000 EM:.0000 EM:.0000 EM:. Loudness Faet Time Control.1000 EM:.0000 EM:.0000 EM:.0000 EM:. Loudness Chart Instrument.0000 EM:.0000 EM:.0000 EM:.0000 EM:. Loudness Chart Instrument.0000 EM:.00  |                             |   |                   |   |
| In, Through)HW20715:4 AES3 inputs (transformer balanced, 110 Ω),<br>Sub-D-F connector, 25-pin, 4 in-and 4 outputs<br>and 3G-SDI interface with 2 x BU-45<br>(transformer balanced, 110 Ω),<br>Sub-D-F connector, 25-pin, 4 in-and 4 outputs<br>and 3G-SDI interface with 2 x BU-45<br>(transformer balanced, 110 Ω),<br>2 x SU-b-F connector, 25-pin, 4 in-and 4<br>outputs eachDimensions (W x H x D):2 v RU-45 (Dante® AoIP)<br>20700CEM:<br>188 x 109 x 45 mm<br>- with TM7-MA3U: 42HP x 3U x 44.5 mm<br>- with tadapter rows, for<br>video rack cabinets with 407 mm depthHW20715:8 AES3 inputs (transformer balanced, 110 Ω),<br>2 x SU-b-F connector, 25-pin, 4 in-and 4<br>outputs eachWeight:20700CEM: approx. 27 kg (w/o power supply<br>video rack cabinets with 407 mm depthHW20711:4 AES3 outputs, Sub-D-F connector, 25-pin, 4<br>with 4 inputs and 4 outputsWeight:20700CEM: approx. 12 kgDigital OutputsOperation with one finger (touch sensitive<br>display) or a computer mouse<br>. Instruments can be scale and freely positioned<br>. Multiformat Surround PPM (3.1, 5.0, 5.1,<br>7.1 C inema, 7.1 DD+)HW20711:4 AES3 outputs, Sub-D-F connector, 25-pin<br>with 4 inputs and 4 outputsHW20715:8 AES3 outputs, 2 x Sub-D-F connector, 25-pin,<br>with 4 inputs and 4 outputs<br>. Sampling rates:HW20715:B AES3 outputs, 2 x Sub-D-F connector, 25-pin,<br>with 4 inputs and 4 outputs<br>. Sub-D-F connector, 25-pin,<br>. HW20715:HW20716:B AES3 outputs, 2 x Sub-D-F connector, 25-pin,<br>. AutputsHW20717:B Cudness Meter:<br>. Loudness Range instrument (LRA)<br>. Loudness Range instrument (LRA)<br>. Loudness Rate in  |                             |   | Π₩20712.          | •                       |
| with HW20715:<br>with HW20715:<br>with HW20717:<br>2 x RJ-45 (Dante® AoIP)Sub-D-F (digital)<br>and 3G-SDI interface with 2 x BNC-F connector, 25-pin, 4 in-and 4 outputs<br>and 3G-SDI interface with 2 x BNC-F connector, 25-pin, 4 in-and 4<br>outputs eachDimensions (W x H x D):<br>- 207000 EM:<br>- with TM7-MADD: 2141 x 132.6 x 49.5 mm<br>- with TM7-MADD: 2141 x 132.6 x 49.5 mm<br>(429 mm depth with adapter rows), for<br>video rack cabinets with 407 mm depthHW20715:<br>- 8 AES3 outputs, Sub-D-F connector, 25-pin, 4 in-and 4<br>outputs eachWeight:<br>- 207000 EM:<br>- 207000 EM: <b< td=""><td>With 11020714.</td><td></td><td>HW20714:</td><td></td></b<>  | With 11020714.              |   | HW20714:          |   |
| with HW20717:<br>with HW20718:<br>Dimensions (W x H x D):2 x RJ-45 (Dante® AoIP)<br>x R42-45 (Ravenna/AES67/ST 2110 AoIP)and 3G-SDI interface with 2 x BNC-F connect-<br>tors in and ThroughDimensions (W x H x D):207000 EM:<br>207000 EM:188 x 109 x 45 mm<br>- with TM7-MAUD: 2141 x 1326 x 495 mm<br>(429 mm depth with adapter rows), for<br>video rack cabinets with 407 mm depthHW20715:8 AES3 inputs (transformer balanced, 110 Ω),<br>2 x Sub-D-F connector, 25-pin, 4 in-and 4<br>outputs eachWeight:0.207000 EM:<br>- 207000 EM:<br>approx .2.7 kg (w/o power supply)<br>207000 EM: approx .1.2 kgHW20715:4 AES3 outputs, Sub-D-F connector, 25-pin,<br>with 4 inputs and 4 outputsWeight:0.207000 EM:<br>- 207000 EM:<br>approx .2.7 kg (w/o power supply)<br>- 207000 EM:<br>approx .1.2 kgHW20711:4 AES3 outputs, Sub-D-F connector, 25-pin,<br>with 4 inputs and 4 outputsWuttformat Surround PPM (31, 50, 5.1,<br>7, 1 Cinema, 7, 1 DD+)Operation with one finger (touch sensitive<br>display) or a computer mouseHW20711:4 AES3 outputs, Sub-D-F connector, 25-pin,<br>with 4 inputs and 4 outputsWuttformat Surround PPM (31, 50, 5.1,<br>7, 1 Cinema, 7, 1 DD+)Operation with one finger (touch sensitive<br>display) or a computer mouseHW20711:4 AES3 outputs, 2 x Sub-D-F connector, 25-pin,<br>with 4 inputs and 4 outputsWuttformat Surround PPM (31, 50, 5.1,<br>7, 1 Cinema, 7, 1 DD+)- 2-ch. and multichannel peakmeter<br>Loudness Mater: ITU-R BS.1770-4/1771,<br>EBU R128, AFSC A/38, ARIB, 0P-59,<br>AGCOM, CALM Act, LEQ(M), TASA, SAWA,<br>custom modeSampling rates:Sappling rates:Loudness Range instrument<br>Loudness Range instrument<br>Radar Loudness Rater instrument<br>Radar Loudness Meter (TC electro  | with HW20715:               |   |                   | •   |
| Dimensions (W x H x D):207000:198 x 163 x 46 mm<br>188 x 109 x 45 mm<br>- with TM7-MA3U: 24Pt x 312 v 44.5 mm<br>- with TM7-MAVID: 214.1 x 132.6 x 49.5 mm<br>(429 mm depth with adapter rows), for<br>video rack cabinets with 407 mm depthHW20715:8 AES3 inputs (transformer balanced, 110 Ω),<br>2 x Sub-D-F connector, 25-pin, 4 in-and 4<br>outputs eachWeight:207000EM: approx. 1.2 kgSampling rates:44.1, 48, 96 kHz, synchronisation to digital input<br>signalOperating temperature:+5° to +40° CHW20711:4 AES3 outputs, Sub-D-F connector, 25-pin,<br>with 4 inputs and 4 outputsFunctions (with all licences activated)Operation with one finger (touch sensitive<br>display) or a computer mouse<br>• Instruments can be scaled and freely positioned<br>• Multiformat Surround PPM (3.1, 5.0, 5.1,<br>7.1 Cinema, 7.1 D+)HW20712:4 AES3 outputs, Sub-D-F connector, 25-pin,<br>with 4 inputs and 4 outputs<br>and 4 outputs<br>a doutputs, Sub-D-F connector, 25-pin,<br>with 4 inputs and 4 outputs<br>a AES3 outputs, Sub-D-F connector, 25-pin,<br>with 4 inputs and 4 outputs<br>a AES3 outputs, Sub-D-F connector, 25-pin,<br>4 in-and 4 outputsFunctions (with all licences activated)• Operation with one finger (touch sensitive<br>display) or a computer mouse<br>• Instrument can be scaled and freely positioned<br>• Multiformat Surround PPM (3.1, 5.0, 5.1,<br>7.1 Cinema, 7.1 D+)• AES3 outputs, 2.4 Sub-D-F connector, 25-pin,<br>4 in-and 4 outputs each• Loudness-Meter: ITU-R BS.1770-4/1771,<br>EBU R128, ATSC A/85, ARIB, OP-59,<br>AGCOM, CALM Act, LEQ(M), TASA, SAWA,<br>custom mode<br>• Loudness Range instrument<br>• Loudness Range instrument (LRA)<br>• Loudness Rater instrument<br>• Loudness Meter (TC electronic®)<br>• SPL meter• AES67 implementation: 44.1, 48, 88.2, 96 kHz f   |                             |   |                   |   |
| <ul> <li>207000EM: 188 x 109 x 45 mm</li> <li>with TM7-MA3U: 42HP x 3U x 445 mm</li> <li>with TM7-MAVID: 214.1 x 132.6 x 495 mm</li> <li>with TM7-MAVID: 214.1 x 132.6 x 495 mm</li> <li>(429 mm depth with adapter rows), for</li> <li>video rack cabinets with 407 mm depth</li> <li>207000EM: approx. 2.7 kg (w/o power supply)</li> <li>207000EM: approx. 1.2 kg</li> <li>Digital Outputs</li> <li>Sampling rates:</li> <li>4.1, 48, 96 kHz, synchronisation to digital input</li> <li>signal</li> <li>Digital Outputs</li> <li>HW20711:</li> <li>4 AES3 outputs, Sub-D-F connector, 25-pin, 4in-and 4</li> <li>outputs each</li> <li>Sampling rates:</li> <li>MW20711:</li> <li>4 AES3 outputs, Sub-D-F connector, 25-pin, with 4 inputs and 4 outputs</li> <li>HW20712:</li> <li>4 AES3 outputs, Sub-D-F connector, 25-pin, with 4 inputs and 4 outputs</li> <li>HW20714:</li> <li>4 AES3 outputs, Sub-D-F connector, 25-pin, with 4 inputs and 4 outputs</li> <li>HW20715:</li> <li>8 AES3 outputs, Sub-D-F connector, 25-pin, with 4 inputs and 4 outputs and 3G-SDI interface with 2 x SNC-F connector, 25-pin, 4 in-and 4 outputs each</li> <li>Acter and multichannel peakmeter</li> <li>Loudness -Meter: ITU-R BS.1770-4/1771, EBU R128, ATSC A485, ARIB, R0-F-50, AGCOM, CALM Act, LEO(M), TASA, SAWA, custom mode</li> <li>Loudness Tame Control</li> <li>Loudness Range instrument (LRA)</li> <li>Logging Data Server</li> <li>Loudness Chart instrument</li> <li>Radar Loudness Meter (TC electronic®)</li> <li>SPL meter</li> </ul>  | with HW20718:               | 2 x RJ-45 (Ravenna/AES67/ST 2110 AoIP)        |                   | tors In and Through   |
| <ul> <li>with TM7-MA3U: 42HP x 3U x 44.5 mm</li> <li>with TM7-MAVD: 214.1 x 132.6 x 49.5 mm<br/>(429 mm depth with adapter rows), for<br/>video rack cabinets with 407 mm depth</li> <li>207000EM: approx. 2.7 kg (w/o power supply)</li> <li>207000EM: approx. 1.2 kg</li> <li>Doperating temperature: +5° to +40° C</li> <li>4 AES3 outputs, Sub-D-F connector, 25-pin,<br/>with 4 inputs and 4 outputs</li> <li>HW20711: 4 AES3 outputs, Sub-D-F connectors, 4 inputs and 4 outputs</li> <li>HW20712: 4 AES3 outputs, Sub-D-F connectors, 4 inputs and 4 outputs</li> <li>HW20714: 4 AES3 outputs, Sub-D-F connector, 25-pin<br/>with 4 inputs and 4 outputs</li> <li>HW20714: 4 AES3 outputs, Sub-D-F connector, 25-pin<br/>with 4 inputs and 4 outputs</li> <li>HW20714: 4 AES3 outputs, Sub-D-F connector, 25-pin<br/>with 4 inputs and 4 outputs and 3G-SDI inter-<br/>face with 2 x BNC-F connector, 25-pin</li> <li>HW20715: 8 AES3 outputs, 2 x Sub-D-F connector, 25-pin,<br/>with 4 inputs and 4 outputs and 3G-SDI inter-<br/>face with 2 x BNC-F connector, 25-pin,<br/>with 4 inputs and 4 outputs and 3G-SDI inter-<br/>face with 2 x BNC-F connector, 25-pin,<br/>with 4 inputs and 4 outputs and 3G-SDI inter-<br/>face with 2 x BNC-F connector, 25-pin,<br/>with 4 inputs and 4 outputs and 3G-SDI inter-<br/>face with 2 x BNC-F connector, 25-pin,<br/>with 4 inputs and 4 outputs each</li> <li>Sampling rates: referenced to digital inputs or internal clock</li> <li>Loudness Fast Time Control</li> <li>Loudness Range instrument (LRA)</li> <li>Louging Data Server</li> <li>Loudness Chart instrument</li> <li>Radar Loudness Meter (TC electronic®)</li> <li>SPL meter</li> </ul>   | Dimensions (W x H x D):     |   | HW20715:          |   |
| <ul> <li>with TM7-MAVID: 214.1 x 132.6 x 49.5 mm<br/>(429 mm depth with adapter rows), for<br/>video rack cabinets with 407 mm depth</li> <li>20700: approx. 2.7 kg (w/o power supply)</li> <li>207000EM: approx. 1.2 kg</li> <li>Digital Outputs</li> <li>207000EM: approx. 1.2 kg</li> <li>bigital outputs, 8 BNC-F connector, 25-pin,<br/>with 4 inputs and 4 outputs</li> <li>HW20712: 4 AES3 outputs, 8 BNC-F connector, 25-pin<br/>with 4 inputs and 4 outputs</li> <li>HW20712: 4 AES3 outputs, 8 BNC-F connector, 25-pin<br/>with 4 inputs and 4 outputs</li> <li>HW20712: 4 AES3 outputs, 2 Sub-D-F connector, 25-pin<br/>with 4 inputs and 4 outputs</li> <li>HW20714: 4 AES3 outputs, 2 Sub-D-F connector, 25-pin<br/>with 4 inputs and 4 outputs</li> <li>HW20715: 8 AES3 outputs, 2 Sub-D-F connector, 25-pin<br/>with 4 inputs and 4 outputs and 3G-SDI inter-<br/>face with 2 x BNC-F connector, 25-pin<br/>with 4 inputs and 4 outputs</li> <li>HW20715: 8 AES3 outputs, 2 x Sub-D-F connector, 25-pin,<br/>4 in-and 4 outputs each</li> <li>Sampling rates: referenced to digital inputs or internal clock</li> <li>AolP</li> <li>HW20717: 32 Dante® AolP network channels, 2 x RJ-45<br/>connectors (Primary, Secondary)</li> <li>Dante® interface: 44.1, 48, 88.2, 96 kHz for<br/>all 32 channels</li> <li>Actioness Chart instrument</li> <li>Radar Loudness Meter (TC electronic®)</li> <li>SPL meter</li> </ul>   |                             |   |                   | ·   |
| (429 mm depth with adapter rows), for<br>video rack cabinets with 407 mm depthsignalWeight:• 20700:<br>20700EM: approx. 2.7 kg (w/o power supply)<br>20700EM: approx. 1.2 kgDigital OutputsOperating temperature:+5° to +40° CHW20711:4 AES3 outputs, Sub-D-F connector, 25-pin,<br>with 4 inputs and 4 outputsFunctions (with all licences activated)• Operation with one finger (touch sensitive<br>display) or a computer mouse<br>• Instruments can be scaled and freely positioned<br>• Multiformat Surround PPM (3.1, 5.0, 5.1,<br>7.1 Cinema, 7.1 DD+)HW20714:4 AES3 outputs, Sub-D-F connector, 25-pin,<br>with 4 inputs and 4 outputs<br>and 4 outputs and 3G-SDI inter-<br>face with 2 x BNC-F connector, 25-pin,<br>with 4 inputs and 4 outputs and 3G-SDI inter-<br>face with 2 x Sub-D-F connector, 25-pin,<br>4 in-and 4 outputs each9 2-ch. and multichannel peakmeter<br>• Loudness -Meter: ITU-R BS.1770-4/1771,<br>EBU R128, ATSC A/85, ARIB, OP-59,<br>AGCOM, CALM Act, LEQ(M), TASA, SAWA,<br>custom modeSampling rates:Fereferenced to digital inputs or internal clockAolP<br>HW20718:• Dante® AolP network channels, 2 x RJ-45<br>connectors (Primary, Secondary)<br>• Dante® interface: 44.1, 48, 88.2, 96 kHz for<br>all 32 channels<br>• Loudness Chart instrument<br>• Radar Loudness Meter (TC electronic®)<br>• SPL meter• M20718:9 SPL meter• SPL meter• Uw20718:* AES67 implementation: 44.1, 48 kHz only<br>* 2 Ravenna/AES67/ST 2110 AolP network<br>channels, 2 x RJ-45 connectors (Primary, Se-<br>condary)  |                             |   |                   |   |
| video rack cabinets with 407 mm depthWeight:20700: approx. 2.7 kg (w/o power supply)<br>207000EM: approx. 1.2 kgOperating temperature:+ 5° to + 40° CFunctions (with all licences activated)• Operation with one finger (touch sensitive<br>display) or a computer mouse• Operation with one finger (touch sensitive<br>display) or a computer mouse• HW20712:• Instruments can be scaled and freely positionedHW20714:• Multiformat Surround PPM (3.1, 5.0, 5.1,<br>   |                             |   | Sampling rates:   |   |
| Weight:       20700:       approx. 2.7 kg (w/o power supply)       Digital Outputs         Operating temperature:       +5° to +40° C       HW20711:       4 AES3 outputs, Sub-D-F connector, 25-pin, with 4 inputs and 4 outputs         Functions (with all licences activated)       • Operation with one finger (touch sensitive display) or a computer mouse       • HW20712:       4 AES3 outputs, Sub-D-F connector, 25-pin with 4 inputs and 4 outputs         • Operation with one finger (touch sensitive display) or a computer mouse       • Instruments can be scaled and freely positioned       HW20714:       4 AES3 outputs, Sub-D-F connector, 25-pin with 4 inputs and 4 outputs         • Instruments can be scaled and freely positioned       • Multiformat Surround PPM (3.1, 5.0, 5.1, 7.1 Cinema, 7.1 DD+)       HW20715:       8 AES3 outputs, 2 x Sub-D-F connector, 25-pin, 4 in-and 4 outputs each         • Loudness-Meter: ITU-R BS.1770-4/1771, EBU R128, ATSC A/85, ARIB, OP-59, AGCOM, CALM Act, LEQ(M), TASA, SAWA, custom mode       • Loudness Test Time Control       • Loudness Test Time Control         • Loudness Range instrument (LRA)       • Loudness Range instrument (LRA)       • SepL meter       • AES67 implementation: 44.1, 48, 88.2, 96 kHz for all 32 channels         • AES67 implementation: 44.1, 48 kHz only       32 Ravenna/AES67/ST 2110 AoIP network channels, 2 x RJ-45 connectors (Primary, Secondary)         • SPL meter       • SPL meter       • AES6 connectors (Primary, Secondary)   |                             |   |                   | signal  |
| <ul> <li>207000EM: approx. 1.2 kg<br/>+5° to +40° C</li> <li>Functions (with all licences activated)</li> <li>Operation with one finger (touch sensitive<br/>display) or a computer mouse</li> <li>Instruments can be scaled and freely positioned</li> <li>Multiformat Surround PPM (3.1, 5.0, 5.1,<br/>7.1 Cinema, 7.1 DD+)</li> <li>2-ch. and multichannel peakmeter</li> <li>Loudness-Meter: ITU-R BS.1770-4/1771,<br/>EBU R128, ATSC A/85, ARIB, OP-59,<br/>AGCOM, CALM Act, LEQ(M), TASA, SAWA,<br/>custom mode</li> <li>Loudness Fast Time Control</li> <li>Loudness Chart instrument<br/>Radar Loudness Meter (TC electronic®)</li> <li>SPL meter</li> <li>HW20718:</li> <li>4 AES3 outputs, Sub-D-F connector, 25-pin,<br/>with 4 inputs and 4 outputs</li> <li>HW20714:</li> <li>4 AES3 outputs, Sub-D-F connector, 25-pin,<br/>with 4 inputs and 4 outputs and 3G-SDI inter-<br/>face with 2 x BNC-F connector, 25-pin,<br/>4 in-and 4 outputs each</li> <li>Sampling rates:</li> <li>referenced to digital inputs or internal clock</li> <li>AoIP</li> <li>HW20717:</li> <li>Burtage AoIP network channels, 2 x RJ-45<br/>connectors (Primary, Secondary)</li> <li>Sampling rates:</li> <li>AES67/ST 2110 AoIP network<br/>channels, 2 x RJ-45 connectors (Primary, Se-<br/>condary)</li> </ul>   | Weight:                     |   | Digital Outputs   |   |
| Operating temperature:+5° to +40° Cwith 4 inputs and 4 outputsFunctions (with all licences activated)• Operation with one finger (touch sensitive<br>display) or a computer mouse<br>• Instruments can be scaled and freely positioned<br>• Multiformat Surround PPM (3.1, 5.0, 5.1,<br>7.1 Cinema, 7.1 DD+)HW20714:4 AES3 outputs, S BNC-F connectors, 4 inputs and 4 outputs• Multiformat Surround PPM (3.1, 5.0, 5.1,<br>7.1 Cinema, 7.1 DD+)• 2-ch. and multichannel peakmeter<br>• Loudness-Meter: ITU-R BS.1770-4/1771,<br>EBU R128, ATSC A/85, ARIB, OP-59,<br>AGCOM, CALM Act, LEQ(M), TASA, SAWA,<br>custom modeSampling rates:referenced to digital inputs or internal clock• Loudness Test Time Control<br>• Loudness Chart instrument<br>• Radar Loudness Meter (TC electronic®)<br>• SPL meter• Ales67 implementation: 44.1, 48 kHz only<br>32 Ravena/AES67/ST 2110 AoIP network<br>channels, 2 x RJ-45 connectors (Primary, Se-<br>condary)   |                             |   |                   | 4 AES3 outputs, Sub-D-F connector, 25-pin,                    |
| Functions (with all licences activated)HW20712:4 AES3id outputs, 8 BNC-F connectors,<br>4 inputs and 4 outputs• Operation with one finger (touch sensitive<br>display) or a computer mouse• HW20714:4 AES3 outputs, Sub-D-F connector, 25-pin<br>with 4 inputs and 4 outputs and 3G-SDI inter-<br>face with 2 x BNC-F connectors In and Through<br>HW20715:• Multiformat Surround PPM (3.1, 5.0, 5.1,<br>7.1 Cinema, 7.1 DD+)• AES3 outputs, 2 x Sub-D-F connector, 25-pin,<br>4 in-and 4 outputs each• 2-ch. and multichannel peakmeter<br>• Loudness-Meter: ITU-R BS.1770-4/1771,<br>EBU R128, ATSC A/85, ARIB, OP-59,<br>AGCOM, CALM Act, LEQ(M), TASA, SAWA,<br>custom mode• AolP• Loudness Time Control<br>• Loudness Chart instrument<br>• Loudness Meter (TC electronic®)<br>• SPL meter• AES67 implementation: 44.1, 48 kHz only<br>HW20718:• W20718:32 Ravenna/AES67/ST 2110 AolP network<br>channels, 2 x RJ-45 connectors (Primary, Sec<br>condary)  | Operating temperature:      |   |                   |   |
| <ul> <li>Operation with one finger (touch sensitive display) or a computer mouse</li> <li>Instruments can be scaled and freely positioned</li> <li>Multiformat Surround PPM (3.1, 5.0, 5.1, 7.1 Cinema, 7.1 DD+)</li> <li>2-ch. and multichannel peakmeter</li> <li>Loudness-Meter: ITU-R BS.1770-4/1771, EBU R128, ATSC A/85, ARIB, OP-59, AGCOM, CALM Act, LEQ(M), TASA, SAWA, custom mode</li> <li>Loudness Test Time Control</li> <li>Loudness Range instrument (LRA)</li> <li>Logging Data Server</li> <li>Loudness Chart instrument</li> <li>Loudness Meter (TC electronic®)</li> <li>SPL meter</li> <li>HW20718:</li> <li>HW20718:</li> <li>HW20718:</li> <li>4 AES3 outputs, Sub-D-F connector, 25-pin, with 4 inputs and 4 outputs and 3G-SDI interface: 44.1, 48 kHz only</li> <li>HW20717:</li> <li>Barpling rates:</li> <li>HW20718:</li> <li>Radar Loudness Meter (TC electronic®)</li> <li>SPL meter</li> </ul>   |                             |   | HW20712:          | 4 AES3id outputs, 8 BNC-F connectors,                         |
| display) or a computer mousewith 4 inputs and 4 outputs and 3G-SDI inter-<br>face with 2 x BNC-F connectors In and ThroughMultiformat Surround PPM (3.1, 5.0, 5.1,<br>7.1 Cinema, 7.1 DD+)HW20715:8 AES3 outputs, 2 x Sub-D-F connector, 25-pin,<br>4 in-and 4 outputs each2-ch. and multichannel peakmeterSampling rates:referenced to digital inputs or internal clockLoudness-Meter: ITU-R BS.1770-4/1771,<br>EBU R128, ATSC A/85, ARIB, OP-59,<br>AGCOM, CALM Act, LEQ(M), TASA, SAWA,<br>custom modeAolPLoudness Test Time Control- Sampling rates:• Dante® AolP network channels, 2 x RJ-45<br>connectors (Primary, Secondary)Loudness Range instrument<br>Loudness Chart instrument- Sampling rates:• Dante® interface: 44.1, 48 kHz onlyHW20718:32 Ravenna/AES67/ST 2110 AolP network<br>channels, 2 x RJ-45 connectors (Primary, Se-<br>condary)   | Functions (with all licence |   |                   | 4 inputs and 4 outputs  |
| <ul> <li>Instruments can be scaled and freely positioned</li> <li>Multiformat Surround PPM (3.1, 5.0, 5.1,<br/>7.1 Cinema, 7.1 DD+)</li> <li>2-ch. and multichannel peakmeter</li> <li>Loudness-Meter: ITU-R BS.1770-4/1771,<br/>EBU R128, ATSC A/85, ARIB, OP-59,<br/>AGCOM, CALM Act, LEQ(M), TASA, SAWA,<br/>custom mode</li> <li>Loudness Test Time Control</li> <li>Loudness Range instrument (LRA)</li> <li>Logging Data Server</li> <li>Loudness Chart instrument</li> <li>Radar Loudness Meter (TC electronic®)</li> <li>SPL meter</li> </ul>   |                             |   | HW20714:          |   |
| <ul> <li>Multiformat Surround PPM (3.1, 5.0, 5.1,<br/>7.1 Cinema, 7.1 DD+)</li> <li>2-ch. and multichannel peakmeter</li> <li>Loudness-Meter: ITU-R BS.1770-4/1771,<br/>EBU R128, ATSC A/85, ARIB, OP-59,<br/>AGCOM, CALM Act, LEO(M), TASA, SAWA,<br/>custom mode</li> <li>Loudness Test Time Control</li> <li>Loudness Range instrument (LRA)</li> <li>Logging Data Server</li> <li>Loudness Chart instrument</li> <li>Radar Loudness Meter (TC electronic®)</li> <li>SPL meter</li> </ul>  |                             |   |                   |   |
| <ul> <li>7.1 Cinema, 7.1 DD+)</li> <li>2-ch. and multichannel peakmeter</li> <li>Loudness-Meter: ITU-R BS.1770-4/1771,<br/>EBU R128, ATSC A/85, ARIB, OP-59,<br/>AGCOM, CALM Act, LEQ(M), TASA, SAWA,<br/>custom mode</li> <li>Loudness Test Time Control</li> <li>Loudness Range instrument (LRA)</li> <li>Logging Data Server</li> <li>Loudness Chart instrument</li> <li>Radar Loudness Meter (TC electronic®)</li> <li>SPL meter</li> </ul>   |                             |   |                   |   |
| <ul> <li>2-ch. and multichannel peakmeter</li> <li>Loudness-Meter: ITU-R BS.1770-4/1771,<br/>EBU R128, ATSC A/85, ARIB, OP-59,<br/>AGCOM, CALM Act, LEO(M), TASA, SAWA,<br/>custom mode</li> <li>Loudness Test Time Control</li> <li>Loudness Range instrument (LRA)</li> <li>Logging Data Server</li> <li>Loudness Chart instrument</li> <li>Radar Loudness Meter (TC electronic®)</li> <li>SPL meter</li> <li>Sampling rates: referenced to digital inputs or internal clock</li> <li>AoIP</li> <li>HW20717: 32 Dante® AoIP network channels, 2 x RJ-45<br/>connectors (Primary, Secondary)</li> <li>Dante® interface: 44.1, 48, 88.2, 96 kHz for<br/>all 32 channels</li> <li>AES67 implementation: 44.1, 48 kHz only</li> <li>32 Ravenna/AES67/ST 2110 AoIP network<br/>channels, 2 x RJ-45 connectors (Primary, Se-<br/>condary)</li> </ul>  |                             |   | 110020713.        |   |
| <ul> <li>Loudness-Meter: ITU-R BS.1770-4/1771,<br/>EBU R128, ATSC A/85, ARIB, OP-59,<br/>AGCOM, CALM Act, LEO(M), TASA, SAWA,<br/>custom mode</li> <li>Loudness Test Time Control</li> <li>Loudness Range instrument (LRA)</li> <li>Logging Data Server</li> <li>Loudness Chart instrument</li> <li>Radar Loudness Meter (TC electronic®)</li> <li>SPL meter</li> </ul>   |                             |   | Sampling rates:   |   |
| EBU R128, ATSC A/85, ARIB, OP-59,<br>AGCOM, CALM Act, LEQ(M), TASA, SAWA,<br>custom modeAoIPLoudness Test Time ControlHW20717:32 Dante® AoIP network channels, 2 x RJ-45<br>connectors (Primary, Secondary)Loudness Range instrument (LRA)- Sampling rates:• Dante® interface: 44.1, 48, 88.2, 96 kHz for<br>all 32 channelsLoudness Chart instrumentHW20718:32 Ravenna/AES67/ST 2110 AoIP network<br>channels, 2 x RJ-45 connectors (Primary, Se-<br>condary)Radar Loudness Meter (TC electronic®)HW20718:32 Ravenna/AES67/ST 2110 AoIP network<br>channels, 2 x RJ-45 connectors (Primary, Se-<br>condary)  |                             |   |                   | 5 · · · · · · · · · · · · · · · · · · ·                       |
| custom modeconnectors (Primary, Secondary)Loudness Test Time Control- Sampling rates:Dante® interface: 44.1, 48, 88.2, 96 kHz for<br>all 32 channelsLougness Range instrument (LRA)- Sampling rates:• Dante® interface: 44.1, 48, 88.2, 96 kHz for<br>all 32 channelsLougness Chart instrument- HW20718:• AES67 implementation: 44.1, 48 kHz only<br>32 Ravenna/AES67/ST 2110 AoIP network<br>channels, 2 x RJ-45 connectors (Primary, Se-<br>condary)  |                             |   | AoIP              |   |
| <ul> <li>Loudness Test Time Control</li> <li>Loudness Range instrument (LRA)</li> <li>Logging Data Server</li> <li>Loudness Chart instrument</li> <li>Radar Loudness Meter (TC electronic®)</li> <li>SPL meter</li> <li>Loudness Test Time Control</li> <li>Sampling rates:</li> <li>Sampling rates:</li> <li>Dante® interface: 44.1, 48, 88.2, 96 kHz for<br/>all 32 channels</li> <li>AES67 implementation: 44.1, 48 kHz only</li> <li>32 Ravenna/AES67/ST 2110 AoIP network<br/>channels, 2 x RJ-45 connectors (Primary, Se-<br/>condary)</li> </ul>   |                             | AGCOM, CALM Act, LEQ(M), TASA, SAWA,          | HW20717:          |   |
| <ul> <li>Loudness Range instrument (LRA)</li> <li>Logging Data Server</li> <li>Loudness Chart instrument</li> <li>Radar Loudness Meter (TC electronic®)</li> <li>SPL meter</li> </ul>   |                             |   |                   |   |
| <ul> <li>Logging Data Server</li> <li>Loudness Chart instrument</li> <li>Radar Loudness Meter (TC electronic®)</li> <li>SPL meter</li> <li>AES67 implementation: 44.1, 48 kHz only</li> <li>MW20718:</li> <li>32 Ravenna/AES67/ST 2110 AoIP network</li> <li>channels, 2 x RJ-45 connectors (Primary, Secondary)</li> </ul>   |                             |   | - Sampling rates: |   |
| <ul> <li>Loudness Chart instrument</li> <li>Radar Loudness Meter (TC electronic®)</li> <li>SPL meter</li> <li>HW20718: 32 Ravenna/AES67/ST 2110 AoIP network<br/>channels, 2 x RJ-45 connectors (Primary, Se-<br/>condary)</li> </ul>   |                             | 5   |                   |   |
| <ul> <li>Radar Loudness Meter (TC electronic®)</li> <li>SPL meter</li> <li>channels, 2 x RJ-45 connectors (Primary, Se-<br/>condary)</li> </ul>   |                             | 00 0  | HW20718:          |   |
| SPL meter condary)  |                             |   |                   |   |
|   |                             |   |                   |   |
|   |                             | Timecode Reader, Loudness Recalculation       | - Sampling rates: | 44.1, 48, 88.2, 96 kHz for all 32 channels                    |

| Basic 4-Channel PP                         | M (Standard Software)  | Global Keyboard  |  |
|--|--|--|--|
|  |  | The Global Keyboard is used for simultaneous control of defined functions  |  |
| General<br>Input sources:                  | analog, digital, 3G-SDI, AoIP, depending on  | in multiple instruments, and for preset recall. It also allows the external control with the integrated GP IO interface. |  |
| 4. shaanad Daalanaatan                     | selected audio interface   |  |  |
| 4-channel Peakmeter:                       | up to 4 x Mono, 2 x Stereo, 1 x Stereo and up to 2 x Mono (no 3.1)                           | Gain Reduction<br>(Operation only with connection to Studer <sup>®</sup> Vista consoles)                                 |  |
| Display:                                   | <ul> <li>max. of 4 ch. total in max. 4 groups</li> <li>Peak level</li> </ul>                 | Display:   | 1 bargraph for Stereo and Surround formats, up   |
|  | <ul> <li>Peak hold</li> </ul>  | Input:   | to 8 bargraphs in multi-channel mode<br>Data stream via TCP/IP and LAN (ethernet)        |
|  | Numerical value of the display   |  | interface  |
| Functions:                                 | <ul> <li>Gain (+20 dB, +40 dB acc. to standard)</li> <li>Peak hold on/off</li> </ul>         | Input routing:<br>Marker:  | external featured streams selectable<br>adjustable threshold for the definition of upper |
|  | <ul> <li>Memory</li> </ul>   | Warker.  | and lower display section  |
|  | Reset  | Colors:  | 32 colors for each bargraph section  |
| Analog Peakmeter                           |  |  |  |
| Analog scales:                             | • DIN5: +550 dB,   |  | W20001: Multichannel Mode  |
|  | • Nordic: +1242 dB,  |  | PPM to multichannel and surround functions and   |
|  | <ul> <li>BR IIa: 7 1, BRIIa ext: 7 1,</li> <li>BR IIb: +1212 dB, BR IIb +1212 dB,</li> </ul> | display. More than 4 chan  | nels and groups can be displayed simultaneously.   |
| Integration time:                          | acc. to standard or 20 ms, 10 ms, 1 ms, 0,1 ms   | Input sources:   | analog, digital, SDI and/or AoIP depending on  |
| 0  | additional 150 ms for British scales   |  | selected audio interface   |
| Peak hold indicator:                       | 1, 2, 4, 10, 20, 30 s, manual reset or off   | Surround Peakmeter:<br>Track layout :  | for 3.1, 5.0, 5.1, 7.1 Cinema, 7.1 DD+ formats selectable for 5.1 Surround:              |
| Digital Peakmeter                          |  | Hack layout .  | <ul> <li>SMPTE.TV: L, R, C, LF, LS, RS</li> </ul>  |
| Word width:                                | 24 bit   |  | <ul> <li>SMPTE.Film: L, LS, C, RS, R, LF</li> </ul>                                      |
| Digital scales:                            | • TP60: +360 dB  |  | <ul> <li>DTS: L, R, LS, RS, C, LF</li> </ul>   |
|  | <ul> <li>Dig60: 060 dB</li> <li>DIN5: +550 dB</li> </ul>                                     |  | <ul> <li>L, C, R, LF, LS, RS</li> <li>Film: L, C, R, LS, RS, LF</li> </ul>               |
|  | <ul> <li>Nordic: +1242 dB</li> </ul>   |  | preset for 7.1 Cinema Surround:  |
|  | BR IIa: 7 1, BRIIa ext: 7 1,   |  | <ul> <li>SMPTE (L, LC, C, RC, R, LS, RS, LF)</li> </ul>                                  |
|  | • BR IIb: +1212 dB, BR IIb +1212 dB,   |  | preset for 7.1 DD+ Surround:   |
| Headroom/Headroom Ref:<br>Operation field: | adjustable from 0 to -20 dB in steps of 1 dB<br>adjustable from 0 to -20 dB in steps of 1 dB | Multichannel Peakmeter:  | L, C, R, LS, RS, LSR, RSR, LFE 2 to 8 single channels in one defined block (de-          |
| Integration time (Attack):                 | acc. to corresponding standard or selectable:  | Multichanner reakineter.   | pending on the audio interface up to 4 blocks)   |
| 5 X /                                      | Sample, 20 ms, 10 ms, 1 ms, 0.1 ms, additional   | 2-channel Peakmeter:   | for different Stereo channel pairs   |
|  | 150 ms for British scales  | Single-channel Peakmeter   | : for different Mono signals   |
| Gain:<br>High-pass filter:                 | +20 dB, +40 dB (acc. to standard)<br>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   | Optional Licence SV  | W20002: Loudness and SPL Display   |
| Over indicator hold time:                  | 1 s or manual  | Expands the Basic 4-char   | nnel PPM with functions for loudness measure-  |
| Over indicator PPM                         |  |  | and summed SPL value calculation   |
| - Threshold:                               | Full Scale, Full Scale -1LSB, Full Scale -2LSB,<br>-0.1 dBFS, -0.5 dBFS, -1 dBFS, -2 dBFS,   |  | an 4 channels software licence SW20001 is<br>ialnorm instrument is available.            |
|  | -3 dBFS  |  |  |
| - Attack time:                             | 1 to 15 samples  | EBU R128 Loudness M  | ode  |
| - Word width:<br>Over indicator True Peak  | 16 to 24 bit, selectable   | ITU BS.1771 Loudness   | Mode   |
| - Threshold:                               | adjustable   |  |  |
| Storog Correlator                          |  | ATSC A/85 Loudness M   | lode   |
| Stereo Correlator<br>Display:              | Bargraph, additional spot indicator between  | ARIB Loudness Mode   |  |
|  | PPM bargraphs  |  |  |
| Scale range:                               | -1 r to 0 to +1 r  | OP-59 Loudness Mode  |  |
| Standard color setting:                    | <ul> <li>red: -1 r to -0.1 r</li> <li>white: 0 r (-0.1 r to +0.1 r)</li> </ul>               | AGCOM Loudness Mod   | e  |
|  | • green: +0.1 r to +1 r  |  |  |
| Attack/release time:                       | 1.0 s/2.5 s  | CALM Loudness Mode   |  |
| AES3 Status Monitor                        |  | LEQ(M) Loudness Mode   |  |
| Display:                                   | Channel data are displayed as plain text, hex  |  |  |
|  | or binary <ul> <li>Channel selectable</li> </ul>   | TASA Loudness Mode   |  |
|  | Channel selectable     Audio bit activity  | SAWA Loudness Mode   |  |
|  | <ul> <li>Hardware status</li> </ul>  |  |  |
|  |  |  |  |

### Customer Specific Loudness Mode

| Customer Specific Loud   |  | - I High:                            | +1.0 LU; I tolerance above Target Level adjus-  |
|--|--|--------------------------------------|---|
| Display:   | Bargraphs for each single channel  |                                      | table from 0 to 10 LU in steps of 0.1 LU  |
|  | (can be combined with PPM bargraphs)   | - I Low:                             | -1.0 LU; I tolerance below Target Level adjus-  |
|  | <ul> <li>M bargraph (Momentary - summation of</li> </ul>   |                                      | table from 0 to -12 LU in steps of 0.1 LU   |
|  | momentary loudness values of all channels  |                                      |   |
|  | for a short span of time)  | Loudness Test Time C                 |   |
|  | <ul> <li>S bargraph (Short - loudness summation</li> </ul>   |                                      | utomatic, semi-automatic or manual loudness   |
|  | value of an adjustable dynamic time frame)   | measurements.                        |   |
|  | <ul> <li>I-Bargraph (Integrated - long term loudness</li> </ul>  | Start:                               |   |
|  | value infinite or manual control)  | - Functions:                         | Autostart after preset load, autostart with gate,   |
|  | <ul> <li>adjustable tolerance range for M, S, I</li> </ul>   |                                      | autostart with gate and autoreset, manually via   |
| umerical display:  | for M, S, I values (labelling adjustable)  |                                      | keys or GPI. With Timecode Reader licence   |
|  | for LRA, TPmax, Mmax, Smax, I-time values  |                                      | (SW20008) activated additional control via  |
| cales:   | Loudness scale:  |                                      | timecode resp. timecode with recalculation.   |
|  | • EBU+9: +918 LU   | <ul> <li>Level for gate:</li> </ul>  | -70,0 LUFS/LKFS; adjustable from -85 to   |
|  | <ul> <li>EBU+3: +318 LU</li> </ul>   |                                      | –10 LUFS/LKFS in steps of 0.5 LUFS/LKFS   |
|  | • EBU+18: +1836 LU   | Stop:                                |   |
|  | • EBU+9a: 1441 LUFS  | - Functions:                         | manually via keys or GPI, autostop with gate,   |
|  | <ul> <li>EBU+18a: -559 LUFS</li> </ul>   |                                      | autostop with gate and time. The stop function  |
|  | <ul> <li>EBU0: 0 –60 LUFS</li> </ul>   |                                      | is automatically set and fixed to timecode, if the  |
|  | <ul> <li>ITU+9: +9 –18 LU (Loudness Units)</li> </ul>  |                                      | start function has been set to a timecode option.   |
|  | <ul> <li>ITU0: 0 –30 LKFS</li> </ul>   | <ul> <li>Level for gate:</li> </ul>  | -70,0 LUFS/LKFS; adjustable from -85 to   |
|  | <ul> <li>ATSC0: 0 –60 LKFS</li> </ul>  |                                      | -10 LUFS/LKFS in steps of 0.5 LUFS/LKFS   |
|  | <ul> <li>ATSC0a: 0 –30 LKFS</li> </ul>   | <ul> <li>Time for gate:</li> </ul>   | 1 s; adjustable from 1 to 15 s in steps of 1 s  |
| eighting filter:   | K filter acc. to ITU BS.1770   |                                      |   |
| irget Level:   | <ul> <li>–23 LUFS; adjustable in the range from –10</li> </ul>   | Loudness Range Inst                  |   |
|  | to –30 LUFS in steps of 1 LUFS   | Display:                             | Graphical display of the Loudness Range   |
|  | <ul> <li>–24 LKFS; adjustable in the range from –10</li> </ul>   | Mode:                                | selectable: LRA Bar, MagicLRA, MagicLRA + I,  |
|  | to –30 LKFS in steps of 1 LKFS   |                                      | MagicLRA + I + Num  |
| ime & Gate Momentary:  |  | Scale range:                         | selectable: 6 LU, 10 LU, 20 LU, 30 LU   |
| <ul> <li>Window Time:</li> </ul>   | adjustable in the range from 200 ms to 1000  | LRA low range:                       | 2 LU; adjustable in the range from 1 to 20 LU in  |
|  | ms in steps of 100 ms  |                                      | steps of 1 LU   |
| <ul> <li>Integration Time:</li> </ul>  | IEC 125 ms Fast, 250 ms (IRT), 500 ms, 750   | Comfort zone:                        | 4 LU; adjustable in the range from 1 to 20 LU in  |
|  | ms, IEC 1000 ms Slow, 1500 ms, 2000 ms   |                                      | steps of 1 LU   |
|  | selectable   | LRA high range:                      | depends on the selected scale range and the   |
| me & Gate Short:   |  |                                      | spread of the comfort zone  |
| <ul> <li>Integration Time:</li> </ul>  | 3 s; time window adjustable from 1 to 20 s in  | Colors:                              | selectable for each range   |
|  | steps of 1 s   |                                      |   |
| ime & Gate Integrated:   |  | SPL Meter Mode                       |   |
| - Silence Gate:  | <ul> <li>-70,0 LUFS; adjustable in the range from</li> </ul>   | Display:                             | Bargraphs for each single channel   |
|  | -80,0 to -40,0 LUFS in steps of 0.5 LUFS,  |                                      | (can be combined with PPM bargraphs)  |
|  | switchable   | <b>.</b>                             | Summation bargraph  |
|  | <ul> <li>–70,0 LKFS; adjustable in the range from</li> </ul>   | Reference point:                     | adjustable in the range from 68 dB to 88 dB in  |
|  | -80,0 to -40,0 LKFS in steps of 0.5 LKFS,  |                                      | steps of 1 dB   |
|  | switchable   | Weighting:                           | Linear, A (Leq(A)), C, CCIR (Leq(M)), k   |
| - Relative Gate:   | -10,0 LU; adjustable from -40,0 LU to 0 LU in  | Integration time:                    | Fast (125 ms), Slow (1 s)   |
|  | steps of 0.5 LUFS, switchable  |                                      |   |
| evel adjustment for the  |  |                                      |   |
| summation:   | <ul> <li>0.0 dB (L, R, C), adjustable between –3 and</li> </ul>  |                                      | SW20003: RTA - Real Time Analyzer   |
|  | +3 dB in steps of 0.5 dB   |                                      | play of the frequency range of single channels,   |
|  | <ul> <li>+1.5 dB (LS, RS, LSR, RSR), adjustable</li> </ul>   |                                      | . For the display of more than 4 channels software  |
|  | between –3 and +3 dB in steps of 0.5 dB  | licence SW20001 is re                | quired.   |
|  | <ul> <li>Off (LFE), selectable: Off, 0 dB, 10 dB</li> </ul>  |                                      |   |
|  |  | Spectrum Analyzer (R                 |   |
|  |  | Input sources:                       | selectable: all channels without LF, all channels,  |
| lerance Levels:<br>- TP Headroom:  | -9.0 dB; adjustable from 0 to -20 dB in steps of   | input sources.                       |   |
| - TP Headroom:   | 0.1 dB   | input oourcool                       | Front, Rear, L/R, single channels, Stereo pairs,  |
|  | 0.1 dB<br>0.0 dB; adjustable from 0 to −20 dB in steps of  |                                      | Front, Rear, L/R, single channels, Stereo pairs, depending on selected mode   |
| <ul><li>TP Headroom:</li><li>TP Over Sensitivity:</li></ul>  | 0.1 dB<br>0.0 dB; adjustable from 0 to −20 dB in steps of<br>0.1 dB  | Frequency range:                     | Front, Rear, L/R, single channels, Stereo pairs,<br>depending on selected mode<br>• Norm: 20 Hz to 20 kHz,  |
| - TP Headroom:   | 0.1 dB<br>0.0 dB; adjustable from 0 to -20 dB in steps of<br>0.1 dB<br>+1.0 LU; M tolerance above Target Level adjus-  |                                      | <ul> <li>Front, Rear, L/R, single channels, Stereo pairs, depending on selected mode</li> <li>Norm: 20 Hz to 20 kHz, additional band &gt; 20 kHz switchable</li> </ul>  |
| <ul><li>TP Headroom:</li><li>TP Over Sensitivity:</li><li>M High:</li></ul>                                      | 0.1 dB<br>0.0 dB; adjustable from 0 to -20 dB in steps of<br>0.1 dB<br>+1.0 LU; M tolerance above Target Level adjus-<br>table from 0 to 10 LU in steps of 0.1 LU  | Frequency range:                     | <ul> <li>Front, Rear, L/R, single channels, Stereo pairs, depending on selected mode</li> <li>Norm: 20 Hz to 20 kHz, additional band &gt; 20 kHz switchable</li> <li>LF: 5 Hz to 5 kHz</li> </ul>   |
| <ul><li>TP Headroom:</li><li>TP Over Sensitivity:</li></ul>  | 0.1 dB<br>0.0 dB; adjustable from 0 to -20 dB in steps of<br>0.1 dB<br>+1.0 LU; M tolerance above Target Level adjus-<br>table from 0 to 10 LU in steps of 0.1 LU<br>-1.0 LU; M tolerance below Target Level adjus-  |                                      | <ul> <li>Front, Rear, L/R, single channels, Stereo pairs, depending on selected mode</li> <li>Norm: 20 Hz to 20 kHz, additional band &gt; 20 kHz switchable</li> <li>LF: 5 Hz to 5 kHz</li> <li>1/3-octave: 31 bands,</li> </ul>  |
| <ul><li>TP Headroom:</li><li>TP Over Sensitivity:</li><li>M High:</li><li>M Low:</li></ul>                       | 0.1 dB<br>0.0 dB; adjustable from 0 to -20 dB in steps of<br>0.1 dB<br>+1.0 LU; M tolerance above Target Level adjus-<br>table from 0 to 10 LU in steps of 0.1 LU<br>-1.0 LU; M tolerance below Target Level adjus-<br>table from 0 to -12 LU in steps of 0.1 LU   | Frequency range:                     | <ul> <li>Front, Rear, L/R, single channels, Stereo pairs, depending on selected mode</li> <li>Norm: 20 Hz to 20 kHz, additional band &gt; 20 kHz switchable</li> <li>LF: 5 Hz to 5 kHz</li> <li>1/3-octave: 31 bands, filter acc. to IEC 225 class 2</li> </ul>   |
| <ul><li>TP Headroom:</li><li>TP Over Sensitivity:</li><li>M High:</li></ul>                                      | 0.1 dB<br>0.0 dB; adjustable from 0 to -20 dB in steps of<br>0.1 dB<br>+1.0 LU; M tolerance above Target Level adjus-<br>table from 0 to 10 LU in steps of 0.1 LU<br>-1.0 LU; M tolerance below Target Level adjus-<br>table from 0 to -12 LU in steps of 0.1 LU<br>+1.0 LU; S tolerance above Target Level adjus-   | Frequency range:                     | <ul> <li>Front, Rear, L/R, single channels, Stereo pairs, depending on selected mode</li> <li>Norm: 20 Hz to 20 kHz, additional band &gt; 20 kHz switchable</li> <li>LF: 5 Hz to 5 kHz</li> <li>1/3-octave: 31 bands, filter acc. to IEC 225 class 2</li> <li>1/6-octave: 61 bands</li> </ul>                                 |
| <ul> <li>TP Headroom:</li> <li>TP Over Sensitivity:</li> <li>M High:</li> <li>M Low:</li> <li>S High:</li> </ul> | 0.1 dB<br>0.0 dB; adjustable from 0 to -20 dB in steps of<br>0.1 dB<br>+1.0 LU; M tolerance above Target Level adjus-<br>table from 0 to 10 LU in steps of 0.1 LU<br>-1.0 LU; M tolerance below Target Level adjus-<br>table from 0 to -12 LU in steps of 0.1 LU<br>+1.0 LU; S tolerance above Target Level adjus-<br>table from 0 to 10 LU in steps of 0.1 LU | Frequency range:<br>Number of bands: | <ul> <li>Front, Rear, L/R, single channels, Stereo pairs, depending on selected mode</li> <li>Norm: 20 Hz to 20 kHz, additional band &gt; 20 kHz switchable</li> <li>LF: 5 Hz to 5 kHz</li> <li>1/3-octave: 31 bands, filter acc. to IEC 225 class 2</li> <li>1/6-octave: 61 bands</li> <li>1/12-octave: 120 bands</li> </ul> |
| <ul><li>TP Over Sensitivity:</li><li>M High:</li><li>M Low:</li></ul>  | 0.1 dB<br>0.0 dB; adjustable from 0 to -20 dB in steps of<br>0.1 dB<br>+1.0 LU; M tolerance above Target Level adjus-<br>table from 0 to 10 LU in steps of 0.1 LU<br>-1.0 LU; M tolerance below Target Level adjus-<br>table from 0 to -12 LU in steps of 0.1 LU<br>+1.0 LU; S tolerance above Target Level adjus-   | Frequency range:                     | <ul> <li>Front, Rear, L/R, single channels, Stereo pairs, depending on selected mode</li> <li>Norm: 20 Hz to 20 kHz, additional band &gt; 20 kHz switchable</li> <li>LF: 5 Hz to 5 kHz</li> <li>1/3-octave: 31 bands, filter acc. to IEC 225 class 2</li> <li>1/6-octave: 61 bands</li> </ul>                                 |

Measuring range: Scaling: Functions:

- 3, 6, 9 dB
- Input selection

45 dB max.

- Peak hold on/off
- A, C, Linear weighting
- Integration time
- Set reference
- Scaling
- Frequency range
- Bargraph arrangement
- Display-Hold

Integration time (ballistics): Impulse, Fast, Slow, Peak (10 ms)

## Optional Licence SW20004: SSA - Surround Sound Analyzer

Dynamic display for visualizing the interaction of all surround parameter corresponding to the subjective listening impression

--- Precondition: Software licences SW20001, SW20002 are activated. ---

#### Surround-Sound-Analyzer

Display:

- Graphical display indicating the single channel and total program loudness acc. to selected weighting filter (Total Volume Indicator) acc. to selected weighting filters (e. g. SPL or Loudness)
  Position and width of phantom sound sources (PSI)
  Correlation of adjacent channels in PSI (color)
- Correlation of adjacent channels in PSI (color, resp. TVI (shape of line): red resp. funnel: negative range, yellow resp. straight line: "O" range, green resp. roof: positive range
- Separate correlators for the outer adjacent channels switchable: red: negative range, white: "0" range, green: positive range
- Dominance indicator (DMI)
- LFE Phase (warning display, if correlation between any channel and LFE is negative)

#### **Optional Licence SW20005: Radar Display**

High resolution circular Loudness display corresponding to the Loudness Radar Meter of TC electronic<sup>®</sup>.

--- Precondition: Software licence SW20002 is activated. ---

For the display of more than 4 channels software licence SW20001 is required.

|                      |  | r ourthold indicatori            | 1 3, 2 3, 1 3, 1 0 3, 20 3, 00 3, 1141144 10301 01 01 |
|----------------------|--|----------------------------------|---|
| Radar Loudness Meter |  | Over indicator hold time:        | 1 s or manual   |
| Display:             | <ul> <li>Momentary Loudness values (circular)</li> </ul> | Over indicator PPM               |   |
|                      | <ul> <li>History (circular)</li> </ul>                   | - Threshold:                     | Full Scale, Full Scale -1LSB, Full Scale -2LSB,       |
|                      | <ul> <li>Measuring time (numerical)</li> </ul>           |                                  | –0.1 dBFS, –0.5 dBFS, –1 dBFS, –2 dBFS,               |
|                      | <ul> <li>2 Loudness descriptors (numerical)</li> </ul>   |                                  | –3 dBFS   |
|                      | <ul> <li>Peak</li> </ul>                                 | <ul> <li>Attack time:</li> </ul> | 1 to 15 samples                                       |
| Mode:                | Radar or Statistics                                      | - Word width:                    | 16 to 24 bit, selectable                              |
| Sliding Loudness:    | 3 s, 6 s, 10 s, 15 s, 30 s, 1 min, 2 min, 4 min, 8 min   | Over indicator True Peak         |   |
| Descriptors:         | Off, Program Loudness, Loudness Max, Loud-               | - Threshold:                     | adjustable  |
|                      | ness Range, Sliding Loudness (max. 2 at a time)          |                                  |   |
| Speed:               | 1, 4, 12, 30 min, 1, 2, 4, 12, 24 h                      |                                  |   |
| Resolution:          | 3 dB, 4 dB, 6 dB, 8 dB, 10 dB, 12 dB, selectable         |                                  |   |
| Low Level:           | -30 to -6 LU   |                                  |   |
|                      |  |                                  |   |

#### Optional Licence SW20006: RTW Premium PPM plus Vectorscope

High resolution Multistandard-PPM display with advanced scales and with Audio Vectorscope (4 instances available) and Moving Coil instruments (PPM, VU, Loudness, BBC mode). Expands licence SW20001 with Multi-Correlator instrument in multi-channel mode, if activated. For the display of Loudness software licence SW20002 is required.

|       | General   |  |
|-------|---|--|
|       | Input sources:                                    | analog, digital, SDI and/or AoIP depending on selected audio interface |
|       | Display:  | Peak level   |
|       |   | <ul> <li>Peak hold</li> </ul>  |
|       |   | <ul> <li>Numerical value of the display</li> </ul>                     |
|       |   | Digital Over   |
|       | Functions:  | • Gain (+20 dB, +40 dB acc. to standard)                               |
| r     |   | <ul><li>Peak hold on/off</li><li>Memory</li></ul>                      |
| l     |   | <ul> <li>Reset</li> </ul>  |
|       |   |  |
|       | Analog Peakmeter Exten                            | ision  |
| Innel | Analog scales:                                    | ▪ Zoom10: +10 −10,   |
| ed    |   | <ul> <li>Zoom1: +11,</li> </ul>  |
| c.    |   | <ul> <li>SMPTE24: +2430</li> </ul>                                     |
|       |   | <ul> <li>SMPTE20: +2040</li> </ul>                                     |
|       |   | • 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                             |
| lor)  | Digital Dealsmater Exten                          | sion   |
| O"    | Digital Peakmeter Extension<br>Word width:        | 24 bit   |
| 0     | Digital scales:                                   | <ul> <li>TP20: +320 dB</li> </ul>                                      |
| nt    | Digital ocalos.                                   | <ul> <li>Dig20: 020 dB</li> </ul>                                      |
| ,     |   | <ul> <li>Dig0: +180 dB</li> </ul>                                      |
|       |   | <ul> <li>Dig18: +1818 dB</li> </ul>                                    |
|       |   | ■ Dig40: +2040 dB  |
| n     |   | ■ ARD9: +960 dB  |
| e)    |   | <ul> <li>DIN10: +1050 dB,</li> </ul>                                   |
|       |   | ▪ Zoom10: +10 −10,   |
|       |   | ■ Zoom1: +1 −1,  |
|       |   | adjustable from 0 to -20 dB in steps of 1 dB                           |
| ess   | Operation field:                                  | adjustable from 0 to -20 dB in steps of 1 dB                           |
|       | Integration time (Attack):                        | acc. to corresponding standard or selectable:                          |
|       | 0.1   | 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:<br>Over indicator hold time: | 1 s, 2 s, 4 s, 10 s, 20 s, 30 s, manual reset or off<br>1 s or manual  |
|       | Over indicator PPM                                | i s ui manual  |
|       | - Threshold:                                      | Full Scale, Full Scale -1LSB, Full Scale -2LSB,                        |
|       | Theonolu,   | -0.1 dBFS, -0.5 dBFS, -1 dBFS, -2 dBFS,                                |
|       |   | -3 dBFS  |
|       | - Attack time:                                    | 1 to 15 samples  |
|       |   | •  |

| Moving Coil Instrument               | ant d  | - Display:                            | red: negative range, white: "O" range,   |
|--------------------------------------|--|---------------------------------------|--|
| available in stereo mode (           |  | Elter.                                | green: positive range  |
| lype:                                | PPM (L/R), PPM (M/S), VU, Loudness, PPM +<br>Loudness (L/R; M, S, or I), selectable            | - Filter:                             | low pass filter switchable (300 Hz)  |
| PPM:                                 |  |                                       |  |
| - Ch. arrangement:                   | Dual, Dual + M/S horizontal, Dual + M/S verti-<br>cal, Stereo horizontal, Stereo vertical      | •                                     | SW20008: TCR - Timecode Reader<br>added or LTC timecode. Timecode display. With an act                       |
| - Scales:                            | <ul> <li>BR IIa: 71, BR IIa ext: 71</li> <li>BR IIb: +1212 dB, BR IIb ext: +1212 dB</li> </ul> | vated licence SW2000<br>applications. | 2 the timecode can be used for loudness and logging  |
| - Integration time:                  | Sample (digital only), 0.1 ms, 1 ms, 10 ms, 20 ms, 150 ms                                      | Timecode Reader (T                    |  |
| - Headroom Ref:                      | available with digital sources only: -10 dB;   | Display:                              | numerical display of   |
| - Heauloonn Kel.                     | adjustable from 0 to $-20$ dB in steps of 1 dB   | Display.                              | <ul> <li>LTC (from analog or digital sources)</li> </ul>   |
| - S mode:                            |  |                                       | <ul> <li>VITC (from SDI data stream)</li> </ul>  |
| - Peak indicator:                    | only available, if M/S type is selected: M3, M6  | Mada                                  |  |
|                                      | Off, Peak, True Peak, BR Peak  | Mode:                                 | "Timecode" selectable when creating an audio   |
| - BR Peak Threshold:                 | 6 dB,  |                                       | group (constitutes a separate audio group)   |
|                                      | <ul> <li>BR IIa: adjustable from 4 to 7 dB in steps of<br/>1 dB</li> </ul>                     | Input:                                | one analog, digital or SDI channel selectable,<br>depending on audio interface being mounted                 |
|                                      | <ul> <li>BR IIb: adjustable from 0 to 12 dB in steps<br/>of 1 dB</li> </ul>                    | Colors:                               | selectable, 32 colors  |
| /U:                                  |  | Loud. Recal. (Loudne                  | ess Recalculation)   |
| - Ch. arrangement:                   | Stereo horizontal, Stereo vertical   | Settings for operating                | automatic, semi-automatic or manual loudness mea   |
| - Scale analog:                      | VU (-20 to +3 dB)  | surements (Loudness                   | Test Time Control).  |
| - Scale digital:                     | VU Digital (-20 to + 3 dB)   | Display:                              | numerical display of   |
| - Lead:                              | 0 dB, adjustable from 0 to 12 dB in steps of 1 dB  | -12                                   | <ul> <li>current timecode</li> </ul>   |
| - Peak indicator:                    | Off, Peak, True Peak   |                                       | <ul> <li>start time &lt; current timecode &lt; stop time</li> </ul>  |
| oudness:                             | on, reak, nuc reak   |                                       | with recalculation   |
|                                      | Dual, Stereo horizontal, Stereo vertical   | Start:                                | with recalculation   |
| - Ch. arrangement:                   |  | - Functions:                          | Autostart after preset load, autostart with gate   |
| - Scales:                            | acc. to Loudness settings  | - I unctions.                         | Autostart after preset load, autostart with gate   |
| - Integration time:                  | acc. to standard   |                                       | autostart with gate and autoreset, manually via  |
| - Peak indicator:                    | Off, no selectable option available  |                                       | keys or GPI. With Timecode Reader licence  |
| PPM + Loudness:                      |  |                                       | (SW20008) activated additional control via   |
| <ul> <li>Ch. arrangement:</li> </ul> | Dual-PPM (as described above) with additional  |                                       | timecode resp. timecode with recalculation.  |
|                                      | Loudness display (BBC mode) for M, S, or I<br>(selectable) in one instrument                   | - Level for gate:                     | <ul> <li>-70,0 LUFS/LKFS; adjustable from -85 to</li> <li>-10 LUFS/LKFS in steps of 0.5 LUFS/LKFS</li> </ul> |
| - Scales:                            | <ul> <li>PPM: see above</li> </ul>   | Stop:                                 | ·  |
|                                      | <ul> <li>Loudness: +9 to -9 LU fixed (mid of scale</li> </ul>                                  | - Functions:                          | manually via keys or GPI, autostop with gate,  |
|                                      | corresponds to Target Level)   |                                       | autostop with gate and time. The stop function   |
| lumerical display:                   | switchable   |                                       | is automatically set and fixed to timecode, if th  |
| amonear aropiay.                     |  |                                       | start function has been set to a timecode optic  |
| Audio Vectorscope (4 in              | stancos availablo)   | - Level for gate:                     | -70,0 LUFS/LKFS; adjustable from -85 to  |
| Surround mode                        | stances available)   | Lever for gate.                       | -10 LUFS/LKFS in steps of 0.5 LUFS/LKFS  |
|                                      |  | Time for geter                        |  |
| (if available):                      |  | - Time for gate:                      | 1 s; adjustable from 1 to 15 s in steps of 1 s   |
| <ul> <li>Display modes:</li> </ul>   | 2-channel  |                                       |  |
|                                      | <ul> <li>4-channel (fixed: L-R above, LS-RS below)</li> </ul>                                  | <b>a</b>                              |  |
| - Inputs:                            | in 2-channel mode selectable, selection de-  |                                       | SW20013: BLITS   |
|                                      | pends on selected format; e.g. for 5.1:  | U U                                   | est signals according to EBU 3304, GLITS and BLI   |
|                                      | L/R, LS/RS, L/C, C/R, L/LS, R/RS   | definition. Automatic a               | nd significant analysis of channel allocation, level,  |
| - AGC:                               | fast/slow  | phase and delay, and p                | polarity of received BLITS 5.1 test signals.   |
| n 2-channel Stereo mode              |  | Precondition: Softw                   | vare licence SW20001 is activated  |
| - Inputs:                            | L-R  |                                       |  |
| - AGC:                               | fast/slow  | Generator                             |  |
| - Grid:                              | L/R or M/S   | Functions:                            | <ul> <li>Line test signal generators for BLITS, GLITS</li> </ul>   |
| Ginar                                |  |                                       | EBU 3304   |
| Iulti-Correlator                     |  |                                       | <ul> <li>Optional intro from stored WAV file</li> </ul>  |
| Surround mode                        |  | Display:                              | Channel related course of outgoing generator   |
|                                      | • for each channel pair of 21 EO E1 71 f-  | Display:                              | 0 00   |
| (if available):                      | • for each channel pair of 3.1, 5.0, 5.1, 7.1 formats  | Signal Javel                          | sequence   |
|                                      | <ul> <li>LFE mode with 5.1, 7.1 formats to display the</li> </ul>                              | Signal level:                         | -18 dBFS nominal   |
|                                      | correlation between each single channel and  | Level offset:                         | 0 dB; adjustable from -12 to +12 dB in steps   |
|                                      |  |                                       |  |
|                                      | LFE channel  |                                       | 1 dB   |

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|                            |  | 1                      |  |
|----------------------------|--|------------------------|--|
| Analyzer                   |  |                        | Vertical Integrated bargraph switchable     Talarana lawale and its diaglass a disstable   |
| Functions:                 | Automatic detection and analysis of incoming     PLITS test signals  | Dianlay                | <ul> <li>Tolerance levels and its display adjustable</li> <li>Bergraphy</li> </ul>         |
| Displays:                  | BLITS test signals   | Display:               | <ul> <li>Bargraph:<br/>Color change of the running bargraph indica-</li> </ul>             |
| - Course:                  | Channel related for incoming BLITS test signals  |                        | tes the section the loudness value is moving   |
| - State/Alarm:             | Bars for fast and easy recognition of  |                        | in: normal, operation range, Headroom, Over,   |
| orato, riann.              | <ul> <li>General signal state</li> </ul>   |                        | invalid (availability depending on selected  |
|                            | Channel allocation   |                        | value)   |
|                            | Level  |                        | Chart-Graph:   |
|                            | <ul> <li>Phase and Delay</li> </ul>  |                        | Continuously drawn graph (value over time)   |
|                            | Polarity   |                        | either of one value as line or rectangle with  |
|                            | In cases of error, the bars will be displayed in red   |                        | colored filling corresponding to the color   |
| - Report:                  | Schedule showing values for  |                        | selection of the horzontal bargraphs or of   |
|                            | <ul> <li>incoming channels</li> </ul>  |                        | up to four values as line, dots, or rectangles   |
|                            | channel allocation   |                        | without filling with individual color selection;   |
|                            | measured level in dBFS   |                        | added with Tolerance Indicator or position of  |
|                            | <ul><li>detected differences in dB</li><li>Phase and Delay in deg and ms</li></ul>                                       | Color:                 | Relative Gate (if selected) <ul> <li>Bargraph:</li> </ul>                                  |
|                            | <ul> <li>Polarity</li> </ul>   | 0001.                  | Individual selectable colors (32) for Normal   |
|                            | Values showing differences or errors will be   |                        | (bargraph color), Operation Range, Headroom  |
|                            | displayed in red   |                        | (TP only), TP Over (TP only), Over (M, S, I  |
|                            |  |                        | only), Invalid (M, S, I only)  |
|                            |  |                        | Chart graph:   |
|                            | W20014: Logging Data Server  |                        | For each value individual selectable colors  |
| -                          | via IP connection or USB flash drive. Advanced   |                        | (32) for display modes without filling, bei  |
|                            | d two-stage definition of thresholds. Communica-   |                        | Darstellung ohne Füllung, otherwise adoption   |
|                            | oftware. Loudness Chart instrument   |                        | of corresponding bargraph colors, additional   |
| Precondition: Licence      | 5₩20002!   |                        | selectable colors for Tolerance Indicator and<br>position of Relative Gate                 |
| Logging Instrument         |  | Time Range:            | Time grid adjustment for the coordinate system   |
| Functions:                 | <ul> <li>Logging of Loudness and TruePeak data of</li> </ul>   | Time Range.            | and the horizontal bargraphs:  |
|                            | two audio groups   |                        | <ul> <li>Increase or decrease of the preset time</li> </ul>                                |
|                            | <ul> <li>Storing of data on USB flash drive or via IP</li> </ul>   |                        | period in steps of one unit or ten units   |
|                            | with LOL - Loudness Quality Logger PC soft-  |                        | <ul> <li>Magnification of the measured course to the</li> </ul>                            |
|                            | ware   |                        | available width of the instrument's window   |
|                            | <ul> <li>Definition of main and secondary limits (indi-</li> </ul>   | Time Range presets:    |  |
|                            | vidual markers) for Mmax, Smax, I and TPmax  | - Auto stretch:        | Automatic stretch of a stopped loudness measu-   |
|                            | to monitor the adherence of e. g. legal regula-  |                        | rement to the available width of the instrument's  |
|                            | <ul><li>tions, current standards or in-house regulations</li><li>Data collection control automatically via LQL</li></ul> |                        | window, switchable (except when controlled via timecode)                                   |
|                            | (IP mode) or manually via control key (USB   | - Hours:               | 0 h; adjustable from 0 to 3 h in steps of 1 h  |
|                            | mode)  | - Minutes:             | 1 m; adjustable from 1 to 59 m in steps of 1 m   |
| Mode:                      | selectable: off, USB, IP   | Time Select:           | <ul> <li>Selection of current time period (marker)</li> </ul>                              |
| Display:                   | Status display in the top line of the instrument   |                        | <ul> <li>Increase or decrease of the marker in step</li> </ul>                             |
|                            | placed on the screen:  |                        | sizes corresponding to the current time grid   |
|                            | <ul> <li>in IP mode: LQL access</li> </ul>   |                        | <ul> <li>Shift of the marker and magnification of the</li> </ul>                           |
|                            | • in USB mode: Disk space, running processes,  |                        | content  |
|                            | storing  | Tolerance Levels:      | 0.0 dB, adjustable from 0.4- 0.0 JD is the f   |
| Identification for notwork | <ul> <li>if logging functionality is turned off</li> <li>Device name and password definable</li> </ul>                   | - TP Headroom:         | -9.0 dB; adjustable from 0 to -20 dB in steps of 0.1 dB                                    |
| Key function (USB):        | <ul> <li>USB run: Start logging</li> </ul>   | - TP Over Sensitivity: | 0.1 dB<br>0.0 dB; adjustable from 0 to -20 dB in steps of                                  |
| Rey function (COD).        | <ul> <li>USB close: Stops logging and creates a</li> </ul>   |                        | 0.1 dB   |
|                            | logfile on the USB flash drive   | - M High:              | +1.0 LU; M tolerance above Target Level adjus-   |
|                            |  | 5                      | table from 0 to 10 LU in steps of 0.1 LU   |
| Loudness Chart Instrur     | nent   | - M Low:               | -1.0 LU; M tolerance below Target Level adjus-   |
| Functions:                 | <ul> <li>Horizontal running bargraphs with individually</li> </ul>   |                        | table from 0 to $-12$ LU in steps of 0.1 LU  |
|                            | definable colors evaluate the common quality   | - S High:              | +1.0 LU; S tolerance above Target Level adjus-   |
|                            | of Loudness values TP, M, S, I   | 0.1                    | table from 0 to 10 LU in steps of 0.1 LU   |
|                            | <ul> <li>Progress of a measurement (value over time)</li> <li>of up to four values can be drawn as graph(a)</li> </ul>   | - S Low:               | -1.0 LU; S tolerance below Target Level adjus-   |
|                            | of up to four values can be drawn as graph(s)  | - I High               | table from 0 to -12 LU in steps of 0.1 LU  |
|                            | <ul><li>on a coordinate system</li><li>Position of the Relative Gate switchable, color</li></ul>                         | - I High:              | +1.0 LU; I tolerance above Target Level adjus-<br>table from 0 to 10 LU in steps of 0.1 LU |
|                            | adjustable   | - I Low:               | -1.0 LU; I tolerance below Target Level adjus-   |
|                            | <ul> <li>Adjustable time ranges</li> </ul>   |                        | table from 0 to $-12$ LU in steps of 0.1 LU  |
|                            | <ul> <li>Selectable time periods for evaluation</li> </ul>   |                        |  |
|                            | ·  |                        |  |

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| <b>Optional Licence SW20015: ISA - Immersive Sound</b><br><b>Analyzer</b><br>Dynamic display for visualizing the interaction of all signal parameters of<br>spatial (immersive) surround formats like 5.1.2, 5.1.4, 7.1.2 or 7.1.4 corres-<br>ponding to the subjective listening impression across two layers (beds)<br>Precondition: Software licences SW20001, SW20002, and SW20004<br>are activated |   | TM7-Video:                             | <ul> <li>TM7 in table-top frame with audio interface for<br/>8-ch. digital inputs and outputs (4 x AES3 ln/<br/>Out, Sub-D) and 3G-/HD-/SD-SDI ln/Through<br/>(2 x BNC)</li> <li>Basic software (system/2 x Stereo-PPM)</li> <li>Table-stand, mains adapter, manual</li> <li>Order no.: TM7-Video</li> </ul>  |
|---|---|--|---|
| Immersive Sound Analy<br>Display:   | <ul> <li>Designed for Immersive audio formats based on 5.1 or 7.1 main beds and 2.0 or 4.0 upper beds</li> <li>Graphical display indicating single channel and total program loudness (Total Volume Indicator)</li> <li>Position and width of phantom sound sources (PSI) in Main- and Upper Beds</li> <li>Phase Correlation between adjacent channels</li> <li>Subjectively perceived acoustic focal point with the Dominance Indicator (DMI) for both Main- and Upper Beds</li> <li>Subjectively perceived acoustic focal point in the complete immersive area with the Immersive Dominance Indicator (IDI)</li> <li>LFE Phase warning (warns in case of negative correlation between any channel and LFE)</li> <li>Allows cross-group measurement of the total loudness of the spatial sound image</li> <li>Formats Supported: 5.1.2, 5.1.4, 7.1.2, 7.1.4</li> </ul> | TM7-Studio:<br>TM7-Rack:<br>TM7-Mount: | <ul> <li>TM7 in table-top frame with audio interface for<br/>8-ch. analog inputs (Sub-D) and 8-ch. digital<br/>inputs and outputs (4 x AES3 In/Out, Sub-D)</li> <li>Basic software (system/2 x Stereo-PPM)</li> <li>Table-stand, mains adapter, manual<br/>Order no.: TM7-Studio</li> <li>TM7 without table-top frame with audio inter-<br/>face for 8-ch. digital inputs and outputs (4 x<br/>AES3 In/Out, Sub-D) and 3G-/HD-/SD-SDI<br/>In/Through (2 x BNC)</li> <li>Basic software (system/2 x Stereo-PPM)</li> <li>Manual<br/>Order no.: TM7-Rack</li> <li>TM7 without table-top frame with audio inter-<br/>face for 8-ch. analog inputs (Sub-D) and 8-ch.<br/>digital inputs and outputs (4 x AES3 In/Out,<br/>Sub-D)</li> <li>Basic software (system/2 x Stereo-PPM)</li> </ul> |
| Items of Delivery<br>TouchMonitor TM7 20700   | ):  |  | Manual Order no.: TM7-Mount   |
| TouchMonitor TM7 20700  | TM7 main unit without table-top frame   | Additional Hardware                    | • 3U mounting adapter <b>TM7-MA3U</b> ,<br>mounting kit including a 19"/3U/42HP rack-<br>mount panel (half-19"/3U) and fastening<br>material for mounting 207000EM into stan-<br>dard 19" sub-racks (e. g. RTW 1647831)   |
|   | <ul> <li>selected audio interface</li> <li>Basic software (system/2 x Stereo-PPM)</li> <li>Manual</li> <li>Order no.: 207000EM + HW-No. (page 4)</li> </ul>   |  | <ul> <li>VID mounting adapter TM7-MAVID,<br/>mounting kit including a half-19*/3U plug-in<br/>panel and fastening material for mounting<br/>207000EM into standard 19* rack-mount<br/>cabinets for video racks</li> </ul>   |
| TM7-RAV:<br>TM7-Dante:  | <ul> <li>TM7 in table-top frame with audio interface for 32 Ravenna/AES67/ST 2110 AoIP network channels (2 x RJ-45)</li> <li>Power supply: 12 - 24 V DC, 24 VA</li> <li>Basic software (system/2 x Stereo-PPM)</li> <li>Table-stand, mains adapter 24 V, manual Order no.: TM7-RAV</li> <li>TM7 in table-top frame with audio interface for 32 Dante® AoIP network channels (2 x RJ-45)</li> <li>Power supply: 12 - 24 V DC, 24 VA</li> <li>Basic software (system/2 x Stereo-PPM)</li> <li>Table-stand, mains adapter 24 V, manual Order no.: TM7-Dante</li> </ul>   |  | <ul> <li>Cabinets for Video racks</li> <li>Table-top Mounting Adapter TM7-MADT,<br/>Mounting kit including a table-top frame,<br/>robust swivel-mounted table-stand, housing<br/>cover, and mounting material for remodelling<br/>207000EM to a table-top unit.</li> <li>19"/3U rack frame 1647831 for mounting up<br/>to 2 TM7-Mount or 207000EM in conjunc-<br/>tion with TM7-MA3U mounting kit. Includes a<br/>blank panel to cover unused space.</li> </ul>   |

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#### **Optional Software Licences**

- Software licence SW20001: Multichannel Mode for the display of multi-channel modes
- Software licence SW20002: Loudness and SPL Display for Loudness, SPL and LRA measurements. \*)
- Software licence SW20003: RTA Real Time Analyzer for the display of the spectral frequency distribution. \*)
- Software licence SW20004: SSA Surround Sound Analyzer to understand the balance of surround programmes intuitively. \*) --- Precondition: Licences SW20001, SW20002! ---
- Software licence SW20005: Radar Display for the display of the Loudness-Radar-Meter of TC electronic®. \*) --- Precondition: Licence SW20002! ---
- Software licence SW20006: RTW Premium **PPM + Vektorskop** for the display of further PPM-scales, Moving Coil instruments and audio vectorscope. Expands licence SW20001 with Multi-Correlator.
- Software licence SW20008: Timecode Reader for the display of SDI embedded or LTC timecodes, recalculation --- Precondition: Licence SW20002! ---
- Software licence SW20013: BLITS to use BLITS analyzer and BLITS, GLITS, EBU 3304 line test signals. --- Precondition: Licence SW20001! ---
- Software licence SW20014: Logging Data Server for the export of measured data via IP or USB flash drive, two-stage definition of thresholds, advanced graphical presentation with RTW LQL PC software, Loudness Chart instrument \*)

  - --- Precondition: Licence SW20002! ---

- Software licence SW20015: ISA Immersive Sound Analyzer to understand the balance of immersive surround programmes intuitively and for cross-group Loudness measurement. --- Precondition: Licences SW20001, SW20002, and SW20004! ---
- Software licence SW20021: TC-RTW for the conversion of TC electronic® TouchMonitor devices to RTW units. Allows the installation of upcoming licences with new product functionalities on these devices. --- Precondition: TouchMonitor devices of TC electronic®! ---

\*) Licence SW20001 is required for the display of more than 4 channels.

#### **Optional accessory**

- Wide voltage power supply 1178-R (100 - 240 V AC/24 V DC 2,7 A, table-top unit with corresponding mains cable for different power systems)
- Snake cable 1167 (4 m, 25-pin Sub-D-M connector to 4 x XLR-M and 4 x XLR-F connectors, for digital inputs and outputs)
- Snake cable 1186 (4 m, 25-pin Sub-D-M connector to 8 x XLR-F connectors, for analog inputs)

# Product Line-up

| TouchMonitor TM7 table-top un<br>7* touch screen 16 : 9 TFT, main un<br>with table-top frame, table-stand, p.<br>supply. Order number: 20700 +<br>Additional audio interface required | it 7" touch screen 16:9 TFT, main unit w/o<br>ower table-top frame, w/o power supply for<br>panel-mounting.        | 3U Mounting Adapter <b>TM7</b> -<br>Mounting kit including a 19*/<br>rack-mount panel (half-19*/2<br>tening material for mounting<br>into standard 19* sub-racks. | '3U/42HPMounting kit including a half-19"/3UBU) and fas-plug-in panel and fastening material for  | Table-top Mounting Adapter <b>TM7-MADT</b><br>Mounting kit including a table-top frame,<br>robust swivel-mounted table-stand,<br>housing cover, and material for remodel-<br>ling 207000EM to a table-top unit. |
|---|--|---|---|---|
| Audio Interface Selection (I/O)   | Max. Channel Count (Hardware)  | Inputs Analog (Balanced)  | Inputs Digital/Outputs Digital  | Audio via Network (AoIP)  |
| additional Order Number: HW207  | <ul> <li>8-channel analog In,</li> <li>8-channel digital In, 8-channel digital Out</li> </ul>                      | 1 x 25-pin Sub-D  | 1 x 25-pin Sub-D<br>(4 x AES3 in, 4 x AES3 Out)   |   |
| additional Order Number: HW207  | <ul> <li>8-channel analog In,</li> <li>8-channel digital In, 8-channel digital Out</li> </ul>                      | 1 x 25-pin Sub-D  | 8 x BNC<br>(4 x AES3id In, 4 x AES3id Out)  |   |
| additional Order Number: HW207  | <ul> <li>3G-SDI In, 3G-SDI Through,</li> <li>8-channel digital In, 8-channel digital Out</li> </ul>                |   | 2 x BNC (3G-SDI In/Through), 1 x 25-<br>pin Sub-D (4 x AES3 In, 4 x AES3 Out)   |   |
| additional Order Number: HW207  | 15 16-channel digital In,<br>16-channel digital Out  |   | 2 x 25-pin Sub-D<br>(8 x AES3 in, 8 x AES3 Out)   |   |
| additional Order Number: HW207  | 32-channels Dante <sup>™</sup> AolP  |   |   | 2 x RJ-45 (Dante® network)<br>(Link/Act 1G, Primary and Secondary)  |
| additional Order Number: <b>HW207</b>   | 32-ch. Ravenna/AES67/ST 2110 AoIP  |   |   | 2 x RJ-45 (Ravenna network)<br>(Link/Act 1G, Primary and Secondary)   |
| Standard Hardware:  |  |   | , GPIO, VGA Out, table-stand, mains adapter. Audio Int<br>IO, VGA-Out. Audio Interface selection is required!   | erface Selection required!  |
| Standard Software:  | Basic 4-channel PPM with analog scale<br>IIb), stereo correlator, gain reduction, glo                              |   | British IIb) and digital scales (0 to -60 dB, +3 to -60 d<br>modules available as licences.   | B True Peak, DIN, Nordic, British IIa and   |
| Preconfigured Models (Table-top   | o- or panel-mount units with specific audio interfa  | ace for typical applications. We  | e recommend licences SW20001, SW20002, SW200  | 04, SW20006 as basic configuration.)  |
| TM7-RAV   | 32-ch. Ravenna/AES67/ST 2110 AoIP  |   |   | 2 x RJ-45 (Ravenna network)<br>(Link/Act 1G, Primary and Secondary)   |
| TM7-Dante   | 32-channels Dante™ AolP  |   |   | 2 x RJ-45 (Dante® network)<br>(Link/Act 1G, Primary and Secondary)  |
| TM7-Video (Table-top with psu)<br>TM7-Rack (Panel-mount w/o ps  |  |   | 2 x BNC (3G-SDI In/Through), 1 x 25-<br>pin Sub-D (4 x AES3 In, 4 x AES3 Out)   |   |
| TM7-Studio (Table-top with psu<br>TM7-Mount (Panel-mount w/o ps   |  | 1 x 25-pin Sub-D  | 1 x 25-pin Sub-D<br>(4 x AES3 in, 4 x AES3 Out)   |   |
| Licences (Software Modules)   | Further informationen on https://www.rtw.com/  | 'en/product-list/audio-monito   | rs/licenses-for-touchmonitor.html   |   |
| Multichannel Mode<br>Order Number: <b>SW20001</b>   |  | er: SW20003 *) Order 1  | Surround Sound Analyzer Radar Display<br>Number: <b>SW20004 *)</b> Order Number: <b>SW20005</b><br>diftion: installed SW20001, Precondition: installed SW<br>2021 |   |
| Timecode Reader<br>Order Number: <b>SW20008 *)</b><br>Precondition: installed SW20002!  | BLITS (Analyzer and Generator)<br>Order Number: <b>SW20013 *)</b><br>Precondition: installed SW200011 Precondition | er: SW20014 *) Order 1<br>: installed SW20002! Precon-  | mmersive Sound Analyzer<br>Number: SW20015<br>dition: SW20001, SW20002<br>V20004 installed!   |   |
| *) Licence SW20001 is required t  | or the display of more than 2 channels.  |   |   |   |
| Dimensions:   | WxHxDin  | mm (approx.)  |   |   |
| Table-top units 20700, TM7-Dant   | e, TM7-Video, TM7-Studio: 198 x 139.5 (1   | 63) x 46 (95) (with table-star  | nd)   |   |
| 207000EM, TM7-Mount:  | 188 x 109 x 4  | 5   |   |   |
| TM7-Rack:   | 42HP (213 mm)  | x 3U (129 mm) x 44.5 mm   |   |   |
| Gefördert vom Bundesministeriu  | m für Wirtschaft und Technologie aufgrund eines<br>the German Parliament, this project is supporter                | Beschlusses des Deutschen   | Bundestages."   |   |

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