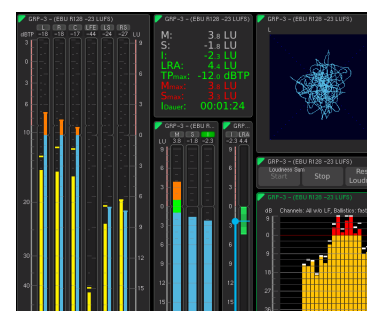


Data Sheet

TouchMonitor TM9 Series



RTW

TouchMonitor TM9 Series



product
design
award

2011 ■

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

The TouchMonitor TM9 range enters a new level of professional audio metering in terms of precision, performance, efficiency and flexibility. The units are equipped with high-grade 9" touch screens, an easy-to-use graphical user interface, and several audio interfaces.

TouchMonitor TM9 handles audio signals using analog, AES3, AES3id and, as an option, 3G SDI audio interfaces. Audio channels deemedbed with the 3G SDI option can even be mixed with other audio inputs (up to 32 input channels can be displayed simultaneously).

Graphical User Interface

The TouchMonitor's graphical user interface is controlled simply by the touch of your finger. Instruments can be scaled, randomly positioned and combined for optimum utilization of the 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 lets the user configure setup changes with ease.

Licences

A totally modular software concept means that only those features have to be purchased that are actually required. This lets you define the functionality of an individual TouchMonitor that suits your needs best. At any time, software modules with new instruments and functions can be added simply by purchasing and activating the corresponding licences.

Gefördert durch:



Bundesministerium
für Wirtschaft
und Technologie

aufgrund eines Beschlusses
des Deutschen Bundestages

Hardware

Common Configuration

- 9" touch screen 16 : 9 TFT (1024 x 600 pixel)
- 16-channel audio interfaces
(analog, AES3, AES3id, selection required, see below)
- 3G SDI interface (hardware option)
- Connectors for Ethernet, VGA, 2 x USB 2.0, GPIO, 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
- Available software licences (see below):
 - 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)

Main Units

20900

TouchMonitor TM9 main unit in a sturdy table-top frame with movable table-stand and power supply.

20900OEM

TouchMonitor TM9 main unit for mounting into front panels, e. g. mixing consoles.



Hardware (continued)

Audio Interfaces (I/O Options)

Several audio interfaces adapted to the main units are available. Please additionally tell us the order number of the audio interface when ordering a main unit!

HW20911



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)

HW20914



16-channel audio interface with:

- 16-channel digital inputs and outputs (unbal., 75 Ohm, 8 x AES3id In, 8 x AES3id Out, 16 x BNC)

HW20912



16-channel audio interface with:

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

HW20915



16-channel audio interface with:

- 16-channel analog inputs (electronically balanced, 2 x Sub-D)

HW20913



16-channel audio interface with:

- 16-channel digital inputs and outputs (transformer balanced, 110 Ohm, 4 x AES3 In/Out, 2 x Sub-D)

Option: 3G-SDI-Interface HW20930



The 3G SDI audio interface expands the input options up to 32 channels and can be mounted into each audio interface HW2091n (when order is placed or at a later point of time)

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 licence is needed at a later point in time, the order process is started from the "Licences" menu of the TM9 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

Provides on 31, 61 or 120 bands a spectral distribution display of the frequency range of single channels, channel pairs or groups. Additional HP HF band available.

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

SW20004: SSA - Surround Sound Analyzer

Dynamic display for visualizing the interaction of all surround or stereo sound parameter corresponding to the subjective listening impression. Licence SW20001 is required for the display of more than 4 channels.

--- Precondition: Licence SW20002! ---



Software (continued)

SW20005: Radar Display

High resolution circular Loudness display corresponding to the Loudness Radar Meter of TC electronic®.

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

--- Precondition: Licence SW20002! ---

SW20006: RTW Premium PPM + Vectorscope

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.

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! ---

SW20021: TC-RTW

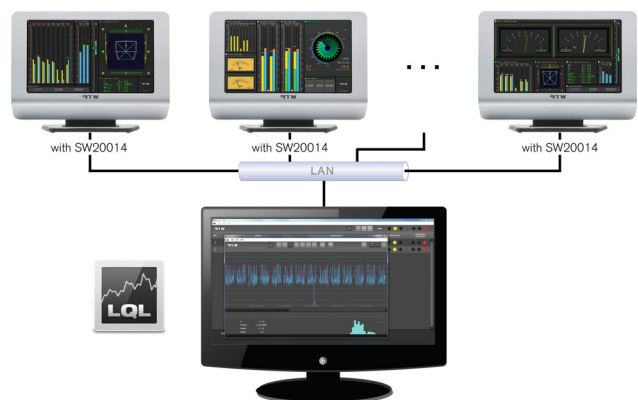
Licence to convert TouchMonitor devices of TC electronic® to RTW units to allow the installation of upcoming licences with new product functionalities.

--- 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 connection 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).

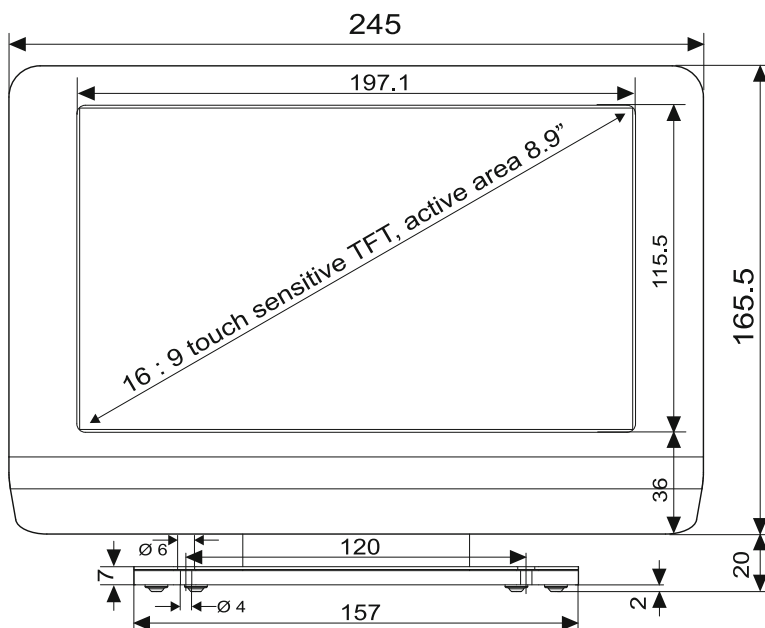
--- Precondition: Licence SW20014 must be installed on each connected TouchMonitor ---



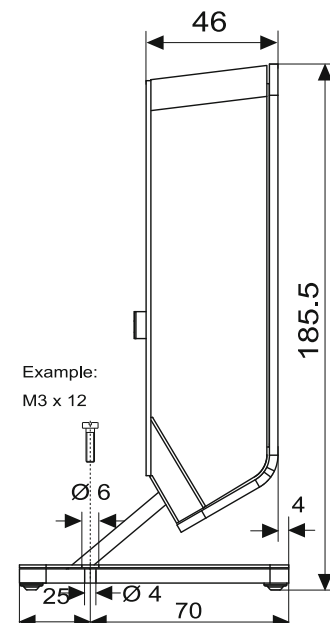
The Loudness Radar Meter is trademark or registered trademark of TC Electronic A/S, 8240 Risskov, Denmark

Dimensions

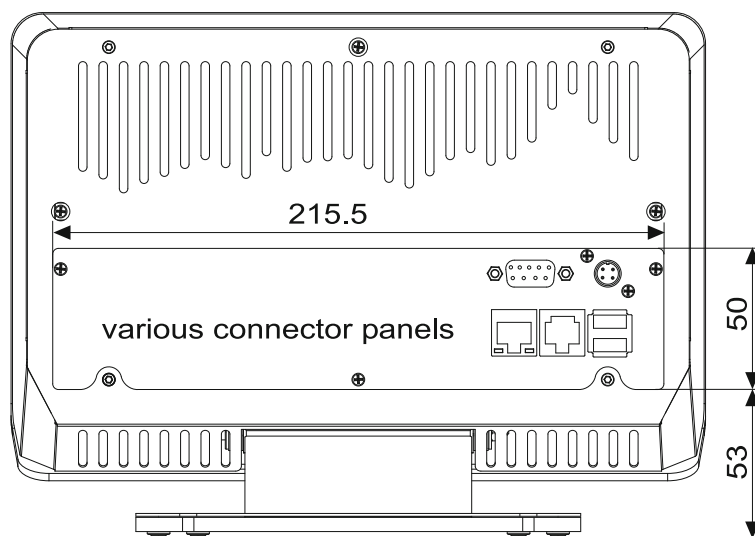
TouchMonitor TM9 20900 Table-Top Unit



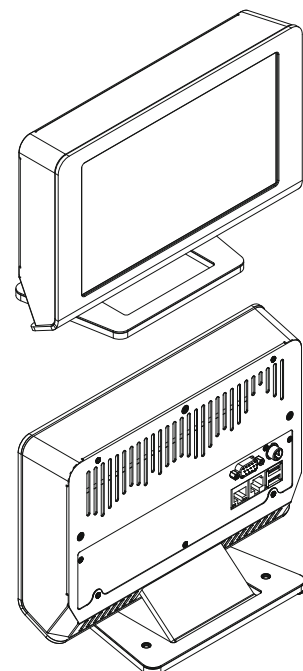
1 | Front view (dimensions in mm)



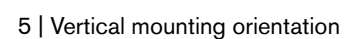
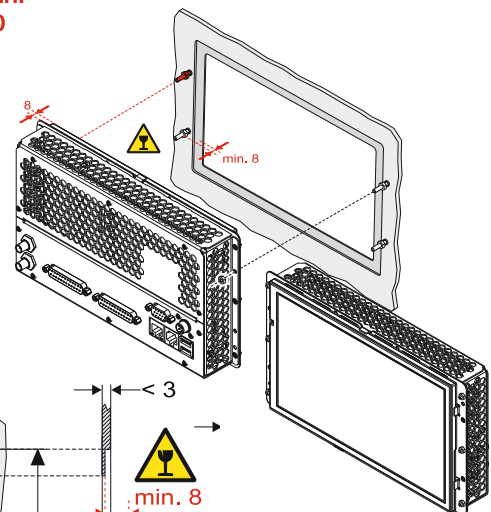
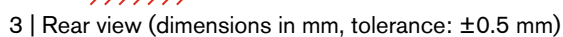
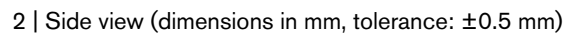
2 | Side view (dimensions in mm)



3 | Rear view (dimensions in mm)



TouchMonitor TM9 20900OEM Version



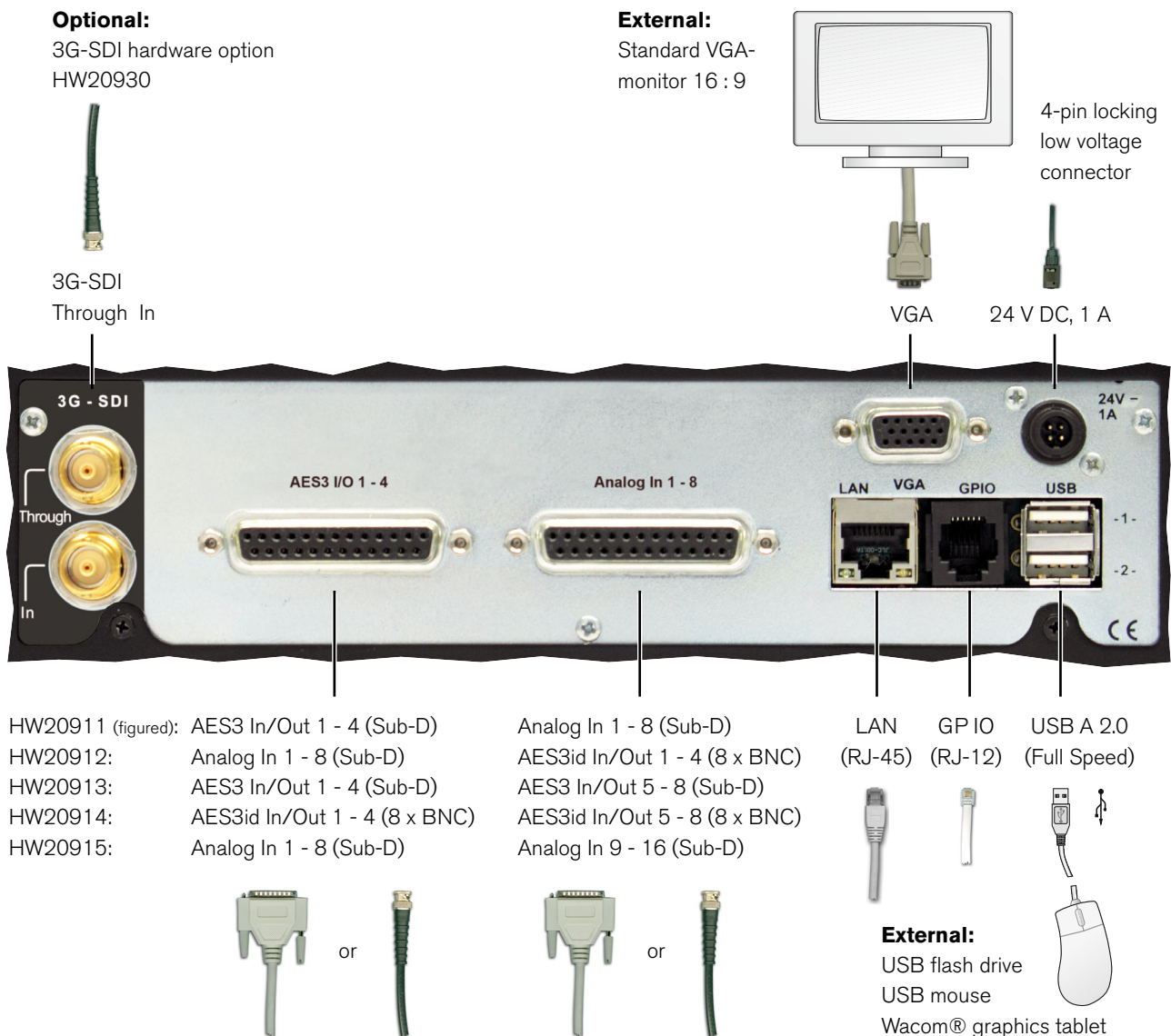
Connection

Connectors



ATTENTION! - For operating the 20900OEM version an appropriate mains adapter is required. RTW recommends the use of the RTW wide voltage power supply 1178-R (100 - 240 V AC/24 V DC, 2.7 A) approved for TouchMonitor and available as an accessory.

This power supply is included in the 20900 table-top package.

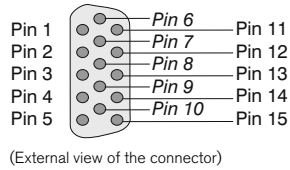


Pin Assignment

VGA (15-pin Sub-D-F)

Pin: Function:

1	R	Video signal
2	G	
3	B	
4 - 8	GND	
9	+5 V	
10	GND	
11	GND	
12	SDA	
13	H-sync	
14	V-sync	
15	SCI	

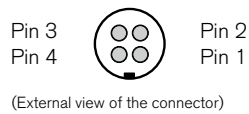


NOTE - The VGA cable shall not exceed 15 m length!

24 V - 1 A (4-pin locking low voltage, type Binder 710)

Pin: Function:

1	+24 V DC
2	+24 V DC
3	0 V
4	0 V



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

USB-A

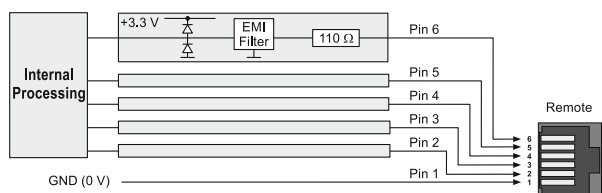
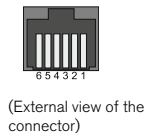
2 Full Speed USB 2.0 interfaces for connecting USB flash drives (for licence handling, presets, et. al.), external mouse or Wacom® tablet

GP IO (RJ-12 6P6C socket)

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

Pin: Function:

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



LAN

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

AES3id In/Out 1 - 4, AES3id In/Out 5 - 8 (unbalanced, BNC-F)

Pin: Function:

Pin:	Signal
Ring:	Shield/chassis

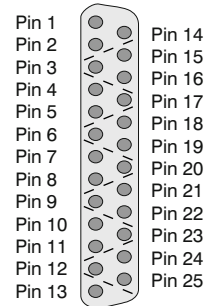


NOTE - The AES3id inputs are permanently terminated with 75 Ω.

Analog In 1 - 8, Analog In 9 - 16 (electr. balanced, 25-pin Sub-D-F)

Pin: Function:

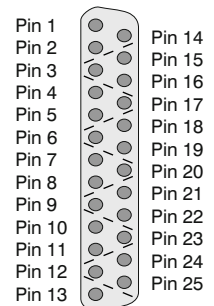
1	Analog input 8 resp. 16 (+, hot)
14	Analog input 8 resp. 16 (-, cold)
2	Shield/chassis
15	Analog input 7 resp. 15 (+, hot)
3	Analog input 7 resp. 15 (-, cold)
16	Shield/chassis
4	Analog input 6 resp. 14 (+, hot)
17	Analog input 6 resp. 14 (-, cold)
5	Shield/chassis
18	Analog input 5 resp. 13 (+, hot)
6	Analog input 5 resp. 13 (-, cold)
19	Shield/chassis
7	Analog input 4 resp. 12 (+, hot)
20	Analog input 4 resp. 12 (-, cold)
8	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



AES3 I/O 1 - 4, AES3 I/O 5 - 8 (transformer-bal., 25-pin Sub-D-F)

Pin: Function:

1	Digital output 4 resp. 8 (+, hot)
14	Digital output 4 resp. 8 (-, cold)
2	Shield/chassis
15	Digital output 3 resp. 7 (+, hot)
3	Digital output 3 resp. 7 (-, cold)
16	Shield/chassis
4	Digital output 2 resp. 6 (+, hot)
17	Digital output 2 resp. 6 (-, cold)
5	Shield/chassis
18	Digital output 1 resp. 5 (+, hot)
6	Digital output 1 resp. 5 (-, cold)
19	Shield/chassis
7	Digital input 4 resp. 8 (+, hot)
20	Digital input 4 resp. 8 (-, cold)
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)
23	Digital input 2 resp. 6 (-, cold)
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 Ω.

3G-SDI Through In (with optional HW20930, unbalanced, BNC-F)

Pin: Function:

Pin:	Signal
Ring:	Shield/chassis



NOTE - The 3G-SDI inputs are permanently terminated with 75 Ω.

Specifications

System

General

Power requirements:	+24 V DC (external 2 A max. overcurrent protective device shall be installed!)
Current drain:	1 A nominal, 2.5 A power-up current (10 μ sec.)
Power dissipation:	approx.: 12.5 W (w/o SDI), 15 W (with SDI)
Display:	9" TFT touch screen 16 : 9 (1024 x 600 pixel)
Connectors:	1 x 15-pin Sub-D-F; VGA output with 1024 x 600 pixel, 65.536 colors, 60 Hz, for connection of an optional external 16 : 9 VGA monitor, selectable 4 : 3 mode 1 x 4-pin locking low voltage connector type Binder 710 (DC) 2 x USB A; USB 2.0 Full Speed connectors for: <ul style="list-style-type: none"> USB flash drives (licence handling, pre-set export and import, software updates) external computer mouse for operating external Wacom® graphics tablet
	1 x GPIO (RJ-12-6P6C) for defined functions or preset recall
	1 x LAN (RJ-45)
with HW20911:	2 x 25-pin Sub-D-F (analog and digital)
with HW20912:	1 x 25-pin Sub-D-F (analog), 8 x BNC-F (digital)
with HW20913:	2 x 25-pin Sub-D-F (digital)
with HW20914:	16 x BNC-F (digital)
with HW20915:	2 x 25-pin Sub-D-F (analog)
Dimensions (W x H x D):	20900: 245 x 185.5 x 46.5 mm 20900OEM: 235 x 135 x 45 mm
Weight:	20900: approx. 2.7 kg (w/o power supply) 20900OEM: approx. 1.2 kg
Operating temperature:	+5° to +40° C

Functions (with all licences activated)

- Operation with one finger (touch sensitive display) or a computer mouse
- Instruments can be scaled and freely positioned
- Multiformat Surround PPM (3.1, 5.0, 5.1, 7.1 Cinema, 7.1 DD+)
- 2-ch. and multichannel peakmeter
- 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 Range instrument (LRA)
- Logging Data Server
- Loudness Chart instrument
- Radar Loudness Meter (TC electronic®)
- SPL meter

- Timecode Reader, Loudness Recalculation
- Moving Coil (BR, VU, Loudness, BBC mode)
- Gain Reduction instrument
- Surround Sound Analyzer (up to 7.1 DD+)
- Stereo Correlator
- 10-fold Multi-Correlator with LFE mode
- 1/3-, 1/6-, 1/12-octave spectrum analyzer
- 2-channel Audio Vectorscope (4 instances)
- Dialnorm
- BLITS analyzer and generator
- AES3 status monitor
- Numerical displays

Analog Inputs

HW20911:	8 analog inputs, Sub-D-F connector, 25-pin
HW20912:	8 analog inputs, Sub-D-F connector, 25-pin
HW20915:	16 analog inputs, 2 Sub-D-F connectors, 25-pin

Reference level:	adjustable in the range from 0 dBu to +10 dBu
Maximum input level:	+24 dBu
Impedance:	> 10 k Ω , electronically balanced
Frequency range:	20 Hz to 22 kHz @ 48 kHz

Digital Inputs

HW20911:	4 AES3 inputs (transformer balanced, 110 Ω), Sub-D-F connector, 25-pin, with 4 inputs and 4 outputs
HW20912:	4 AES3id inputs (unbalanced, 75 Ω), 8 BNC-F connectors, 4 inputs and 4 outputs
HW20913:	8 AES3 inputs (transformer balanced, 110 Ω), 2 Sub-D-F connectors, 25-pin, with 4 inputs and 4 outputs each
HW20914:	8 AES3id inputs (unbalanced, 75 Ω), 16 BNC-F connectors, 8 inputs and 8 outputs
Sampling rates:	44.1, 48, 96 kHz, synchronisation to digital input signal

Digital Outputs

HW20911:	4 AES3 outputs, Sub-D-F connector, 25-pin, with 4 inputs and 4 outputs
HW20912:	4 AES3id outputs, 8 BNC-F connectors, 4 inputs and 4 outputs
HW20913:	8 AES3 outputs, 2 Sub-D-F connectors, 25-pin, with 4 inputs and 4 outputs each
HW20914:	8 AES3id outputs, 16 BNC-F connectors, 8 inputs and 8 outputs
Sampling rates:	referenced to digital inputs or internal clock



Specifications (continued)

Basic 4-Channel PPM (Standard Software)

General

Input sources:	analog and/or digital, depending on 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)
Display:	<ul style="list-style-type: none">max. of 4 ch. total in max. 4 groupsPeak levelPeak holdNumerical value of the display
Functions:	<ul style="list-style-type: none">Gain (+20 dB, +40 dB acc. to standard)Peak hold on/offMemoryReset

Analog Peakmeter

Analog scales:	<ul style="list-style-type: none">DIN5: +5 .. -50 dB,Nordic: +12 .. -42 dB,BR IIa: 7 .. 1, BR IIa ext: 7 .. 1,BR IIb: +12 .. -12 dB, BR IIb +12 .. -12 dB, acc. to standard or 20 ms, 10 ms, 1 ms, 0,1 ms additional 150 ms for British scales
Integration time:	
Peak hold indicator:	1, 2, 4, 10, 20, 30 s, manual reset or off

Digital Peakmeter

Word width:	24 bit
Digital scales:	<ul style="list-style-type: none">TP60: +3 .. -60 dBDig60: 0 .. -60 dBDIN5: +5 .. -50 dBNordic: +12 .. -42 dBBR IIa: 7 .. 1, BR IIa ext: 7 .. 1,BR IIb: +12 .. -12 dB, BR IIb +12 .. -12 dB,
Headroom/Headroom Ref:	adjustable in the range from 0 to -20 dB in steps of 1 dB
Operation field:	adjustable in the range from 0 to -20 dB in steps of 1 dB
Integration time (Attack):	acc. to corresponding standard or selectable: Sample, 20 ms, 10 ms, 1 ms, 0,1 ms, additional 150 ms for British scales
Gain:	+20 dB, +40 dB (acc. to standard)
High-pass filter:	Off, 5 Hz, 10 Hz, 20 Hz
Peak hold indicator:	1 s, 2 s, 4 s, 10 s, 20 s, 30 s, manual reset or off
Over indicator hold time:	1 s or manual
Over indicator PPM	
- Threshold:	Full Scale, Full Scale -1LSB, Full Scale -2LSB, -0.1 dBFS, -0.5 dBFS, -1 dBFS, -2 dBFS, -3 dBFS
- Attack time:	1 to 15 samples
- Word width:	16 to 24 bit, selectable
Over indicator True Peak	
- Threshold:	adjustable

AES3 Status Monitor

Display:	<ul style="list-style-type: none">Channel data are displayed as plain text, hex or binaryChannel selectableAudio bit activityHardware status
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Global Keyboard

The Global Keyboard is used 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.

Gain Reduction

Display:	1 bargraph for Stereo and Surround formats, up to 8 bargraphs in multi-channel mode
Input:	Data stream via TCP/IP and LAN interface
Input routing:	external featured streams selectable
Marker:	adjustable threshold for the definition of upper and lower display section
Colors:	32 colors for each bargraph section

SW20001: Multichannel Mode (Software Licence)

Expands Basic 4-channel PPM to multichannel and surround functions and display. More than 4 channels and groups can be displayed simultaneously.

Input sources:	analog and/or digital, depending on selected audio interface
Surround Peakmeter:	for 3.1, 5.0, 5.1, 7.1 formats
Track layout :	selectable for 5.1 Surround: <ul style="list-style-type: none">SMPTE.TV: L, R, C, LF, LS, RSSMPTE.Film: L, LS, C, RS, R, LFDTS: L, R, LS, RS, C, LFL, C, R, LF, LS, RSFilm: L, C, R, LS, RS, LF preset for 7.1 Cinema Surround: <ul style="list-style-type: none">SMPTE (L, LC, C, RC, R, LS, RS, LF) preset for 7.1 DD+ Surround: <ul style="list-style-type: none">L, C, R, LS, RS, LSR, RSR, LFE
Multichannel Peakmeter:	2 to 8 single channels in one defined block (depending on the audio interface up to 4 blocks)
2-channel Peakmeter:	for different Stereo channel pairs
Single-channel Peakmeter:	for different Mono signals

SW20002: Loudness and SPL Display (Software Licence)

Expands the Basic 4-channel PPM with functions for loudness measurement and for SPL display and summed SPL value calculation. For the display of more than 4 channels software licence SW20001 is required. Then, also the Dialnorm instrument is available.

EBU R128 Loudness Mode

ITU BS.1771 Loudness Mode

ATSC A/85 Loudness Mode

ARIB Loudness Mode

OP-59 Loudness Mode

AGCOM Loudness Mode

CALM Loudness Mode

LEQ(M) Loudness Mode

TASA Loudness Mode

SAWA Loudness Mode



Specifications (continued)

Customer Specific Loudness Mode

Display:	<ul style="list-style-type: none"> Bargraphs for each single channel (can be combined with PPM bargraphs) M bargraph (Momentary - summation of momentary loudness values of all channels for a short span of time) S bargraph (Short - loudness summation value of an adjustable dynamic time frame) I-Bargraph (Integrated - long term loudness value infinite or manual control) adjustable tolerance range for M, S, I for M, S, I values (labelling adjustable)
Numerical display:	for LRA, TPmax, Mmax, Smax, I-time values
Scales:	Loudness scale: <ul style="list-style-type: none"> EBU+9: +9 .. -18 LU EBU+3: +3 .. -18 LU EBU+18: +18 .. -36 LU EBU+9a: 14 .. -41 LUFS EBU+18a: -5 .. -59 LUFS EBU0: 0 .. -60 LUFS ITU+9: +9 .. -18 LU (Loudness Units) ITU0: 0 .. -30 LKFS ATSC0: 0 .. -60 LKFS ATSC0a: 0 .. -30 LKFS
Weighting filter:	K filter acc. to ITU BS.1770
Target Level:	<ul style="list-style-type: none"> -23 LUFS; adjustable in the range from -10 to -30 LUFS in steps of 1 LUFS -24 LKFS; adjustable in the range from -10 to -30 LKFS in steps of 1 LKFS
Time & Gate Momentary:	
- Window Time:	adjustable in the range from 200 ms to 1000 ms in steps of 100 ms
- Integration Time:	IEC 125 ms Fast, 250 ms (IRT), 500 ms, 750 ms, IEC 1000 ms Slow, 1500 ms, 2000 ms selectable
Time & Gate Short:	
- Integration Time:	3 s; time window adjustable in the range from 1 to 20 s in steps of 1 s
Time & Gate Integrated:	
- Silence Gate:	<ul style="list-style-type: none"> -70,0 LUFS; adjustable in the range from -80,0 to -40,0 LUFS in steps of 0.5 LUFS, switchable -70,0 LKFS; adjustable in the range from -80,0 to -40,0 LKFS in steps of 0.5 LKFS, switchable
- Relative Gate:	-10,0 LU; adjustable in the range from -40,0 LU to 0 LU in steps of 0.5 LUFS, switchable
Level adjustment for the summation:	<ul style="list-style-type: none"> 0.0 dB (L, R, C), adjustable between -3 and +3 dB in steps of 0.5 dB +1.5 dB (LS, RS, LSR, RSR), adjustable between -3 and +3 dB in steps of 0.5 dB Off (LFE), selectable: Off, 0 dB, 10 dB
Tolerance Levels:	
- TP Headroom:	-9.0 dB; adjustable from 0 to -20 dB in steps of 0.1 dB
- TP Over Sensitivity:	0.0 dB; adjustable from 0 to -20 dB in steps of 0.1 dB
- M High:	+1.0 LU; M tolerance above Target Level adjustable from 0 to 10 LU in steps of 0.1 LU
- M Low:	-1.0 LU; M tolerance below Target Level adjustable from 0 to -12 LU in steps of 0.1 LU
- S High:	+1.0 LU; S tolerance above Target Level adjustable from 0 to 10 LU in steps of 0.1 LU
- S Low:	-1.0 LU; S tolerance below Target Level adjustable from 0 to -12 LU in steps of 0.1 LU

- I High: +1.0 LU; I tolerance above Target Level adjustable from 0 to 10 LU in steps of 0.1 LU
- I Low: -1.0 LU; I tolerance below Target Level adjustable from 0 to -12 LU in steps of 0.1 LU

Loudness Test Time Control

Settings for operating automatic, semi-automatic or manual loudness measurements.

Start:

- Functions: Autostart after preset load, autostart with gate, autostart with gate and autoreset, manually via keys or GPI. With Timecode Reader licence (SW20008) activated additional control via timecode resp. timecode with recalculation.
- Level for gate: -70,0 LUFS/LKFS; adjustable from -85 to -10 LUFS/LKFS in steps of 0.5 LUFS/LKFS

Stop:

- Functions: manually via keys or GPI, autostop with gate, autostop with gate and time. The stop function is automatically set and fixed to timecode, if the start function has been set to a timecode option.
- Level for gate: -70,0 LUFS/LKFS; adjustable from -85 to -10 LUFS/LKFS in steps of 0.5 LUFS/LKFS
- Time for gate: 1 s; adjustable from 1 to 15 s in steps of 1 s

Loudness Range Instrument (LRA)

Display:	Graphical display of the Loudness Range
Mode:	selectable: LRA Bar, MagicLRA, MagicLRA + I, MagicLRA + I + Num
Scale range:	selectable: 6 LU, 10 LU, 20 LU, 30 LU
LRA low range:	2 LU; adjustable in the range from 1 to 20 LU in steps of 1 LU
Comfort zone:	4 LU; adjustable in the range from 1 to 20 LU in steps of 1 LU
LRA high range:	depends on the selected scale range and the spread of the comfort zone
Colors:	selectable for each range

SPL Meter Mode

Display:	<ul style="list-style-type: none"> Bargraphs for each single channel (can be combined with PPM bargraphs) Summation bargraph
Reference point:	adjustable in the range from 68 dB to 88 dB in steps of 1 dB
Weighting:	Linear, A (Leq(A)), C, CCIR (Leq(M)), k
Integration time:	Fast (125 ms), Slow (1 s)

SW20003: RTA - Real Time Analyzer (Software Licence)

Spectral distribution display of the frequency range of single channels, channel pairs or groups.
For the display of more than 4 channels software licence SW20001 is required.

Spectrum Analyzer (RTA)

Input sources:	selectable: all channels without LF, all channels, Front, Rear, L/R, single channels, Stereo pairs, depending on selected mode
Frequency range:	<ul style="list-style-type: none"> Norm: 20 Hz to 20 kHz, additional band > 20 kHz switchable LF: 5 Hz to 5 kHz
Number of bands:	<ul style="list-style-type: none"> 1/3-octave: 31 bands, filter acc. to IEC 225 class 2 1/6-octave: 61 bands 1/12-octave: 120 bands



Specifications (continued)

Weighting filter: Linear; Linear, A, C selectable
 Peak hold indicator: 1 s, 2 s, 4 s, 10 s, 20 s, 30 s, manual reset or off
 Measuring range: 45 dB max.
 Scaling: 3, 6, 9 dB
 Functions:

- Input selection
- 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)

SW20004: SSA - Surround Sound Analyzer (Software Licence)

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

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

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

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) resp. TVI (shape of line): red resp. funnel: negative range, yellow resp. straight line: "0" 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)

SW20005: Radar Display (Software Licence)

High resolution circular Loudness display corresponding to the Loudness Radar Meter of TC electronic®.

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

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

Radar Loudness Meter

Display:

- Momentary Loudness values (circular)
- History (circular)
- Measuring time (numerical)
- 2 Loudness descriptors (numerical)
- Peak

Mode: Radar or Statistics
 Sliding Loudness: 3 s, 6 s, 10 s, 15 s, 30 s, 1 min, 2 min, 4 min, 8 min
 Descriptors: Off, Program Loudness, Loudness Max, Loudness Range, Sliding Loudness (max. 2 at a time)

Speed: 1 min, 4 min, 12 min, 30 min, 1 h, 2 h, 4 h, 12 h, 24 h
 Resolution: 3 dB, 4 dB, 6 dB, 8 dB, 10 dB, 12 dB, selectable
 Low Level: -30 to -6 LU

SW20006: RTW Premium PPM plus Vectorscope (Software Licence)

High resolution Multistandard-PPM display with advanced scales and with Audio Vectorscope (4 instances available), and Moving Coil instruments.

Expands licence SW20001 with Multi-Correlator instrument in multi-channel mode, if activated.

General

Input sources: analog and/or digital, depending on selected audio interface

Display:

- Peak level
- Peak hold
- Numerical value of the display
- Digital Over

Functions:

- Gain (+20 dB, +40 dB acc. to standard)
- Peak hold on/off
- Memory
- Reset

Analog Peakmeter Extension

Analog scales:

- Zoom10: +10 .. -10,
- Zoom1: +1 .. -1,
- SMPTE24: +24 .. -30
- SMPTE20: +20 .. -40
- NHK

Integration time: acc. to standard or 20 ms, 10 ms, 1 ms, 0,1 ms

Peak hold indicator: 1, 2, 4, 10, 20, 30 s, manual reset or off

Digital Peakmeter Extension

Word width: 24 bit
 Digital scales:

- TP20: +3 .. -20 dB
- Dig20: 0 .. -20 dB
- Dig0: +18 .. 0 dB
- Dig18: +18 .. -18 dB
- Dig40: +20 .. -40 dB
- ARD9: +9 .. -60 dB
- DIN10: +10 .. -50 dB,
- Zoom10: +10 .. -10,
- Zoom1: +1 .. -1,

Headroom/Headroom Ref: adjustable from 0 to -20 dB in steps of 1 dB

Operation field: adjustable from 0 to -20 dB in steps of 1 dB

Integration time (Attack): acc. to corresponding standard or selectable: Sample, 20 ms, 10 ms, 1 ms, 0,1 ms

Gain: +20 dB, +40 dB (acc. to standard)

High-pass filter: Off, 5 Hz, 10 Hz, 20 Hz

Peak hold indicator: 1 s, 2 s, 4 s, 10 s, 20 s, 30 s, manual reset or off

Over indicator hold time: 1 s or manual

Over indicator PPM

- Threshold: Full Scale, Full Scale -1LSB, Full Scale -2LSB, -0.1 dBFS, -0.5 dBFS, -1 dBFS, -2 dBFS, -3 dBFS

- Attack time: 1 to 15 samples

- Word width: 16 to 24 bit, selectable

Over indicator True Peak

- Threshold: adjustable



Specifications (continued)

Moving Coil Instrument

(available in stereo mode only)

Type: PPM (L/R), PPM (M/S), VU, Loudness, PPM + Loudness (L/R; M, S, or I), selectable

PPM:

- Ch. arrangement: Dual, Dual + M/S horizontal, Dual + M/S vertical, Stereo horizontal, Stereo vertical
- Scales:
 - BR IIa: 7. .1, BR IIa ext: 7. .1
 - BR IIb: +12. .-12 dB, BR IIb ext: +12. .-12 dB
- Integration time: Sample (digital only), 0.1 ms, 1 ms, 10 ms, 20 ms, 150 ms
- Headroom Ref: available with digital sources only: -10 dB; adjustable from 0 to -20 dB in steps of 1 dB only available, if M/S type is selected: M3, M6 Off, Peak, True Peak, BR Peak
- S mode:
- Peak indicator:
- BR Peak Threshold: 6 dB,
 - BR IIa: adjustable from 4 to 7 dB in steps of 1 dB
 - BR IIb: adjustable from 0 to 12 dB in steps of 1 dB

VU:

- Ch. arrangement: Stereo horizontal, Stereo vertical
- Scale analog: VU (-20 to +3 dB)
- Scale digital: VU Digital (-20 to +3 dB)
- Lead: 0 dB, adjustable from 0 to 12 dB in steps of 1 dB
- Peak indicator: Off, Peak, True Peak

Loudness:

- Ch. arrangement: Dual, Stereo horizontal, Stereo vertical
- Scales: acc. to Loudness settings
- Integration time: acc. to standard
- Peak indicator: Off, no selectable option available

PPM + Loudness:

- Ch. arrangement: Dual-PPM (as described above) with additional Loudness display (BBC) for M, S, or I (selectable) in one instrument
- Scales:
 - PPM: see above
 - Loudness: +9 to -9 LU fixed (mid of scale corresponds to Target Level)

Numerical display: switchable

Audio Vectorscope (4 instances available)

in Surround mode

(if available):

- Display modes:
 - 2-channel
 - 4-channel (fixed: L-R above, LS-RS below)
- Inputs: in 2-channel mode selectable, selection depends on selected format; e. g. for 5.1: L/R, LS/RS, L/C, C/R, L/LS, R/RS
- AGC: fast/slow

in 2-channel Stereo mode

- Inputs: L-R
- AGC: fast/slow
- Grid: L/R or M/S

Multi-Correlator

in Surround mode

(if available):

- for each channel pair of 3.1, 5.0, 5.1, 7.1 formats
- LFE mode with 5.1, 7.1 formats to display the correlation between each single channel and LFE channel

- Display: red: negative range, white: "0" range, green: positive range
- Filter: low pass filter switchable (300 Hz)

SW20008: TCR - Timecode Reader (Software Licence)

Decoding of SDI embedded or LTC timecode. Timecode display. With an activated licence SW20002 the timecode can be used for loudness and logging applications.

Timecode Reader (TCR)

- Display: numerical display of
 - LTC (from analog or digital sources)
 - VITC (from SDI data stream)
- Mode: "Timecode" selectable when creating an audio group (constitutes a separate audio group)
- Input: one analog, digital or SDI channel selectable, depending on audio interface being mounted
- Colors: selectable, 32 colors

Loud. Recal. (Loudness Recalculation)

Settings for operating automatic, semi-automatic or manual loudness measurements (Loudness Test Time Control).

- Display: numerical display of
 - current timecode
 - start time < current timecode < stop time with recalculation

Start:

- Functions: Autostart after preset load, autostart with gate, autostart with gate and autoreset, manually via keys or GPI. With Timecode Reader licence (SW20008) activated additional control via timecode resp. timecode with recalculation.
- Level for gate: -70,0 LUFS/LKFS; adjustable from -85 to -10 LUFS/LKFS in steps of 0.5 LUFS/LKFS

Stop:

- Functions: manually via keys or GPI, autostop with gate, autostop with gate and time. The stop function is automatically set and fixed to timecode, if the start function has been set to a timecode option.
- Level for gate: -70,0 LUFS/LKFS; adjustable from -85 to -10 LUFS/LKFS in steps of 0.5 LUFS/LKFS
- Time for gate: 1 s; adjustable from 1 to 15 s in steps of 1 s

SW20013: BLITS (Software Licence)

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: Software licence SW20001 is activated. ---

Generator

- Functions:
 - Line test signal generators for BLITS, GLITS, EBU 3304
 - Optional intro from stored WAV file
- Display: Channel related course of outgoing generator sequence
- Signal level: -18 dBFS nominal
- Level offset: 0 dB; adjustable from -12 to +12 dB in steps of 1 dB
- Outputs: digital using the output routing



Specifications (continued)

Analyzer

Functions:	<ul style="list-style-type: none"> Automatic detection and analysis of incoming BLITS test signals
Displays:	
- Course:	Channel related for incoming BLITS test signals
- State/Alarm:	Bars for fast and easy recognition of <ul style="list-style-type: none"> General signal state Channel allocation Level Phase and Delay Polarity
- Report:	In cases of error, the bars will be displayed in red Schedule showing values for <ul style="list-style-type: none"> incoming channels channel allocation measured level in dBFS detected differences in dB Phase and Delay in deg and ms Polarity Values showing differences or errors will be displayed in red

SW20014: Logging Data Server (Software Licence)

Export of measured data via IP connection or USB flash drive. Advanced graphical presentation and two-stage definition of thresholds. Communication with RTW LQL PC software.

--- Precondition: Licence SW20002! ---

Logging Instrument

Functions:	<ul style="list-style-type: none"> Logging of Loudness and TruePeak data of two audio groups Storing of data on USB flash drive or via IP with LQL - Loudness Quality Logger PC software Definition of main and secondary limits (individual markers) for Mmax, Smax, I and TPmax to monitor the adherence of e. g. legal regulations, current standards or in-house regulations Data collection control automatically via LQL (IP mode) or manually via control key (USB mode)
Mode:	selectable: off, USB, IP
Display:	Status display in the top line of the instrument placed on the screen: <ul style="list-style-type: none"> in IP mode: LQL access in USB mode: Disk space, running processes, storing if logging functionality is turned off
Identification for network:	Device name and password definable
Key function (USB):	<ul style="list-style-type: none"> USB run: Start logging USB close: Stops logging and creates a logfile on the USB flash drive

Loudness Chart Instrument

Functions:	<ul style="list-style-type: none"> Horizontal running bargraphs with individually definable colors evaluate the common quality of Loudness values TP, M, S, I Progress of a measurement (value over time) of up to four values can be drawn as graph(s) on a coordinate system Position of the Relative Gate switchable, color adjustable Adjustable time ranges Selectable time periods for evaluation
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Display:

- Vertical Integrated bargraph switchable
- Tolerance levels and its display adjustable
- Bargraph:
 - Color change of the running bargraph indicates the section the loudness value is moving in: normal, operation range, Headroom, Over, invalid (availability depending on selected value)
- Chart-Graph:
 - Continuously drawn graph (value over time) either of one value as line or rectangle with colored filling corresponding to the color selection of the horizontal bargraphs or of up to four values as line, dots, or rectangles without filling with individual color selection; added with Tolerance Indicator or position of Relative Gate (if selected)

Color:

- Bargraph:
 - Individual selectable colors (32) for Normal (bargraph color), Operation Range, Headroom (TP only), TP Over (TP only), Over (M, S, I only), Invalid (M, S, I only)
- Chart graph:
 - For each value individual selectable colors (32) for display modes without filling, bei Darstellung ohne Füllung, otherwise adoption of corresponding bargraph colors, additional selectable colors for Tolerance Indicator and position of Relative Gate

Time Range:

Time grid adjustment for the coordinate system and the horizontal bargraphs:

- Increase or decrease of the preset time period in steps of one unit or ten units
- Magnification of the measured course to the available width of the instrument's window

Time Range presets:

- Auto stretch:

Automatic stretch of a stopped loudness measurement to the available width of the instrument's window, switchable (except when controlled via timecode)

- Hours:

0 h; adjustable from 0 to 3 h in steps of 1 h

- Minutes:

1 m; adjustable from 1 to 59 m in steps of 1 m

Time Select:

- Selection of current time period (marker)
- Increase or decrease of the marker in step sizes corresponding to the current time grid
- Shift of the marker and magnification of the content

Tolerance Levels:

- TP Headroom:

-9.0 dB; adjustable from 0 to -20 dB in steps of 0.1 dB

- TP Operation Range:

0.0 dB; adjustable from 0 to -20 dB in steps of 0.1 dB

- M High:

+1.0 LU; M tolerance above Target Level adjustable from 0 to 10 LU in steps of 0.1 LU

- M Low:

-1.0 LU; M tolerance below Target Level adjustable from 0 to -12 LU in steps of 0.1 LU

- S High:

+1.0 LU; S tolerance above Target Level adjustable from 0 to 10 LU in steps of 0.1 LU

- S Low:

-1.0 LU; S tolerance below Target Level adjustable from 0 to -12 LU in steps of 0.1 LU

- I High:

+1.0 LU; I tolerance above Target Level adjustable from 0 to 10 LU in steps of 0.1 LU

- I Low:

-1.0 LU; I tolerance below Target Level adjustable from 0 to -12 LU in steps of 0.1 LU



Specifications (continued)

HW20930/HW20930UPG: 3G-SDI Deembedder Interface (Hardware Option)

Inputs:	1 x BNC In
Outputs:	1 x BNC Through, selected input signals are active looped through without processing
Functions:	<ul style="list-style-type: none">▪ Detection of validity of the applied SDI signal▪ Detection of frequency (SD/HD/3G)▪ Detection of contained format▪ Detection of validity of the contained and applied audio groups and deembedding
Deembedding:	<ul style="list-style-type: none">▪ Display of up to 32 channels▪ Single link (SD/HD/3G): max. 4 audio groups with 4 audio channels each▪ Dual link (3G): max. 8 audio groups with 4 audio channels each

Items of Delivery

TouchMonitor TM9 20900:	<ul style="list-style-type: none">▪ TM9 main unit in a table-top frame▪ selected audio interface▪ Basic software (system/Stereo-PPM)▪ Table-stand, mains adapter, manual Order no.: 20900 (+ HW-No.)
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TouchMonitor TM9 20900OEM:	<ul style="list-style-type: none">▪ TM9 main unit without table-top frame▪ selected audio interface▪ Basic software (system/Stereo-PPM)▪ Manual Order no.: 20900OEM (+ HW-No.)
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Hardware options

- 3G-SDI interface **HW20930** when placing the order together with selected audio interface
- 3G-SDI interface **HW20930UPG** when retrofitting the selected audio interface at a later point of time

Additional Hardware Options

- Table-top Mounting Adapter **TM9-MADT**, Mounting kit including a table-top frame, robust swivel-mounted table-stand, housing cover, and mounting material for remodelling 20900OEM to a table-top unit.

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: Licence 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 **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 TM9 table-top unit
9" touch screen 16 : 9 TFT, table-top unit with table-stand, power supply
Order number: 20900

TouchMonitor TM9 OEM unit
9" touch screen 16 : 9 TFT, main unit without housing for panel-mounting
Order number: 20900OEM

Audio Interface Selection (I/O Options)	max. Channel Count (Hardware)	Inputs Analog (balanced)	Inputs Digital/Outputs Digital	Input Option 3G-SDI Interface HW20930/HW20930UPG
add. Order Number: HW20911	8-channel analog In, 8-channel digital In, 8-channel digital Out	1 x 25-pin Sub-D	1 x 25-pin Sub-D (4 x AES3 in, 4 x AES3 Out)	add. order/can be retrofitted
add. Order Number: HW20912	8-channel analog In, 8-channel digital In, 8-channel digital Out	1 x 25-pin Sub-D	8 x BNC (4 x AES3id In, 4 x AES3id Out)	add. order/ can be retrofitted
add. Order Number: HW20913	16-channel digital In, 16-channel digital Out	---	2 x 25-pin Sub-D (8 x AES3 in, 8 x AES3 Out)	add. order/ can be retrofitted
add. Order Number: HW20914	16-channel digital In, 16-channel digital Out	---	16 x BNC (8 x AES3id In, 8 x AES3id Out)	add. order/ can be retrofitted
add. Order Number: HW20915	16-channel analog In	2 x 25-pin Sub-D	---	add. order/ can be retrofitted

Standard Hardware: Table-top unit with easy-to-use graphical interface, Ethernet, 2 x USB, GPIO, VGA Out, table-stand, mains adapter. Audio Interface Selection required!
OEM unit with easy-to-use graphical interface, Ethernet, 2 x USB, GPIO, VGA-Out. Audio Interface Selection required!

Standard Software: Basic 4-channel PPM with analog scales (DIN +5, Nordic, British Ila, British IIb) and digital scales (0 to -60 dB, +3 to -60 dB True Peak, DIN, Nordic, British Ila and IIb), stereo correlator, gain reduction, and global keyboard. Other software modules available as licences.

Licences (Software Modules) Further information on <https://www.rtw.com/en/produkte/audio-monitor/touchmonitor-tm9.html> --> Options

Multichannel Mode Order Number: SW20001	Loudness and SPL Display Order Number: SW20002 *	RTA - Real Time Analyzer Order Number: SW20003 *	SSA - Surround Sound Analyzer Order Number: SW20004 * Precondition: installed SW20002!	Radar Display Order Number: SW20005 * Precondition: installed SW20002!	Premium PPM plus Vectorscope Order Number: SW20006 . Expands SW20001 with Multi-Correlator
Timecode Reader Order Number: SW20008 * Precondition: installed SW20002!	BLITS (Analyzer and Generator) Order Number: SW20013 * Precondition: installed SW20001!	Logging Data Server Order Number: SW20014 * Precondition: installed SW20002!	TC-RTW (Conversion Kit) Order Number: SW20021 Precondition: TM of TC electronic#!		

*! Licence SW20001 is required for the display of more than 2 channels.

Dimensions: W x H x D in mm (approx.)

TM9 Table-top unit 20900: 245 x 185.5 x 46.5

TM9 OEM version 20900OEM: 235 x 135 x 45



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