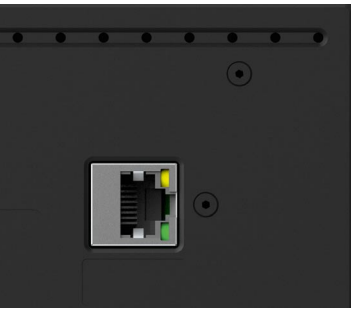
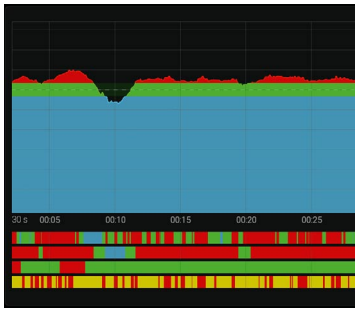
Data Sheet

TouchMonitor 5





EYES ON YOUR AUDIO

TouchMonitor 5

Touch Screen ▪ Flexible Screen Layout ▪ Dante® AoIP ▪ RAVENNA®/AES67/ST 2110 AoIP ▪ 16 Channels ▪ Surround ▪ Immersive PPM/TP ▪ Stereo Correlator ▪ Loudness ▪ LRA ▪ Dialog Gated Loudness ▪ Premium Metering ▪ Loudness Chart ▪ Vectorscope

TouchMonitor 5 is a compact AoIP (Audio over IP) based Stereo, Surround and Immersive audio meter with a comprehensive suite of measurement tools for loudness, level and phase. It can be integrated either into Dante® or into RAVENNA®/AES67/ST 2110 AoIP networks and can be powered over ethernet. This gives you instant control over up to 16 audio channels, e.g. for stereo, surround and immersive formats including 5.1 and 7.1.4, allowing you to meet specific delivery requirements with precision at all times.

Graphical User Interface

The TouchMonitor 5's graphical user interface is controlled simply by the touch of your finger. The integrated instruments can be scaled, randomly positioned and combined for optimum utilization of the available screen space.

With its IP address and the comprehensive Web App, TouchMonitor 5 can be adapted to your individual needs within the respective AoIP networks.

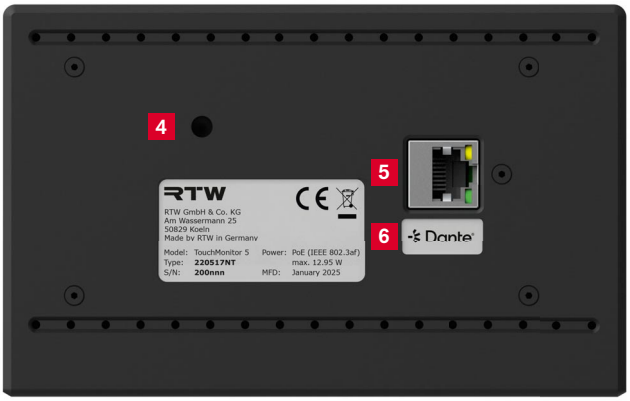
The Device

Hardware

- Compact table-top device with 5“ capacitive touch screen 16 : 9 TFT (1280 x 720 pixel) with multitouch functionality 1
- 16-channel audio over IP interface for Dante® 6 or RAVENNA® 7 audio networks (RJ-45 ethernet)
- Power supply via ethernet connection (PoE - power over ethernet, IEEE802.3af compliant) 5
- Control via finger (touch screen) 1
- Freely scalable and positionable applications and instruments 2
- Up to 31 presets selectable
- Installation with table-stand 3 or extensively mountable using various 1/4” threads 4

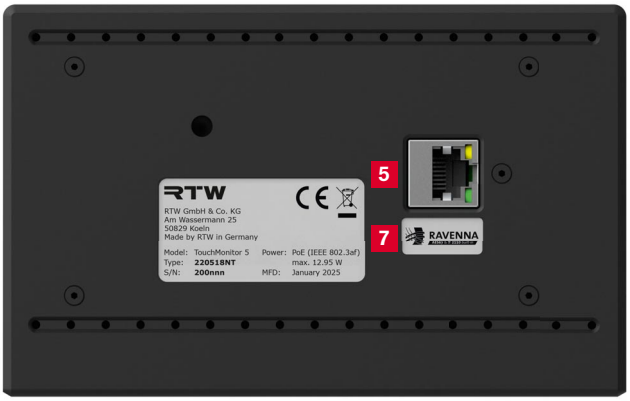
Software

- Device configuration via IP address and Web App within the Dante® network (web-based interface)
- Support for Stereo, Surround, Immersive and Multichannel formats for up to 16 channels incl. 5.1 and 7.1.4 formats
- Loudness & SPL functions acc. to all common standards and Loudness Range instrument (LRA)
- Dialog Gated Loudness measurement
- Loudness Chart (Loudness over time)
- Premium Metering with Multiformat-PPM and TP meter incl. comprehensive scales and Moving Coil needle instruments
- Audio Vectorscope and Stereo Correlator



▲ **220517NT** (Dante®)

220518NT (RAVENNA®) ▼



Essential Features

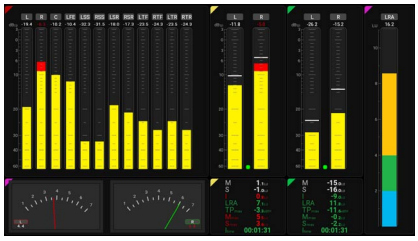
TouchMonitor 5 is equipped with a comprehensive software package. Beside the control functions, the software provides applications and instruments that can be used individually depending on the area of application. Core of TouchMonitor 5 is the Metering application, which can be positioned up to four times. So you are able to carry out extensive measurement tasks in parallel.

Metering

The Metering application provides the familiar RTW Premium metering functions and instruments: Multiformat PPM, TP meter, Moving Coil needle instruments, Audio Vectorscope, loudness measurement and calculation, loudness range display, Loudness Chart, SPL and Dialog Gated Loudness. With support for up to 16 AoIP network channels, TouchMonitor 5 can handle channel configurations from stereo to 9.1.6. including 5.1 and 7.1 surround as well as 7.1.4 and 9.1.6 immersive.

PPM/TP Meter, Moving Coil

The PPM/TP meter displays the levels of channel configurations on up to 16 bargraphs with different scales. A spot correlator can be displayed for a stereo PPM. Peak hold displays, peak memory and over indicator can be switched on. Stereo signals can also be displayed as pointer instruments (moving coil) and loudness displays can be added.

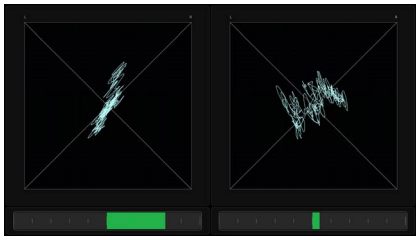


Dialog Gated Loudness

Dialog-gated loudness measurements ensure compliance with dialog-based specifications e. g. the Netflix transmission standards. The Loudness Num instrument is supplemented with metrics such as ID (Dialog-Based Integrated), SD (Dialog-Based Short-Time), and D (Dialog Content Percentage).

Audio Vectorscope

The 2-channel Audio Vectorscope provides a real-time visualization of the phase relationship between two channels of a stereo pair. The dynamic motion and spread of the Lissajous figure shows stereo width, signal balance, and potential issues such as comb filter effects, phase shifts, or rotations.



Loudness Chart

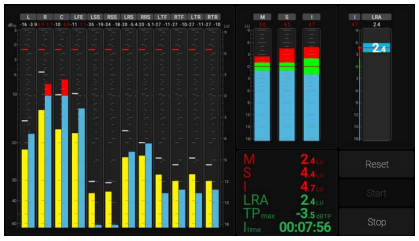
The loudness chart provides a detailed visual representation of audio loudness levels over time, offering a clear and comprehensive overview of audio's loudness dynamics. By selcting different parameters, the instrument can be used to monitor dynamics of transients or long-term loudness trends, for example.

Stereo Correlator

The Stereo Correlator is used to analyze and display the phase relationship between the two channels of a stereo signal, offering valuable insights into its stereo compatibility.

Loudness, Loudness Range

TouchMonitor 5 supports all international loudness standards such as EBU R128, ITU-R BS.1770-4/1771-1, ATSC A/85, ARIB, OP-59, AGCOM, CALM, LEQ(M), TASA and SAWA. With the Loudness Sum instrument you get a bargraph display of the summed Loudness values M, S, and/or I of a Loudness measurement. The Loudness Num instrument displays these and many other relevant values numerically (M, S, I, LRA, TPmax, Mmax, Smax, Itime). The loudness measurement is supplemented by the loudness range instrument (LRA) for graphically displaying the loudness variance in short time spans.



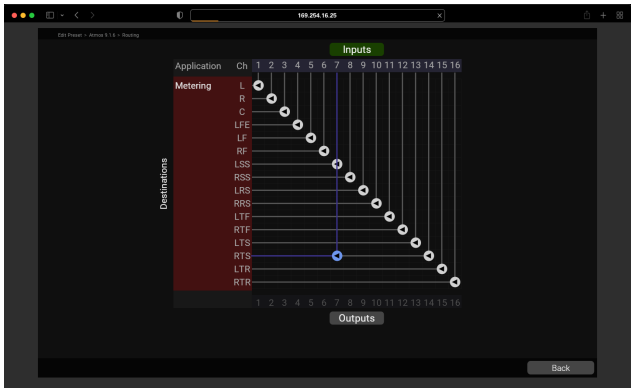
Essential Features (continued)

Web-based Interface

The TouchMonitor 5 is a network-based device. It is therefore also set up via the network, using the IP address of the device and a standard web browser in the same AoIP network.
With the user interface (WebApp) displayed in the browser, you can make the general settings, create and manage up to 31 of your own presets, create your own screen views and much more. You can also control access to the device and restrict operation to certain functions to prevent unwanted use.

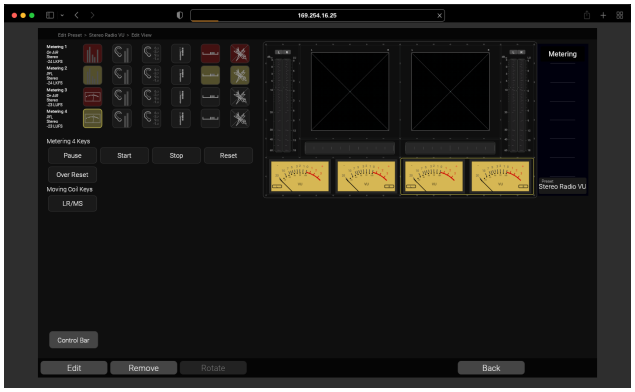
Extensive Routing

The routing matrix is used to determine the audio channels to be used as inputs in the preset. The 16 channels assigned in the Dante Controller™ resp. the RAVENNA® management offer many possibilities. For example, the same channels can be used for each application. Or they can be split up so that the applications are independent from each other.



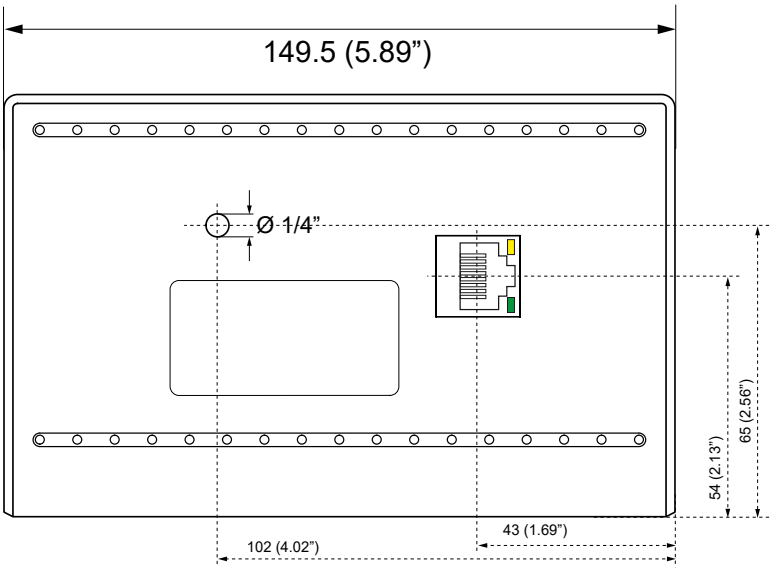
Own Display Views

TouchMonitor 5 allows you to design your own displays views for the selected applications. The size, ratio and positioning can be defined for each instrument. Several instruments can also be rotated to adapt them to your own requirements. Buttons can be placed anywhere on the screen, whereby the buttons in the sidebar can be hidden together with the sidebar.

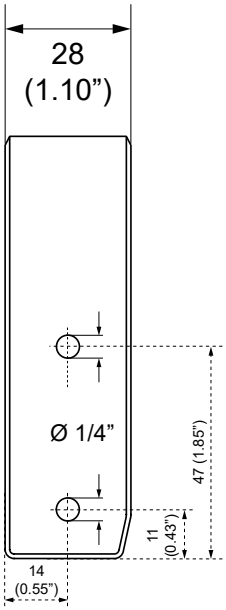


Dimensions

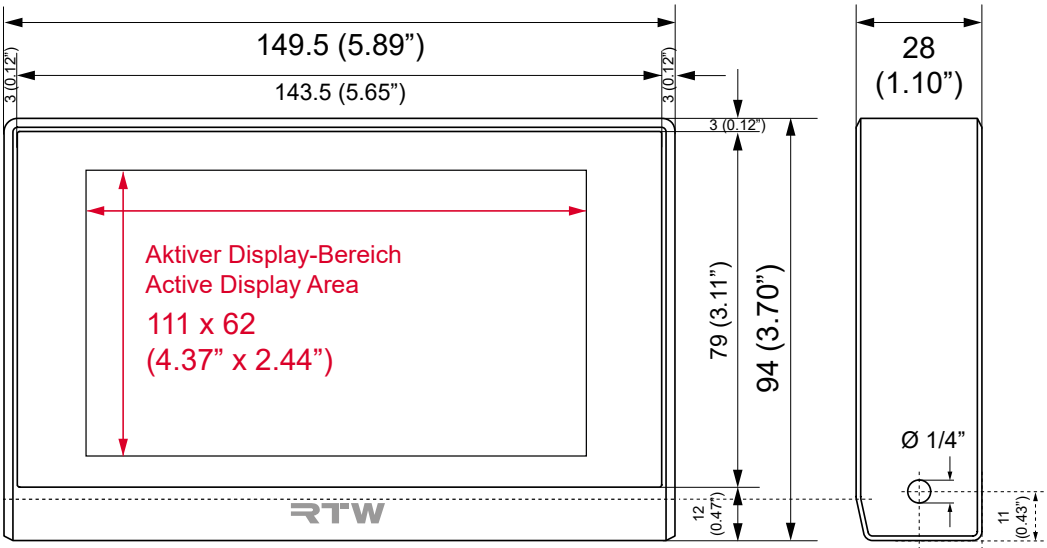
TouchMonitor 5 Table-top Unit (220517NT, 220518NT)



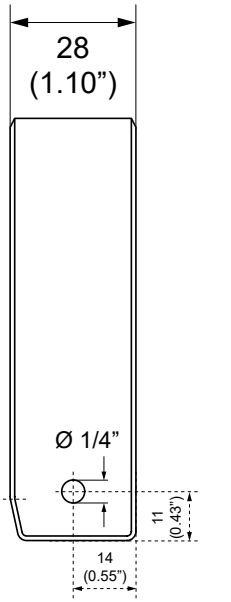
1 | Rear view | dimensions in mm (inch)

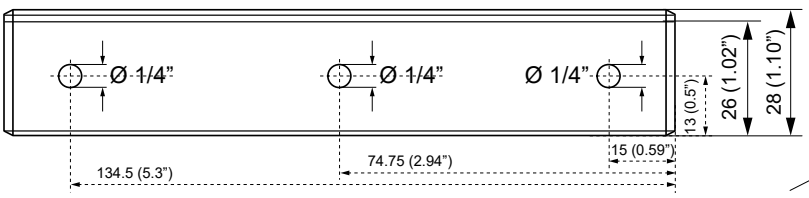


2 | Side views | dimensions in mm (inch)

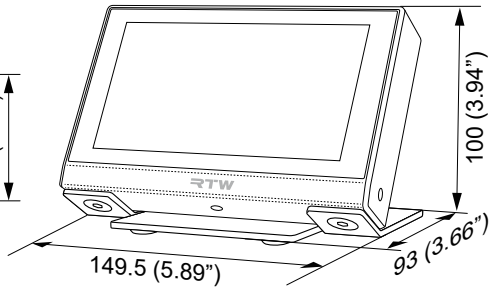


3 | Front view | dimensions in mm (inch)





4 | Bottom view | dimensions in mm (inch)



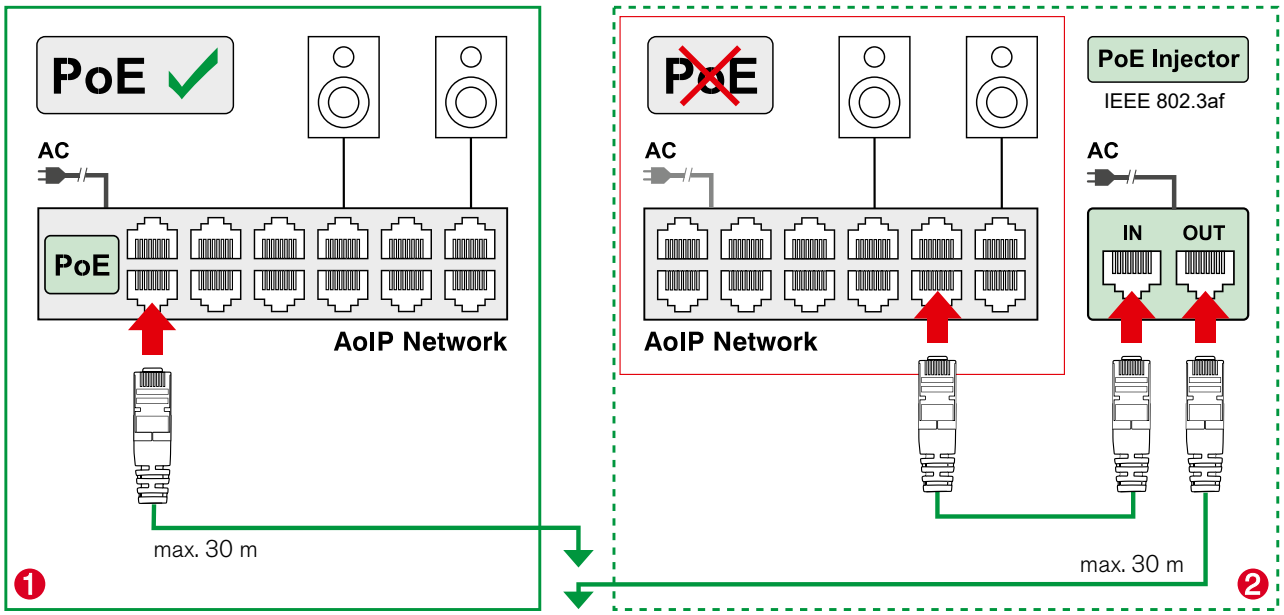
5 | Foot print | dimensions in mm (inch)

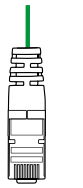
Connections

RJ-45 Ethernet Connector

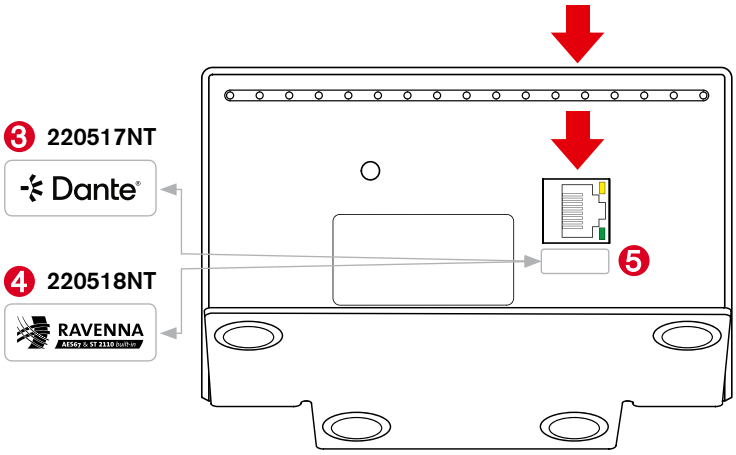
NOTE

- **The power supply of the TouchControl 5 is done via the network connection and the Dante® AoIP network without any additional cable, if this network has the Power over Ethernet functionality (PoE - IEEE 802.3af-compliant) ❶.**
- **If your switch does not provide Power Over Ethernet, an IEEE 802.3af-compliant ethernet power injector such as the RTW 14554-xx is required for power supply ❷.**
- **Model 220517NT is build for Dante® networks ❸ and model 220518NT for RAVENNA® networks ❹. Please note the corresponding sticker below the Ethernet connector on the back of the housing ❺.**





TouchMonitor 5 is certified with CAT 7 cables, but CAT 5E, CAT 6 or CAT 7 can be used.
Maximum cable length: 30 m



Accessory

14554-xx Ethernet Power Injector

Specifications

System

General

Power requirements:	Power over Ethernet (PoE - IEEE 802.3af-compliant)
Power consumption:	12 W maximum
Display:	5" capacitive touch display 16 : 9 with multi-touch funtion (1280 x 720 pixel)
Connectors:	1 x RJ-45: LAN/Ethernet built-in socket for Dante® or RAVENNA® audio over IP and power supply (PoE - IEEE 802.3af-compliant)
Dimensions (W x H x D):	149.5 x 94 x 28 mm (without table-stand)
Weight:	approx. 890 g (incl. stand)
Installation:	7 x 1/4" threads for mounting the table-stand or alternative mounting options
Operating temperature:	+5° to +35° C

Functions

- Operation with touch sensitive display
- Instruments and controls can freely be scaled and positioned
- Multiformat PPM and TP meter for level metering of up to 16 channels in different configurations (Mono, Stereo, Surround, Immersive or Multichannel)
- Multiformat PPM and TP meter
- 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
- Dialog Gated Loudness measurements
- Loudness Test Time Control
- Loudness Range instrument (LRA)
- Chart instrument (Loudness over time)
- SPL meter
- Moving Coil (BR, VU, Loudness, BBC mode)
- Spot Correlator in the Stereo bargraph display
- Stereo Correlator instrument (phase meter)
- Audio Vectorscope and Stereo Correlator
- Numerical displays
- Immersive-Setups (5.1.2, 5.1.4, 5.1.6, 7.1.2, 7.1.4, 7.1.6, 9.1.2, 9.1.4, 9.1.6)
- Up to 32 presets selectable (31 user-definable, 1 write-protected with standard settings)
- Configuration of the device via IP address and Web App in the network

Digital Inputs

Inputs:	16 audio over IP inputs (network channels, Dante® or RAVENNA® depending on device version) via RJ-45 built-in socket
Sample rates:	44.1, 48, 88.2, 96 kHz for all 16 channels
Word width:	16, 24, 32 bit

Latency

Minimum network latency:	▪ Dante®: 1 ms (Dante Controller™) ▪ RAVENNA®: 0.25 ms
Internal device latency:	1 ms

Be aware that latency also depends on other network devices, such as switches and other networked products.

Application Metering

Provides the familiar RTW Premium metering functions (multi-format PPM and TP meter, moving coil, audio vectorscope) and the functions for loudness calculation, loudness range display and loudness over time display. Up to 4 instances are possible.

General

Input sources:	16 AoIP network channels
Formats:	Mono, Stereo, Surround, Immersive, Multichannel
- Mono:	several single channel signals selectable
- Stereo:	several 2-channel Stereo pairs selectable
- Surround:	**5.1**; LCR, LCM, 4.0, 5.0, 5.1, 6.0, 6.1, 7.0, 7.1 selectable
- Immersive:	**5.1.4**; 5.1.2, 5.1.4, 5.1.6, 7.1.2, 7.1.4, 7.1.6, 9.1.2, 9.1.4, 9.1.6 selectable
- Multichannel:	**8**; 1 to 16 single channels in one instrument selectable

PPM

Display type:	**Bargraph**; Bargraph (for all formats) or Moving Coil needle instrument (for Stereo format)
Display:	▪ Peak level ▪ Peakhold (depending on type) ▪ Numerical value of the display ▪ Digital Over
Functions:	▪ Gain (+20 dB, +40 dB acc. to standard), ▪ Peakhold on/off (depending on type) ▪ Memory ▪ Reset (Memory/Peakhold)

Digital Peakmeter (PPM)/TP Meter

Display type:	Bargraph, variously combinable with loudness display
Orientation:	**vertical**; vertical or horizontal selectable
Word width:	24 bit
Digital Scales:	▪ TP60: +3 .. –60 dB (default) ▪ TP20: +3 .. –20 dB ▪ Dig60: 0 .. –60 dB (Attack: Sample) ▪ Dig40: +20 .. –40 dB (Attack: Sample) ▪ Dig20: 0 .. –20 dB (Attack: Sample) ▪ Dig0: +18 .. 0 dB (Attack: Sample) ▪ Dig18: +18 .. –18 dB (Attack: Sample) ▪ ARD9: +9 .. –60 dB (Attack: 10 ms) ▪ DIN5: +5 .. -50 dB (Attack: 10 ms) ▪ DIN10: +10 .. -50 dB (Attack: 10 ms) ▪ Nordic: +12 .. -42 dB (Attack: 10 ms) ▪ BR IIa: 7 .. 1 (Attack: 20 ms) ▪ BR IIa ext: 7..1 (Attack: 20 ms) ▪ BR IIb: +12 .. -12 dB (Attack: 20 ms) ▪ BRIIb ext: +12..-12 dB (Attack: 20 ms) ▪ Zoom10: +10 .. –10 (Attack: 10 ms) ▪ Zoom1: +1 .. –1 (Attack: 10 ms)
Scale marker:	**Off**; switchable in the range from –30 to 0 dB in steps of 0.5 dB or Off

Specifications (continued)

Headroom:
- **–9 dB**; adjustable in the range from 0 to –20 dB in steps of 1 dB (not available for Dig40, Dig0, Dig18, ARD9)
- fixed with reference 997 Hz for:
  - Dig40:+20..-40dB: 0 dB fixed at –20 dBFS, Headroom up to +20 dB at 0 dBFS
  - Dig0:+18..0dB: 0 dB fixed at –18 dBFS, Headroom up to +18 dB at 0 dBFS
  - Dig18:+18..-18dB: 0 dB fixed at –18 dBFS, Headroom up to +18 dB at 0 dBFS
  - ARD9:+9..-60dB: 0 dB fixed at –9 dBFS, Headroom up to +9 dB at 0 dBFS

Operation field: adjustable in the range from 0 to –20 dB in steps of 1 dB

Integration time (Attack): acc. to corresponding standard or (partly) selectable: Sample, 20 ms, 10 ms, 1 ms, 0,1 ms, British BRII scales also 150 ms

High-pass filter: **Off**; 5 Hz, 10 Hz, 20 Hz or Off selectable (not for TP scales)

Peakhold display: **Off**; 1 s, 2 s, 4 s, 10 s, 20 s, 30 s, manual reset or Off selectable

Over indicator hold time: 1 s or manual

Over indicator PPM
- Threshold: **–1 dB**; adjustable in the range from –10 to 0 dB in steps of 0.1 dB
- Attack time: 1 to 15 samples
- Word width: 16 to 24 bit, selectable

Over indicator TruePeak
- Threshold: **–1 dB**; adjustable in the range from –4 to 0 dB in steps of 0.1 dB

Colors: 32 individually selectable for each section

Stereo Correlator

Display: Bargraph, additional spot indicator between PPM bargraphs

Scale range: -1 r to 0 to +1 r

Standard color setting:
- red: -1 r to -0.1 r
- white: 0 r (-0.1 r to +0.1 r)
- green: +0.1 r to +1 r

Attack/release time: 1.0 s/2.5 s

Moving Coil Instruments
(only available in Stereo mode)

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

PPM:
- Channel arrangement: Dual, Dual + M/S horizontal, Dual + M/S vertical, Stereo horizontal, Stereo vertical
- Scales:
  - BR IIa: 7. .1 (default)
  - BR IIb: +12. .-12 dB
- Integration time: **10 ms**; Sample, 0,1 ms, 1 ms, 10 ms, 20 ms, 150 ms selectable
- Headroom Ref: **–10 dB**; adjustable in the range from 0 to –20 dB in steps of 1 dB
- Peak indicator: **off**; Peak, True Peak, BR Peak, off selectable
- BR Peak Threshold: **6**
  - BR IIa: adjustable in the range from 4 to 7 dB in steps of 0.25
  - BR IIb: adjustable in the range from 0 to 12 dB in steps of 1 dB

VU:
- Channel arrangement: Stereo horizontal, Stereo vertical
- Scale: VU (–20 to + 3 dB)
- Lead: 0 dB; adjustable in the range from 0 to 12 dB in steps of 1 dB
- Peak indicator: off; Peak, TruePeak, off selectable

Loudness:
- Channel arrangement: Dual, Stereo horizontal, Stereo vertical
- Scales: acc. to Loudness settings
- Integration time: acc. to standard
- Peak indicator: off, no selection

PPM + Loudness:
- Channel arrangement: Dual-PPM (as described above) with additional Loudness display (BBC mode) for M, S or I (selectable) in one instrument
- Scales:
  - PPM: see above
  - Loudness: +9 to –9 LU fixed (center of the scale represents the Target Level of the selected Loudness standard)

Numerical display: switchable in all modes

Audio Vectorscope
in 2-channel Stereo mode
- Inputs: L-R
- Mode: **L/R** or M/S, switchable
- Grid: **Solid** or Dotted

Loudness & SPL

Loudness and SPL measurements acc. to all relevant worldwide standards and guidelines including Dialog Gated Loudness and Loudness Range.

General

Functions:
- Loudness bargraph displays of the single channels, can be combined with PPM in various ways
- Loudness Sum: Momentary, Shortterm and Integrated of all channels of a format
- Test time control
- Dialog-based loudness measurement
- Numerical display of the sum, maximum, LRA, dialog gated and duration values
- Loudness Range instrument (LRA)
- SPL meter

Bargraph display:
- Loudness sum of the channels in selectable combination of the values:
  - M bargraph (Momentary - summation of momentary loudness values of all channels for a short span of time)
  - S bargraph (Shortterm - 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
- Dialog/No Dialog indicator

Bargraph orientation: **vertical**; vertical or horizontal selectable

Numerical display:
- **<all>**; M, S, I, LRA, TPmax, Mmax, Smax, I-Time values
- additionally for Dialog Gated measurement: SD, ID, LRAD, D

Specifications (continued)

Area-dependent settings

- Europe: EBU R128
- United Kingdom: EBU R128
- North/South America: ITU 1771
- Offtralia: OP-59
- Asia: ARIB

Standard-dependent settings:

In the defined loudness standards, specific parameters are fixed that cannot be changed or can only be changed in part. The setting ranges for changeable parameters ([1])) can be looked up under the corresponding designation in the “Customer-specific Loudness Mode” section.

ITU-BS.1771

Scales:	**ITU+9: +9..-18 LU**, ITU0: 0..-30 LKFS
Weighting filter:	ITU BS.1770 (k)
Target Level: [1])	**–24 LKFS**
Momentary:	400 ms
Shortterm: [1])	**3 s**
Integrated Silence Gate:	–70,0 LKFS, switchable
Integrated Relative Gate:	–10 LU, switchable
Tolerances	
- Over: [1])	**–2 dBTP**
- Headroom: [1])	**–9 dB**
- M, S high: [1])	**+1 LU**
- M, S low: [1])	**–1 LU**
- I high: [1])	**+2 LU**
- I low: [1])	**–2 LU**

EBU-R128

Scales:	**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
Weighting filter:	ITU BS.1770 (k)
Target Level: [1])	**–23 LUFS**
Momentary:	400 ms
Shortterm:	3 s
Integrated Silence Gate:	–70,0 LUFS
Integrated Relative Gate:	–10 LU
Tolerances	
- Over: [1])	**–1 dBTP**
- Headroom: [1])	**–9 dB**
- M, S, I high: [1])	**+1 LU**
- M, S, I low: [1])	**–1 LU**

ATSC-A/85, CALM Act, OP-59

Scales:	ITU+9: +9..-18 LU, **ATSC0: 0..-60 LKFS**, ATSC0a: 0..-30 LKFS
Weighting filter:	ITU BS.1770 (k)
Target Level: [1])	**–24 LKFS**
Momentary:	400 ms
Shortterm: [1])	**3 s**
Integrated Silence Gate:	–70,0 LKFS, switchable
Integrated Relative Gate:	–10 LU, switchable
Tolerances	
- Over: [1])	**–2 dBTP**
- Headroom: [1])	**–9 dB**
- M, S, I high: [1])	**+2 LU**
- M, S, I low: [1])	**–2 LU**

ARIB

Scale:	ATSC0: 0..-60 LKFS
Weighting filter:	ITU BS.1770 (k)
Target Level: [1])	**–24 LKFS**
Momentary:	400 ms
Shortterm:	3 s
Integrated Silence Gate:	–70,0 LKFS, switchable
Integrated Relative Gate:	–10 LU, switchable
Tolerances	
- Over: [1])	**–1 dBTP**
- Headroom: [1])	**–9 dB**
- M, S, I high: [1])	**0 LU**
- M, S, I low: [1])	**0 LU**

AGCOM

Scales:	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, ITU0: 0..-30 LKFS, **ATSC0: 0..-60 LKFS**, ATSC0a: 0..-30 LKFS
Weighting filter:	ITU BS.1770 (k)
Target Level: [1])	**–24 LKFS**
Momentary:	400 ms
Shortterm: [1])	**3 s**
Integrated Silence Gate:	–70,0 LKFS
Integrated Relative Gate:	–10 LU
Tolerances	
- Over: [1])	**–2 dBTP**
- Headroom: [1])	**–9 dB**
- M, S, I high: [1])	+2 LU
- M, S, I low: [1])	**–2 LU**

Streaming

Scales:	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, ITU0: 0..-30 LKFS, ATSC0: 0..-60 LKFS, ATSC0a: 0..-30 LKFS
Weighting filter:	ITU BS.1770 (k)
Target Level: [1])	**–15 LUFS**
Momentary:	400 ms
Shortterm:	3 s
Integrated Silence Gate:	–70,0 LUFS
Integrated Relative Gate:	–8 LU
Tolerances	
- Over: [1])	**–5 dBTP**
- Headroom: [1])	**–9 dB**
- M, S, I high: [1])	**+0,5 LU**
- M, S, I low: [1])	**–0,5 LU**

LEQ(M)

Scales:	**TASA**, SAWA
Weighting filter:	linear, A (Leq(A)), C, CCIR Leq(M), ITU BS.1770 (k)
Reference level:	**78 dB**; adjustable in the range from 68 to 88 dB in steps of 1 dB
Integration time:	IEC 1000 ms slow
Shortterm:	3 s
Integrated Silence Gate:	Off
Integrated Relative Gate:	Off
Tolerances	
- Over: [1])	**–2 dBTP**
- Headroom: [1])	**–9 dB**
- M, S, I high: [1])	**+1 LU**
- M, S, I low: [1])	**–1 LU**

Specifications (continued)

TASA

Scales:	TASA
Weighting filter:	linear, A (Leq(A)), C, CCIR Leq(M), ITU BS.1770 (k)
Reference level:	85 dB
Integration time:	IEC 1000 ms slow
Shortterm:	3 s
Integrated Silence Gate:	Off
Integrated Relative Gate:	Off
Tolerances	
- Over: [1]	-2 dBTP
- Headroom: [1]	-9 dB
- M, S, I high: [1]	+1 LU
- M, S, I low: [1]	-1 LU

SAWA

Scales:	SAWA
Weighting filter:	linear, A (Leq(A)), C, CCIR Leq(M), ITU BS.1770 (k)
Reference level:	82 dB
Integration time:	IEC 1000 ms slow
Shortterm:	3 s
Integrated Silence Gate:	Off
Integrated Relative Gate:	Off
Tolerances	
- Over: [1]	**–2 dBTP**
- Headroom: [1]	**–9 dB**
- M, S, I high: [1]	**+1 LU**
- M, S, I low: [1]	**–1 LU**

[1] Setting range see “Customer-specific Loudness Mode”

For more standards, see the corresponding article on our blog page on the Internet: rtw.com/en/standards (https://rtw.com/index.php?id=1609)

Customer-specific Loudness Mode (Custom)

Scales: [2]
Loudness scales:
- 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: [2]
- **–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

Momentary: [2]
- Window Time (SQR): **400 ms**; adjustable in the range from 200 ms to 1000 ms in steps of 100 ms
- Integration Time (IIR): IEC 125 ms Fast, 250 ms, 500 ms, 750 ms, IEC 1000 ms Slow, 1500 ms, 2000 ms selectable

Shortterm: [2]
- Integration Time: **3 s**; time window adjustable from 1 to 20 s in steps of 1 s

Integrated: [2]
- Silence Gate:
  - **–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 to 0 LU in steps of 0.5 LU, switchable

Level adjustment for the summation: [2]
- **0.0 dB** (L, R, C); adjustable between –6 and +6 dB in steps of 0.5 dB
- +1.5 dB (LS, RS, LSR, RSR), adjustable between –6 and +6 dB in steps of 0.5 dB
- Off (LFE); Off, 0 dB, 10 dB selectable

[2] Limited availability of settings depending on the Loudness standard used

Tolerances (different presets depending on the Loudness standard used):
- TP Over Sensitivity: **–1,0 dBTP**; adjustable in the range from 0 to –4 dBTP in steps of 0.1 dBTP
- TP Headroom: **–9.0 dB**; adjustable in the range from 0 to –20 dB in steps of 0.1 dB
- M High: **+1.0 LU**; M tolerance above Target Level, adjustable in the range from 0 to 10 LU in steps of 0.1 LU
- M Low: **–1.0 LU**; M tolerance below Target Level, adjustable in the range from 0 to –10 LU in steps of 0.1 LU
- S High: **+1.0 LU**; S tolerance above Target Level, adjustable in the range from 0 to 10 LU in steps of 0.1 LU
- S Low: **–1.0 LU**; S tolerance below Target Level, adjustable in the range from 0 to –10 LU in steps of 0.1 LU
- I High: **+1.0 LU**; I tolerance above Target Level, adjustable in the range from 0 to 10 LU in steps of 0.1 LU
- I Low: **–1.0 LU**; I tolerance below Target Level, adjustable in the range from 0 to –10 LU in steps of 0.1 LU

Dialog Gated

Scales:	ITU+9: +9..-18 LU, **ITU0: 0..-30 LKFS**
Weighting filter:	ITU BS.1770 (k)
Target Level:	**–24 LKFS**; adjustable in the range from –10 to –30 LKFS in steps of 1 LKFS
Momentary:	
- Window Time (SQR):	**400 ms**; adjustable in the range from 200 ms to 1000 ms in steps of 100 ms
- Integration Time (IIR):	IEC 125 ms Fast, 250 ms, 500 ms, 750 ms, IEC 1000 ms Slow, 1500 ms, 2000 ms selectable
Shortterm:	
- Integration Time:	**3 s**; time window adjustable from 1 to 20 s in steps of 1 s
Integrated Gate:	
- Absolute Threshold:	**–70.0 LKFS**; adjustable in the range from –80.0 to –40.0 LKFS in steps of 0.5 LKFS, switchable
- Relative Threshold:	**–10.0 LU**; adjustable in the range from –40.0 to 0 LU in steps of 0.5 LU, switchable

Specifications (continued)

Dialog Gated:
- Target Level: **–27 LKFS**; adjustable in the range from –30.0 to –10.0 LKFS in steps of 1 LKFS
- Threshold: **–15 %**; adjustable in the range from 0 to 100 % in steps of 1 %
- Absolute Threshold: **–70.0 LKFS**; adjustable in the range from –80.0 to –40.0 LKFS in steps of 0.5-LKFS, switchable
- Relative Threshold: **–10.0 LU**; adjustable in the range from –40.0 to 0 LU in steps of 0.5 LU, switchable
- Dialog channels: **L, R, C**; each available channel selectable

Tolerances:
- M, S High: **+1.0 LU**; M tolerance above Target Level, adjustable in the range from 0 to 10 LU in steps of 0.1 LU
- M, S Low: **–1.0 LU**; M tolerance below Target Level, adjustable in the range from 0 to –10 LU in steps of 0.1 LU
- I High: **+0.5 LU**; S tolerance above Target Level, adjustable in the range from 0 to 10 LU in steps of 0.1 LU
- I Low: **–0.5 LU**; S tolerance below Target Level, adjustable in the range from 0 to –10 LU in steps of 0.1 LU
- MD, SD High: **+1.0 LU**; I tolerance above dialog gated Target Level, adjustable in the range from 0 to 10 LU in steps of 0.1 LU
- MD, SD Low: **–1.0 LU**; I tolerance below dialog gated Target Level, adjustable in the range from 0 to –10 LU in steps of 0.1 LU
- ID High: **+0.5 LU**; S tolerance above dialog gated Target Level, adjustable in the range from 0 to 10 LU in steps of 0.1 LU
- ID Low: **–0.5 LU**; S tolerance below dialog gated Target Level, adjustable in the range from 0 to –10 LU in steps of 0.1 LU

Netflix

Scales: ITU+9: +9..-18 LU, **ITU0: 0..-30 LKFS**
Weighting filter: ITU BS.1770 (k)
Target Level: –24 LKFS
Momentary: 400 ms
Shortterm:
- Integration Time: 3 s

Integrated Gate:
- Absolute Threshold: –70.0 LKFS
- Relative Threshold: –10.0 LU

Dialog Gated:
- Target Level: –27 LKFS
- Threshold: **–15 %**; adjustable in the range from 0 to 100 % in steps of 1 %
- Absolute Threshold: **–70.0 LKFS**; adjustable in the range from –80.0 to –40.0 LKFS in steps of 0.5-LKFS, switchable
- Relative Threshold: **–10.0 LU**; adjustable in the range from –40.0 to 0 LU in steps of 0.5 LU, switchable
- Dialog channels: **L, R, C**; each available channel selectable

Toleranzen
- M, S High: **+1.0 LU**; M tolerance above Target Level, adjustable in the range from 0 to 10 LU in steps of 0.1 LU
- M, S Low: **–1.0 LU**; M tolerance below Target Level, adjustable in the range from 0 to –10 LU in steps of 0.1 LU
- I High: **+0.5 LU**; S tolerance above Target Level, adjustable in the range from 0 to 10 LU in steps of 0.1 LU
- I Low: **–0.5 LU**; S tolerance below Target Level, adjustable in the range from 0 to –10 LU in steps of 0.1 LU
- MD, SD, ID High: **+2.0 LU**; I tolerance above dialog gated Target Level, adjustable in the range from 0 to 10 LU in steps of 0.1 LU
- MD, SD, ID Low: **–2.0 LU**; I tolerance below dialog gated Target Level, adjustable in the range from 0 to –10 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.
- Level for gate: **–85.0 LUFS/LKFS**; adjustable in the range from –85 to –10 LUFS/LKFS in steps of 0.5 LUFS/LKFS

Stop:
- Functions: **manual control only**, autostop with gate, autostop with gate and time.
- Level for gate: **–85.0 LUFS/LKFS**; adjustable in the range from –85 to –10 LUFS/LKFS in steps of 0.5 LUFS/LKFS
- Time for gate: **1 s;** adjustable in the range from 1 to 15 s in steps of 1 s

Loudness Range Instrument (LRA)

Display: Graphical display of the Loudness Range of the I measurement
Mode: **LRA Bar**; LRA Bar, MagicLRA, MagicLRA + I, MagicLRA + I + Num selectable
Scale range: **10 LU**; 6 LU, 10 LU, 20 LU, 30 LU selectable
LRA low range: **2 LU**; adjustable in the range from 0 to 30 LU in steps of 0.5 LU
Comfort zone: **4 LU**; adjustable in the range from 0 to 30 LU in steps of 0.5 LU
LRA high range: depends on the selected scale range and the spread of the comfort zone
Colors: 32 individually selectable for each section

SPL Meter

Display: Bargraph for summation of channels
Orientation: **vertical**; vertical or horizontal selectable
Weighting: **A (Leq(A))**; Linear, A (Leq(A)), C, CCIR (Leq(M)), ITU BS.1770 (k) selectable
Integration time: **Fast**; Fast (125 ms), Slow (1 s) selectable
Reference point: **78 dB(A)**; adjustable in the range from 68 to 88 dB(A) in steps of 1 dB
Scale range: includes 32 dB
Scale:
- 68 to 88 dB(A) in steps of 2 dB with reference point 78 dB(A)
- Changes when changing the reference point
- Changing the reference point does not change the reference level

Specifications (continued)

Loudness Chart Instrument

Functions:
- Horizontal running bargraphs with individually definable colors evaluate the common quality of Loudness values TP, M, S, I acc. to selected standard
- Progress of a measurement (value over time) of one of the four selectable values M, S, I or TP drawn as graph in a coordinate system
- Vertical bargraph for the selected value
- Adjustable time ranges
- TP scale and operation range selectable

Display:
- Bargraph:
  Color change of the running bargraph indicates the section the loudness value is moving in: normal range, operation range, Headroom, Over (availability depending on selected value)
- Chart-Graph:
  Continuously drawn graph (value over time) of one value as line with colored filling corresponding to the color selection of the horzontal bargraphs, added with Tolerance Indicator or position of the relative gate (if selected)
- Buttons for the selection of the loudness value and the time range

Time Range: Time grid adjustment for the coordinate system and the horizontal bargraphs: **Auto**, 10 s, 30 s, 1 min, 5 min, 10 min, 30 min, 1 h, 2 h selectable

TP-Skala: **TP60: +3 .. –60 dB**, TP20: +3 .. –20 dB

TP-Arbeitsbereich: **0 dB**; einstellbar im Bereich von 0 bis –20 dB in 1-dB-Schritten

Colors: 32 individually selectable for normal range, operation range and Headroom

Optional Ethernet Power Injector 14554-xx

This IEEE 802.3af-compliant power injector is required when the Dante® AoIP network provides insufficient or no power over Ethernet (PoE).

Manufacturer:	Phihong Technology Co., Ltd., No. 568, Fusing 3rd RD., Gueishan District, Taoyuan City, Taiwan
Model:	POE15M-1AFE - Single Port Power over Ethernet (PSE), Gigabit-compatible
Standard:	IEEE 802.3af
Input:	100 - 240 V AC, 800 mA, 50 - 60 Hz
Output:	56 V DC, 275 mA, 15.4 W
Performance class:	0
PD power range:	0.44 to 12.94 W
PSE power usage:	maximum: 15.4 W
Certificates:	CE, UKCA, UL (Canada, US), FCC, IC, LPS, CAN ICES-3(B)/NMB-3(B)
Territorial coverage:	North America, Canada, Europe, Great Britain, Australia/New Zealand

Items of Delivery

TouchControl 5 Dante®:
- Dante® based immersive audio meter
- User customizable table-top device with 5" touch display and 16 Dante®-channels for stereo, surround and immersive formats
- Premium metering (PPM, TP, Moving Coil)
- Audio Vectorscope, Stereo Correlator
- Loudness, SPL and LRA
- Chart instrument (Loudness over time)
- Table-stand
- Quick start guide

Order no.: 220517NT

TouchControl 5 RAVENNA®:
- RAVENNA®/AES67/ST 2110-based immersive audio meter
- User customizable table-top device with 5" touch display and 16 RAVENNA®-channels for stereo, surround and immersive formats
- Premium metering (PPM, TP, Moving Coil)
- Audio Vectorscope, Stereo Correlator
- Loudness, SPL and LRA
- Chart instrument (Loudness over time)
- Table-stand
- Quick start guide

Order no.: 220518NT

Optional Accessories

- Ethernet Power Injector **14554**, PoE table-top device with corresponding mains cable for different regions:
  - Europe: **14554-EU** (mains cable for Europe or similar)
  - USA: **14554-US** (mains cable for USA or similar)
  - Australia: **14554-AU** (mains cable for Australia or similar)
  - UK: **14554-GB** (mains cable for United Kingdom or similar)
  - International: **14554-IN** (includes all cables)
- Metal mounting plate **1166** for mounting with 3/8" holds (e. g. gooseneck, mic stand)

RTW GmbH & Co. KG
Am Wassermann 25 | 50829 Koeln (Cologne) | Germany
Phone: +49 221 70 913-0
Internet: www.rtw.com | E-Mail: sales@rtw.com

EYES ON YOUR AUDIO