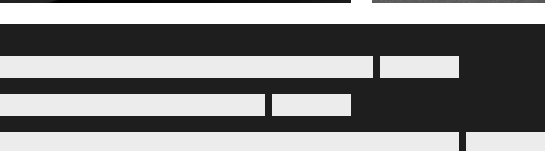


# Data Sheet TouchControl 5



# TouchControl 5



**Touch Screen • Flexible Screen Layout • Pushable Rotary Knob • AoIP I/O • 32 Channels • Speaker Calibration • SPL • Chart Fader • PPM/TP • Multichannel • Immersive • Loudness • LRA • RTA • Prem. Metering • VSC • Monitor Control • Bass Management**

TouchControl 5 is a compact AoIP (Audio over IP) based monitor controller, using the monitor control engine of the well-known SurroundControl. It supports AoIP standards (Dante® or RAVENNA®/AES67/ST 2110) and can be powered over ethernet. It features instant control over a high channel

count: up to 32 audio channels can be controlled with one single knob. Besides others, it provides a high-quality microphone input, speaker output, headphone output and features e. g. mute/solo, metering, SPL measurement and talkback.

## Graphical User Interface

The TouchControl 5's graphical user interface is controlled simply by the touch of your finger and the pushable rotary knob. 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, TouchControl 5 can be adapted to your individual needs within the AoIP network (Dante® or RAVENNA®).

# The Device

## Hardware

- 5" capacitive touch screen 16 : 9 TFT (1280 x 720 pixel) with multitouch functionality **1**
- 32-channel audio over IP interface for Dante® or RAVENNA® audio networks (RJ-45 ethernet) **4**
- Power supply via ethernet connection (PoE - power over ethernet, IEEE802.3af compliant) **4**
- Integrated Microphone for SPL measurement & talkback **2**
- Studio-grade 48 V phantom powered high-quality microphone input (XLR) **5**
- Powerful headphone output e. g. for monitoring a user-defined downmix (6.3 mm Stereo jack) **6**
- Analog 2-channel stereo loudspeaker output (Line Out - 3.5 mm Stereo jack) **7**
- Control via touch screen and pushable rotary knob **1 3**
- Freely scalable and positionable applications and instruments
- Up to 31 presets selectable

## Software

- Device configuration via IP address and Web App within the Dante® or RAVENNA® network (web-based interface)
- Toolbox with simple TruePeak meter and up to four on-screen faders (slider) for up to 32 channels, Talkback application
- Support for Stereo, Surround, Immersive and Multichannel formats for up to 32 channels incl. 5.1 and 7.1.4 formats
- Loudness & SPL functions acc. to all common standards, Loudness Chart and Loudness Range instrument (LRA)
- Comprehensive functions for Monitor Control (like Solo, Cut, Phase, DIM, Mute) and loudspeaker level calibration, 8-band equalizer, SPL measurement, Bass Management and up to 4 sources and 4 destinations (loudspeaker sets)
- Premium Metering with Multiformat-PPM and TP meter incl. comprehensive scales and Moving Coil needle instruments, Audio Vectorscope and Real Time Analyzer



320517ND (Dante®) | 320518ND (RAVENNA®)

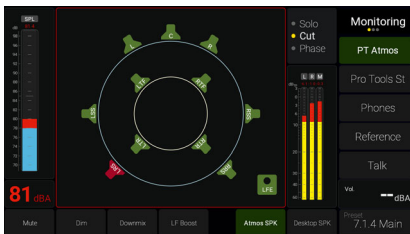


# Essential Features

TouchControl 5 is equipped with a comprehensive software package. Beside the control functions, the software provides various applications and instruments that can be used individually depending on the area of application. Core of the system is the pushable rotary knob and the Monitoring application, which you can use to calibrate, control and monitor your monitoring system. With the Metering application, which can be positioned up to four times, you can carry out extensive measurement tasks. And with the Leveling application, which can also be used four times, you can control the level of individual formats or channel groups.

Not forgetting the Talkback application, which can be used to address any node in the audio network via the built-in or an external microphone. And when placed up to four times, Intercom communication between several TouchControl 5 units is possible.

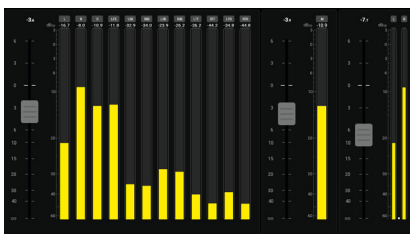
## Monitor Control



This application includes downmix, DSP-supported speaker calibration (with internal or external microphone), SPL display, selection of up to 4 sources and up to 4 speaker sets, solo, cut, phase, mono, dim, mute and test tone generator. The SPL display (bar graph and/or numerical) shows the sound pressure level measured live in your room.

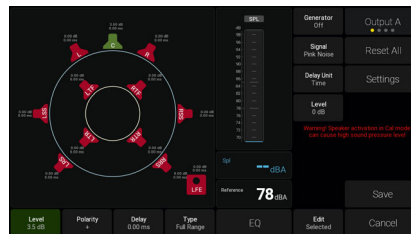
The downmix instrument outputs surround or immersive mixes in stereo and mono to speakers, headphones or any AoIP channel. Each speaker can be muted or soloed or its phase can be rotated.

## Leveling



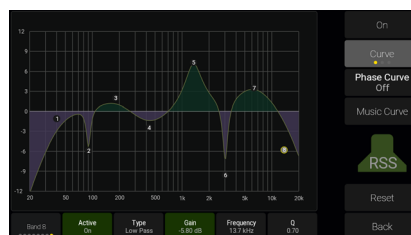
This application is used for independent control (leveling) of individual channels or channel groups with up to 4 faders and simple TP meters, which can be combined with the rotary knob for relative level control of several channel groups.

## Loudspeaker Level Calibration



The speakers in the setup can be calibrated with regards to level, delay and EQ. The support for measurement microphones, the built-in test tone generator and the live input SPL meter form the tool combination for calibrating the speaker levels.

## Loudspeaker DSP section



Each speaker has a DSP section for ultimate control. Delay, gain and phase can be set individually, and a 8-band EQ is available for each speaker in each setup.

## Talkback

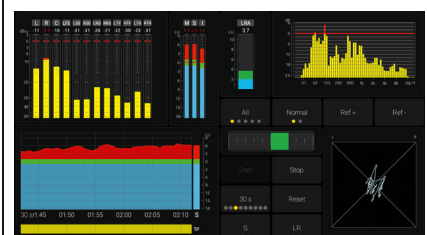
This application uses the built-in or an external microphone as an intercom microphone to address each node in the audio network including Intercom functionality. Up to 4 instances are possible.

## Bass Management



Up to two LFE channels with adjustable crossover frequencies can be adapted to the requirements with the bass management. Full-range speakers and smaller speakers can be finely tuned to each other and operated in the same system. HP filters for bass-controlled speakers, all-pass filters for other speakers and an additional SUB output channel for formats without LFE are also available.

## Metering



This application provides the familiar RTW Premium metering functions and instruments: Multiformat PPM, TP meter, Moving Coil needle instruments, loudness measurement and calculation, loudness range, chart, SPL display, SPL sum value calculation, Audio Vectorscope and Real Time Analyzer. Up to 4 instances are possible.



## Essential Features (continued)

### Web-based Interface

The TouchControl 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 Dante® or RAVENNA® 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.

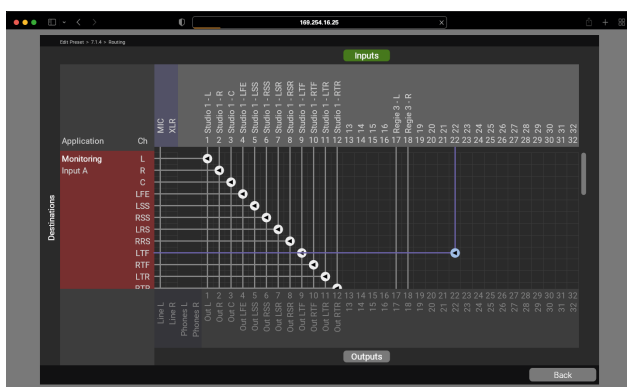


### Extensive Routing

The routing matrix is used to determine the audio channels to be used as inputs and outputs in the preset. The 32 channels assigned in the Dante Controller™ resp. the RAVENNA® manager and the physical inputs and outputs offer many possibilities. For example, the same channels can be used for monitoring and metering. Or they can be split up so that metering is independent of monitoring.

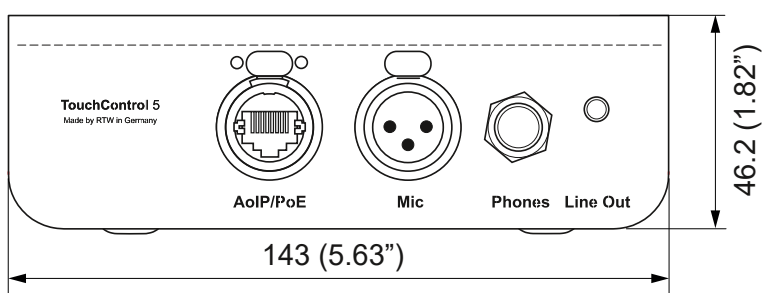
### Own Display Views

TouchControl 5 allows you to design up to three of your own display views. Independently from the applications, you can place any instrument in any view and determine its size and ratio. 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 are available on all display views of the preset.

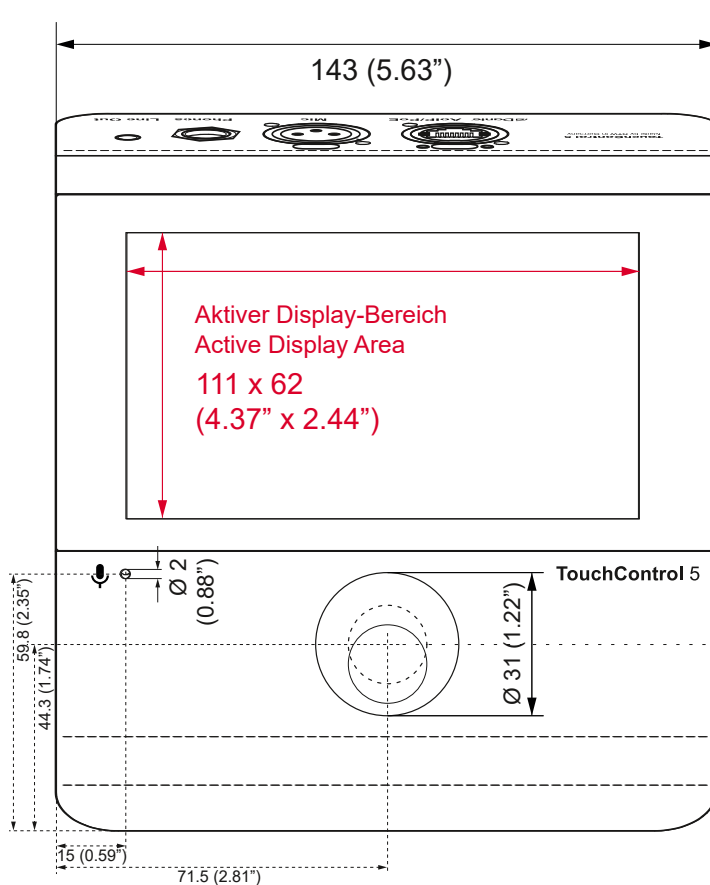


# Dimensions

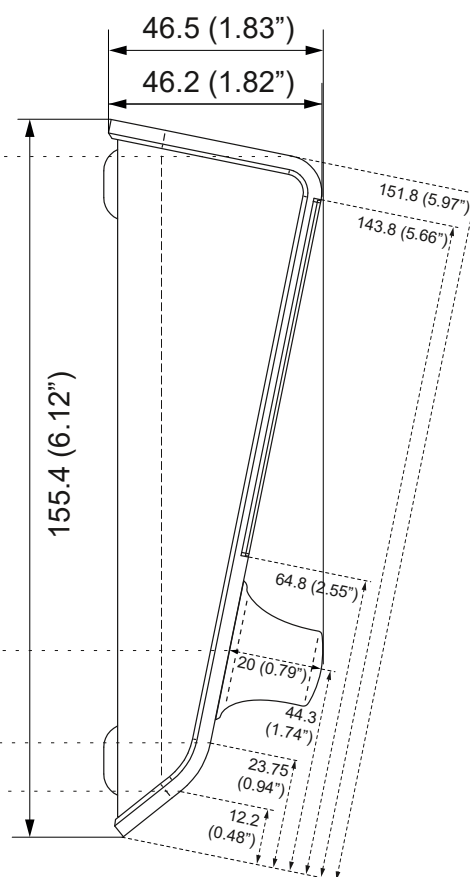
## TouchControl 5 Desk-top Unit (320517ND/320518ND)



1 | Rear view | dimensions in mm (inch)



2 | Front view/top view | dimensions in mm (inch)



3 | Side view | dimensions in mm (inch)



# Connections

## Connectors



**NOTE** - The power supply of the TouchControl 5 is done via the network connection (AoIP/PoE) and the Dante® (320517ND) resp. RAVENNA® (320518ND) AoIP network without any additional cable, if this network has the Power over Ethernet functionality (PoE - IEEE 802.3af-compliant) **1**.

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 **2**.

**TouchControl 5**  
Made by RTW in Germany

**AoIP/PoE**  
Use plug type etherCON NE8MX-6-T/ NE8MX6 + wired CAT-7 S/FTP shield \*)

**Mic**  
(Use XLR-M plug)

**Phones**  
(Use 6.3 mm jack)

**Line Out**  
(Use 3.5 mm jack)

**1** PoE Network  
AC PoE PoE ✓

**2** PoE Injector  
IEEE 802.3af RTW 14554-xx  
AC OUT IN PoE ✗

**AoIP**  
max. 30 m

**Mic**

**Phones**

**Line Out**

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

# 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 wit multitouch funtion (1280 x 720 pixel)
Connectors:	1 x RJ-45: LAN/Ethernet built-in socket NE8FD type for Dante® audio over IP and power supply (PoE - IEEE 802.3af-compliant) 1 x 3-pin XLR-F (microphone input, switchable phantom powered 48 V - Mic), 3 kOhm 1 x 1/4 inch Stereo jack (6.3 mm headphone output - Phones) 1 x 3,5 mm Stereo jack (analog loudspeaker output - Line Out)
Dimensions (W x H x D):	143 x 46,5 x 155,4 mm
Weight:	approx. 830 g
Operating temperature:	+5° to +35° C

Functions (Availability depends on selected application)

- Operation with touch sensitive display and pushable rotary knob
- Instruments and controls can freely be scaled and positioned
- Monitor Control and SPL measurement for up to 4 sources/destinations
- Integrated and calibrated microphone for SPL measurment and talkback
- Studio-grade 48 V phantom powered high-quality microphone input (XLR)
- Powerful 1/4 inch Headphones output with the option of monitoring a user-defined downmix (6.3 mm Stereo jack)
- Analog 3.5mm speaker output with the option of monitoring a user-defined downmix (3.5 mm Stereo jack)
- Multiformat PPM and TP meter for level metering of up to 32 channels with in different configurations (Mono, Stereo, Surround, Immersive or Multichannel)
- 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
- Loudness Test Time Control
- Loudness Range instrument (LRA)
- Loudness Chart (Loudness over time)
- SPL meter
- Test signal generator
- Moving Coil (BR, VU, Loudness, BBC mode)
- Spot Correlator in the Stereo bargraph display
- Audio Vectorscope, Real Time Analyzer
- Downmix with adjustable coefficients
- Numerical displays
- Up to 4 on-screen fader and simple TP Meter for the simultaneous control of up to 32 input channels

- Bass Management for up to 4 loudspeaker sets
- Level calibration for each individual loudspeaker in each of the output sets
- 8-band equalizer for each loudspeaker
- 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, 22.2, Array)
- 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 AoIP network

### Digital Inputs

Inputs:	32 Audio over IP inputs (network channels, Dante® or RAVENNA® depending on the device type) via the RJ-45 built-in socket NE8FD type
Sample rates:	44.1, 48, 88.2, 96 kHz
Word width:	16, 24, 32 bit

### Digital Outputs

Outputs:	32 Audio over IP outputs (network channels, Dante® or RAVENNA® depending on the device type) via the RJ-45 built-in socket NE8FD type referenced to digital inputs or internal clock
Sample rates:	

### Latency

Internal device latency:	3 ms (independent from sample rate)
Minimum network latency:	▪ Dante®: 1 ms (Dante Controller™) ▪ RAVENNA®: 0.25ms

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

### Pushable Rotary Knob

Function:	<ul style="list-style-type: none"><li>▪ Turn to control the volume with definable listening level (individual, initial, maximum)</li><li>▪ Push to trigger a defined action</li><li>▪ On the <b>Calibration</b> screen: Rotate to select options for activated buttons</li><li>▪ On the <b>Calibration</b> screen: Push to deactivate all selected speakers</li></ul>
Push function:	<b>Mute</b> , DIM, Recall Reference Volume. Allocation of a function in the WebApp
Volume:	
- user-defined:	<b>78 dBC/dBA</b> ; adjustable in the range from 10 to 100 dBC/dBA in steps of 0.5 dB or off. Volume can be called up at any time by touching the <b>Reference</b> button placed on the screen or by pushing the rotary knob when the corresponding push function is defined
- maximum:	<b>100 dBC/dBA</b> ; adjustable in the range from 60 to 100 dBC/dBA in steps of 0.5 dB or off
- at power on:	last set monitoring level, reference monitoring level or none (Silence)
- at preset recall:	last set monitoring level, reference monitoring level or none (Silence)
Unit:	▪ absolute: dBC oder dBA or ▪ relative (dB): 0 dB refers to the selected reference level (e. g. 78 dBA)





## Specifications (continued)

### Application Leveling

Used for independent control (leveling) of individual channels or channel groups with up to 4 on-screen sliders (faders), which can be combined with the rotary knob for relative level control of several channel groups.

Up to 4 instances are possible.

- Functions:
- Digital fader for the level control of up to 32 channels in different formats
  - Up to 4 faders simultaneously possible
  - Change of the different levels of selected faders by the use of the rotary knob
  - Simple TruePeak meter with fixed labeling and scale
  - Spot Correlator in Stereo mode

#### Digital fader

Fader range: **0 dB \***; adjustable from -infinity to +6 dB in steps of 1 dB

#### TP-Meter

- Display: Up to 4 TP meter, coupled with faders
- Scale: **TP60: +3..-60 dB**

\*) Default values are in **bold**.

### Application Talkback

Provides the option of using the built-in or an external microphone as an intercom microphone that can address any node in the audio network.

Up to 4 instances are possible.

#### Talkback

- Function:
- Instrument for using the internal or external microphone for Talkback
  - Adjustment via input/output routing
  - With enabled Monitoring application DIM is active
- Hold function. as switch (**hold**) or push button (momentary)
- Talkback source: Internal microphone (MIC), external microphone (XLR) or any AoIP audio channel
- Internal source:
- Internal Mic Gain: **0 dB**; adjustable in the range from 0 to +40 dB in steps of 0.5 dB
- External source:
- Talkback level trim: **0 dB**; adjustable in the range from -12 to +12 dB in steps of 0.5 dB (inputs of other applications inside the preset can be influenced)
  - High-Pass-Filter: **Off** or On
  - High-Pass-Frequenz: **120 Hz**; adjustable in the range from 80 to 250 Hz in steps of 1 Hz
  - Phantom Power: **Off** or On
  - XLR-Gain: **0 dB**; adjustable in the range from -8 to 60 dB in steps of 0.5 dB

### Application Metering

Provides the familiar RTW Premium metering functions (multi-format PPM and TP meter, moving coil, RTA, audio vectorscope) and the functions for loudness calculation, loudness range display, chart, SPL display and sum SPL value calculation, vectorscope and real time analyzer.

Up to 4 instances are possible.

#### General

- Input sources: 32 network channels, Mic In, Internal Mic
- Output destinations: 32 channels, Headphone Out, Line Out
- Formats: Mono, Stereo, Surround, Immersive, Multichannel
- Mono: several single channel signals selectable
  - Stereo: several 2-channel Stereo pair 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, 22.2, Array selectable
  - Multichannel: **8**; 1 to 32 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)
  - BR IIb ext: +12..-12 dB (Attack: 20 ms)
  - Zoom10: +10 .. -10 (Attack: 10 ms)
  - Zoom1: +1 .. -1 (Attack: 10 ms)



## Specifications (continued)

Scale marker:	<b>Off</b> ; switchable in the range from -30 to 0 dB in steps of 0.5 dB or Off
Headroom:	<ul style="list-style-type: none"> <li>▪ <b>-9 dB</b>; adjustable in the range from 0 to -20 dB in steps of 1 dB (not available for Dig40, Dig0, Dig18, ARD9)</li> <li>▪ fixed with reference 997 Hz for: <ul style="list-style-type: none"> <li>- Dig40:+20..-40dB: 0 dB fixed at -20 dBFS, Headroom up to +20 dB at 0 dBFS</li> <li>- Dig0:+18..0dB: 0 dB fixed at -18 dBFS, Headroom up to +18 dB at 0 dBFS</li> <li>- Dig18:+18..-18dB: 0 dB fixed at -18 dBFS, Headroom up to +18 dB at 0 dBFS</li> <li>- ARD9:+9..-60dB: 0 dB fixed at -9 dBFS, Headroom up to +9 dB at 0 dBFS</li> </ul> </li> </ul>
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 BR11 scales also 150 ms
Gain:	+20 dB, +40 dB acc. to standard
High-pass filter:	<b>Off</b> ; 5 Hz, 10 Hz, 20 Hz or Off selectable (not for TP scales)
Peakhold display:	<b>Off</b> ; 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:	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 TruePeak	
- Threshold:	<b>-1 dBTP</b> ; adjustable in the range from -3 to +3 dBTP in steps of 0.1 dBTP

### 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:	<ul style="list-style-type: none"> <li>▪ BR IIa: 7..1 (default)</li> <li>▪ BR IIb: +12..-12 dB</li> </ul>
- Integration time:	<b>10 ms</b> ; Sample, 0,1 ms, 1 ms, 10 ms, 20 ms, 150 ms selectable
- Headroom Ref:	<b>-10 dB</b> ; adjustable in the range from 0 to -20 dB in steps of 1 dB
- S mode:	only available, if M/S type is selected: M3, M6
- Peak indicator:	<b>off</b> ; Peak, True Peak, BR Peak, off selectable
- BR Peak Threshold:	<b>6</b> <ul style="list-style-type: none"> <li>▪ BR IIa: adjustable in the range from 4 to 7 dB in steps of 0.25</li> <li>▪ BR IIb: adjustable in the range from 0 to 12 dB in steps of 1 dB</li> </ul>
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:	<ul style="list-style-type: none"> <li>▪ PPM: see above</li> <li>▪ Loudness: +9 to -9 LU fixed (center of the scale represents the Target Level of the selected Loudness standard)</li> </ul>
Numerical display:	switchable in all modes

### Stereo Correlator

Display:	Bargraph, additional spot indicator between PPM bargraphs
Scale range:	-1 r to 0 to +1 r
Standard color setting:	<ul style="list-style-type: none"> <li>▪ red: -1 r to -0.1 r</li> <li>▪ white: 0 r (-0.1 r to +0.1 r)</li> <li>▪ green: +0.1 r to +1 r</li> </ul>
Attack/release time:	1.0 s/2.5 s

### Audio Vectorscope

Function:	2-channel display of the phase interaction of any two channels on a rotated coordinate system (Lissajous figure)
Inputs:	Any pair selectable for the display
Mode:	<b>L/R</b> or M/S, switchable
Grid display:	<b>Solid</b> or Dotted
Colors:	24 colors each for background, background grid, grid, waveform

### Loudness & SPL

Loudness and SPL measurements acc. to all relevant worldwide standards and guidelines like ITU-R BS.1770-4/1771-1, EBU R128, ATSC A/85, ARIB, OP-59, AGCOM, CALM Act, LEQ(M), TASA, SAWA, SPL, including Dialog Gated Loudness and Loudness Range.

### General

Functions:	<ul style="list-style-type: none"> <li>▪ Loudness bargraph displays of the single channels, can be combined with PPM in various ways</li> <li>▪ Loudness Sum: Momentary, Shortterm and Integrated of all channels of a format</li> <li>▪ Test time control</li> <li>▪ Dialog-based loudness measurement with own summing and numeric instruments</li> <li>▪ Numerical display of the sum, maximum, LRA and duration values</li> <li>▪ Loudness Range instruments (LRA, LRA D)</li> <li>▪ SPL</li> <li>▪ Loudness sum of the channels in selectable combination of the values: <ul style="list-style-type: none"> <li>- M bargraph (Momentary - summation of momentary loudness values of all channels for a short span of time)</li> <li>- S bargraph (Shortterm - loudness summation value of an adjustable dynamic time frame)</li> <li>- I bargraph (Integrated - long term loudness value infinite or manual control)</li> <li>- adjustable tolerance range for M, S, I</li> </ul> </li> <li>▪ Separate Loudness Sum display for dialog-based measurements</li> <li>▪ Dialog/ no dialog indicator</li> </ul>
Bargraph display:	
Bargraph orientation:	<b>vertical</b> or horizontal selectable



## Specifications (continued)

Numerical display: **M, S, I, LRA, TP Max, Time**; available values depending on selected Loudness standard:  
M, S, I, LRA, TPmax, Mmax, Smax, Time, PLR, LDR, S dialog, I Dialog, LRA Dialog, Dialog Amount,

### Area-dependent settings

- Europe: EBU R128
- United Kingdom: EBU R128
- North/South America: ITU 1771
- Australia: 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 (°) 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: °) **-24 LKFS**  
Momentary: 400 ms  
Shortterm: °) **3 s**  
Integrated Silence Gate: -70,0 LKFS, switchable  
Integrated Relative Gate: -10 LU, switchable  
Tolerances  
- Over: °) **-2 dBTP**  
- Headroom: °) **-9 dB**  
- M, S, I high: °) **+2 LU**  
- M, S, I low: °) **-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: °) **-23 LUFS**  
Momentary: 400 ms  
Shortterm: 3 s  
Integrated Silence Gate: -70,0 LUFS  
Integrated Relative Gate: -10 LU  
Tolerances  
- Over: °) **-1 dBTP**  
- Headroom: °) **-9 dB**  
- M, S, I high: °) **+1 LU**  
- M, S, I low: °) **-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: °) **-24 LKFS**  
Momentary: 400 ms  
Shortterm: °) **3 s**  
Integrated Silence Gate: -70,0 LKFS, switchable  
Integrated Relative Gate: -10 LU, switchable  
Tolerances  
- Over: °) **-2 dBTP**  
- Headroom: °) **-9 dB**  
- M, S, I high: °) **+2 LU**  
- M, S, I low: °) **-2 LU**

#### ARIB

Scale: ATSC0: 0..-60 LKFS  
Weighting filter: ITU BS.1770 (k)  
Target Level: °) **-24 LKFS**  
Momentary: 400 ms  
Shortterm: 3 s  
Integrated Silence Gate: -70,0 LKFS, switchable  
Integrated Relative Gate: -10 LU, switchable  
Tolerances  
- Over: °) **-1 dBTP**  
- Headroom: °) **-9 dB**  
- M, S, I high: °) **0 LU**  
- M, S, I low: °) **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  
ITU BS.1770 (k)  
Weighting filter: ITU BS.1770 (k)  
Target Level: °) **-24 LKFS**  
Momentary: 400 ms  
Shortterm: °) **3 s**  
Integrated Silence Gate: -70,0 LKFS  
Integrated Relative Gate: -10 LU  
Tolerances  
- Over: °) **-2 dBTP**  
- Headroom: °) **-9 dB**  
- M, S, I high: °) **+2 LU**  
- M, S, I low: °) **-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  
ITU BS.1770 (k)  
Weighting filter: ITU BS.1770 (k)  
Target Level: °) **-15 LUFS**  
Momentary: 400 ms  
Shortterm: 3 s  
Integrated Silence Gate: -70,0 LUFS  
Integrated Relative Gate: -8 LU  
Tolerances  
- Over: °) **-5 dBTP**  
- Headroom: °) **-9 dB**  
- M, S, I high: °) **+0,5 LU**  
- M, S, I low: °) **-0,5 LU**

#### Customer-specific Loudness Mode (Custom)

Scales: °) 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; A, C, CCIR, k filter acc. to ITU BS.1770, or switchable (None)  
Target Level: °)   
▪ **-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



## Specifications (continued)

### Momentary: <sup>2)</sup>

- 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 (IRT), 500 ms, 750 ms, IEC 1000 ms Slow, 1500 ms, 2000 ms selectable

### Shortterm: <sup>2)</sup>

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

### Integrated: <sup>2)</sup>

- 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: <sup>2)</sup>

- **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

<sup>2)</sup> 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 -12 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 -12 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 -12 LU in steps of 0.1 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: <sup>1)</sup> **-2 dBTP**
  - Headroom: <sup>1)</sup> **-9 dB**
  - M, S, I high: <sup>1)</sup> **+1 LU**
  - M, S, I low: <sup>1)</sup> **-1 LU**

### 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: <sup>1)</sup> **-2 dBTP**
  - Headroom: <sup>1)</sup> **-9 dB**
  - M, S, I high: <sup>1)</sup> **+1 LU**
  - M, S, I low: <sup>1)</sup> **-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: <sup>1)</sup> **-2 dBTP**
  - Headroom: <sup>1)</sup> **-9 dB**
  - M, S, I high: <sup>1)</sup> **+1 LU**
  - M, S, I low: <sup>1)</sup> **-1 LU**

<sup>1)</sup> 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/en/standards) (<https://rtw.com/index.php?id=1609>)

### SPL

- Display: Bargraph for summation of channels
- Orientation: **vertical** or horizontal selectable
- Weighting: **A**; Linear (None), A, C, CCIR, K (ITU BS.1770) selectable
- M Integration time: **IIR: 125 ms (fast)** oder IIR: 1000 ms (Slow) selectable
- Target level: **78 dB**; adjustable in the range from 68 to 88 dB in steps of 1 dB
- Reference point: **78 dB**; adjustable in the range from 68 to 88 dB in steps of 1 dB

### 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:		- MD, SD, ID High:	<b>+2.0 LU</b> ; I tolerance above dialog gated Target Level, adjustable in the range from 0 to 10 LU in steps of 0.1 LU
- Target Level:	<b>-27 LKFS</b> ; adjustable in the range from -30.0 to -10.0 LKFS in steps of 1 LKFS	- MD, SD, ID Low:	<b>-2.0 LU</b> ; I tolerance below dialog gated Target Level, adjustable in the range from 0 to -10 LU in steps of 0.1 LU
- Threshold:	<b>-15 %</b> ; adjustable in the range from 0 to 100 % in steps of 1 %		
- Absolute Threshold:	<b>-70.0 LKFS</b> ; adjustable in the range from -80.0 to -40.0 LKFS in steps of 0.5-LKFS, switchable		
- Relative Threshold:	<b>-10.0 LU</b> ; adjustable in the range from -40.0 to 0 LU in steps of 0.5 LU, switchable		
- Dialog channels:	<b>L, R, C</b> ; each available channel selectable		
Tolerances:			
- M, S High:	<b>+1.0 LU</b> ; M tolerance above Target Level, adjustable in the range from 0 to 10 LU in steps of 0.1 LU		
- M, S Low:	<b>-1.0 LU</b> ; M tolerance below Target Level, adjustable in the range from 0 to -10 LU in steps of 0.1 LU		
- I High:	<b>+0.5 LU</b> ; S tolerance above Target Level, adjustable in the range from 0 to 10 LU in steps of 0.1 LU		
- I Low:	<b>-0.5 LU</b> ; S tolerance below Target Level, adjustable in the range from 0 to -10 LU in steps of 0.1 LU		
- MD, SD High:	<b>+1.0 LU</b> ; 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:	<b>-1.0 LU</b> ; I tolerance below dialog gated Target Level, adjustable in the range from 0 to -10 LU in steps of 0.1 LU		
- ID High:	<b>+0.5 LU</b> ; S tolerance above dialog gated Target Level, adjustable in the range from 0 to 10 LU in steps of 0.1 LU		
- ID Low:	<b>-0.5 LU</b> ; S tolerance below dialog gated Target Level, adjustable in the range from 0 to -10 LU in steps of 0.1 LU		
<b>Netflix</b>			
Scales:	ITU+9: +9..-18 LU, <b>ITU0: 0..-30 LKFS</b>		
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:	<b>-15 %</b> ; adjustable in the range from 0 to 100 % in steps of 1 %		
- Absolute Threshold:	<b>-70.0 LKFS</b> ; adjustable in the range from -80.0 to -40.0 LKFS in steps of 0.5-LKFS, switchable		
- Relative Threshold:	<b>-10.0 LU</b> ; adjustable in the range from -40.0 to 0 LU in steps of 0.5 LU, switchable		
- Dialog channels:	<b>L, R, C</b> ; each available channel selectable		
Toleranzen			
- M, S High:	<b>+1.0 LU</b> ; M tolerance above Target Level, adjustable in the range from 0 to 10 LU in steps of 0.1 LU		
- M, S Low:	<b>-1.0 LU</b> ; M tolerance below Target Level, adjustable in the range from 0 to -10 LU in steps of 0.1 LU		
- I High:	<b>+0.5 LU</b> ; S tolerance above Target Level, adjustable in the range from 0 to 10 LU in steps of 0.1 LU		
- I Low:	<b>-0.5 LU</b> ; S tolerance below Target Level, adjustable in the range from 0 to -10 LU in steps of 0.1 LU		
		<b>Loudness Test Time Control</b> (Trigger Settings)	
		Settings for operating automatic, semi-automatic or manual loudness measurements.	
		Start:	
		- Functions:	<b>Autostart after preset load</b> , autostart with gate, autostart with gate and autoreset, manually via keys.
		- Level for gate:	<b>-70,0 LUFS/LKFS</b> ; adjustable in the range from -85 to -10 LUFS/LKFS in steps of 0.5 LUFS/LKFS
		Stop:	
		- Functions:	<b>manual control only</b> , autostop with gate, autostop with gate and time.
		- Level for gate:	<b>-70,0 LUFS/LKFS</b> ; adjustable in the range from -85 to -10 LUFS/LKFS in steps of 0.5 LUFS/LKFS
		- Time for gate:	<b>1 s</b> ; adjustable in the range from 1 to 15 s in steps of 1 s
		<b>Loudness Range Instrument (LRA, LRA D)</b>	
		Display:	Graphical display of the Loudness Range of the I measurement
		Mode:	<b>LRA Bar</b> ; LRA Bar, MagicLRA, MagicLRA + I, MagicLRA + I + Num selectable
		Scale range:	<b>10 LU</b> ; 6 LU, 10 LU, 20 LU, 30 LU selectable
		LRA low range:	<b>2 LU</b> ; adjustable in the range from 0 to 30 LU in steps of 0.5 LU
		Comfort zone:	<b>4 LU</b> ; 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:	selectable for each range, 32 predefined colors
		<b>Loudness Chart Instrument</b>	
		Functions:	<ul style="list-style-type: none"> <li>Horizontal running bargraphs with individually definable colors evaluate the common quality of Loudness values TP, M, S, I acc. to selected standard</li> <li>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</li> <li>Vertical bargraph for the selected value</li> <li>Adjustable time ranges</li> <li>TP scale and operation range selectable</li> <li>Bargraph: <ul style="list-style-type: none"> <li>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)</li> </ul> </li> <li>Chart-Graph: <ul style="list-style-type: none"> <li>Continuously drawn graph (value over time) of one value as line with colored filling corresponding to the color selection of the horizontal bargraphs, added with Tolerance Indicator or position of the relative gate (if selected)</li> </ul> </li> <li>Buttons for the selection of the loudness value and the time range</li> </ul>
		Display:	



## Specifications (continued)

Time Range:	Time grid adjustment for the coordinate system and the horizontal bargraphs: <b>Auto</b> , 10 s, 30 s, 1 min, 5 min, 10 min, 30 min, 1 h, 2 h selectable
TP-Skala:	<b>TP60: +3 .. -60 dB</b> , TP20: +3 .. -20 dB
TP-Arbeitsbereich:	<b>0 dB</b> ; einstellbar im Bereich von 0 bis -20 dB in 1-dB-Schritten
Colors:	32 individually selectable for normal range, operation range and Headroom

### Spectrum Analyzer (Real Time Analyzer - RTA)

Spectral distribution display of the frequency range of single channels, channel pairs or groups.

Functions:	<ul style="list-style-type: none"><li>▪ Input selection</li><li>▪ Peak hold on/off, color selection</li><li>▪ A, C, Linear weighting</li><li>▪ Integration time</li><li>▪ Set reference</li><li>▪ Scaling</li><li>▪ Frequency range</li><li>▪ Bargraph arrangement</li><li>▪ Display-Hold</li><li>▪ Buttons for on-screen control of the frequency range, the channel selection, the scale steps, the reference range and the Peak hold reset</li></ul>
Input sources:	selectable: all channels without LF, all channels, individual channels
Frequency range:	<ul style="list-style-type: none"><li>▪ Norm: 20 Hz to 20 kHz, additional H band &gt; 20 kHz switchable</li><li>▪ LF: 5 Hz to 5 kHz</li></ul>
Number of bands:	<ul style="list-style-type: none"><li>▪ 1/3-octave: 31 bands</li><li>▪ 1/6-octave: 61 bands</li><li>▪ 1/12-octave: 120 bands</li></ul>
Weighting filter:	Linear; Linear, A, C selectable
Peak hold indicator:	1 s, 2 s, 4 s, 10 s, 30 s, manual reset or off
Measuring range:	45 dB max.
Reference range:	-36 to +36 dB
Scaling:	Steps with 3, 6 or 9 dB
Integration time (ballistics):	Impulse, Fast, Slow, Peak (10 ms)

### LF Bleed

Function:	Display of the amount of unwanted high-frequency audio signals in the LFE channel above a user-definable frequency
Display:	LFE bargraph with TP60 scale (-60 to 0 dBFS)
Frequency:	<b>120 Hz</b> ; selectable in the range from 20 Hz to 250 Hz in steps of 1 Hz
Orientation:	<b>vertical</b> or horizontal
Colors:	32 colors selectable for background and individual sections of the bargraph display

### Application Monitoring

Full Mono to extensive Surround and Immersive control (Monitor Control), bass management, speaker level calibration and volume level monitoring with numerical display, SPL value calculation or direct measurement with internal microphone.

#### General

Functions:	<ul style="list-style-type: none"><li>▪ Instrument for monitoring Mono, Stereo, Surround and Immersive signals</li><li>▪ Arrangement of up to 32 loudspeakers</li><li>▪ Multifunctional rotary knob for controlling the volume level and other functions</li></ul>
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- Definable loudspeaker functions Solo, Cut, Phase
- DIM and MUTE function
- Numerical display
- Calculation of the SPL value of the electrical signal
- Measured SPL value via internal or external microphone
- 4 switchable inputs A/B/C/D (via one button or via separate buttons), can be labeled individually
- 4 switchable loudspeaker sets A/B/C/D (via one button or via separate buttons), can be labeled individually
- Downmix instrument (coupled with A-input) with customizable coefficients
- B/C/D outputs same as A or Stereo or Off
- Instrument for switching between loudspeakers and headphones (Phones output can be routed to the outputs or a Dante® resp. RAVENNA® connection)
- Bass management to operate full range and small speakers in the same system, support of two LFE channels
- Two dedicated bass management outputs
- Support of Array loudspeakers acc. to Dolby® guidelines
- LF-Boost function switchable
- Surr-Att function switchable
- HP filter for all bass managed speakers and All-pass filter for others
- For formats without an LFE, an additional SUB output channel is added
- Input-Instrument with input selection for the use of Intercom functionality between several TouchControl 5
- Button with toggle function for the selection of the loudspeaker modes Solo, Cut or Phase
- Stylized circular speaker representation acc. to the selected audio format (ITU circle)
- Control of the selected speaker function by single or multiple tapping of the corresponding speaker symbols (toggle or multiple)
- Color indication of the loudspeaker state (green: active, red: inactive, outline: phase inverted)
- Switchable SPL or Loudness display
- Toggle buttons for input A/B/C/D, output A/B/C/D, Mono, Dim, Mute, LF-Boost, Surr-Att, Phones, Downmix, Reference
- Listening volume display

Display:

#### SPL Meter

Display:	Bargraph for summation of channels
Display SPL value:	Absolute (dBC, dBA) or relative (0 dB refers to the reference point, e. g. 78 dBA)
Orientation:	<b>vertical</b> or horizontal selectable
Weighting:	<b>A</b> ; Linear (None), A, C, CCIR, K (ITU BS.1770) selectable
Integration time:	<b>IIR: 125 ms (fast)</b> oder IIR: 1000 ms (Slow) selectable
Reference point:	<b>78 dB</b> ; adjustable in the range from 68 to 88 dB in steps of 1 dB
Scale range:	includes 32 dB





## Specifications (continued)

- Scale:
- 68 to 100 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

### Speakers

- Modes:
- Stereo;** Mono, Stereo, Surround, Immersive selectable
- Surround formats: **5.1;** LCR, LCM, 4.0, 5.0, 5.1, 6.0, 6.1, 7.0, 7.1 selectable
- Immersive formats: **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, 22.2, Array selectable
- Inputs A/B/C/D:
- Delay: **0 ms;** adjustable in the range from 0 to 200 ms in steps of 0.1 ms
- Gain (Trim): **0 dBFS;** adjustable in the range from -60 to +6 dBFS in steps of 0.5 dBFS
- Mix In: **Off** or On, allows to mix additional signals to the selected input, e. g. for Talkback
- LF-Boost: On or **Off**, increases the level of the LF output by +10 dB
- Sur att.: On or **Off**, decreases the level of the surround channels by -3 dB

### Individual Loudspeaker Settings

The loudspeakers available in the network can be assigned to four sets (A/B/C/D) and individually adjusted for the respective listening situation.

- Name: max. 3 characters
- Type: full range or non-full range
- Gain: **0 dB;** adjustable in the range from -24 to +12 dB in steps of 0.5 dB
- Delay: **0 ms;** adjustable in the range from 0 to 200 ms in steps of 0.02 ms (units can be ms, m, ft)
- Polarity: **+** or -
- BM Level: Increasing or decreasing the signal level sent from each non-full range speaker to the LFE output
- Equalizer (EQ): 8 bands, can be enabled individually
- Phase Curve: On or **Off**, the phase curve will be added to all bands
- Music Curve: Activates the Dolby Atmos® Music Curve, applies it to the bands 4 to 8 and activates it with the corresponding values (bands 1 to 3 remain unchanged)
- Individual band settings:
- Band 1
- Type: **Peak;** Peak, Low Shelf, High Shelf, Low Pass, Band Pass, High Pass, All Pass 2P, All Pass 4P, Notch; selectable
- Gain: **0 dB;** adjustable in the range from -18 to +18 dB in steps of 0.1 dB
- Frequency: **150 Hz;** adjustable in the range from 20 Hz to 20 kHz
- Bandwidth (Q): **0.7;** adjustable in the range from 0 to 10 in steps of 0.1
- Band 2
- Type: **Peak;** Peak, Low Shelf, High Shelf, Low Pass, Band Pass, High Pass, All Pass 2P, All Pass 4P, Notch; selectable
- Gain: **0 dB;** adjustable in the range from -18 to +18 dB in steps of 0.1 dB

- Frequency: **300 Hz;** adjustable in the range from 20 Hz to 20 kHz
- Bandwidth (Q): **0.7;** adjustable in the range from 0 to 10 in steps of 0.1
- Band 3
- Type: **Peak;** Peak, Low Shelf, High Shelf, Low Pass, Band Pass, High Pass, All Pass 2P, All Pass 4P, Notch; selectable
- Gain: **0 dB;** adjustable in the range from -18 to +18 dB in steps of 0.1 dB
- Frequency: **600 Hz;** adjustable in the range from 20 Hz to 20 kHz
- Bandwidth (Q): **0.7;** adjustable in the range from 0 to 10 in steps of 0.1
- Band 4
- Type: **Peak;** Peak, Low Shelf, High Shelf, Low Pass, Band Pass, High Pass, All Pass 2P, All Pass 4P, Notch; selectable
- Gain: **0 dB;** adjustable in the range from -18 to +18 dB in steps of 0.1 dB
- Frequency: **1.2 kHz;** adjustable in the range from 20 Hz to 20 kHz
- Bandwidth (Q): **0.7;** adjustable in the range from 0 to 10 in steps of 0.1
- Band 5
- Type: **Peak;** Peak, Low Shelf, High Shelf, Low Pass, Band Pass, High Pass, All Pass 2P, All Pass 4P, Notch; selectable
- Gain: **0 dB;** adjustable in the range from -18 to +18 dB in steps of 0.1 dB
- Frequency: **2.4 kHz;** adjustable in the range from 20 Hz to 20 kHz
- Bandwidth (Q): **0.7;** adjustable in the range from 0 to 10 in steps of 0.1
- Band 6
- Type: **Peak;** Peak, Low Shelf, High Shelf, Low Pass, Band Pass, High Pass, All Pass 2P, All Pass 4P, Notch; selectable
- Gain: **0 dB;** adjustable in the range from -18 to +18 dB in steps of 0.1 dB
- Frequency: **4.8 kHz;** adjustable in the range from 20 Hz to 20 kHz
- Bandwidth (Q): **0.7;** adjustable in the range from 0 to 10 in steps of 0.1
- Band 7
- Type: **Peak;** Peak, Low Shelf, High Shelf, Low Pass, Band Pass, High Pass, All Pass 2P, All Pass 4P, Notch; selectable
- Gain: **0 dB;** adjustable in the range from -18 to +18 dB in steps of 0.1 dB
- Frequency: **9.6 kHz;** adjustable in the range from 20 Hz to 20 kHz
- Bandwidth (Q): **0.7;** adjustable in the range from 0 to 10 in steps of 0.1
- Band 8
- Type: **Peak;** Peak, Low Shelf, High Shelf, Low Pass, Band Pass, High Pass, All Pass 2P, All Pass 4P, Notch; selectable
- Gain: **0 dB;** adjustable in the range from -18 to +18 dB in steps of 0.1 dB
- Frequency: **19.2 kHz;** adjustable in the range from 20 Hz to 20 kHz
- Bandwidth (Q): **0.7;** adjustable in the range from 0 to 10 in steps of 0.1



## Specifications (continued)

### Loudspeaker Calibration

Level calibration for each individual loudspeaker in each output set

Edit mode:	<ul style="list-style-type: none"> <li>▪ <b>Solo</b>: Editing the selected loudspeakers (symbols turn green) or</li> <li>▪ Selected: Simultaneous monitoring of activated loudspeakers (green) and editing of the last selected speaker (yellow)</li> </ul>
Gain:	<b>0 dB</b> ; adjustable in the range from -24 to +12 dB in steps of 0.5 dB
Delay:	<b>0 ms</b> ; adjustable in the range from 0 to 200 ms in steps of 0.2 ms
Delay unit:	<b>Time</b> ; Time, Distance Metric, Distance Imperial selectable
Test tone generator:	On or <b>Off</b>
- Signal:	Pink Noise; Sine, White Noise, Pink Noise, XOver Tone selectable
- Level:	<b>0 dB</b> ; adjustable in the range from -90 to 0 dB in steps of 0.5 dB
SPL calibration meter	
- Input:	Internal microphone (Mic) or external microphone (XLR) or any Dante® channel
- Phantom supply:	On or <b>Off</b>
- XLR Gain:	<b>0 dB</b> ; adjustable in the range from -8 to +60 dB in steps of 1 dB
- Weighting filter:	A or <b>C</b> selectable
- Response:	<b>Slow</b> ; Fast (125 ms), Slow (1 s) selectable
- Display SPL value:	Absolute (dB(A)) or relative (0 dB refers to the reference point, e. g. 78 dB(A))

### Bass-Management

Active:	<b>Yes</b> ; Yes, No (enables the bass management)
Frequency:	<b>125 Hz</b> ; crossover frequency adjustable in the range from 63 to 250 Hz
Sub level:	<b>0</b> ; adjustable from -24 to 0 dB in steps of 1 dB
Filters:	<b>Phase Safe</b> ; Phase Safe (phase ratios remain unchanged), Lagacy (conventional method), Bypass (manual filtering with EQ) selectable

### Loudspeaker Selection Modes

Functions:	<ul style="list-style-type: none"> <li>▪ Button for switching through the Solo, Cut, Phase modes</li> <li>▪ Definable behavior when tapping the loudspeaker symbols in the circular display</li> </ul>
Symbol behavior:	
- in operation:	<ul style="list-style-type: none"> <li>▪ Radio button style (alternate enable/disable) in Solo mode</li> <li>▪ Adding style (select one or several, reset all by fast double tapping) in Cut mode</li> </ul>
- in calibration mode:	<ul style="list-style-type: none"> <li>▪ Adding mode (select one or several, reset each by tapping again)</li> <li>▪ Reset all by pressing the rotary knob</li> </ul>
Modes:	<b>Solo</b> ; Solo, Cut, Phase successively selectable
Solo mode	
- Function:	<ul style="list-style-type: none"> <li>▪ Solo in place (green), all other speakers muted (red)</li> <li>▪ Solo mixed to defined loudspeaker</li> <li>▪ Double tapping on a loudspeaker symbol solos the corresponding whole channel group</li> </ul>
- Target loudspeaker:	<b>Channel</b> (Solo in place); channel, L, R, L+R, Center selectable, signal is always Mono
Cut mode	
- Function:	<ul style="list-style-type: none"> <li>▪ Cut mutes the selected loudspeaker (red), all other loudspeaker are kept active (green)</li> <li>▪ Double tapping on a loudspeaker symbol mutes the corresponding whole channel group</li> </ul>

### Phase mode

- Function:

- Phase switches the polarity of the selected channels
- Loudspeaker symbol changes to a green outline
- Channel labeling is marked with ^

### DIM (Mute all)

Function:

- Button to reduce the monitoring volume by a predefined value or "Mute all"
- Can be used as momentary or latch/hold switch

DIM level:

- **-20 dB**; adjustable in the range from -80 to 0 dB in steps of 1 dB or Mute
- Temporarily adjustable by touching and holding the DIM button and turning the rotary knob

DIM Phones output:

**Off** or On

### Mute

Function:

- Button for muting the loudspeakers
- Can be used as momentary or latch/hold switch

Display:

Key/button and Volume meter appears red, when Mute function is active

Mute Phones output:

**Off** or On

### Mono

Function:

- Button to output the signal in a mono-summed format
- Output of a defined loudspeaker (depending on the selected Speakers mode)

Target loudspeaker:

**L+R**; Center, L, R, L+R, All w/o LFE/Sub selectable, signal is always Mono

### Downmix (5.1, 7.1 only)

Functions:

- Downmix instrument is connected upstream of the A inputs
- Downmix output signal (L/R and/or Mono) can be routed into the Dante® network
- Customizable downmix coefficients
- Switching between current speaker setup and L-R monitoring
- Display and/or monitoring
- 3-channel TP Meter (for L/R and M Downmix)
- available for the surround formats 5.1, 7.1
- LS/RS summed to L/R
- LSR/RSR summed to L/R
- CS summed to L/R
- Front summed to L/R
- all other loudspeakers summed to L/R
- Individually customizable downmix coefficients using the sliders in the WebApp

Channel level for Downmix

(available channels depending on the selected Speakers mode)

- Channel Gain:

**-3 dB**; adjustable in the range from -12 to 0 dB in steps of 0.5 dB

Mono Downmix sum:

**-3 dB**; adjustable in the range from -12 to 0 dB in steps of 0.5 dB

Peakhold display:

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

### Phones

Function:

- Instrument/button for switching between loudspeakers and headphones
- Phones output can be routed to the outputs or a AoIP connection

Trim:

**0 dB**; adjustable in the range from -12 to 0 dB in steps of 0.5 dB



## Specifications (continued)

### Input Instrument (Intercom Functionality)

Functions:	<ul style="list-style-type: none"><li>▪ In combination with the Talkback application, communication between several TouchControl 5 devices is possible</li><li>▪ Input instrument with input selection and level control for mixing external audio sources into the Monitoring signal</li><li>▪ Input Trim control and Mute option for flexible communication</li></ul>
Displays:	<ul style="list-style-type: none"><li>▪ Numerical level display for the selected input</li><li>▪ Appears red with Mute function active</li></ul>
Input level:	<b>0.0 dB</b> ; adjustable in the range from -60 to +6 dB in steps of 0.5 dB

### Application Tools

Includes additional instruments

#### Label

Functions:	<ul style="list-style-type: none"><li>▪ Positionable text field</li><li>▪ Freely selectable colors for text and background (HSB color model, web colors)</li><li>▪ Continuously adjustable font size</li><li>▪ Font type selectable</li><li>▪ Orientation selectable</li></ul>
Label:	Enter up to 15 characters (default: <b>Label</b> )
Background:	Color setting for the background according to the HSB color model or entry of web color codes (8 digits)
Text:	Color setting for the text according to the HSB color model or entry of web color codes (8 digits)
Font Size:	<b>60 %</b> ; continuously adjustable font size in the range from 20 % to 80 % of the label area
Font Style:	<b>Thin</b> ; Thin, Thin Italic, Normal, Italic, Bold, Bold Italic selectable
Orientation:	<b>Horizontal</b> or Vertical selectable

### 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 monitor controller with metering.
- User customizable table-top device with 5" touch display, build-in calibrated microphone and 32 Dante®-channels for stereo, surround and immersive speaker formats
- Monitor Controller for up to 4 input and 4 output sets
- Speaker level calibration
- SPL measurement
- Bass management
- Premium metering (PPM, TP, Moving Coil)
- Audio Vectorscope, Real Time Analyzer
- Loudness, Loudness Chart, SPL and LRA
- Toolbox with leveling and talkback
- Quick start guide

**Order no.: 320517ND**

TouchControl 5 Ravenna:

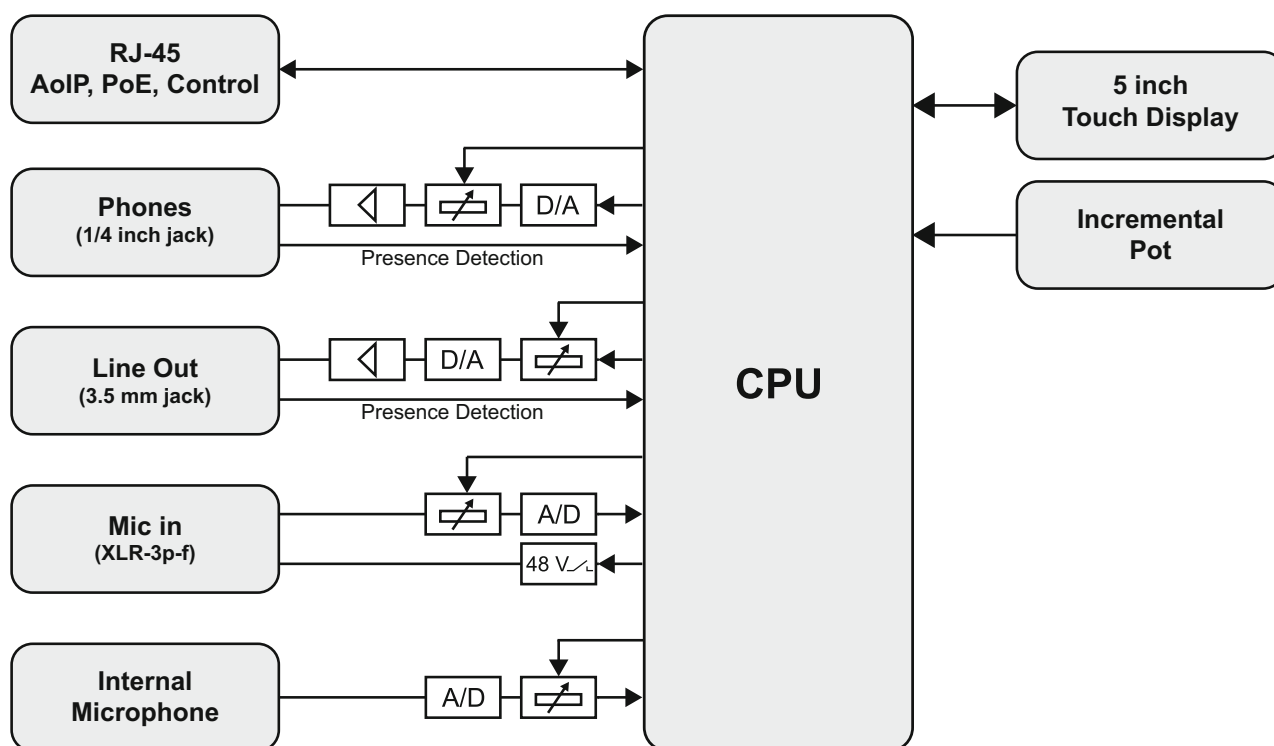
- RAVENNA®/AES67/ST 2110 based immersive monitor controller with metering.
- User customizable table-top device with 5" touch display, build-in calibrated microphone and 32 RAVENNA®-channels for stereo, surround and immersive speaker formats
- Monitor Controller for up to 4 input and 4 output sets
- Speaker level calibration
- SPL measurement
- Bass management
- Premium metering (PPM, TP, Moving Coil)
- Audio Vectorscope, Real Time Analyzer
- Loudness, Loudness Chart, SPL and LRA
- Toolbox with leveling and talkback
- Quick start guide

**Order no.: 320518ND**

### 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)

# Block Diagram



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