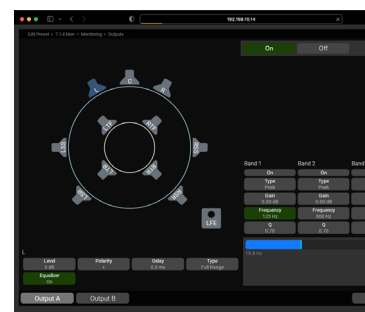


Data Sheet TouchControl 5



TouchControl 5



Touch Screen • Flexible Screen Layout • Pushable Rotary Knob • Dante® AoIP I/O • 32 Channels • Speaker Calibration • SPL Fader • PPM/TP • Multichannel • Immersive • Loudness • LRA • Premium Metering • 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 the AoIP standards Dante® and AES67 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. Beside 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 Dante® AoIP network.

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® 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

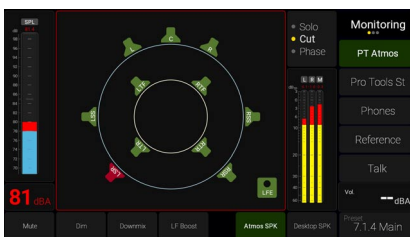
- Device configuration via IP address and Web App within the Dante® network (web-based interface)
- Toolbox with simple TruePeak meter and up to four on-screen faders (slider) for up to 32 channels, Talkback application
- Support for Stereo, Surround, Immersive and Multichannel formats for up to 32 channels incl. 5.1 and 7.1.4 formats
- Loudness & SPL functions acc. to all common standards and Loudness Range instrument (LRA)
- Comprehensive functions for Monitor Control (like Solo, Cut, Phase, DIM, Mute) and loudspeaker level calibration, 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



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.

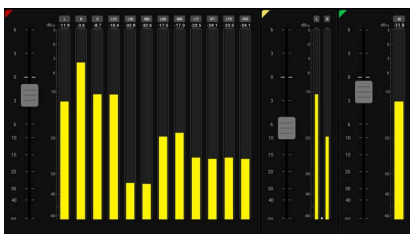
Monitor Control



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.

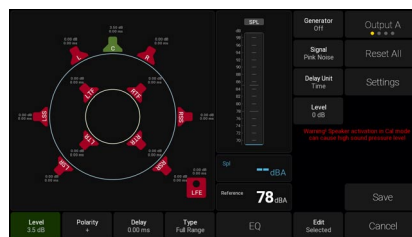
The downmix instrument outputs surround or immersive mixes in stereo and mono to speakers, headphones or any Dante® channel. Each speaker can be muted or soloed or its phase can be rotated.

Leveling



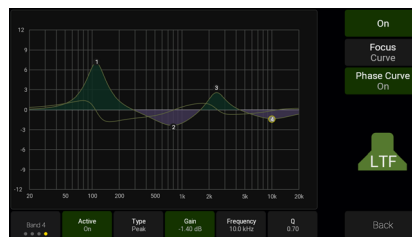
This application is used for independent control (leveling) of individual channels or channel groups with up to 4 faders and simple TP meters, which can be combined with the rotary knob for relative level control of several channel groups.

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 4-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.

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 display and SPL display and SPL sum value calculation. 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® 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.

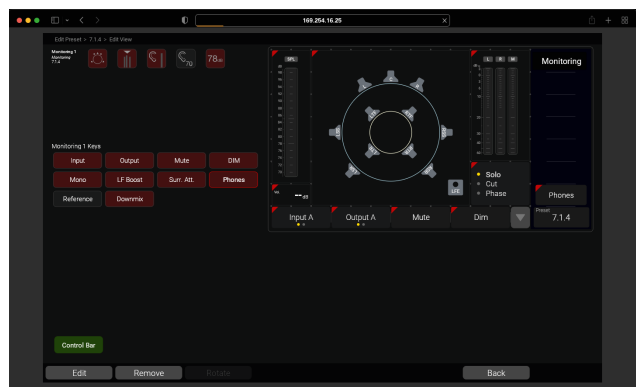
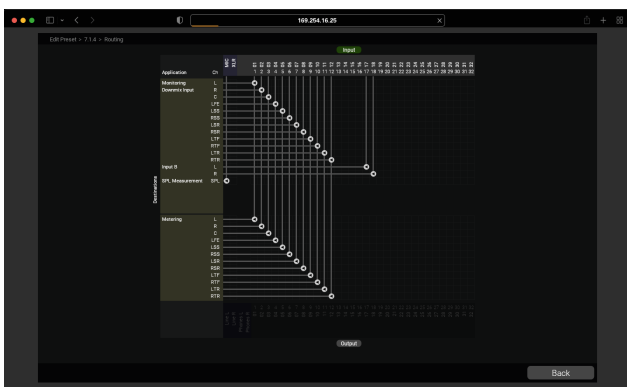


Extensive Routing

The routing matrix is used to determine the audio channels to be used as inputs and outputs in the preset. The 32 Dante® channels assigned in the Dante Controller™ 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.

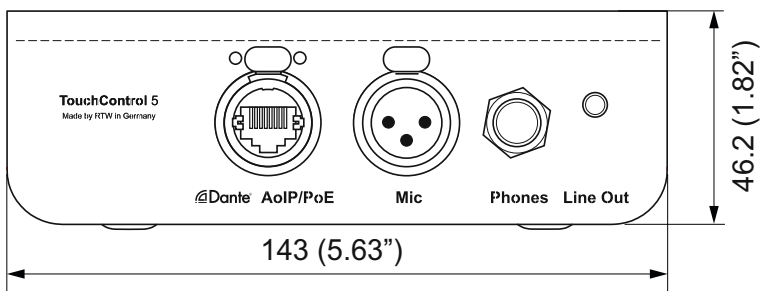
Own Display Views

TouchControl 5 allows you to design 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 are available on all display views of the preset.

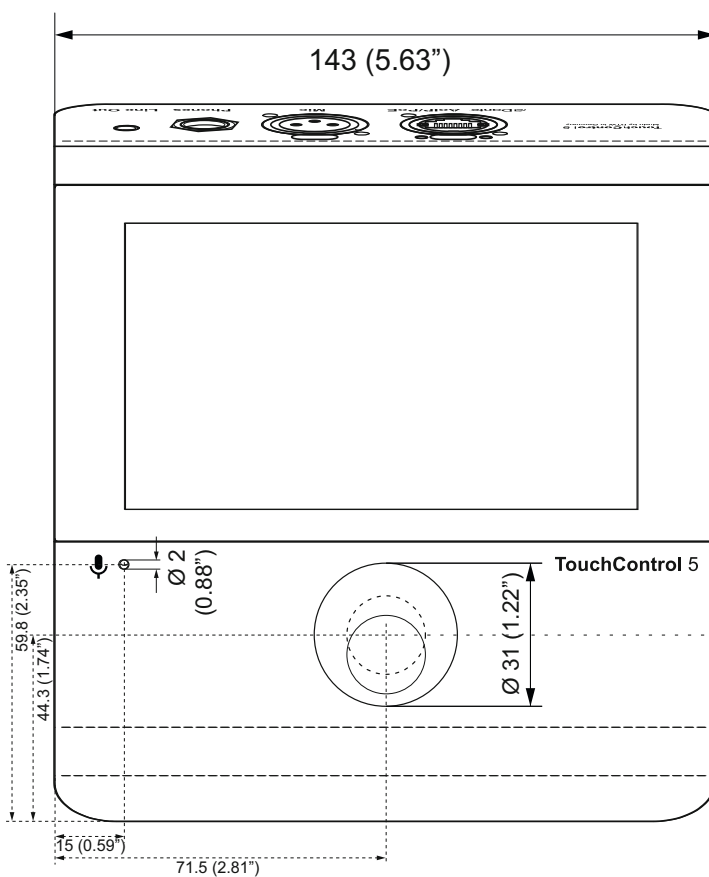


Dimensions

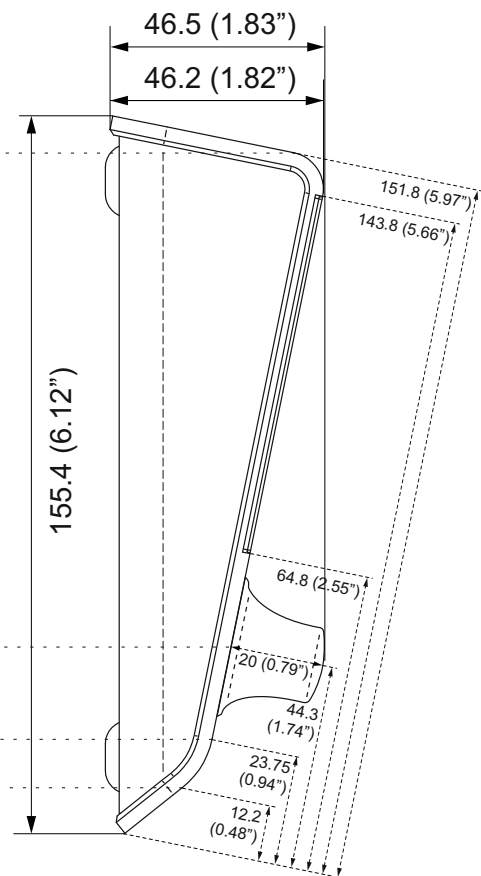
TouchControl 5 Desk-top Unit (320517ND)



1 | Rear view | dimensions in mm (inch)



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



3 | Side view | dimensions in mm (inch)

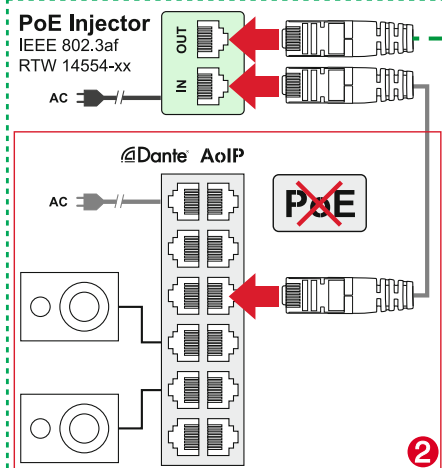
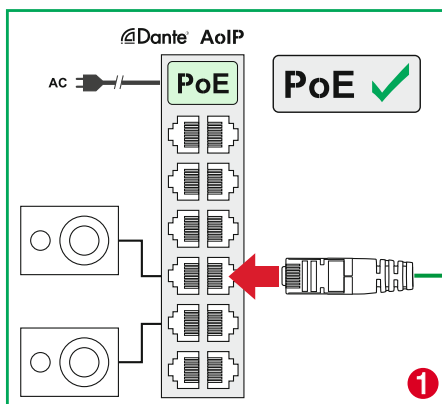
Connections

Connectors



NOTE - The power supply of the TouchControl 5 is done via the network connection and the Dante® 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**.



Dante® 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)



max. 30 m



*) 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 measurement 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)
- Multifformat PPM and TP meter for level metering of up to 32 channels with in different configurations (Mono, Stereo, Surround, Immersive or Multichannel)
- Multifformat 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
- Loudness Test Time Control
- Loudness Range instrument (LRA)
- SPL meter
- Test signal generator
- Moving Coil (BR, VU, Loudness, BBC mode)

- Spot Correlator in the Stereo bargraph display
- Numerical displays
- Up to 4 on-screen fader and simple TP Meter for the simultaneous control of up to 32 Dante® input channels
- Bass Management for up to 2 LFE channels
- Level calibration for each individual loudspeaker in each of the outputs
- 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)
- 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 Dante® network

Digital Inputs

Inputs:	32 Dante® audio over IP inputs (network channels) via 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 Dante® audio over IP outputs (network channels) via RJ-45 built-in socket NE8FD type referenced to digital inputs or internal clock
Sample rates:	

Pushable Rotary Knob

Function:	<ul style="list-style-type: none">▪ Volume control with definable listening level (individual, initial, maximum)▪ Quickly reset the monitoring level to the user-defined value using the Reference button on the screen▪ Rotate to select options with activated buttons on the Calibration screen▪ Press to deactivate all selected speakers on the Calibration screen
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Volume:	
- user-defined:	78 dB(A) ; adjustable in the range from 10 to 100 dB(A) in steps of 0.5 dB or off
- maximum:	100 dB(A) ; adjustable in the range from 60 to 100 dB(A) 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 (dB(A)) or relative (dB)
- Reference relative:	0 dB refers to the selected reference level (e. g. 78 dB(A))



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.

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 Dante® 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) and the functions for loudness calculation, loudness range display, SPL display and sum SPL value calculation.

Up to 4 instances are possible.

General

- Input sources: 32 Dante® AoIP network channels, Mic In, Internal Mic
- Output destinations: 32 Dante® channels, Headphone Out, Line Out
- Formats:
- Mono: several single channel signals selectable
 - Stereo: several 2-channel Stereo pair selectable **5.1**; LCR, LCM, 4.0, 5.0, 5.1, 6.0, 6.1, 7.0, 7.1 selectable
 - Surround: **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 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 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:	Off ; switchable in the range from -30 to 0 dB in steps of 0.5 dB or Off
Headroom:	<ul style="list-style-type: none"> ▪ -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: <ul style="list-style-type: none"> - 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 BR11 scales also 150 ms
Gain:	+20 dB, +40 dB acc. to standard
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:	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:	-1 dBTP ; 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"> ▪ 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
- S mode:	only available, if M/S type is selected: M3, M6
- Peak indicator:	off ; Peak, True Peak, BR Peak, off selectable
- BR Peak Threshold:	6 <ul style="list-style-type: none"> ▪ 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:	<ul style="list-style-type: none"> ▪ 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

Loudness & SPL

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

General

Functions:	<ul style="list-style-type: none"> ▪ 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 ▪ Numerical display of the sum, maximum, LRA and duration values ▪ Loudness Range instrument (LRA) ▪ SPL meter
Bargraph display:	Loudness sum of the channels in selectable combination of the values: <ul style="list-style-type: none"> ▪ 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) <ul style="list-style-type: none"> ▪ adjustable tolerance range for M, S, I
Numerical display:	<all> ; M, S, I, LRA, TPmax, Mmax, Smax, I-Time values

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 (!) 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



Specifications (continued)

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

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>)



Specifications (continued)

Customer-specific Loudness Mode (Custom)

Scales: ²⁾	Loudness scales: <ul style="list-style-type: none"> ▪ EBU+9: +9 .. -18 LU ▪ EBU+3: +3 .. -18 LU ▪ EBU+18: +18 .. -36 LU ▪ EBU+9a: 14 .. -41 LUFS ▪ EBU+18a: -5 .. -59 LUFS ▪ EBU0: 0 .. -60 LUFS ▪ ITU+9: +9 .. -18 LU (Loudness Units) ▪ ITU0: 0 .. -30 LKFS ▪ ATSC0: 0 .. -60 LKFS ▪ ATSC0a: 0 .. -30 LKFS
Weighting filter:	k filter acc. to ITU BS.1770
Target Level: ²⁾	<ul style="list-style-type: none"> ▪ -23 LUFS; adjustable in the range from -10 to -30 LUFS in steps of 1 LUFS ▪ -24 LKFS; adjustable in the range from -10 to -30 LKFS in steps of 1 LKFS
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 (IRT), 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:	<ul style="list-style-type: none"> ▪ -70.0 LUFS; adjustable in the range from -80.0 to -40.0 LUFS in steps of 0.5 LUFS, switchable ▪ -70.0 LKFS; adjustable in the range from -80.0 to -40.0 LKFS in steps of 0.5 LKFS, switchable
- Relative Gate:	-10.0 LU ; adjustable in the range from -40.0 to 0 LU in steps of 0.5 LU, switchable
Level adjustment for the summation: ²⁾	<ul style="list-style-type: none"> ▪ 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 -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

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: **-70.0 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: **-70.0 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:	selectable for each range, 32 predefined colors

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 level:	-21 dBFS (997 Hz sine wave, defines reference point); adjustable in the range from -25 to -9 dBFS in steps of 1 dB
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:	<ul style="list-style-type: none"> ▪ 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
Display SPL value:	Absolute (dB(A)) or relative (0 dB refers to the reference point, e. g. 78 dB(A))



Specifications (continued)

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:

- Instrument for monitoring Mono, Stereo, Surround and Immersive signals
- Arrangement of up to 32 loudspeakers
- Multifunctional rotary knob for controlling the volume level and other functions
- 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)
- 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® connection)
- Bass management to operate full range and small speakers in the same system, support of two LFE channels
- 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

Display:

- 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

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 selectable

Inputs A/B/C/D:

-Delay:

0 ms; adjustable in the range from 0 to 200 ms in steps of 0.1 ms

Outputs A/B/C/D:

-Gain (Trim):

0 dBFS; adjustable in the range from -20 to +6 dBFS in steps of 0.5 dBFS

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 **-**

Equalizer (EQ)

Band 1

- Type:

Peak; Peak, Low Shelf, High Shelf, Low Pass, Band Pass, High Pass, All Pass 2P, All Pass 4P, Notch; selectable

- Frequency:

125 Hz; adjustable in the range from 20 Hz to 20 kHz

- Bandwidth:

0.7; adjustable in the range from 0 to 10 in steps of 0.1

- Gain:

0 dB; adjustable in the range from -18 to +18 dB in steps of 0.1 dB

Band 2

- Type:

Peak; Peak, Low Shelf, High Shelf, Low Pass, Band Pass, High Pass, All Pass 2P, All Pass 4P, Notch; selectable

- Frequency:

800 Hz; adjustable in the range from 20 Hz to 20 kHz

- Bandwidth:

0.7; adjustable in the range from 0 to 10 in steps of 0.1

- Gain:

0 dB; adjustable in the range from -18 to +18 dB in steps of 0.1 dB

Band 3

- Type:

Peak; Peak, Low Shelf, High Shelf, Low Pass, Band Pass, High Pass, All Pass 2P, All Pass 4P, Notch; selectable

- Frequency:

2.40 kHz; adjustable in the range from 20 Hz to 20 kHz

- Bandwidth:

0.7; adjustable in the range from 0 to 10 in steps of 0.1

- Gain:

0 dB; adjustable in the range from -18 to +18 dB in steps of 0.1 dB



Specifications (continued)

<p>Band 4</p> <p>- Type: Peak; Peak, Low Shelf, High Shelf, Low Pass, Band Pass, High Pass, All Pass 2P, All Pass 4P, Notch; selectable</p> <p>- Frequency: 10.0 kHz; adjustable in the range from 20 Hz to 20 kHz</p> <p>- Bandwidth: 0.7; adjustable in the range from 0 to 10 in steps of 0.1</p> <p>- Gain: 0 dB; adjustable in the range from -18 to +18 dB in steps of 0.1 dB</p> <p>Loudspeaker Calibration</p> <p>Level calibration for each individual loudspeaker in each output set</p> <p>Edit mode:</p> <ul style="list-style-type: none"> ▪ Solo: Editing the selected loudspeakers (symbols turn green) or ▪ Selected: Simultaneous monitoring of activated loudspeakers (green) and editing of the last selected speaker (yellow) <p>Gain: 0 dB; adjustable in the range from -24 to +12 dB in steps of 0.5 dB</p> <p>Delay: 0 ms; adjustable in the range from 0 to 200 ms in steps of 0.2 ms</p> <p>Delay unit: Time; Time, Distance Metric, Distance Imperial selectable</p> <p>Test tone generator:</p> <p>- Signal: On or Off Pink Noise; Sine, White Noise, Pink Noise, XOver Tone selectable</p> <p>- Level: 0 dB; adjustable in the range from -90 to 0 dB in steps of 0.5 dB</p> <p>SPL calibration meter</p> <p>- Input: Internal microphone (Mic) or external microphone (XLR) or any Dante® channel</p> <p>- Phantom supply: On or Off</p> <p>- XLR Gain: 0 dB; adjustable in the range from -8 to +60 dB in steps of 1 dB</p> <p>- Weighting filter: A or C selectable</p> <p>- Response: Slow; Fast (125 ms), Slow (1 s) selectable</p> <p>- Display SPL value: Absolute (dB(A)) or relative (0 dB refers to the reference point, e. g. 78 dB(A))</p> <p>Bass-Management</p> <p>Enabled: Yes; Yes, No</p> <p>Crossover frequency: 125 Hz; adjustable in the range from 62.5 to 250 Hz</p> <p>Sub level: 0; adjustable from -24 to 0 dB in steps of 1 dB</p> <p>Loudspeaker Selection Modes</p> <p>Functions:</p> <ul style="list-style-type: none"> ▪ Button for switching through the Solo, Cut, Phase modes ▪ Definable behavior when tapping the loudspeaker symbols in the circular display <p>Symbol behavior:</p> <p>- in operation:</p> <ul style="list-style-type: none"> ▪ Radio button style (alternate enable/disable) in Solo mode ▪ Adding style (select one or several, reset all by fast double tapping) in Cut mode <p>- in calibration mode:</p> <ul style="list-style-type: none"> ▪ Adding mode (select one or several, reset each by tapping again) ▪ Reset all by pressing the rotary knob 	<p>Modes: Solo; Solo, Cut, Phase successively selectable</p> <p>Solo mode</p> <p>- Function:</p> <ul style="list-style-type: none"> ▪ Solo in place (green), all other speakers muted (red) ▪ Solo mixed to defined loudspeaker ▪ Double tapping on a loudspeaker symbol solos the corresponding whole channel group <p>- Target loudspeaker: Channel (Solo in place); channel, L, R, L+R, Center selectable, signal is always Mono</p> <p>Cut mode</p> <p>- Function:</p> <ul style="list-style-type: none"> ▪ Cut mutes the selected loudspeaker (red), all other loudspeaker are kept active (green) ▪ Double tapping on a loudspeaker symbol mutes the corresponding whole channel group <p>Phase mode</p> <p>- Function:</p> <ul style="list-style-type: none"> ▪ Phase switches the polarity of the selected channels ▪ Loudspeaker symbol changes to a green outline ▪ Channel labeling is marked with ^ <p>DIM (Mute all)</p> <p>Function:</p> <ul style="list-style-type: none"> ▪ Button to reduce the monitoring volume by a predefined value or "Mute all" ▪ Can be used as momentary or latch/hold switch <p>DIM level:</p> <ul style="list-style-type: none"> ▪ -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 <p>DIM Phones output: Off or On</p> <p>Mute</p> <p>Function:</p> <ul style="list-style-type: none"> ▪ Button for muting the loudspeakers ▪ Can be used as momentary or latch/hold switch <p>Mute Phones output: Off or On</p> <p>Mono</p> <p>Function:</p> <ul style="list-style-type: none"> ▪ Button to output the signal in a mono-summed format ▪ Output of a defined loudspeaker (depending on the selected Speakers mode) <p>Target loudspeaker: L+R; Center, L, R, L+R, All w/o LFE/Sub selectable, signal is always Mono</p> <p>Downmix (5.1, 7.1 only)</p> <p>Functions:</p> <ul style="list-style-type: none"> ▪ Downmix instrument is connected upstream of the A inputs ▪ Downmix output signal (L/R and/or Mono) can be routed into the Dante® network ▪ 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
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Specifications (continued)

Downmix rules:	<ul style="list-style-type: none">LS/RS summed to L/RLSR/RSR summed to L/RCS summed to L/RFront summed to L/Rall other loudspeakers summed to L/R Individual settings of channel levels and panning via mix matrix
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:	<ul style="list-style-type: none">Instrument for switching between loudspeakers and headphonesPhones output can be routed to the outputs or a Dante® connection
Trim:	0 dB ; adjustable in the range from -12 to 0 dB in steps of 0.5 dB

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:	Pihong 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 Monitor Control & Meter:

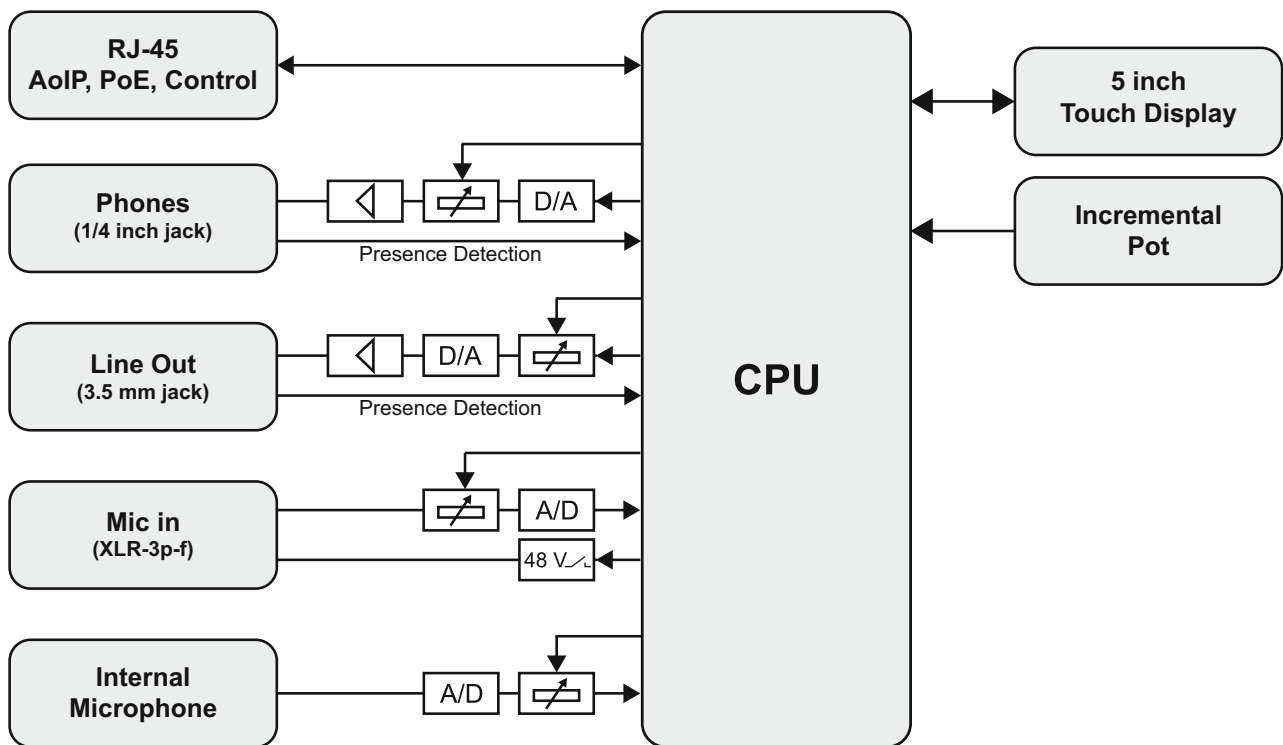
- Dante® based immersive monitor controller with metering.
- User customizable table-top device with 5" touch display, build-in calibrated microphone and 32 Dante®-channels for stereo, surround and immersive speaker formats
- Monitor Controller for up to 4 input and 4 output sets
- Speaker level calibration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

Order no.: 320517ND

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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