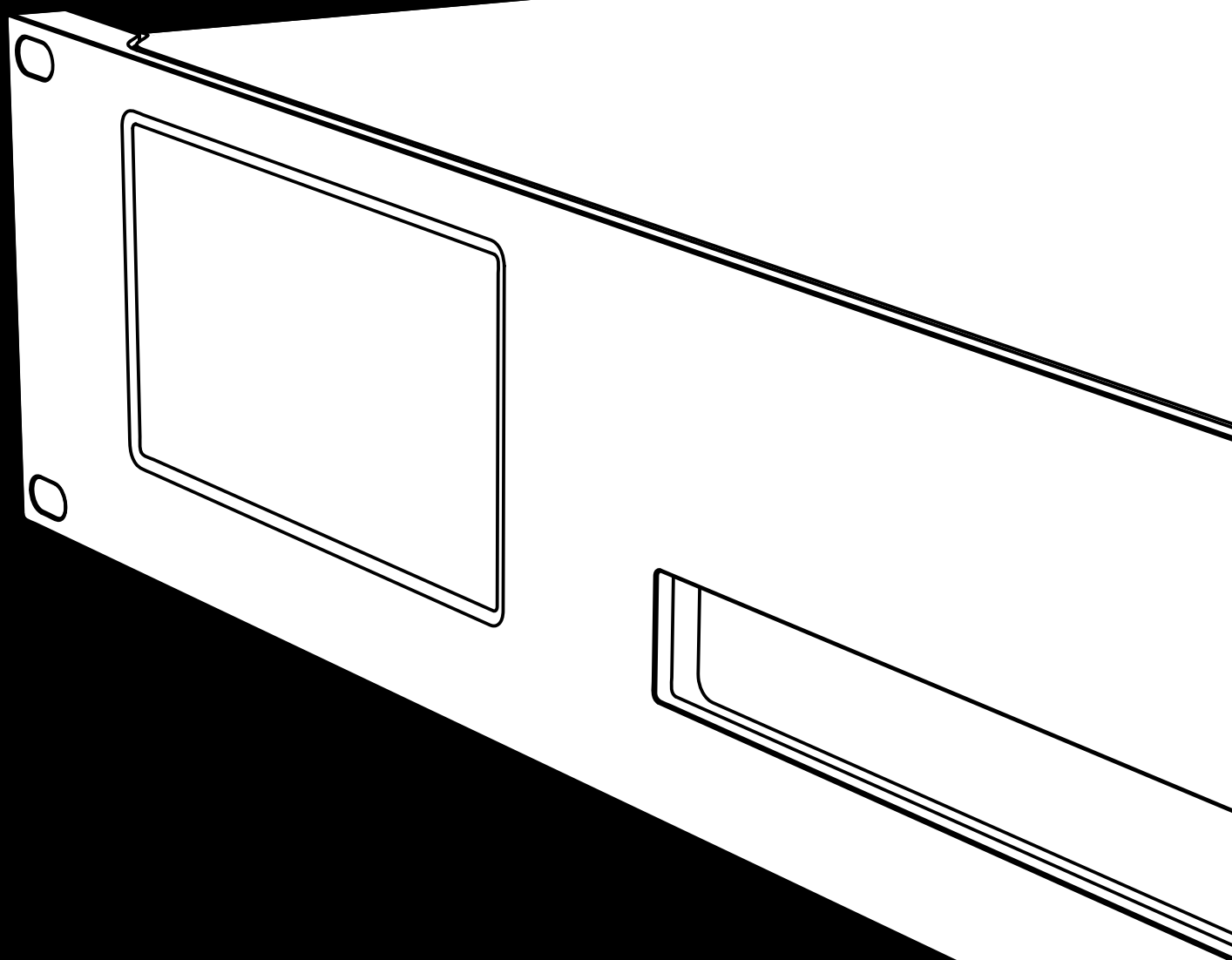


xD

40D

Reference manual

1.3 en



Notes on document version

All previous versions of this document are hereby no longer valid.

Version 1.3:

1. US power cord Z2612.024 NEMA 5-20P within delivery as standard added.

Refer to:

⇒ Chapter 2 "Scope of supply" on page 6

2. Chapter "Hardware reference" ⇒ Section "Power supply" revised.

Refer to:

⇒ Chapter 8.1 "Power supply" on page 31.

General information

40D Reference manual

Version: 1.3 en, 02/2024, D2039.EN .01

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Keep this document with the product or in a safe place so that it is available for future reference.

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Explanation of graphical symbols



The lightning symbol within a triangle is intended to alert the user to the presence of uninsulated "dangerous voltages" within the unit's chassis that may be of sufficient magnitude to constitute a risk of electric shock to humans.

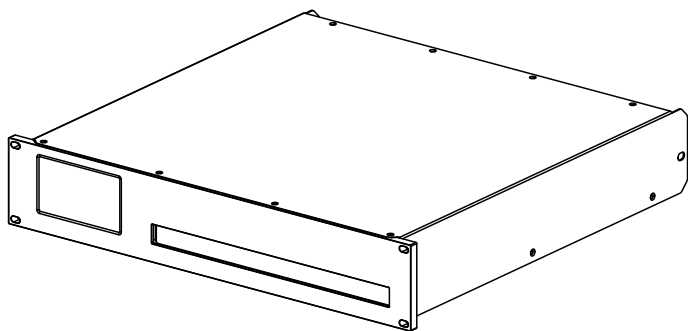


The exclamation point within a triangle is intended to alert the user to the presence of important operating and service instructions in the literature accompanying the product.

Before using this product, carefully read the applicable items of the following safety instructions.

1. Keep these instructions for future reference.
2. Read these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. **WARNING!** To reduce the risk of fire or electric shock:
 - Do not expose this unit to rain or moisture.
 - Keep water or other liquids away from the unit.
 - Do not place liquid filled containers, for example beverages, on top of the unit.
 - Do not operate the unit while it is wet or standing in liquid.
6. Always operate the unit with the chassis ground wire connected to the electrical safety earth.
Do not defeat the safety purpose of a grounding-type plug. A grounding-type plug has two blades and a third grounding prong. The third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
7. Do not use this unit if the power cord is damaged or frayed. Protect the power cord from being walked upon or pinched, particularly at the plugs and the point where it exits from the apparatus.
8. The unit is intended for use in a 19" rack. Follow the mounting instructions. When a rack on wheels is used, exercise caution when moving the loaded rack to avoid injury from tipping over.
9. Unplug this apparatus during lightning storms or when unused for long periods of time.
10. Never connect an output pin to any other amplifier input or output pin or to the earth (ground). This may damage the unit or lead to electric shock.
11. Lay all cables connected to the unit carefully so that they cannot be crushed by vehicles or other equipment and that no one can either step on them or trip over them.
12. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way such as:
 - Power-supply cord or plug is damaged.
 - Liquid has been spilled into the unit.
 - An object has fallen into the unit.
 - The unit has been exposed to rain or moisture.
 - The unit does not operate normally.
 - The unit was dropped or the chassis is damaged.
 - Do not remove top or bottom covers. Removal of the covers will expose hazardous voltages. There are no user serviceable parts inside and removal may void the warranty.
13. Use the mains plug as the disconnecting device and keep it readily accessible. If the mains plug is not readily accessible due to mounting in a 19" equipment cabinet, then the mains plug for the entire rack must be readily accessible.
14. An experienced user must always supervise the equipment, especially if inexperienced adults or minors are using the equipment.

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The d&b 40D amplifier is designed for installation purposes and is intended to be used with applicable d&b loudspeakers.

A "LINEAR" setup is available allowing the amplifier to be used as a linear installation power amplifier.

Note: d&b audiotechnik will accept no liability for any damages to third-party loudspeakers when operated with d&b amplifiers in "LINEAR" mode.

NOTICE!

The device complies with the electromagnetic compatibility requirements of EN 55032:2019 (product family standard for audio, video, audio-visual and entertainment lighting control apparatus for professional use) for the environment Class B (residential).

Acoustic interference and malfunctions may occur if the unit is operated in the immediate vicinity of high-frequency transmitters (e.g. wireless microphones, mobile phones, etc.). Damage to the device is unlikely, but cannot be excluded.

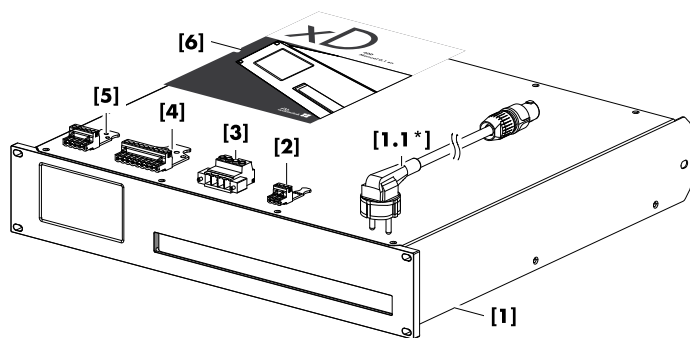
1.1 Loudspeaker types

The maximum number of cabinets driven by each channel varies depending on their nominal impedance. It can be found in the respective loudspeaker manual and also in the data section of each loudspeaker product page on the d&b website at www.dbaudio.com.

The minimum recommended impedance per channel is 4 ohms.

Nom. impedance	Cabinets per channel
4 Ω	1
8 Ω	2
12 Ω	3
16 Ω	4
20 Ω	5

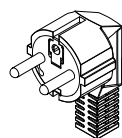
A list of d&b loudspeakers supported by the amplifier is included in the Release notes of the amplifier firmware. The latest version can be found on the d&b website at www.dbaudio.com.



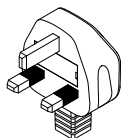
Before starting up the device, please verify the shipment for completeness and proper condition of the items.

If there is any sign of obvious damage to the unit and/or the power cord, do not operate the unit and contact your local dealer from whom you received it.

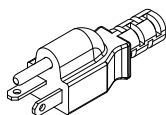
Pos.	Qty.	d&b Code	Description
[1]	1	Z2830	d&b 40D Amplifier
Including:			
[1.1*]	1	Z2612.xxx	Power cord (specific to country*)
[2]	9		3-pin Phoenix Euroblock female: - Intended for the INPUT/LINK/FAULT connector sockets. - Connector type: MSTB 2.5 / 3-STZ - Phoenix order code: 1776168
[3]	2		4-pin Phoenix Euroblock male: - Intended for the SPEAKER OUTPUTS connector sockets. - Connector type: IPC 5/4-STF-7.62 - Phoenix order code: 1709173
[4]	1		9-pin Phoenix Euroblock female: - Intended for the GPI connector socket. - Connector type: MSTB 2.59-STZ-5.08 - Phoenix order code: 1764316
[5]	1		5-pin Phoenix Euroblock female: - Intended for the GPO connector socket. - Connector type: MSTB 2.55-STZ-5.08 - Phoenix order code: 1776142
[6]	1	D2036.EN .01	d&b 40D Start-up manual.



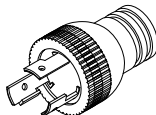
Z2612.000
3-pin Schuko
CEE 7/7



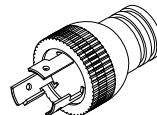
Z2612.010
3-pin UK
BS 1363A



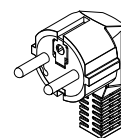
Z2612.024*
3-pin U.S.
NEMA 5-20P
*within delivery



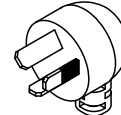
Z2612.025*
3-pin U.S.
NEMA L6-20P
*optional



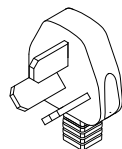
Z2612.035
3-pin Japan
NEMA L6-20P



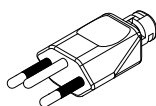
Z2612.040
3-pin South Korea
KS C8305



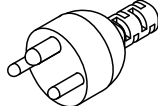
Z2612.050
3-pin Australia
AS 3112



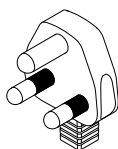
Z2612.060
3-pin China
GB 2099



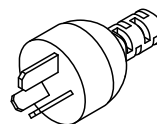
Z2612.070
3-pin Switzerland
SEV 1011



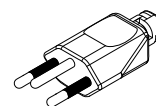
Z2612.090
3-pin Denmark
Afsnit 107-2-D1



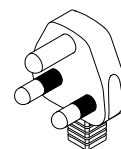
Z2612.100
3-pin South Africa
SANS 164-1



Z2612.110
3-pin Argentina
IRAM 2073



Z2612.120
3-pin Brazil
NBR 14136



Z2612.130
3-pin India
IS 1293

*** Mains plug types and associated standards**
(Similar illustrations, not in scale)

Operating conditions

Operating temperature (*continuous/**short-term)	
..... -10 °C ... +40*/+50** °C (+14 °F ... +104*/+122** °F)	
Storage temperature	 -20 °C ... +70 °C (-4 °F ... +158 °F)
Humidity (rel.), non-condensating	 < 70 %

Power supply

Switched mode power supply with automatic mains range selection and active Power Factor Correction (PFC).

Mains connector	 powerCON® TRUE 1 TOP
Rated mains voltage (High range)	 208 - 240 V, 50 - 60 Hz
Rated mains current (High range)	 13 A
Rated mains voltage (Low range)	 100 - 127 V, 50 - 60 Hz
Rated mains current (Low range)	 20 A

Protection circuits

Mains and power supply: Overvoltage and undervoltage, inrush current limiter, internal fuse.

Output: Overcurrent, DC offset, HF voltage limiter, pop-noise suppression.

Cooling: Temperature-dependent fan, self-resetting overtemperature protection.

Power consumption (typical values)

Standby	 13 W
Idling	 130 W
Peak output	 2900 W

Audio power outputs*

SPEAKER OUTPUTS A/B/C/D	 2 x 4-pin Phoenix Euroblock female
Maximum output voltage/current	 180 V _{peak} /35 A _{peak}
Output power rating EIA-426B noise CF 12 dB	 4 x 2000 W/8 Ω
.....	 4 x 2400 W/4 Ω
Sine wave 1 kHz, long term, +40 °C (+104 °F)	 4 x 250 W/4 Ω
Frequency response (-1 dB, Linear mode)	 35 Hz - 25 kHz
Gain (Linear mode @ 0 dB)	 31 dB

Output noise/Dynamic range

Output noise (BW 20 kHz)/dynamic range (BW 20 kHz, reference 180 V _{pk})	
Analog input	 350 μV _{RMS} /111 dB
Analog input, A-weighting	 250 μV _{RMS} /114 dB
Digital input	 200 μV _{RMS} /116 dB
Digital input, A-weighting	 150 μV _{RMS} /119 dB

THD+N / Crosstalk

THD+N (unweighted, 20 - 20 kHz)	
4 x 250 W/8 ohms	 < -86 dB/0.005 %
4 x 250 W/4 ohms	 < -83 dB/0.007 %
Crosstalk (20 - 20 kHz)	 < -70 dB
.....	 4 x 250 W into 8/4 Ω

Analog inputs and outputs

INPUT A1 - A4	 3-pin Phoenix Euroblock male
Pin assignment	 (↓) GND, neg., pos.
Input impedance	 32 kΩ, electronically balanced
CMRR @ 100 Hz/1 kHz / 10 kHz	 >80/>80/>70 dB
Maximum input level (balanced/unbalanced)	 +25/+18 dBu
.....	 +27.3 dBu @ 0 dBFS

Digital inputs and outputs

INPUT - D1/2, D3/4	 3-pin Phoenix Euroblock male, AES3
Pin assignment	 (↓) GND, AES Signal, AES Signal
Input impedance	 110 Ω, transformer balanced
Sampling frequency	 44.1 48 96 192 kHz
Word length	 16 - 24 bit
LINK - D1/2, D3/4	 3-pin Phoenix Euroblock male
Pin assignment	 (↓) GND, AES Signal, AES Signal
.....	 electronically balanced
Output modes	 Mains on: analog signal buffering (refresh)
.....	 Mains off/power fail: bypass relay

ETHERNET 1 (PRI)/ETHERNET 2 (SEC)

Connector type	 2 x RJ 45
ETHERNET 1 (PRI)	 Remote control via R1, Star topology
ETHERNET 2 (SEC)	 Currently disabled

IP settings (factory default)

IP address/Subnet mask	 192.168.1.40/255.255.255.0
------------------------	----------------------------------

GPI/GPO/FAULT

External power supply	 24 VDC ±25% (18 - 30 VDC)/150 W
-----------------------	---------------------------------------

GPI	 8 x Opto-coupled (galvanic isolation)
High-level	 18 ... 30 VDC
Low-level	 0 ... 9 VDC
Serial resistance	 5.4 kOhms
Forward voltage drop (U _{f(max.)})	 3.7 V
Input current draw per pin @ 9/18/24/30 VDC	
.....	 1.5/2.6/3.7/4.8 mA
Connector type	 1 x 9-pin Phoenix Euroblock male
Pin assignment	 (↓) GND, GPIs 1 - 8

GPO	 4 x Low-Side-Switch-Relay
High-state	 Closed (connected to common GPO GND)
Low-state	 Open (high resistive)
Max. current draw	 1 A/Total: 4 A
Connector type	 1 x 5-pin Phoenix Euroblock male
Pin assignment	 (↓) GND, GPOs 1 - 4

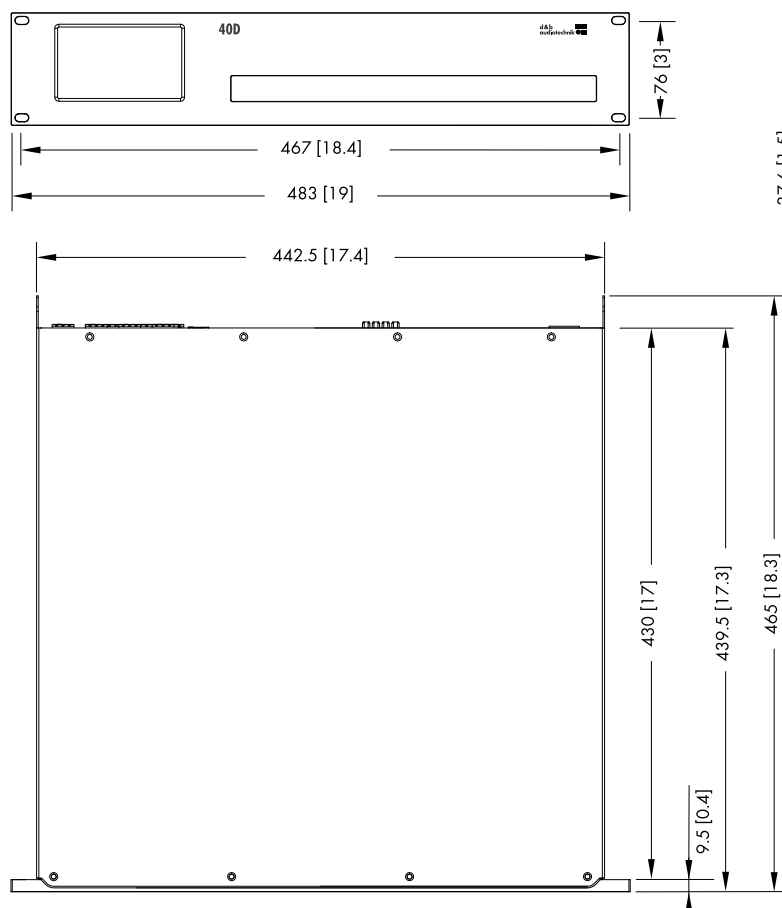
FAULT	 NO - Normally Open NC - Normally Closed
.....	 1 x 3-pin Phoenix Euroblock male

Digital Signal Processing

System start-up time	< 21 sec.
Time to tone (Standby/ReadyStandby)	< 4 / < 1 sec.
Time to tone (Off/Wake on Audio)	< 21 / < 4 sec.
Conversion	96 kHz
Latency analog/digital (AES) input	0.3/0.3 msec.
A/D conversion	27 Bit (dual-stacked A/D converters)
Internal processing	Combination of high-resolution fixed pointand floating point processing
Equalizer	two user definable 16-band equalizersFilter types: PEQ/Notch/HiShlv/LowShlv/Asym
Delay	0.3 msec. - 10 sec.
Frequency generator	Pink noise or Sine wave 10 Hz - 20 kHz

Controls and indicators

RESET	Recessed push-button (rear panel)
TFT color touchscreen	4.3"/480 x 272 pixels



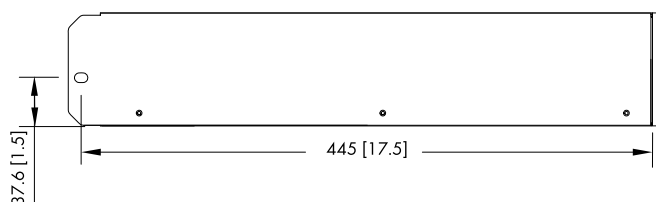
40D enclosure dimensions in mm [inch]

Fan noise emission

Rack mounted, measured on axis, 1 m (3.3 ft) to front panel, A-weighting.	
Min./Max. RPM	30/50 dB(A)
.....Ambient temperature 23 °C/73.4 °F	

Dimensions and weight

Height x width x depth	2 RU x 19" x 465 mm (18.3")
Weight	13.3 kg/29.3 lb



* Audio power output – Measurement references:

All data is valid for 23 °C (73.4 °F) ambient temperature and 230 VAC/50 Hz mains supply.

The power rating of noise signals is defined as the maximum of the instantaneous output power divided by a factor of two.

The power of burst signals refers to the power during the "on" period.

The duration of the peak output of a sine wave signal is defined at a drop of 0.5 dB/10% relative to the maximum output power.

EIA-426B noise			
Crest factor	Load	Power rating	Power average
12 dB	4 ohms 8 ohms	4 x 2400 W 4 x 2000 W	4 x 300 W 4 x 250 W
9 dB	4 ohms 8 ohms	4 x 1300 W 4 x 2000 W	4 x 325 W 4 x 500 W
6 dB	4 ohms 8 ohms	4 x 700 W 4 x 1150 W	4 x 375 W 4 x 575 W
1 kHz burst			
On/off time	Load	Power	
20 ms/0 dB 480 ms/−20 dB	4 ohms 8 ohms	4 x 1200 W 4 x 1150 W	
200 ms/0 dB 600 ms/−20 dB	4 ohms 8 ohms	4 x 700 W 4 x 750 W	
1 kHz sine wave			
Channels used	Load	Max. output power	Duration of max. output
1	4 ohms 8 ohms	1 x 2400 W 1 x 2000 W	110 ms 2000 ms
4	4 ohms 8 ohms	4 x 2400 W 4 x 2000 W	5 ms 4 ms

3.1 Current/power draw and thermal dissipation

Measurement references

For all noise signals, the values are measured at the maximum level just before any amplifier limiter activity (no Gain Reduction).

Noise CF 12 dB: Noise signal according to EIA-426-B with a crest factor of 12 dB.

This represents the use case of live music or less compressed recorded music.

Noise CF 9 dB: Noise signal according to EIA-426-B with a crest factor of 9 dB.

This represents the use case of music with medium compression.

Noise CF 6 dB: Noise signal according to EIA-426-B with a crest factor of 6 dB.

This represents the use case of heavily compressed music.

Sine wave (100 ms): 1 kHz sine wave signal, 0 dBFS input level and a duration of 1 s.

The RMS current value is calculated over a 100 ms time window. This window is stepped in increments of 10 ms over the recording. The resulting value is the highest current within a window of 100 ms.

230 VAC / 50 Hz / 0.5 Ω Source impedance - all channels driven								
State	Load [ohms]	Mains current [A RMS]	Power factor	Input power [W]	Output power [W]	Power loss [W]	BTU/hr	kCal/hr
Standby	-	0.26	0.22	13.5	-	13.5	46	12
Standby/Wake on Audio	-	0.29	0.31	20.8	-	20.8	71	18
ReadyStandby	-	0.43	0.54	52.6	-	52.6	179	45
Eco	-	0.83	0.54	103	-	103	351	89
Idling	-	0.75	0.74	127	-	127	433	109
Noise CF 12 dB	8 4	6.1 7.8	0.95 0.96	1300 1700	1000 1200	300 500	1024 1706	258 430
Noise CF 9 dB	8 4	11.6 8.2	0.98 0.97	2550 1800	2000 1300	550 500	1876 1706	473 430
Noise CF 6 dB	8 4	13 8.8	0.99 0.98	2900 1950	2300 1400	600 550	2047 1876	516 473
Sine wave max. 1 s	8 4	16.6 16.5	- -	- -	- -	- -	- -	- -

208 VAC / 60 Hz / 0.5 Ω Source impedance - all channels driven								
State	Load [ohms]	Mains current [A RMS]	Power factor	Input power [W]	Output power [W]	Power loss [W]	BTU/hr	kCal/hr
Standby	-	0.28	0.20	11.9	-	11.9	41	10
Standby/Wake on Audio	-	0.32	0.32	20.8	-	20.8	71	18
ReadyStandby	-	0.46	0.53	50.2	-	50.2	171	43
Eco	-	0.86	0.54	97	-	97	331	83
Idling	-	0.82	0.74	126	-	126	430	108
Noise CF 12 dB	8 4	6.8 8.8	0.96 0.96	1350 1750	1000 1200	350 550	1194 1876	301 473
Noise CF 9 dB	8 4	13.1 9.2	0.98 0.98	2600 1850	2000 1300	600 550	2047 1876	516 473
Noise CF 6 dB	8 4	13.7 9.9	0.99 0.98	2750 2000	2100 1400	650 600	2218 2047	559 516
Sine wave max. 1 s	8 4	18.4 18.4	- -	- -	- -	- -	- -	- -

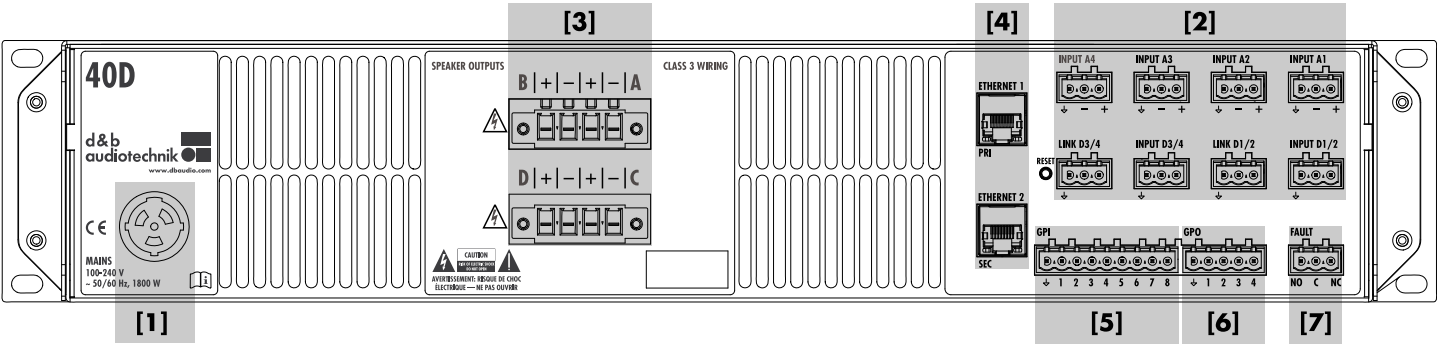
120 VAC / 60 Hz / 0.2 Ω Source impedance - all channels driven

State	Load [ohms]	Mains current [A RMS]	Power factor	Input power [W]	Output power [W]	Power loss [W]	BTU/hr	kCal/hr
Standby	-	0.23	0.41	11.4	-	11.4	39	10
Standby/Wake on Audio	-	0.32	0.50	18.8	-	18.8	64	16
ReadyStandby	-	0.60	0.72	52.0	-	52.0	177	45
Eco	-	1.44	0.60	104	-	104	355	89
Idling	-	1.26	0.86	130	-	130	444	112
Noise CF 12 dB	8 4	12.1 15.9	0.96 0.96	1350 1800	1000 1200	350 600	1194 2047	301 516
Noise CF 9 dB	8 4	18.8 16.6	0.98 0.98	2100 1900	1600 1300	500 600	1706 2047	430 516
Noise CF 6 dB	8 4	19.7 17.7	0.99 0.98	2250 2000	1650 1400	600 600	2047 2047	516 516
Sine wave max. 1 s	8 4	25.2 27.7	- -	- -	- -	- -	- -	- -

100 VAC / 60 Hz / 0.2 Ω Source impedance - all channels driven

State	Load [ohms]	Mains current [A RMS]	Power factor	Input power [W]	Output power [W]	Power loss [W]	BTU/hr	kCal/hr
Standby	-	0.21	0.49	10.3	-	10.3	35	9
Standby/Wake on Audio	-	0.34	0.55	18.7	-	18.7	64	16
ReadyStandby	-	0.65	0.75	48.2	-	48.2	164	41
Eco	-	1.54	0.61	94.8	-	94.8	323	82
Idling	-	1.45	0.88	128	-	128	437	110
Noise CF 12 dB	8 4	14.9 19.9	0.97 0.96	1400 1850	1000 1200	400 650	1365 2218	344 559
Noise CF 9 dB	8 4	21.2 20.8	0.98 0.98	2000 1950	1450 1300	550 650	1876 2218	473 559
Noise CF 6 dB	8 4	21.0 21.1	0.99 0.99	2000 2000	1450 1350	550 650	1876 2218	473 559
Sine wave max. 1 s	8 4	30.3 32.7	- -	- -	- -	- -	- -	- -

4.1 Connections



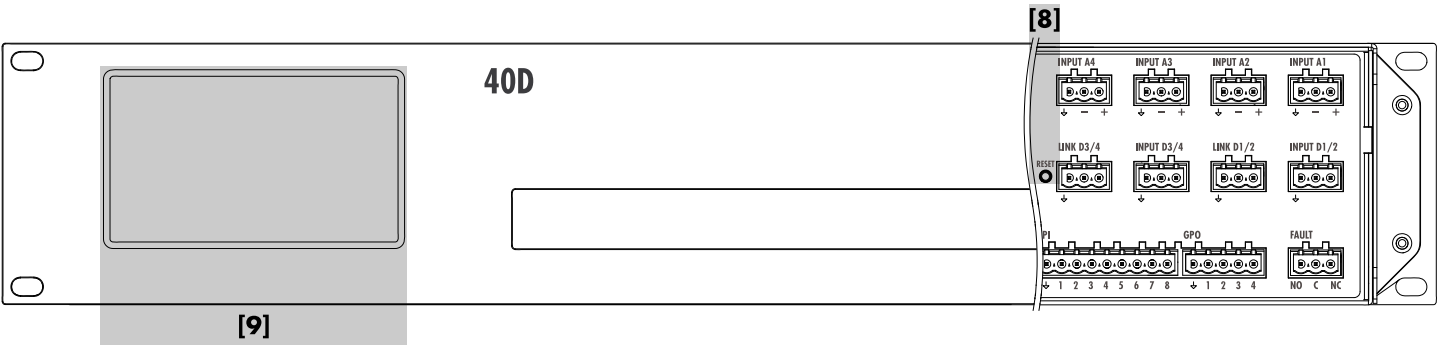
- [1] Mains connector socket.
Refer to ⇒ Chapter 5.2.1 "Mains connection" on page 14.
- [3] Output connectors.
Refer to ⇒ Chapter 5.2.3 "SPEAKER OUTPUTS" on page 16.
- [2] Audio INPUT (analog/digital) and LINK connectors.
Refer to ⇒ Chapter 5.2.2 "Audio input and output connectors" on page 15.

[4] ETHERNET.
Refer to ⇒ Chapter 5.2.4 "ETHERNET (Dual Ethernet port)" on page 17.

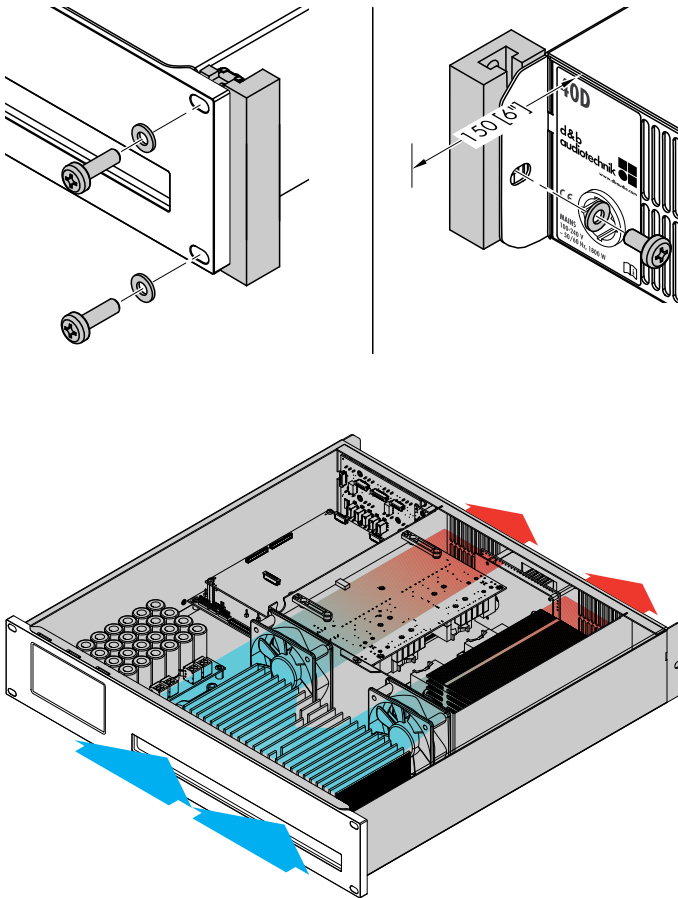
[5] GPI /GPO connector.
[6] Refer to ⇒ Chapter 5.2.5 "GPI/GPO (Hardware description)" on page 18.

[7] FAULT connector.
Refer to ⇒ Chapter 5.2.6 "FAULT" on page 18.

4.2 Controls and indicators - User interface



- [9] User interface / Status indicators
Refer to
- [8] RESET
Refer to ⇒ Chapter 5.3.1 "RESET (System reset)" on page 19



5.1 Rack mounting and cooling

Rack mounting

The enclosure is designed to fit standard 19" equipment racks or cabinets, it is strongly recommended that you:

NOTICE!

When mounting the device into 19" equipment racks or cabinets, it is strongly recommended that you:

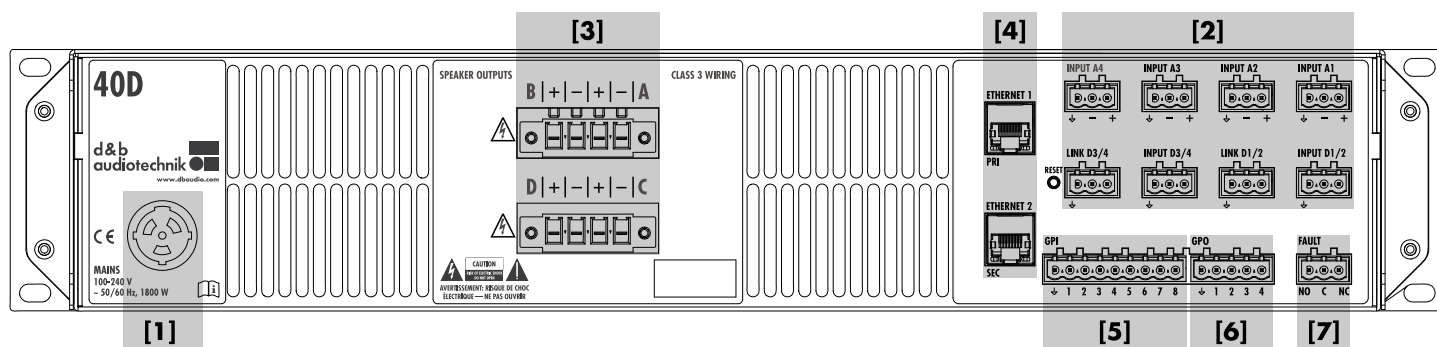
- **Always** fix the device at its **front AND rear-mounted rack ears** using appropriate rack mounting screws and U washers, as shown in the graphic opposite.
- Alternatively use shelves fixed to the inner sides of the equipment rack or cabinet.

Cooling

Thermal conditions are a vital factor to ensure operational safety of the power amplifiers. The amplifiers are equipped with two internal fans that draw cool air from the front into the housing and channel the warm air towards the back of the device.

- Please ensure that adequate cool airflow is provided.
- Do not block or cover the front panel air intake or the vents on the rear panel.
- If the amplifiers are installed in sealed cabinets (e.g. in fixed installations), use additional fan modules with filters that can be easily replaced without opening the sealed cabinets.
- Do not combine the amplifiers with D6 or D12 amplifiers in one rack.
- Do not rack up the amplifiers together with other devices producing additional heat with opposing airflow.

5.2 Connections



5.2.1 Mains connection



WARNING!

Potential risk of electric shock or fire.

The device is a protective class 1 unit. A missing earth (ground) contact may cause dangerous voltages in the housing and controls and may lead to electric shock.

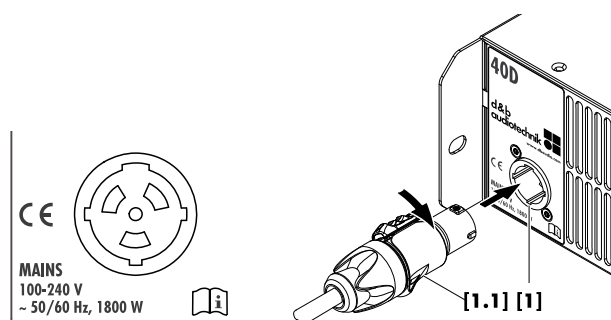
- Connect the device to mains power supplies with protective earth only.
- If there is any sign of obvious damage to the power cord and/or mains plug, do not use the power cord and replace it before further use.
- Please ensure the mains connector is accessible at any time to disconnect the device in case of malfunction or danger. If the mains plug is not readily accessible due to mounting in a 19" rack or equipment cabinet, then the mains plug for the entire rack or cabinet must be readily accessible.
- Do not connect or disconnect the mains plug under load.

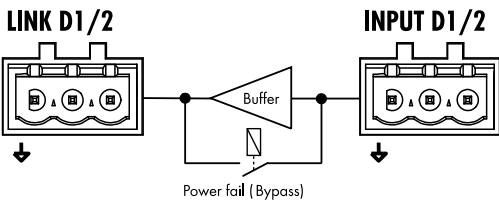
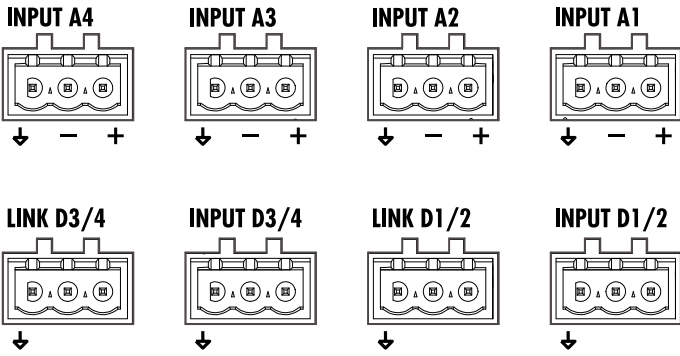
Before connecting the device to mains voltage, check that the mains voltage and frequency correspond to the specifications on the rating label next to the mains connector socket on the rear panel of the unit.

Mains voltage range:

100 to 240 VAC, ~50/60 Hz, 1800 W.

A powerCON® TRUE 1 TOP mains connector socket **[1]** is fitted on the rear panel and an appropriate power cord **[1.1]** is supplied.





5.2.2 Audio input and output connectors

The rear panel features eight installation specific Phoenix Euroblock connectors with the following assignments:

- four analog inputs (A1 - A4)
- two digital AES3 inputs (D1/2 and D3/4 - four channels) with corresponding LINK outputs.

Each input channel can be routed to any of the output channels A to D $\Rightarrow$ Input routing.

Analog INPUT (A1 - A4)

A 3-pin Phoenix Euroblock connector (male) is provided for each analog input to accept the supplied 3-pin Phoenix Euroblock connector (female). To feed (link) the input signal on to the next device in the signal chain, the connector can also be used as a cable tap.

Specifications

Pin assignment	(↓) GND, neg., pos.
Input impedance	32 kOhms, electronically balanced
CMRR @ 100 Hz/1 kHz/10 kHz	>80/>80/>70 dB
Maximum input level (balanced/unbalanced)	+25/+18 dBu
.....	+27.3 dBu @ 0 dBFS

Digital INPUT and LINK (D1/2 - D3/4)

A 3-pin Phoenix Euroblock connector (male) is provided for each pair of digital inputs to accept the supplied 3-pin Phoenix Euroblock connector (female).

The corresponding digital LINK output (1/2, 3/4) can be used to feed a refreshed input signal to the next device in the signal chain. The signal shape (the rising and falling edges of the signal) and level are refreshed with an analog buffer amplifier.

A power fail relay is incorporated to prevent interruption of the signal chain should there be a power failure. In this situation, the digital input signal bypasses the analog buffer amplifier and is routed directly to the LINK output.

Specifications

Pin assignment	(↓) GND, AES Signal, AES Signal
Input impedance	110 ohms, transformer balanced
Sampling frequency	44.1 48 96 192 kHz
Word length	16 - 24 bit
Digital LINK (D1/2, D3/4)	3-pin Phoenix Euroblock male
.....	electronically balanced
.....	analog signal buffering (refresh), power fail relay (Bypass)

5.2.3 SPEAKER OUTPUTS



WARNING!

Potential risk of electric shock or fire.

Risk of electric shock

The amplifier output pins can carry dangerous voltages.

- Only use isolated loudspeaker cables with correctly fitted connectors.
- Never connect an amplifier output pin to any other input or output connector pin or protective earth (ground).
- **Bridge mode is not applicable.**

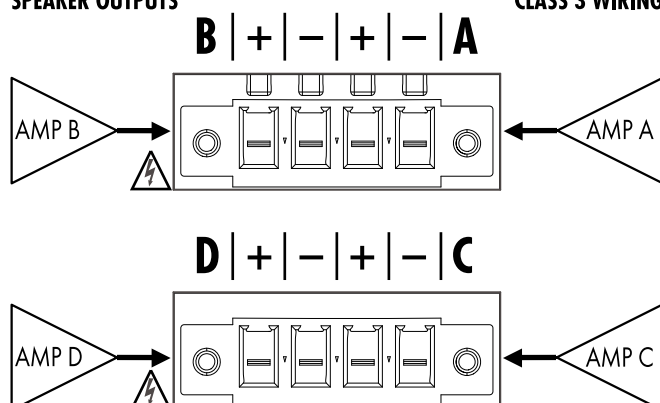
Risk of fire

To avoid any heating of the output connector terminal (glowing contact), the wires need to be properly fitted to the output connector terminal.

- Only use the enclosed Phoenix Euroblock connector terminals [3].
- Observe the maximum cross-section of 6 mm² (AWG 10).
- Ensure all contact screws are properly tightened.
Recommended **torque** settings (min/max): **0.7/0.8** N·m.
- Ensure the fixing screws of the connector terminal are properly fitted to the output connector socket of the device.

SPEAKER OUTPUTS

CLASS 3 WIRING



The amplifier is equipped with two Phoenix Euroblock connector sockets (female), one for each pair of amplifier output channels (A/B, C/D).

All pins of both output connectors are hardwired and permanently driven using the following pin assignment.

SPEAKER OUTPUTS A (B, C, D)

+ = Amp A (B, C, D) pos.

- = Amp A (B, C, D) neg.

5.2.4 ETHERNET (Dual Ethernet port)

NOTICE!

Only **shielded network cables (STP)** must be used!

The device allows standard remote control via the d&b Remote control software or the integrated Web remote interface.

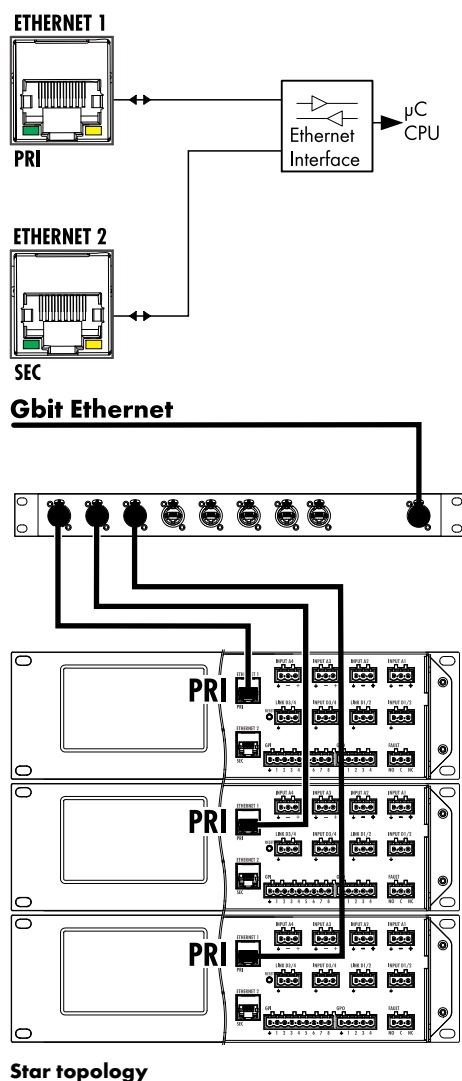
For this purpose, use the upper RJ45 (**ETHERNET 1/PRI**) connector socket (1 Gbit/s/100 Mbit/s – peer-to-peer) requiring star topology network wiring. Daisy-chaining is not supported.

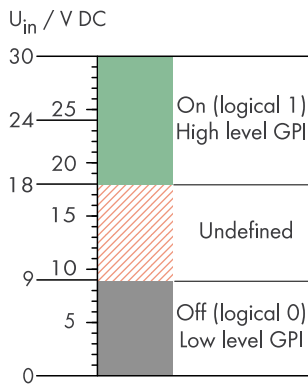
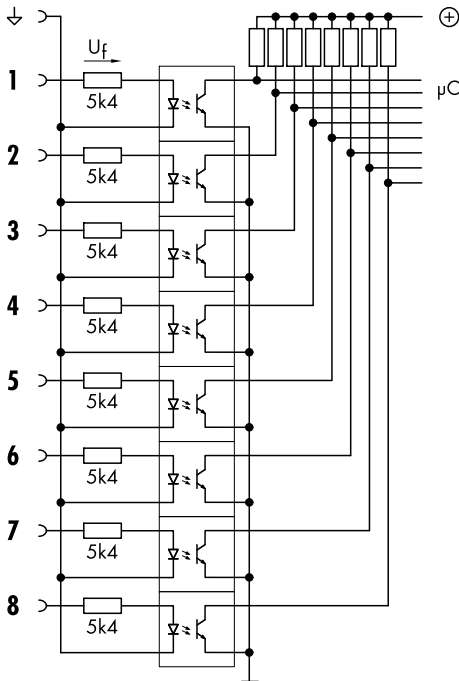
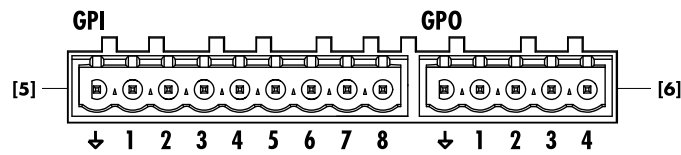
Note: The bottom RJ45 connector socket (**ETHERNET 2/SEC**) is not enabled but is reserved for future feature implementations.

LED indicators

The two LED indicators above the respective connector in use indicate the following states:

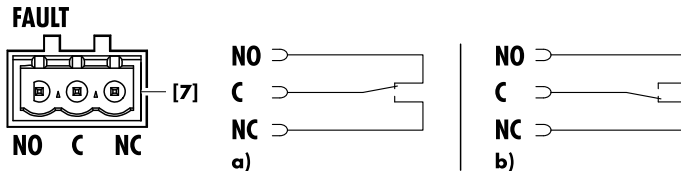
- Green** Illuminates permanently when the device is connected to an active network and flashes as long as a data stream is transmitted.
- Yellow**
- Is off when the speed is 100 Mbit/s.
 - Illuminates permanently when the speed is 1 Gbit/s.





GPI | GPO

Schematic circuit diagrams and logic level chart (GPI)



FAULT

Schematic circuit diagram and switching status:

- a) Device is On and operating
- b) Device is Off or general device error

5.2.5 GPI/GPO (Hardware description)

Up to eight opto-coupled GPI pins [5] (**G**eneral **P**urpose **I**ntput) and up to four GPO pins [6] (**G**eneral **P**urpose **O**utput) are available as additional digital control lines. This enables external control and detection functions.

Note: A detailed description of how to configure the GPIOs and assign the available software objects (functions) correspondingly is given in ⇒ Chapter 6.2 "GPIO Configuration" on page 25.

Each GPI provides either level (Hi/Lo active - non-latching) or edge (rising/falling - latching) triggering.

Note: When using a GPI or GPO contact, observe the following:

- An external DC power supply is required.
- **GPI:** The corresponding pin is connected via an opto-coupler with a serial resistance of 5.4 kΩ.
- **GPO:** The corresponding pin is connected to ground (GND/↓) via a relay (Low-Side-Switch).

Make sure the current per GPO pin does not exceed 1 A.

Technical specifications

External power supply 24 VDC ±25% (18 - 30 VDC)/150 W

GPI 8 x Opto-coupled (galvanic isolation)
 High-level 18 ... 30 VDC
 Low-level 0 ... 9 VDC
 Serial resistance 5.4 kOhms
 Forward voltage drop ($U_{f(max.)}$) 3.7 V
 Input current draw per pin @ 9/18/24/30 VDC
 1.5/2.6/3.7/4.8 mA
 Connector type 1 x 9-pin Phoenix Euroblock male
 Pin assignment (↓) GND, GPIs 1 - 8

GPO 4 x Low-Side-Switch-Relay
 High-state Closed (connected to common GPO GND)
 Low-state Open (high resistive)
 Max. current draw 1 A/Total: 4 A
 Connector type 1 x 5-pin Phoenix Euroblock male
 Pin assignment (↓) GND, GPOs 1 - 4

5.2.6 FAULT

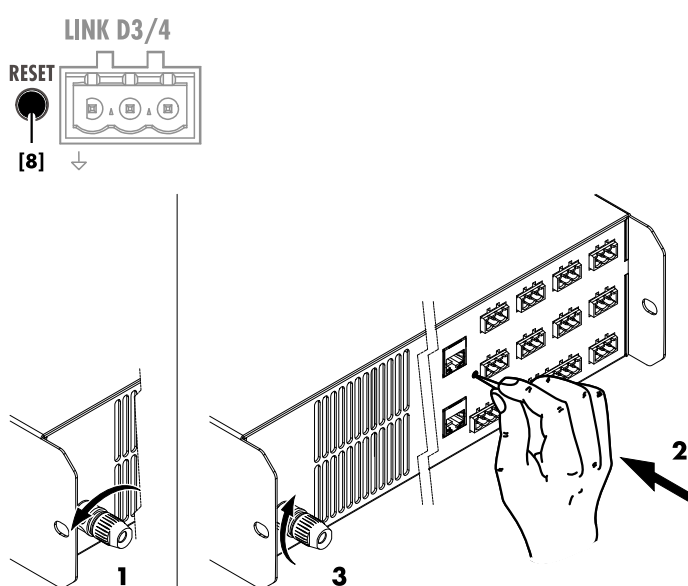
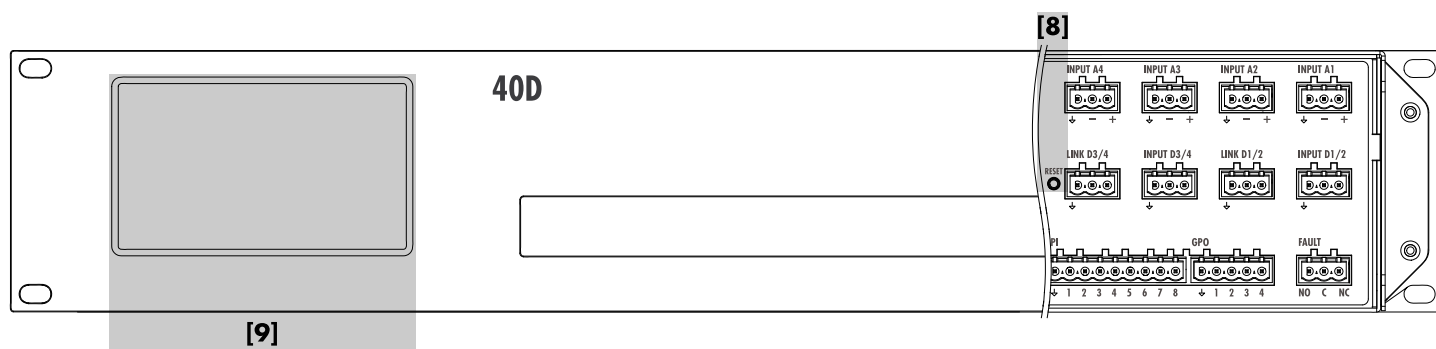
An additional 3-pin Phoenix Euroblock fault contact [7] is provided allowing a general device error to be remotely indicated.

Note:

- The assignment of the corresponding software object is fixed and cannot be changed by the user.
- During a firmware update, the fault contact switches to status b), as shown in the graphic opposite.

NO Normally Open
C Common
NC Normally Closed

5.3 Controls and indicators



5.3.1 RESET (System reset)

A reset button (RESET [8]) is located on the rear panel next to the digital LINK D3/D4 connector terminal.

To prevent accidental system reset, the button is slightly recessed.

To perform a system reset, proceed as follows:

Note: All device preferences will be set to factory defaults except for the network and fixed device settings.

1. Isolate the device from mains power by releasing the powerCON connector and turn it counterclockwise.
2. Press and hold the «RESET» button using an appropriate pen.
3. While holding the «RESET» button pressed, repower the device by turning the powerCON connector clockwise.
 - ↳ Long confirmation beep.
4. Release the «RESET» button and briefly press the button again within 2 sec.
 - ↳ Short confirmation beep ⇒ the device will reboot.

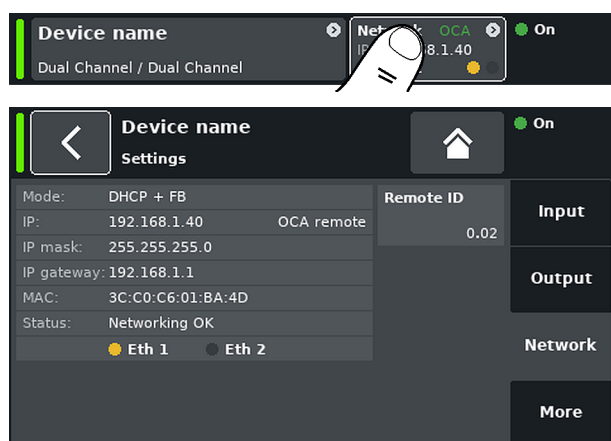
5.3.1.1 Network reset option (IP settings)

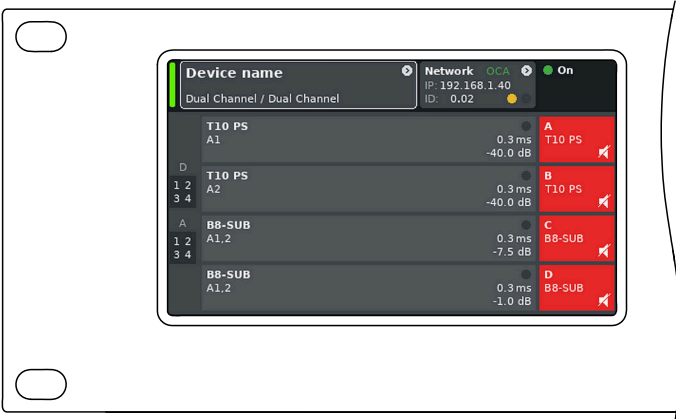
Executing the following reset procedure allows you to locally change/edit the network (IP) settings, if required.

Once the settings have been changed and the device has been shut down, the access to the network settings will be disabled again after repowering the device.

1. During normal operation, press and hold the «RESET» button for 5 sec.
 - ↳ Long confirmation beep.
2. Release the «RESET» button and briefly press the button again within 2 sec.
 - ↳ Short confirmation beep.

The network settings will become accessible for editing by tapping the «Network» navigation button as shown in the graphic opposite.





5.3.2 TFT color touchscreen - User interface

NOTICE!

The touch panel utilizes a thin flexible sheet that may be damaged by sharp objects or heavy treatment.

The user interface consists of a 4.3" TFT color touchscreen [9] with a resolution of 480 x 272 pixels.

The resistive touchscreen responds to pressure and therefore can be operated by a fingertip, even when wearing gloves or by an appropriate stylus tip (pen).

Screen contents

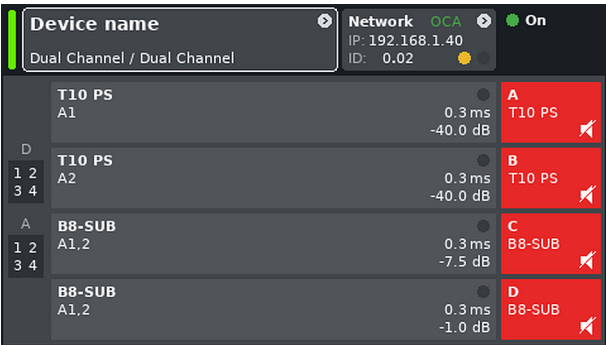
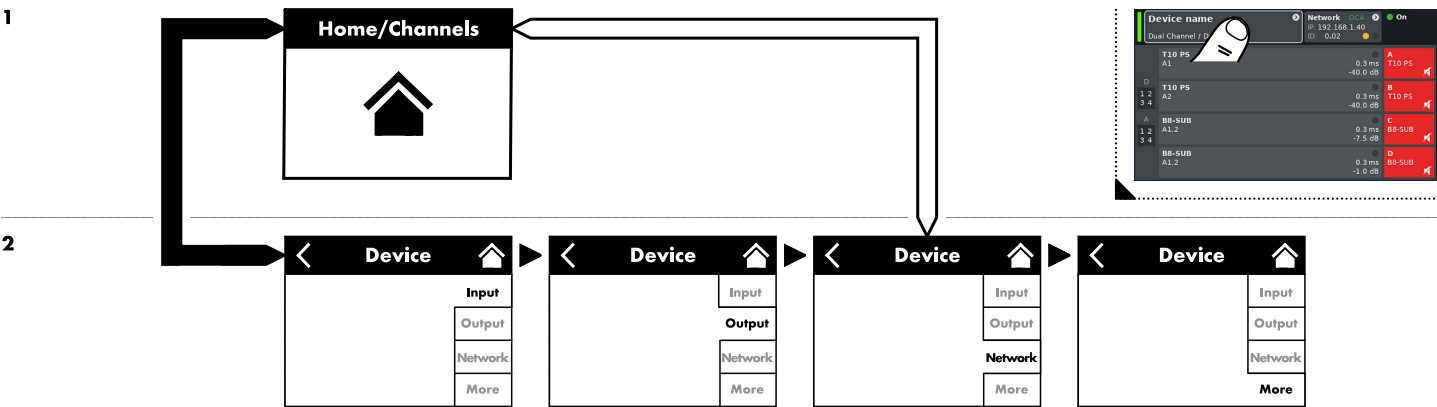
The display provides comprehensive information regarding the channel settings/statuses as well as the device settings/statuses.

The structure of the screen content(s) is divided into two main axes, the «Home» view, including the «Channel» settings/statuses, and the «Device» settings/statuses views.

Accessing the screen contents

⇒ To access a particular subscreen, simply tap  the corresponding screen item, shown as an example in the graphic below.

Screen access and structure chart



5.4 Screen contents

5.4.1 Home

From the Home screen, the screen structure is divided into two main sections (axes), the **Header** and **Data** (Channel strip) sections.

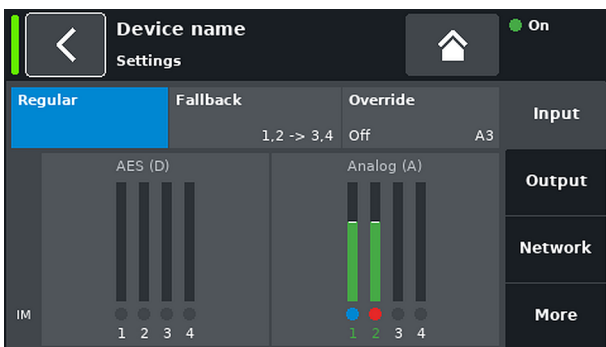
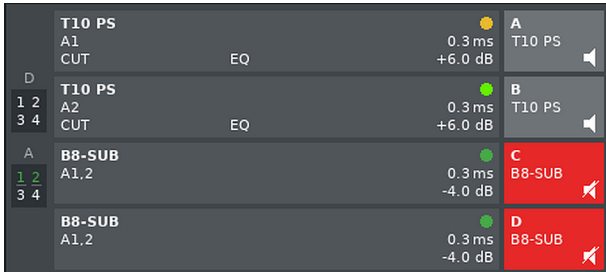
The navigation buttons allow for vertical access to the subscreens while the tab structure on the right side of each subscreen provides a clear horizontal order.

In addition, the header gives direct access to the Network subscreen.

The Home screen can be accessed from any subscreen at any level using the Home button .

Header

The header section features the most vital device status information. This includes (from left to right):



1. Power-on indicator

Yellow: Indicates the start-up phase of the power supply.

Green: Indicates that the device is switched on.

Grey: Indicates that the device is in standby mode.

Red: Indicates a device error.

2. Device name and output mode settings

This navigation button provides direct access to the ⇒ Input subscreen.

3. Network settings and status

This navigation button provides direct access to the ⇒ Network subscreen.

- OCA**
- **Green:** The device is connected to the d&b Remote network and R1 is in «Online» mode.
 - **Black:** The device is not connected to the d&b Remote network or R1 is offline.

IP: IP address.

ID: Remote ID.

In addition, the network speed is indicated by dedicated LEDs with the following color code:

Green 1 Gbit/s network.

Yellow 10/100 Mbit/s network.

Grey No link up.

4. Additional information field regarding the power on status of the device.

Data - Channel strips

The data section features the actual channel strips starting with the input connector and then following the real signal flow from left to right. All vital information is displayed. This includes:

1. Input signal present (ISP).
2. Channel configuration and signal status (ISP/GR/OVL).
3. Channel mute status.
4. Error messages.

5.4.2 Input

The data section of the Input subscreen provides the following information:

1. The Fallback and Override settings.
2. Input metering for both the digital (AES (D)) and analog (Analog (A)) inputs.
3. Underneath the meter bars the input monitoring (IM) status is indicated by a dedicated LED with the following color code:

Grey IM not activated

Blue IM activated

Red IM fault

- ↳ A corresponding error message will be issued in the header of the Home screen and in addition, the affected channel is indicated within the ISP indicators on the left of the data area.

	Device name				On
	Settings				
	A	B	C	D	
Speaker	T10 PS	T10 PS	B8-SUB	B8-SUB	Input
Input	-1.0 dBu	-1.0 dBu	+5.0 dBu	+5.0 dBu	
Output	37 V	36 V	0 V	0 V	Output
GR/Headrm.	+8 dB	+8 dB	-32 dB	-32 dB	
Impedance	99.9 Ω	99.9 Ω	99.9 Ω	99.9 Ω	Network
Power	1 W	1 W	0 W	0 W	
Temperature	46 °C	46 °C	45 °C	45 °C	More
ISP / OSP					
GR / OVL					
Mains/SMPS	231 V / 50 Hz		126 W	30 °C	

5.4.3 Output

The data section of the Output subscreen provides the following information:

Note: The values indicated in the graphic opposite do not correspond to real-world conditions.

1st line	Mute status of each channel.
Speaker	Loudspeaker setups selected for the individual channels.
Input	Actual input signal levels of the individual channels.
Output	Actual output voltages of the individual amplifier channels.
GR/Headrm.	Relationship between headroom (Headrm.) and gain reduction (GR) with peak hold for 1 sec.
Display ranges:	
GR:	0 dB ⇒ +32 dB.
Headrm.:	-32 dB ⇒ 0 dB.
Impedance	Actual load impedance values for the individual amplifier channels.
Power	Power actually delivered by the individual amplifier channels.
Temperature	Actual temperatures of the individual amplifier channels.
ISP/OSP	Indicates whether the input signal (ISP) as well as the amplifier output signal (OSP) of the individual channel are present.
GR/OVL	Indicates whether gain reduction (GR - Yellow) of the respective channel is active or the respective channel is overloaded (OVL - Red).
Mains/SMPS	Displays the actual mains voltage and frequency followed by the actual power consumption of the power supply. In addition the actual temperature of the power supply is indicated.

	Device name		On
	Settings		
Mode:	DHCP + FB	Remote ID	Input
IP:	192.168.1.40	OCA remote	
IP mask:	255.255.255.0	0.02	Output
IP gateway:	192.168.1.1		
MAC:	3C:C0:C6:01:BA:4D		Network
Status:	Networking OK		
	● Eth 1 ● Eth 2		More

5.4.4 Network

The data section of the Network subscreen provides the following information:

Mode:	Actual IP mode.
IP:	Actual IP settings.
IP mask:	
IP gateway:	
MAC:	Displays the fixed MAC address of the device.
Status:	Provides status information on the network.
Remote ID	Unique Remote identifier of the respective device in the format [nn] . [nn] . The first two digits represent the Subnet . Within the network up to 100 subnets can be defined (values 0 to 99).

The following two digit represents the **Device ID** for each subnet (values 1 to 63).

In addition the network speed is indicated by dedicated LEDs with the following color code:

- Green** 1 Gbit/s network.
- Yellow** 10/100 Mbit/s network.
- Grey** No link up.

5.4.5 More

In the More subscreen, additional information is provided via further navigation buttons (subscreens) and information fields.

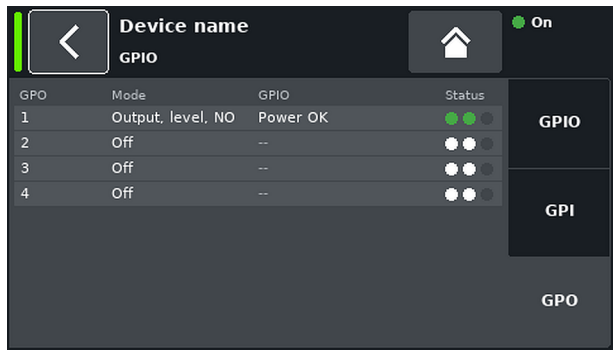
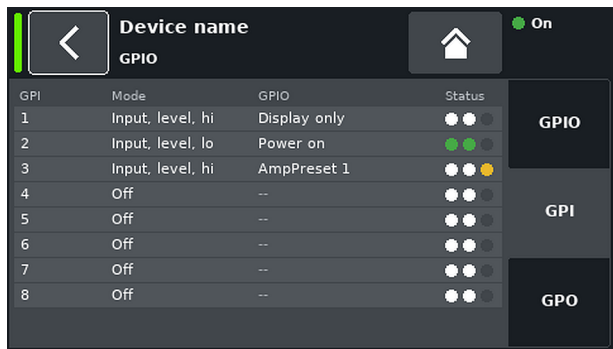
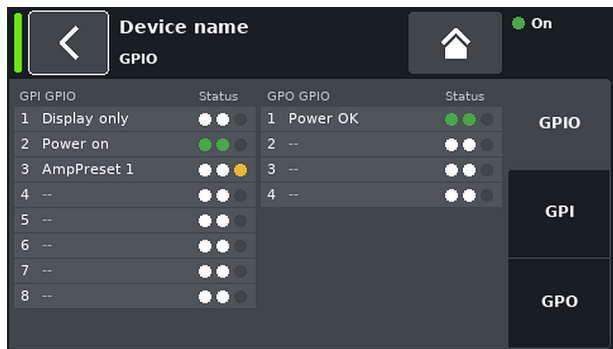
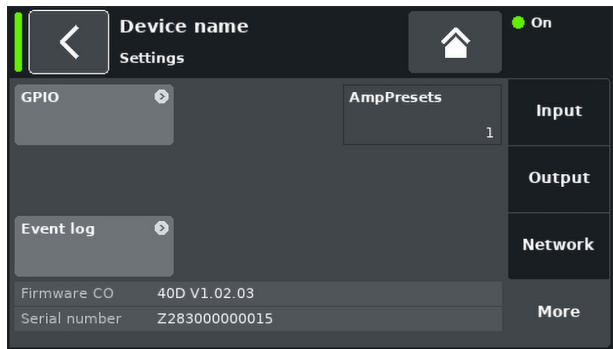
In addition, the current firmware version («Firmware CO») and the «Serial number» of the devices are indicated at the bottom of the screen.

5.4.5.1 GPIO

The data section of the GPIO subscreen provides a general overview of the assigned functions and the actual statuses of both the GPI and the GPO contacts at one glance.

In addition, a more detailed view is provided on separate tabs for either the **GPI** or the **GPO** configurations (Mode/Function) and their current states.

- Status** Three status LEDs are provided indicating the following states:
- The first LED indicates the status of the GPIOs.
For GPIs the logical status and for GPOs the status of the relay (●).
 - The second LED indicates the status of the related Object (binary object) or AmpPreset (●).
 - The third LED illuminates as soon as an error has occurred (●).



Device name		
Event log		
864	Error appeared Channel 'B' LF Calibration fault, 99.9{Ohm}	16 Sep 2022 06:28:02.044
865	Error appeared Channel 'C' LF Calibration fault, 99.9{Ohm}	16 Sep 2022 06:28:09.598
866	Error appeared Channel 'D' LF Calibration fault, 99.9{Ohm}	16 Sep 2022 06:28:19.254
867	Info ----- Shutdown (Reason 1, PwrOn 0) -----	16 Sep 2022 15:54:38.054
868	Info ***** Startup 40D V1.02.03 *****	19 Sep 2022 09:37:32.906
869	Info Startup count 101, power-on time 502h 0min	19 Sep 2022 09:37:34.608

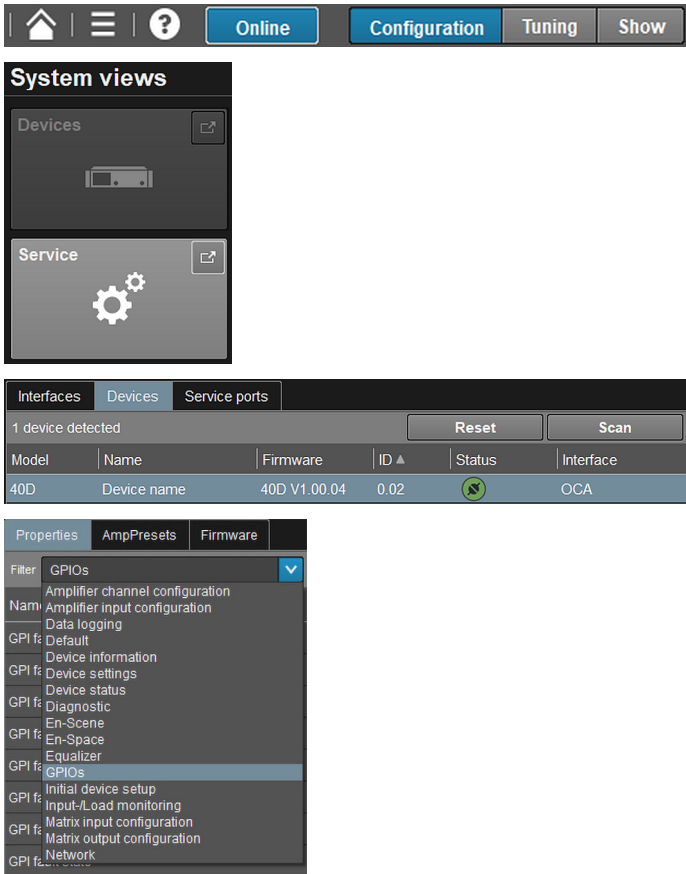
5.4.5.2 Event log

The event log stores a maximum of 10000 records. Once the maximum number of records is reached, the system starts deleting the first ones.

Device name		
Settings		
GPIO Event log Firmware CO 40D V1.02.03 Serial number Z283000000015	AmpPresets 1	Input
		Output
		Network
		More

5.4.5.3 AmpPresets

The number of the currently active AmpPresest is shown.



6.1 Initial device setup

The device is mainly intended to be set up and operated via the d&b Remote network using the d&b R1 Remote control software. Provided R1 is already installed and the device has been connected either directly or through the network, proceed as follows:

- ⇒ From the startup menu, choose the «R1 V3 Initial device setup» entry.
 - ↳ R1 is launched and automatically switches to «Online» mode and the «Service» view is displayed.
- In the left pane of the view, the connected device is listed.
- In the right pane, the corresponding «Filter» ⇒ «Initial device setup» is set by default and provides you with basic parameters (in alphabetical order) to set up the device.

6.2 GPIO Configuration

- To configure the GPIOs, switch R1 to «**Configuration**» mode.
- From the «System views» select «**Service**».
 - ↳ R1 enters the «Service» view with the «Interfaces» tab being active.
- Select the «**Devices**» tab.
 - ↳ In the right pane of the «Service» view the «**Properties**» tab becomes accessible
- From the «**Filter**» drop-down list select «**GPIOs**» or «Initial device setup»
 - ↳ The table will become accessible indicating the GPI/GPO states and providing the related parameter function and mode.

Properties	AmpPresets	Firmware
Filter	GPIOs	Property
Name	Device/Ch.	Rec.
GPI fault state	0	2
GPI fault state	0	6
GPI fault state	0	3
GPI fault state	0	7
GPI fault state	0	8
GPI fault state	0	1
GPI fault state	0	5
GPI fault state	0	4
GPI function	0	4
GPI function	0	8
GPI function	0	5
GPI function	0	6
GPI function	0	3
GPI function	0	1
GPI function	0	2
GPI function	0	7

Within the «GPIOs» table, the parameter are listed for either GPIs and GPOs.

GPI state GPO state	The GPIO state corresponds to the voltage applied in relation to the selected GPI mode.
GPI internal state GPO internal state	The GPIO internal state depends on the selected GPI/O function.
GPI function GPO function	Assigns the corresponding function (Object).
GPI mode GPO mode	Trigger/switching behavior of the corresponding GPI/GPO contact. It can be combined with either level (non-latching) or edge (latching) triggering, as detailed below.

GPI function

- Display only
Mainly intended as Debug function. Displays the status of the respective GPIO without any assignment to Objects or Presets.
- Power on
- Channel mute (Mute Ch A ... Mute Ch D, Mute all)
- AmpPreset 1 ... 15
- Alarm preset 1 ... 3
- Backup 1 ... 3
- Input Fallback/Input Override

GPO function

- Mains Voltage OK
- Power OK
Indicates when the power amplifier stage has reached its full rail voltage and the device is ready for operation ($\Rightarrow$ not Standby).
- Channel error
Ch A Error ... Ch D Error, Error Ch any (cumulative output)
- Channel protection
Ch A Protection ... Ch D Protection, Protection Ch any (cumulative output)
- Internal Error
Indicates an internal error of the device which causes an interruption of the audio signal. Explicitly excluded are "Load monitoring, System check and Overvoltage or Undervoltage" conditions/states.
- Channel mute (Mute Ch A ... Mute Ch D, Mute any, Mute all)

GPI mode

Off: The corresponding GPI contact is disabled.

Input, level, lo: Level triggered - Lo active - 

Input, level, hi: Level triggered - Hi active - 

Input, edge, rising: Edge triggered - rising - 

Input, edge, falling: Edge triggered - falling - 

GPO mode

Off: The corresponding GPO contact is disabled.

Output, level, NO: Level triggered - normally open (NO)

Output, level, NC: Level triggered - normally closed (NC)

GPO manual control: Manual operation (hand control).
Mainly intended for test purposes.

Status Three status LEDs are provided indicating the following states:

The first LED indicates the status of the GPIOs.

For GPIs the logical status and for GPOs the status of the relay.

- For outputs, the logical status is "1" (●) when the relay is closed.
- For edge triggered inputs, the internal Object/AmpPreset states are the same as the GPI status and vice versa.
- For outputs in "NO" mode (normally open), the statuses of the Object and GPO are the same. In "NC" mode (normally closed), the status of the GPO is inverted.
- For level triggered inputs, the GPI status is defined by the external voltage applied. However, the triggered Object/AmpPreset can be changed for whatever reason, i.e. an AmpPreset was modified or an AmpPreset, which is defined for a dedicated GPI is loaded.

The second LED indicates the status of the related Object (binary object) or AmpPreset.

Objects/AmpPresets and GPIs are evaluated separately.

- For Objects, the logical status is "1" (●) when the Object is logical "1" (binary object).
- For AmpPresets, the logical status is "1" (●) when the AmpPreset is loaded and not modified.

The third LED illuminates as soon as an error has occurred (●).

Provided the corresponding GPI/GPO is selected, a corresponding message will be issued on the bottom left of the GPIO screen.

Recommended and tested browsers:

- Windows:**
- Firefox V22.0 or higher
 - Microsoft Internet Explorer V11 or higher
 - Microsoft Edge V12 or higher
 - Google Chrome V21 or higher
 - Opera V15 or higher
- macOS:**
- Safari V6.0 or higher
 - Firefox V22.0 or higher
 - Google Chrome V21 or higher
 - Opera V15 or higher
- iOS:**
- iOS 6 or higher
- Android:**
- Mobile Firefox V27.0 or higher
 - Android Browser V4.4 or higher

6.3 Web Remote interface

Alternatively, the integrated Web Remote interface also provides direct access to the user interface using a standard web browser. The Web Remote interface is mainly intended for configuring a single device.

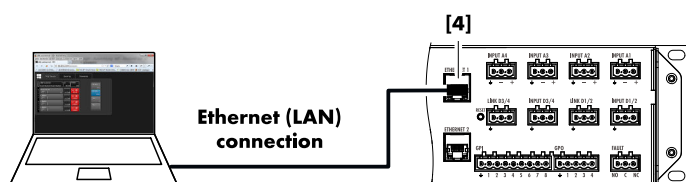
Note: A detailed description of the Web Remote interface is given in ⇒ Chapter 7 "Web Remote interface" on page 28.

Physical setup and direct connection

Simply connect the LAN connector port of your computer to the upper RJ45 (ETHERNET 1/PRI) connector socket [4] of the device.

By factory default, the IP address is set to: 192.168.1.40. To access the device, manually assign an IP address to the computer in your network in the same subnet as the device.

1. Navigate to the network settings of your computer associated with your network adapter.
2. Open the corresponding network properties dialog.
3. Enter a static IP address (e.g. 192.168.1.11) in the same subnet (255.255.255.0) as the device.
4. Confirm the changes and close the network properties dialog.
5. To display the Web Remote interface page of the device, enter its IP address (192.168.1.40) in the address bar of your web browser.



In addition, a Web Remote interface is integrated which provides direct access to the user interface of a single amplifier using a standard web browser.

Note: The user interface of the amplifier can only be accessed after connecting the amplifier to a computer via Ethernet. It is possible to connect the computer and the amplifier directly, however, this requires the IP mode DHCP+LL.

The use of a router with DHCP server is recommended for setting up the network connection. If the router also provides a wireless access point, the amplifier may also be controlled using mobile devices.

Recommended and tested browsers:

- Windows:**
- Firefox V22.0 or higher
 - Microsoft Internet Explorer V11 or higher
 - Microsoft Edge V12 or higher
 - Google Chrome V21 or higher
 - Opera V15 or higher
- macOS:**
- Safari V6.0 or higher
 - Firefox V22.0 or higher
 - Google Chrome V21 or higher
 - Opera V15 or higher
- iOS:**
- iOS 6 or higher
- Android:**
- Mobile Firefox V27.0 or higher
 - Android Browser V4.4 or higher

Remote control

To enable remote control via the Web Remote interface, proceed as follows:

1. Establish a connection between the network connector of the amplifier and the router.
 - ↳ After a while, the «Remote» tab of the amplifier screen will display the IP address the DHCP server has assigned to the device.
2. Type this address into the address field of the browser or the mobile device that is connected to the network.
 - ↳ In this case: **10.5.2.78**
3. For multiple amplifiers, open one browser tab for each amplifier connected and apply the corresponding IP address.

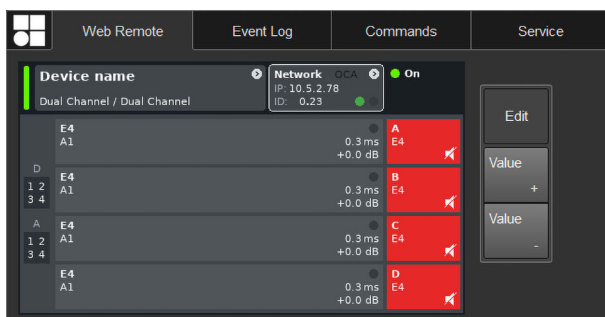
Web Remote interface page

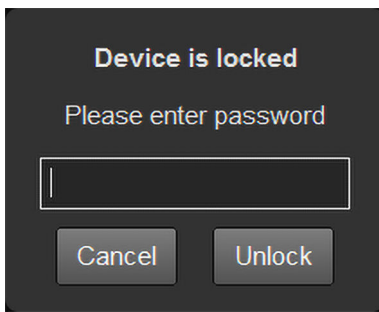
The Web Remote interface page is split into four tabs: the «Web Remote», «Event log», «Commands» and «Service» tabs.

Web Remote tab

The «Web Remote» tab shows the actual screen of the connected amplifier.

All screens and screen items can be accessed by simply clicking the relevant item.





Password dialog

Once the device is locked with a password, the Web Remote interface is also locked and can no longer be accessed.

A corresponding dialog will pop up to allow you to unlock the device.

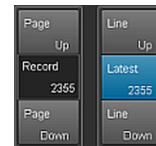
Line	Latest	Line	Page	Record	Page
Up	515	Down	Up	515	Down
Record	Date + time (UTC)	Type	Text no.	Text	
501	15 Aug 2022 08:50:54.759	Error #165 cleared	-350	Input monitoring fault D1 (level 0 0dBFS, lock 0, DS data pri 0, DS data sec 0)	
502	15 Aug 2022 08:50:54.759	Error #166 cleared	-251	Input monitoring fault D2 (level 0 0dBFS, lock 0, DS data pri 0, DS data sec 0)	
503	15 Aug 2022 08:50:54.759	Warning #160 cleared	-803	Input fallback (A1=0, A2=0, D1=0, D2=0)	
504	15 Aug 2022 08:51:14.809	Error #165 appeared	250	Input monitoring fault D1 (level -140 0dBFS, lock 1, DS data pri 0, DS data sec 0)	
505	15 Aug 2022 08:51:14.809	Error #166 appeared	251	Input monitoring fault D2 (level -140 0dBFS, lock 1, DS data pri 0, DS data sec 0)	
506	15 Aug 2022 08:51:14.810	Warning #160 appeared	803	Input fallback (A1=0, A2=0, D1=1, D2=1)	
507	15 Aug 2022 08:51:25.798	Warning #160 cleared	-803	Input fallback (A1=0, A2=0, D1=0, D2=0)	
508	15 Aug 2022 11:35:45.887	Error #165 cleared	-250	Input monitoring fault D1 (level 0 0dBFS, lock 0, DS data pri 0, DS data sec 0)	
509	15 Aug 2022 11:35:45.888	Error #166 cleared	-251	Input monitoring fault D2 (level 0 0dBFS, lock 0, DS data pri 0, DS data sec 0)	
510	15 Aug 2022 11:36:08.192	Error #165 appeared	250	Input monitoring fault D1 (level -140 0dBFS, lock 1, DS data pri 0, DS data sec 0)	
511	15 Aug 2022 11:36:08.192	Error #166 appeared	251	Input monitoring fault D2 (level -140 0dBFS, lock 1, DS data pri 0, DS data sec 0)	
512	15 Aug 2022 13:47:43.546	Error #165 cleared	-250	Input monitoring fault D1 (level 0 0dBFS, lock 0, DS data pri 0, DS data sec 0)	
513	15 Aug 2022 13:47:43.547	Error #166 cleared	-251	Input monitoring fault D2 (level 0 0dBFS, lock 0, DS data pri 0, DS data sec 0)	
514	17 Aug 2022 11:25:29.312	Error appeared	222	Channel 'A' LF System check Fault, 99.9(Ohm)	
515	17 Aug 2022 11:25:32.235	Error appeared	222	Channel 'A' HF System check Fault, 99.9(Ohm)	

Capacity: 10000 records, latest record no.: 515
Current time on device: 19 Aug 2022 12:18:37 UTC

Event log tab

The «Event log» stores a maximum of 10000 records. Once the maximum number of records is reached, the system starts deleting the first ones ⇒ Ring buffer.

The number of records displayed depends on the size of the browser window.



Located on the right-hand side of the record list are various Navigation buttons allowing you to scroll through the list using the «Page Up/Down» or «Line Up/Down» buttons or by directly jumping to the «Latest» record.

In addition, the editable «Record» field allows you to enter a dedicated record number. The corresponding record will be displayed at the very bottom of the record list.

Storage option (Save)

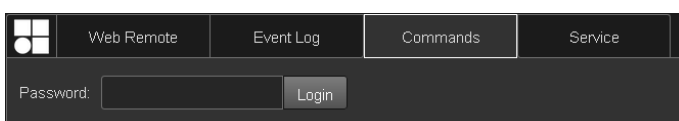
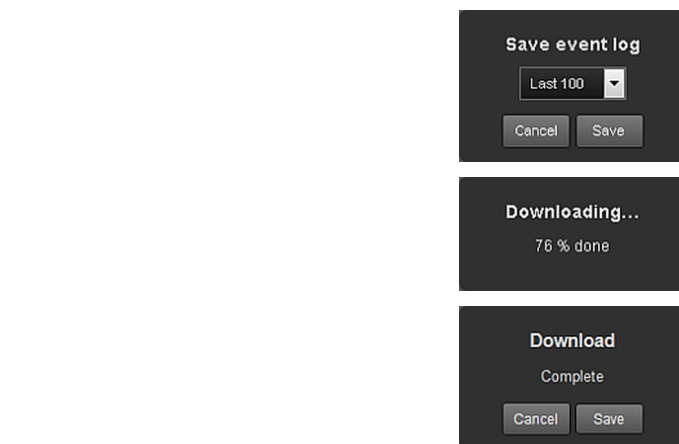
In addition, a storage option is provided which allows you to store the Event log data locally. This is mainly intended for service and/or troubleshooting purposes.

To save the Event log data locally, proceed as follows:

- Select the «Save» button at the bottom right corner of the web browser window.
 - A corresponding dialog will pop up providing you with a drop-down list from which you can select either the number («Last [n]») of records or «All» records to be saved.
- Choose the desired option from the drop-down list and select «Save».
 - The event log data will be downloaded and the download progress will be displayed.
 - Once the download is completed, a corresponding message will be displayed.
- Select «Save» to store the Event log data locally.
 - Your web browser will display the corresponding dialog and the file will be saved as **Event .log** to the local download directory you have specified in the download settings of your browser.

Commands tab

This functionality is intended for service purposes only.



Service tab

The «Service» tab provides a «Backup»/«Restore» function for the complete device configuration.

Note: Backups can only be restored on devices of the same type and that have a matching firmware version.

Login

To access the service functions, you first have to log in.

If the device is locked by password protection, use the corresponding password to log in. If no password protection is applied, use "dbaudio" as a password.

Backup

- ⇒ Select the «Download backup file from device» button to store the backup file (*.backup) locally.
 - ↳ Your web browser will display the corresponding dialog and the file will be saved to the local download directory you have specified in the download settings of your browser.

Restore

1. Select the «Upload backup file to device» button to upload the backup file onto the device.
 - ↳ Your web browser will display the corresponding dialog.

Once the backup file is uploaded, the «Remote ID» and «IP settings» become accessible and can be edited, if necessary by simply clicking into the corresponding input field..
2. As a final step, select the «Activate backup file on device» button to apply the backup and remote settings.

Log file collection

For service or trouble shooting purposes, a log file collection can be downloaded.

- ⇒ Select the «Download log file collection» button to store the collection file (*.logpack.) locally.
 - ↳ Your web browser will display the corresponding dialog and the file will be saved to the local download directory you have specified in the download settings of your browser.

Logout

To exit the «Service» tab functions, click the «Logout» button at the top.

Licenses and Copyright

Selecting the d&b logo at the top left opens the «Licenses and Copyright» information page.

8.1 Power supply

The device utilizes a switch mode power supply with active Power Factor Correction (PFC) and automatic mains range selection.

The power supply is equipped with mains voltage monitoring, overvoltage and undervoltage protection as well as an inrush current limiter.

8.1.1 Active Power Factor Correction (PFC)

The active Power Factor Correction provides a clean and highly efficient sinusoidal current draw, thus providing highest performance under adverse mains conditions or when very long power cabling is necessary.

The power factor is above 0.9 for mains power consumption values of 350 W or higher.

8.1.2 Mains voltage monitoring

The mains voltage and frequency are recorded by the power supply and can be viewed on screen. Where voltages outside of this range are present, a self-resetting protective circuit responds quickly to isolate the internal "Main Power Supply" leaving only a supervisory circuit running to monitor the mains voltage. The device accepts mains voltages of up to 400 VAC_{RMS} without damage to the device in case of a missing neutral line or running phase to phase.

8.1.3 Automatic mains range selection

The automatic mains range selection enables the device to be used with any mains supply worldwide without the need for manual action. The automatic range selection is only available on plug-in but not during operation. Once in high or low range, the SMPS expects a permanent mains voltage in this range. To switch from one range to the other, the unit must be disconnected from the mains.

The power supply incorporates a "Mains Power Supply" and an "Auxiliary Power Supply".

Mains Power Supply

The Mains Power Supply feeds the power amplifiers within the following nominal mains ranges:

High range	208 - 240 VAC
Low range	100 - 127 VAC

Auxiliary Power Supply

The Auxiliary Power Supply feeds the DSP section and the device control and operates within the range from 55 VAC_{RMS} to 400 VAC_{RMS}.

Behavior with fluctuating mains voltages

With mains voltages other than the nominal voltages specified above, the device switches to the adequate mode for either "Standby" (Protection) or "Operation".

The voltage thresholds are dependent on the slope of the mains voltage change.

└ 55	←	75	←	133		170	←	266	←	400
Undervoltage		Low range		Undefined		High range		Overvoltage		
Standby (Protection)		Operation		Standby (Protection)		Operation		Standby (Protection)		
55	└	⇒	85	⇒	140		190	⇒	276	⇒ 400

Undervoltage
Undefined
Overvoltage

Depending on the operating state, the device will be switched to Standby mode (Protection).

NOTICE!

In **Overvoltage** state with mains voltages above 400 V, damage to the device cannot be excluded.

In **Undervoltage** state, the Auxiliary Power Supply for the device control operates down to 55 V_{AC RMS}.

Up to this threshold ...:

- The display remains active and the device can be operated locally.
- The LED indicators on the front panel remain active.
- Remote control via web remote or R1 is still possible without restrictions.
- Below this threshold, the device will be switched off.

8.1.4 Mains inrush current limiter

The Main Power Supply is started softly to limit inrush current. Up to two 40D may be powered up at the same time without triggering a line circuit breaker of 13 - 16 A (@ 230 V) or 20 A (@ 100 - 120 V) respectively.

8.1.5 Mains supply requirements

Due to its automatic mains voltage selection, the amplifier can be fed from all usual mains voltages within the rated ranges as stated in ⇒ Chapter 8.1.3 "Automatic mains range selection" on page 31.

For the average and peak current requirements for specific mains voltages please refer to ⇒ Chapter 3.1 "Current/power draw and thermal dissipation" on page 10.

To ensure safe and stable operation, observe the following recommendations and specifications:

- Operate a single amplifier on a 13 A circuit breaker at 208 to 240 V (high range) or on a 20 A circuit breaker at 100 to 127 V (low range).
- Operate the amplifier at a high-range supply (208 to 240 V), if possible. A low-range supply (100 to 127 V) requires a cable cross section that is 4 times higher to achieve comparable power performance.

- When three amplifiers are operated with a three-phase (120°) mains supply, the current on the N (neutral) conductor can be minimized by matching loads and signals between the three devices.
- Keep the supply line as short as possible and its cross section as high as possible, especially when operating the device at 100 to 127 V. Voltage drop at full load (20/13 A at 115/230 V) should not exceed 5 %. For reference specifications, refer to the following table.

Maximum cable lengths for 5 % voltage drop at 3600 W mains power draw				
Cable cross section	100 V	120 V	208 V	230 V
1.3 mm ² - AWG 16	Not permitted	Not permitted	21 m/69 ft	25 m/82 ft
1.5 mm ²	Not permitted	Not permitted	24 m/79 ft	29 m/95 ft
2.1 mm ² - AWG 14	Not permitted	Not permitted	33 m/108 ft	40 m/131 ft
2.5 mm ²	Not permitted	Not permitted	40 m/131 ft	49 m/161 ft
3.3 mm ² - AWG 12	12 m/39.5 ft	18 m/60 ft	53 m/174 ft	64 m/210 ft
4.0 mm ²	15 m/50 ft	21 m/69 ft	63 m/206.5 ft	78 m/256 ft
5.3 mm ² - AWG 10	19 m/62 ft	28 m/92 ft	83 m/272 ft	102 m/334.5 ft
6.0 mm ²	22 m/72 ft	32 m/105 ft	95 m/312 ft	116 m/380.5 ft
8.4 mm ² - AWG 8	31 m/101 ft	44 m/144 ft	133 m/436 ft	162 m/531.5 ft

8.1.6 Generator operation/UPS requirements

To operate the amplifier using a mains generator or uninterruptible power supply (UPS), observe the following:

- With the 40D amplifier the apparent power figure (VA value) is about the same as the effective power figure (W value).
- Use a generator or UPS that can deliver the maximum power required by the entire system. Assume a short time power draw of 3 kVA per 40D. This is particularly important when using a UPS without dedicated short-time overload capability.
- Run the generator or UPS at 220 to 240 V, if available. 50 or 60 Hz is not an issue.

8.2 Power amplifiers

The power amplifiers fitted to the 40D utilize Class D technology similar to a switch mode power supply. Compared to the known linear amplifier concept (Class A, AB, G or H), Class D power amplifiers produce less heat and allow for a compact and light-weight design.

While supplying very high maximum output swing, they maintain high efficiency with any kind of signal and load and run as cool as possible. Channels share the same power supply and are thermally coupled to provide even higher average power figures when unevenly loaded. TOP/SUB setups and active cardioid subwoofers are cases of typical use. A sophisticated circuit design decreases the impact of the load on the amplifier performance and enables a well defined sound reproduction. A comprehensive set of protection features individually prevents each channel from overload and/or damage/fault. Channels that are not affected will continue to operate, if safely possible.

8.3 Cooling fans

Two temperature and level controlled fans are incorporated for cooling the internal components, which allows greater cooling during louder program material. The fan speed is consequently reduced during quieter passages preventing background noise interference. If the unit heats up a «Temp. Warning» is issued and the fans will give full cooling power permanently.

9.1 Service



CAUTION!

Potential risk of explosion.

The device incorporates a lithium battery which may cause danger of explosion if not replaced correctly.

Refer replacement only to qualified service personnel authorized by d&b audiotechnik.

Do not open the device. No user serviceable parts inside. In case of any damage do not operate the device under any circumstances.

Refer servicing only to qualified service personnel authorized by d&b audiotechnik. In particular if:

- objects or liquids have entered the device.
- the device does not operate normally.
- the device was dropped or the housing is damaged.

9.2 Maintenance and care

During normal operation, the amplifier provides maintenance-free service.

Due to the cooling concept, no dust filters are required. As a result, filter exchange or cleaning the filters is not necessary.

However, the air-intake is covered by a grill which should be regularly cleaned (vacuumed) using an appropriate vacuum cleaner.

9.2.1 Touchscreen cleaning

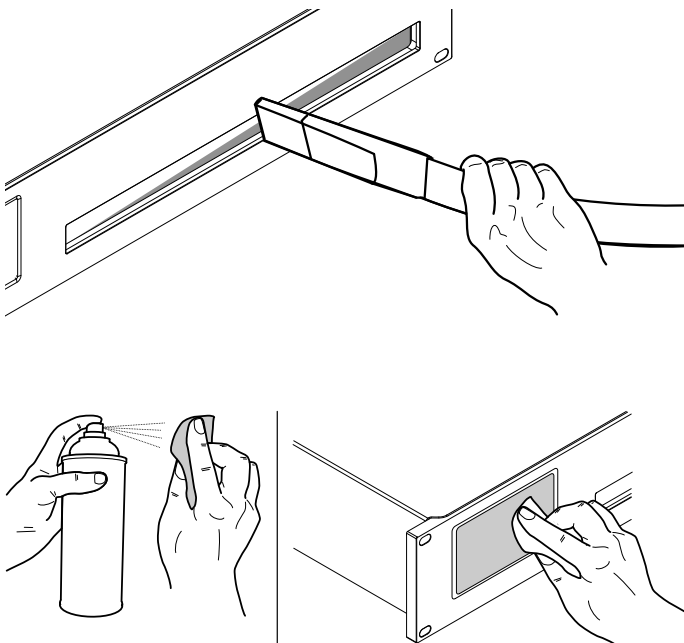
After a certain period of time, the touchscreen may require cleaning.

For this purpose, proceed as follows:

- Use a soft cloth only.
- Do not use any solvent cleaners.

To remove very heavy dirt from the panel, it may be helpful to use a special cleaning spray for TFT screens. In this case, proceed as follows:

1. Spray on the soft cloth before wiping the screen.
 - ↳ Never apply/spray directly on the screen as the liquid could penetrate the device.
2. Wipe the screen with moderate pressure.



9.3 Possible error messages

The following table lists possible error messages appearing within the Web Remote interface ordered by the error Id.

ID	Display text	Eventlog text	Description	Location	Possible reasons
11	System error 128	System error 128 (I2C, IC 0x%02X, Pos %d)	Internal I2C comm. error	DS	Internal hardware or software fault
15	Unknown device type	Unknown device type %d	Unknown device type		Wrong or missing serial No.
16	Invalid device ident	Invalid device ident %d	Invalid hardware configuration	ADDAC, Amp, SMPS	Missing or wrong module identification
19	Invalid display ident	Invalid display board ident %d	Invalid DISPLAY identification	Display	Missing or wrong DISPLAY identification
20	Program error %u	Program error %d, %d, %d, %d	Program error	DSP	Various
21	Invalid DSP Data	Invalid DSP database (Position %d, Error %d)	Invalid DSP data	DSP	Software error
25	Program error %u	Program error %d: AWL error %d in AWL %d, line %d	Program error	DSP	Various
27	SMPS in bootloader	SMPS stuck in bootloader	Software missing on SMPS controller	SMPS	Firmware update failed or flash corruption, retry update
28	SMPS comm. error	SMPS communication error (error %04X)	SMPS comm. error Missing keepalive for 1 sec	SMPS	SMPS fault or internal communication disturbed
30	SMPS temp. error %d °C	SMPS temperature error %3d°C (power %uW)	Critical SMPS temperature	SMPS	Insufficient cooling
32-34	SMPS supply error	SMPS supply error XXXVXXX (%5dmV, err %04X)	Supply voltage out of range	SMPS	Fluctuating mains voltage, SMPS fault
35	SMPS ZK1 overvoltage	SMPS supply error Zk1 overvoltage (Zk1 %3dV, %04X)	Supply voltage out of range	SMPS	
36	Mains surge	Mains surge detected (Zk1 peak %3dV, Mains peak %3dV)	SMPS surge restart	SMPS	Rapid surge on mains voltage
37	Mains undefined range	Mains undefined range (avg %3dV, err %04X)	Mains voltage out of range at startup	SMPS	Refer to: ⇒ Chapter 8.1 "Power supply" on page 31
38	SMPS overcurrent	SMPS overcurrent (i-peak %3.1dA, avg %3dV, err %04X)	SMPS overcurrent	SMPS	Refer to: ⇒ Chapter 8.1 "Power supply" on page 31
39	Mains overvoltage	Mains overvoltage (avg %3dV, peak %3dV, err %04X)	Mains voltage too high for current range	SMPS	Refer to: ⇒ Chapter 8.1 "Power supply" on page 31

ID	Display text	Eventlog text	Description	Location	Possible reasons
40	Mains undervoltage	Mains undervoltage (avg %3dV, peak %3dV, err %04X)	Mains voltage too low for current range	SMPS	Refer to: ⇒ Chapter 8.1 "Power supply" on page 31
41	Mains frequency fault	Mains frequency fault (%3d Hz, err %04X)	Mains frequency out of range	SMPS	External
43	SMPS restart error	SMPS error: too many restarts (restart count %d)	SMPS restart fault	SMPS	An error prevents startup or SMPS fault
44	SMPS rail "Eco" error	SMPS rail "Eco" error (i-peak %3.1dA, rail %3dV, err %04X)	SMPS rail "Eco" error	SMPS	Power consumption too high in "Eco"
45	SMPS rail startup error	SMPS rail startup error (i-peak %3.1dA, rail %3dV, err %04X)	SMPS rail error at startup	SMPS	Power consumption too high during startup phase
46	SMPS rail run error	SMPS rail run error (i-peak %3.1dA, rail %3dV, err %04X)	SMPS rail error	SMPS	Power Consumption too high in normal mode.
47	SMPS controller reset	SMPS controller unexpectedly reset (reason: %04X)	SMPS controller unexpectedly reset	SMPS	Various
50	Invalid device para	Channel '%c': invalid device parameters (device ident %d)	Invalid device parameters	DSP	Software error or wrong device type detected
51	Invalid DSP prog %u	Channel '%c' : invalid DSP program %d	DSP program invalid	DSP	Software error
52	DSP boot error	Channel '%c': DSP boot error (DSP program %d)	DSP boot error	DSP	DSP or software error
53	DSP systick stall	DSP '%c' system ticker stalled	DSP Systick stalled	DSP	DSP or software error
58	DSP comm. error	Channel '%c': DSP communication error	DSP comm. error	DSP	DSP fault or software error
59	Invalid setup data	Channel '%c': invalid speaker setup (speaker id %d, no. %d, err %d)	DSP invalid setup data	DSP	Software error
61	Invalid AP slot %d	Channel '%c': invalid AP slot %d (file version %d)	Invalid ArrayProcessing data		Software error
78	Full amp. error.	Full amp. error (SMPA AB %04X, SMPA CD %04X)	Full amp. error	SMPA	All channels show an error
79	Amp. in bootloader	Channel '%c' stuck in bootloader	Amp. in bootloader	SMPA	Firmware update failed or flash corruption, Retry update
80	Amp. comm. error	Channel '%c' communication error (error %04X)	Amp. comm. error No keepalive for 1 sec	SMPA	Communication disturbed or SMPA fault
82	Temperature error %d °C	Channel '%c' temperature error %d °C (power %uW)	Critical amp. channel temperature	SMPA	Insufficient cooling

ID	Display text	Eventlog text	Description	Location	Possible reasons
83-87	Supply fault	Channel '%c' supply fault XXXX (err %04X, %5dmV)	Aux. supply voltage out of range	SMPA	Hardware fault
88	Overcurrent	Channel '%c' output overcurrent (CL counter %3.1ukCnt, power %uW, temp. %d°C)	Overcurrent, Overvoltage on output	SMPA	Short circuit on output
89	DC on output	Channel '%c' DC error	DC on output	SMPA	Hardware fault
90	HF on output	Channel '%c' HF error	HF on output	SMPA	Software error
91	Ext. amp. error	Channel '%c' ext. amp. reported an error (ext. err %04X, err %04X)	Ext. Amp. controller in protection	SMPA	
92	Ext. amp. no comm.	Channel '%c' ext. amp. no communication (ext. err %04X, err %04X)	Ext. amp. no comm.	SMPA	
93	Sudden overtemp.	Channel '%c' sudden temporary overtemperature (i-peak %3.1dA)	Sudden temporary overtemperature on channel	SMPA	Current peak on output
94	Overtemperature %d°C	Channel '%c' overtemperature %d°C (power %uW)	Channel mute due to overtemperatur	SMPA	Insufficient cooling
95	Clock fault	Channel '%c' clock fault (%3.1ukHz, power %uW)	Clock fault	SMPA	SMPA fault
96	Supply fault	Channel '%c' supply fault 220V (err %04X, %5dmV)	Supply fault	SMPA	Hardware fault, short on output, SMPA, SMPS fault
97	Rail loss mute	Channel '%c' muted due to rail loss (err %04X, %3.1dV)	Rail unexpectedly low	SMPA	Mains voltage loss
98	Mains loss mute	Channel '%c' muted due to mains loss (err %04X, avg. %3dV)	Mains unexpectedly not OK	SMPA	Mains voltage loss
99	Temp. warning %d°C	Channel '%c' temperature warning %d°C (power %uW)	High channel temperature warning	SMPA	Insufficient cooling
100	SMPS temp. warning %d°C	SMPS temperature warning %3d°C (power %uW)	High SMPS temperature warning	SMPS	Insufficient cooling
124	OCA remote error	OCA remote error %u	OCA remote error		
150	Speaker imp. fault		Load Monitoring impedance error		Speaker or cable fault
160	Input fallback	Input fallback (A1=%d, A2=%d, D1=%d, D2=%d)	Input Fallback		Input Fallback was activated

ID	Display text	Eventlog text	Description	Location	Possible reasons
161-164	Input monitoring fault	Input monitoring fault AX (level %4.1ddBu, threshold %4.1ddBu)	Input Monitoring Fault		Cabling
165-168	Input monitoring fault	Input monitoring fault DX (level %4.1ddBFS, lock %d, DS data pri %d, DS data sec %d)	Input Monitoring Fault		Cabling, routing, unlocked



10.1 Declaration of Conformity

This declaration applies to:

d&b Z2830 40D Amplifier

by d&b audiotechnik GmbH & Co. KG.

All product variants are included, provided they correspond to the original technical version and have not been subject to any later design or electromechanical modifications.

We herewith declare that said products are in conformity with the provisions of the respective directives including all applicable amendments.

Detailed and applicable declarations are available on request and can be ordered from d&b or downloaded from the d&b website at www.dbaudio.com.



10.2 WEEE Declaration (Disposal)

Electrical and electronic equipment must be disposed of separately from normal waste at the end of its operational lifetime.

Please dispose of this product according to the respective national regulations or contractual agreements. If there are any further questions concerning the disposal of this product, please contact d&b audiotechnik.

WEEE-Reg. -Nr. DE: 13421928

10.3 Licenses and Copyright

A list of the components and a full-text version of all licenses and copyrights can be accessed using the amplifier's Web Remote interface.

⇒ Selecting the d&b logo at the top left of the «Web Remote» interface page allows access to the «Licenses and Copyright» information page.

This page provides an overview of the open source software used in this product. As required by the GPL and LGPL licenses, we will send you a copy of the used source code on request. If you would like to obtain a copy, please contact us by mail to:

software.support@dbaudio.com

