AF 50H

Compact 50 watts IP amplifier



Easy integration | Compact size | Loudspeaker line monitoring | IoIP® and SIP | ONVIF VMS integration

Flexible amplification

The AF 50H provides a particularly high output range and various loudspeaker outputs. The amplifier is universally suitable for any size of application up to complex public address and Intercom solutions. It is specifically optimised for installation either in a 19" rack or on site. This helps to save on cabling and any costs incurred.

Thanks to its high flexibility, the AF 50H is applicable in the most diverse areas where a reliable and powerful public address is needed. Thereby, this amplifier covers all requirements from public service facilities, critical infrastructure and smart city applications, office and school buildings up to the requirements of challenging and high-noise industrial environments.

Features and highlights

- 50 W total output power
- Loudspeaker connectors for 70 V or 100 V powered loudspeakers
- Class-D amplifier optimised for high efficiency at low operating temperatures
- Full IoIP® and SIP support
- Support of ONVIF Profile S for unidirectional audio transmission allows either audio announcements via a VMS (video management systems) or audio streaming to a VMS
- Short-circuit and over-range protected
- Line monitoring between amplifier and Intercom Server
- Loudspeaker line monitoring for the 70 V/100 V loudspeaker output (requires licence L-AF-LM)
- Up to 16 kHz transmission bandwidth for highest speech intelligibility
- Easy integration in existing systems
- High level of reliability
- Support of Intercom station features (e.g. two-way communication and talk-back functionality, audio monitoring, IVC and equalizer)
- Installation in a 19" rack or on-site
- Rugged housing made of polycarbonate

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AF 50H
Technical specifications



Technical data

IP rating:	IP20 (acc. EN 60529)
Output power:	50 W_{RMS}
Loudspeaker outputs:	low-resistance (min. impedance: 4 Ω) or 70 V/100 V
Microphone input:	nominal level: 14 mV at 3.3 kΩ microphone supply voltage: 2.5 V
Line output:	nominal level: 0 dBu (0.775 V)
Inputs:	2 inputs for floating contacts (detection of 5 input states)
Output:	relay output (changeover contact): max. 60 W (DC)/37.5 VA (AC), max. 2 A, max. 60 VDC/30 VAC_{eff} expected life: min. 5 x 10^4 (2 A), 10^5 (1 A)
Control input:	0 – 10 V (for remote volume control)
Protocols (IoIP):	IoIP protocol based on UDP/IP
Protocols (SIP):	IPv6,IPv4, TCP, UDP, HTTP (RFC 2617, RFC 3310), RTP (RFC 3550), RTCP, DHCP, SDP (RFC 2327), SIP (RFC 3261), SNMPv2, STUN, TFTP, URI (RFC 2396), DTMF Decoding (RFC 2876, RFC 2833), SIP User Agent (UDP RFC 3261), SIP Refer Method (RFC 3515)
Codecs (SIP):	G.711 a-Law, G.711 µ-Law, G.722
ONVIF specification:	ONVIF Profile S for unidirectional audio
IoIP audio bandwidth:	16 kHz
SIP audio bandwidth:	7 kHz
Total harmonic distortion (THD+N):	4 Ω, 8 Ω, 70 V/100 V: < 0.2%
Operating temperature range:	–25 °C to +55 °C (–13 °F to +131 °F)
Storage temperature range:	–25 °C to +70 °C (–13 °F to +158 °F)
Relative humidity:	up to 95%, not condensing
Connections:	2 RJ45 modular jacks with LEDs for connection to the Intercom/SIP server (IP Uplink, IP Downlink) pluggable screw terminals (0.08 mm^2 – 1.5 mm^2): power supply, outputs, microphone [1], inputs, line output, 70 V/100 V loudspeaker output pluggable screw terminals (0.08 mm^2 – 2.5 mm^2): low-resistance loudspeaker output expansion plug for e.g. EB2E2A
Power supply:	20 – 26 VDC [2] (max. 2.6 A at 4 Ω/50 W or max. 1.3 A at 8 Ω/25 W, max. 3 A at the 70 V/100 V loudspeaker output) or PoE
PoE (Power over Ethernet) [3]:	IEEE 802.3af/Class 0, IEEE 802.3at/Type 1
Cabling:	min. Cat. 5
Dimensions (W x H x D):	201 x 44 x 255 mm (7.91 x 1.73 x 10.04 in)
Weight incl. package:	approx. 1,600 g (3.53 lbs)

[1] In order to fulfil the electromagnetic compatibility directive, the cable of a connected microphone has to be less than 30 m and shielded.
[2] Use only power supply units with straight through earth (e.g. PA60W24V).
[3] If power supply over PoE is used, an attenuation of up to 12 dB is possible. This is equal to an output power of 6 W.

Extent of supply

- Amplifier
- Short reference

NOTE:
The power supply is not included in extent of supply.

Line length in LAN

The maximum line length of Cat. 5 cabling in a LAN is 100 m (328 ft) – e.g. from switch to amplifier.

System requirements

IoIP

Intercom Server
- GE 800 (min. PRO 800 6.3) with G8-IP (min. G3-8-IP 6.6D) or
- GE 300 (min. PRO 800 6.3) with G3-IP (min. G3-8-IP 6.6D) or
- IS 300 (min. PRO 800 6.3) or
- VirtuoSIS (min. 9.0) or
- GE 700 with GE700-UPG (min. PRO 800 6.3) with G7-DSP-IP

Configuration software
- min. CCT 800 9.0
- IP Station Config (included in setup of CCT 800)

SIP
- S3/S6/VirtuoSIS (min. 9.0) or
- Compatible SIP server (see compatibility list "**Interoperability SIP**") or
- Serverless operation

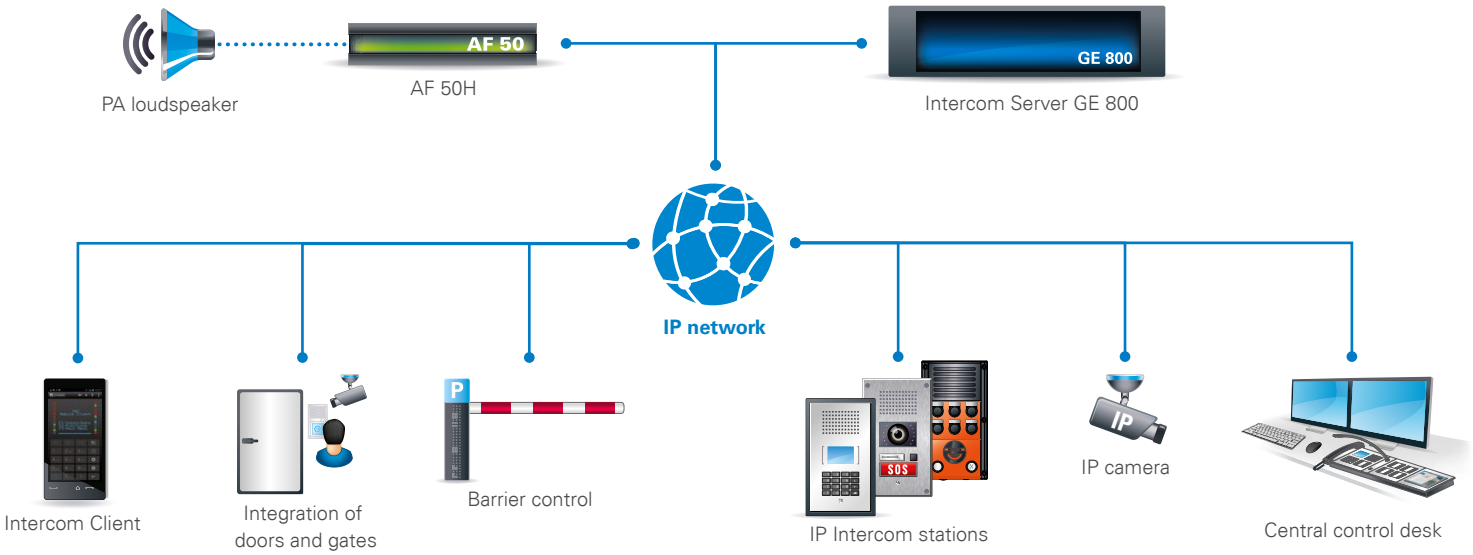
Device firmware
- IoIP-Device (min. version 8.0)
- SIP Series (min. version 4.1)

ATTENTION
Downgrading to firmware version lower than IoIP-Device 8.0 is not supported.

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System overview

The following illustration shows an example of the integration of an AF 50H amplifier into an IP network.



Requirements to the network for use as SIP device

Ports

- The configuration via the web interface is done via TCP port 80 (cannot be configured).
- The communication from the SIP device to the SIP server is done via the following ports (both are configurable):
  - SIP: UDP port 5060
  - RTP: UDP port 16384 (incoming)

Requirements to the network for use as IoIP device

IP addresses and ports

- For the AF 50H, the DHCP functionality is available. If DHCP is not used, the AF 50H must have a fixed IP address.
- In case of a changing public IP address, dynamic registration of an AF 50H is possible.
- Communication from the program IP Station Config is done via port 16399 (cannot be configured).
- Communication from the AF 50H to the Intercom Server (UDP protocol) is done via port 16400 (configurable).

QoS requirements

- One-way delay max. 100 ms
- Delay jitter max. 50 ms
- 0% packet loss for perfect audio quality

Bandwidth

For further information on bandwidth, see guideline "**IoIP Technology**".

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AF 50H
Installation instructions

Mounting instructions

- Do not place the device in areas where it may become wet or damp, and avoid dusty, humid and high temperature environments. The device shall only be used indoor.
- Loudspeaker cable size: 0.08 to 2.5 mm² (loudspeaker out 4–16 Ω) and 0.08 to 1.5 mm² (loudspeaker out 70 V/100 V).
- The electrical connections of the device have to face downwards when mounting it on a wall.
- The Ethernet cable shall only be connected to an inside network environment where over-voltage transients are not likely.
- Do not cover the device.
- Use shielded Ethernet cables only.
- Before using the device, ensure all cables are connected correctly and not damaged.
- Use only power supply units with straight through earth (e.g. PA60W24V).

LED status indication

LED "POWER" (front side)

- Permanent green: power supply applied
- Green blinking: only PoE power supply applied

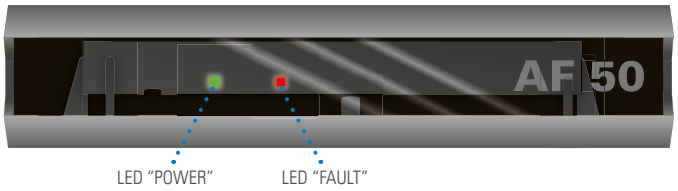
LED "FAULT" (front side)

- Permanent red: short-circuit detected at the loudspeaker out (4–16 Ω)
- Red blinking: loudspeaker line monitoring fault detected at the loudspeaker out (70 V/100 V)

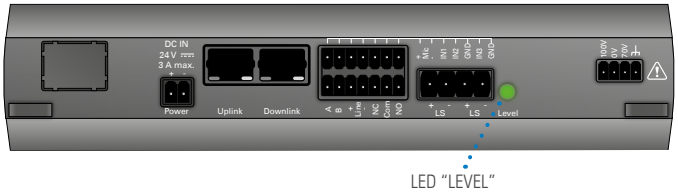
LED "Level" (back side)

- Red: clipping detected
- Green/orange: amplification okay

Front view



Rear view

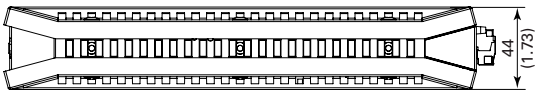


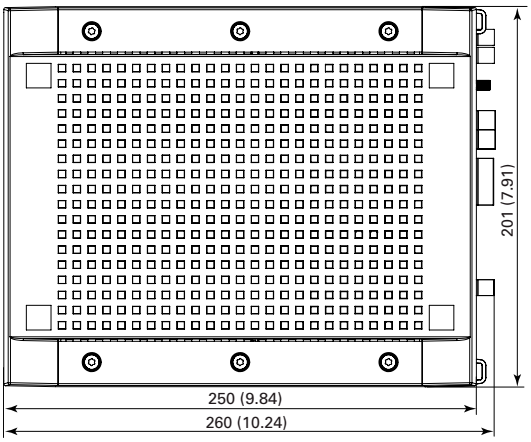
Safety warnings

- This device shall be installed or replaced by trained and qualified personnel only.
- ⚠ Caution: Exposed connections or cables. During operation, up to 100 volts may be present. Contact may cause electric shock.
- To disconnect the device safely from the power supply, unplug the DC power supply and all Ethernet connectors.
- Do not make any modifications to the device and do not open the housing.
- For safety reasons, all grounding points must be in the same groundbed.
- The DC power supply of the device must comply with the requirements for LPS (acc. to IEC/EN 60950-1) or PS2 (acc. to IEC/EN 62368-1) (max. 100 W). If one power supply (> 100 W) is used for multiple devices, a overcurrent protective device must be installed in each device's supply line.
- This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
  - Reorient or relocate the receiving antenna.
  - Increase the separation between the equipment and receiver.
  - Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
  - Consult the dealer or an experienced radio/TV technician for help.

Dimensions

Measuring units in mm (in), not to scale!

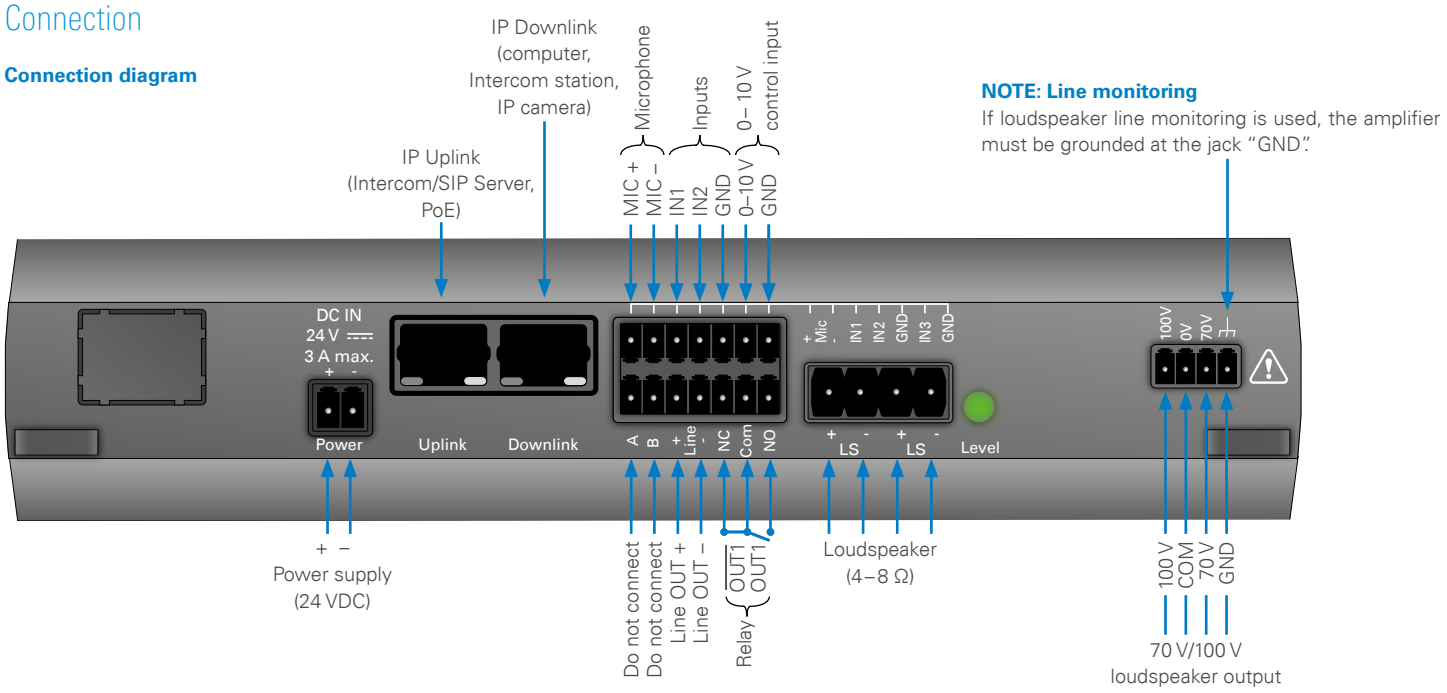




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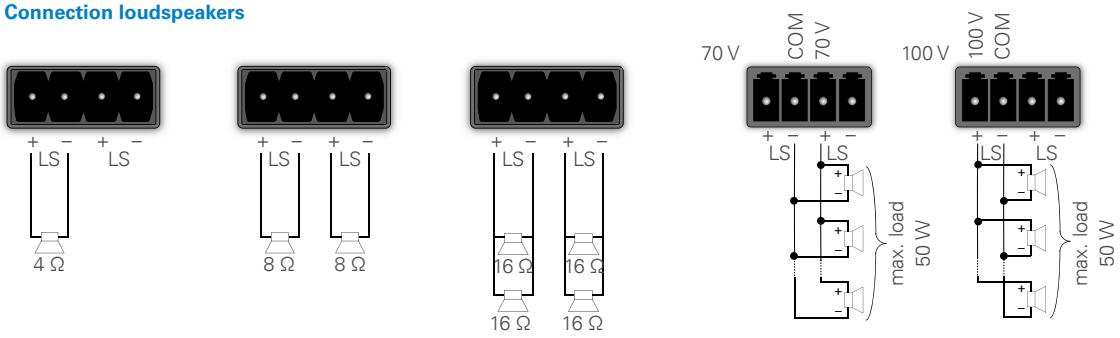
Connection

Connection diagram



NOTE: Line monitoring
If loudspeaker line monitoring is used, the amplifier must be grounded at the jack "GND".

Connection loudspeakers



Volume settings

The volume can be controlled via CCT 800 in IoIP operation mode and via the web interface in SIP operation mode or via the volume control ("IN3").

Mounting

The AF 50H can be placed on a desk or be mounted using a wall mount kit or a rack mount kit:
- Wall mount kit PF-WM (not included in extent of supply; for mounting, see short reference "PF-WM")
- Rack mount kit PF-WM (not included in extent of supply; for mounting, see short reference "PF-RM")

Microphone loudspeaker distance for IVC

If IVC (Intelligent Volume Control) is used, the distance between microphone and the nearest loudspeaker has to be less than 3 m. In this way, an unwanted increase of the loudspeaker volume level is prevented.

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AF 50H
Complementary information

Loudspeaker line monitoring

Functionality

With loudspeaker line monitoring, it is possible to detect the following errors at the loudspeaker output:

- **Short-circuit** (impedance < 20 Ω at 100 V/< 10 Ω at 70 V)

  ATTENTION: Loop impedance

  The loop impedance for the loudspeaker cable must be lower than 20 Ω at 100 V/10 Ω at 70 V in order to be able to detect short-circuits.
- **Short circuit to ground** (impedance to ground < 50 kΩ)
- **Disconnection** (impedance > 1 kΩ)
- **Impedance changing** (± 10%, ± 20%, ± 30%, ± 40% and ± 50%)

Loudspeaker line monitoring is based on an impedance measurement with adjustable tolerance values of ± 10%, ± 20%, ± 30%, ± 40% and ± 50%. These values obviate against errors depending on temperature value changing, deterioration and so on. During the impedance measurement, a pilot signal (67 Hz with –23 dBFS) is put out. The measurement is also carried out during audio output. An error is displayed with measurement cycles every 60 seconds.

System requirements

Software

- IoIP operation: licence "L-AF-LM"
- SIP operation: no licence required

Configuration (IoIP operation)

ATTENTION: Required configuration

For the configuration of loudspeaker line monitoring, an active connection between CCT 800 and the amplifier is required.

- Go to: ***Subscriber > Station Properties > AF series > AF 50H >*** *tab* ***Line Monitoring***
- Activate the checkbox **Line Monitoring**.
- In the drop-down list **Line**, select the used line type ("70 V" or "100 V").
- In the drop-down list **Tolerance**, select the tolerance value for measurements. Within this tolerance, a deviation from the reference value will not be interpreted as error. It is recommended to set the tolerance value to ± 30%.
- Click on **Measure ...** to measure the impedance of the loudspeaker line. The measurement is displayed in the filed "Impedance".
- Click on **Accept ...** to set the current measured value as nominal value. The current nominal value is displayed in the filed "Impedance nominal value".
- After the configuration, send the CCT 800 configuration to the Intercom Server.

Quality tested. Reliable. Smart.

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The development and manufacturing processes are certified in accordance with **EN ISO 9001:2015**.

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