

# AF 50H

Compact 50 watts IP amplifier



Easy  
integration

Compact  
size

Loudspeaker  
line  
monitoring

IoIP<sup>®</sup> 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<sup>®</sup> 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

# AF 50H

## Technical specifications



### Technical data

<b>IP rating:</b>	IP20 (acc. EN 60529)
<b>Output power:</b>	50 W <sub>RMS</sub>
<b>Loudspeaker outputs:</b>	low-resistance (min. impedance: 4 Ω) or 70 V/100 V
<b>Microphone input:</b>	nominal level: 14 mV at 3.3 kΩ microphone supply voltage: 2.5 V
<b>Line output:</b>	nominal level: 0 dBu (0.775 V)
<b>Inputs:</b>	2 inputs for floating contacts (detection of 5 input states)
<b>Output:</b>	relay output (changeover contact): max. 60 W (DC)/37.5 VA (AC), max. 2 A, max. 60 VDC/30 VAC <sub>eff</sub> expected life: min. 5 x 10 <sup>4</sup> (2 A), 10 <sup>6</sup> (1 A)
<b>Control input:</b>	0–10 V (for remote volume control)
<b>Protocols (IoIP):</b>	IoIP protocol based on UDP/IP
<b>Protocols (SIP):</b>	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)
<b>Codecs (SIP):</b>	G.711 a-Law, G.711 μ-Law, G.722
<b>ONVIF specification:</b>	ONVIF Profile S for unidirectional audio
<b>IoIP audio bandwidth:</b>	16 kHz
<b>SIP audio bandwidth:</b>	7 kHz
<b>Total harmonic distortion (THD+N):</b>	4 Ω, 8 Ω, 70 V/100 V: < 0.2%
<b>Operating temperature range:</b>	–25 °C to +55 °C (–13 °F to +131 °F)
<b>Storage temperature range:</b>	–25 °C to +70 °C (–13 °F to +158 °F)
<b>Relative humidity:</b>	up to 95%, not condensing
<b>Connections:</b>	2 RJ45 modular jacks with LEDs for connection to the Intercom/SIP server (IP Uplink, IP Downlink) pluggable screw terminals (0.08 mm <sup>2</sup> –1.5 mm <sup>2</sup> ): power supply, outputs, microphone <sup>1)</sup> , inputs, line output, 70 V/100 V loudspeaker output pluggable screw terminals (0.08 mm <sup>2</sup> –2.5 mm <sup>2</sup> ): low-resistance loudspeaker output expansion plug for e.g. EB2E2A
<b>Power supply:</b>	20–26 VDC <sup>2)</sup> (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
<b>PoE (Power over Ethernet) <sup>3)</sup>:</b>	IEEE 802.3af/Class 0, IEEE 802.3at/Type 1
<b>Cabbling:</b>	min. Cat. 5
<b>Dimensions (W x H x D):</b>	201 x 44 x 255 mm (7.91 x 1.73 x 10.04 in)
<b>Weight incl. package:</b>	approx. 1,600 g (3.53 lbs)

### Extent of supply

- Amplifier
- Device identification document
- 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

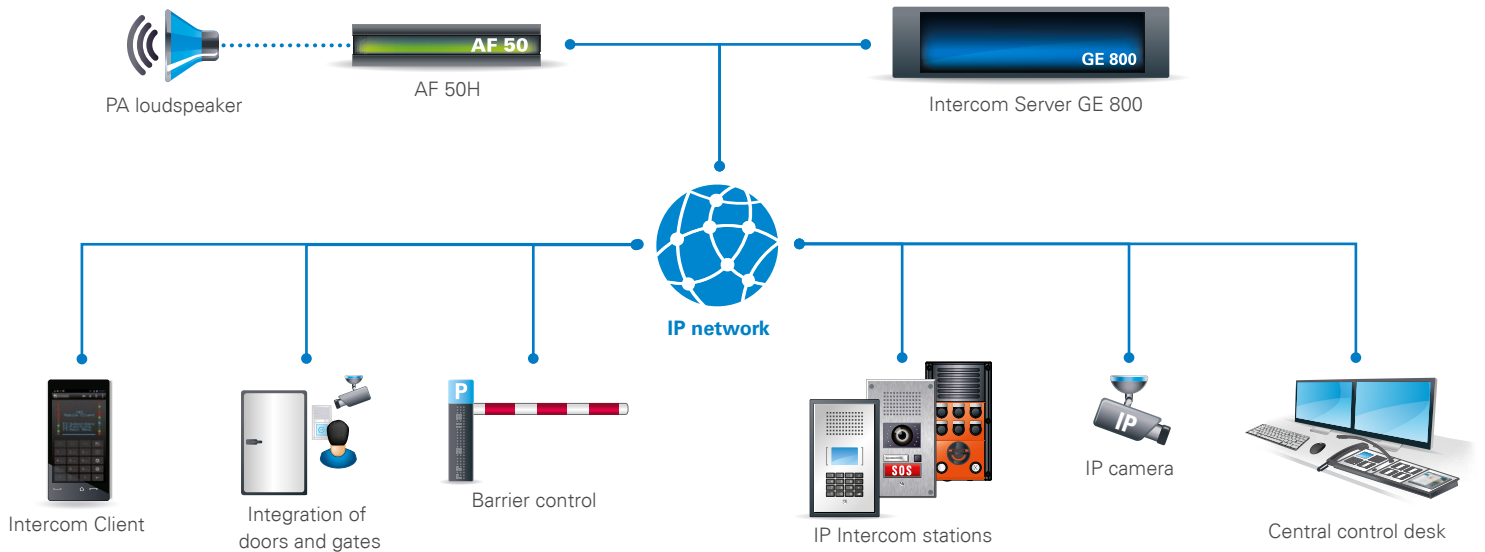
- IoIP-Device (min. version 8.0)
- SIP Series (min. version 4.1)

### ATTENTION

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

## 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 IolP 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 "IolP Technology".

# 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 mm<sup>2</sup> (loudspeaker out 4–16 Ω) and 0.08 to 1.5 mm<sup>2</sup> (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

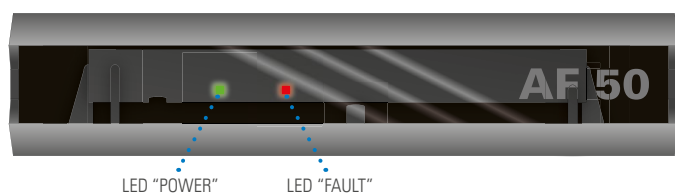
#### LED "FAULT" (front side)

- 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)

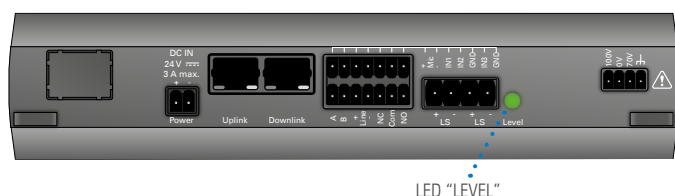
#### LED "Level" (back side)

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

#### Front view



#### Rear view

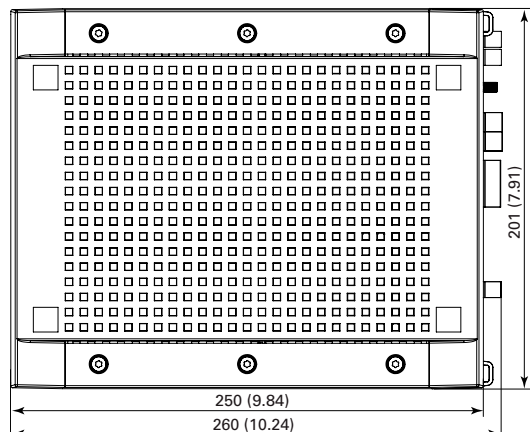


### Safety warnings

- 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 grounded.
- 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, an over-current 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.

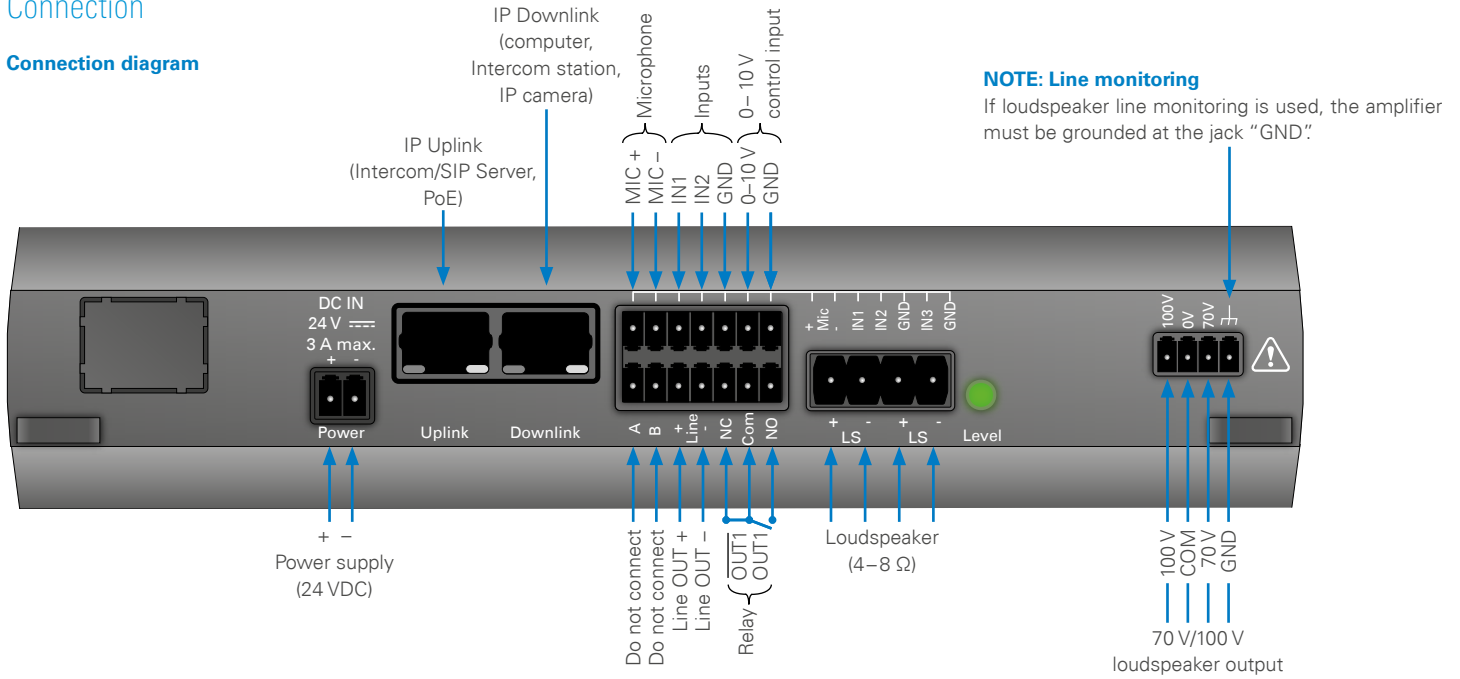
### Dimensions

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

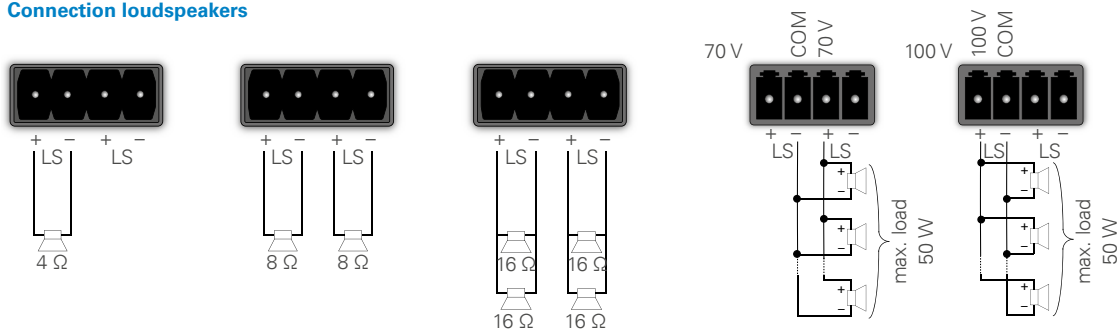


## Connection

### Connection diagram



### 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.

# 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  $< 20 \Omega$  at 100 V/ $< 10 \Omega$  at 70 V)
  - ATTENTION: Loop impedance**  
The loop impedance for the loudspeaker cable must be lower than  $20 \Omega$  at 100 V/ $10 \Omega$  at 70 V in order to be able to detect short-circuits.
- **Short circuit to ground** (impedance to ground  $< 50 \text{ k}\Omega$ )
- **Disconnection** (impedance  $> 1 \text{ k}\Omega$ )
- **Impedance changing** ( $\pm 10\%$ ,  $\pm 20\%$ ,  $\pm 30\%$ ,  $\pm 40\%$  and  $\pm 50\%$ )

Loudspeaker line monitoring is based on an impedance measurement with adjustable tolerance values of  $\pm 10\%$ ,  $\pm 20\%$ ,  $\pm 30\%$ ,  $\pm 40\%$  and  $\pm 50\%$ . These values obviate against errors depending on temperature value changing, deterioration and so on. During the impedance measurement, a pilot signal (67 Hz with  $-23 \text{ dBFS}$ ) 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 (" $70 \text{ V}$ " or " $100 \text{ V}$ ").
- 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  $\pm 30\%$ .
- 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.

COMMEND products are developed and manufactured by Commend International in Salzburg, Austria.

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



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