

im3

Ultra-compact Intercom module



	Ready for Symphony Cloud
Modular solution	Fully IP-based
Full HD camera support	Future-proof system

Powerful built-in solution

The im3 is a powerful basic-core Intercom module that brings the power of the Concerto Series' Intercom multi-connectivity for buildings, industry and similar environments to the world of OEM system integration.

The im3 combines a variety of communication and control sources on a compact single-source device. With lots of options for audio and video connectivity, it acts as a communication hub. This makes it a flexible Intercom module, giving operators an easy one-stop option to custom-build combined communication and monitoring solutions to suit their individual needs.

Ready for Symphony Cloud Services

The Intercom stations can be connected to Symphony and use its services. Symphony is the world's first cloud-based Intercom platform with "Privacy and Security by Design". Visit the Symphony website to find out about the services currently available and if they are already offered in your country.

symphony.commend.com

Features and highlights

- Supports the Commend camera module cm1 for SIP video calls
- Crystal clear sound with up to 20 kHz speech quality and a power of up to 10 W thanks to the latest Smart Audio Amplifier technology
- Special audio functions provide high speech quality in any situation
- OpenDuplex® for natural, hands-free communication
- Compact and rugged housing with RJ45 jack for easy installation
- Pluggable spring-type terminals enable simple and fast connection of cables
- Easy to expand with add-on equipment via USB interface
- 2 inputs for floating contacts and 1 relay output

Accessories

Loudspeaker module LSM

With the LSM, the im3 can be equipped with a loudspeaker. The loudspeaker module can be attached directly to the Intercom module.



Camera module cm1

With the cm1, an im3 can be equipped with a high-quality, high-performance camera. The timeless and inconspicuous design makes it suitable for modern buildings. Via the HS-Link connection, the camera module can be installed with a distance of up to 3 m to the im3.



USB I/O module EB1E1A

With the USB I/O module EB1E1A, a base module can be expanded with an additional input and a relay output (normally open contact). The EB1E1A can be connected to a free USB port. By doing this, an input as well as a floating, galvanically-isolated output contact is available immediately – e.g. for use with a door opener.



USB I/O module EB8E8A

A device can be quickly expanded with inputs and outputs using the USB I/O module. The total of 8 inputs and 8 outputs of the EB8E8A enable an easily scalable solution. The EB8E8A complies with Commend's strict cyber security guidelines, e.g. for switching outputs. The module is connected using USB.



NOTE

The device supports connecting 1 USB device of the same type at any time.
Example: 1 EB3E2A-AUD and 1 EB1E1A.

Expansion module EB3E2A-AUD

The EB3E2A-AUD expansion module provides an easy way to expand the I/O and audio capabilities of an Intercom station. The expansion module is suitable for any applications where additional inputs and outputs are required. It has three inputs, two output relays and ports for direct connection of an external loudspeaker, external microphones and handset. Line-in and line-out connectors provide additional flexibility. The module can be connected to the Intercom station through a USB cable and is immediately available in the system.



Safety switch box IP Secure Connector

The IP Secure Connector provides high performance and high, absolute security, even if the connected Intercom station is located outdoors: If an unauthorised attempt is made to remove the Intercom station, e.g. to access the connected Ethernet cable, the IP Secure Connector interrupts the connection to the Intercom station and LAN. This ensures that it is neither possible to access the network nor to open a door or gate. Furthermore, the IP Secure Connector provides power supply in form of PoE and has two inputs and three outputs.



Power injector PA 25W POE-DC

In applications where PoE sourcing equipment is not available, the optional power injector PA 25W POE-DC offers a compact, convenient solution. It supports a wide DC input range (24–48 V) and is IEEE 802.3af/at compliant. The power injector connects easily and conveniently to an Intercom station through an Ethernet cable.



Induction loop kit AFIL-USB

With the AFIL-USB, an Intercom station can easily and quickly be equipped with an induction loop amplifier module. To do so, only a free USB jack is required at the station.



Microphone MIC 480

The MIC 480 is a high-quality microphone specially designed for harsh outdoor environments. It can be installed for use with Intercom stations in parking columns, ticket machines or elevator panels or used as a customer-side microphone for counter intercoms.



Loudspeaker LS8, LS15 or AL 10-16

With the LS8, LS15 or AL 10-16 (see image), an Intercom station can be equipped with an external loudspeaker.



Top-hat rail clamp ET 901-HSH35

With the ET 901-HSH35, the im3 can be installed on a top-hat rail. It is possible to mount the Intercom module upright.

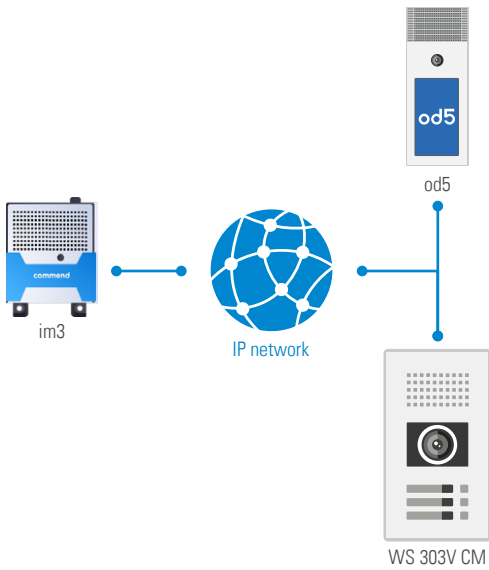


RGB status indication LED3

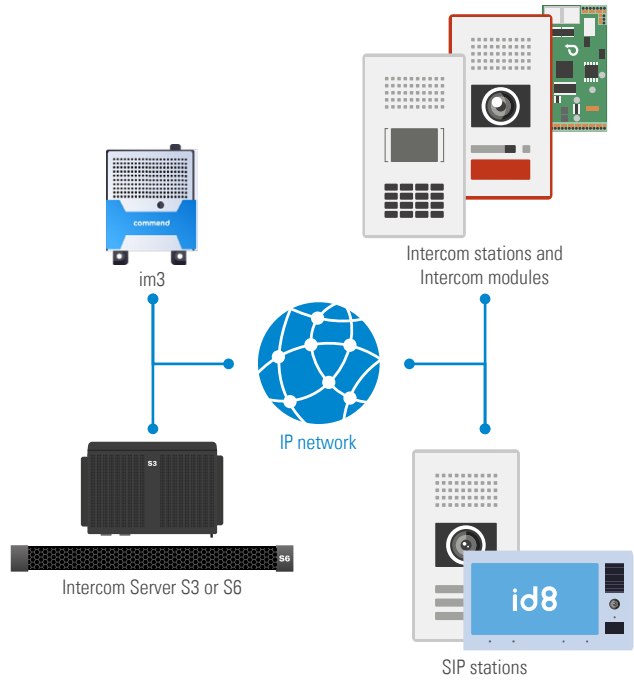
The LED3 is designed for installation in an LSM for status indication.

System overview

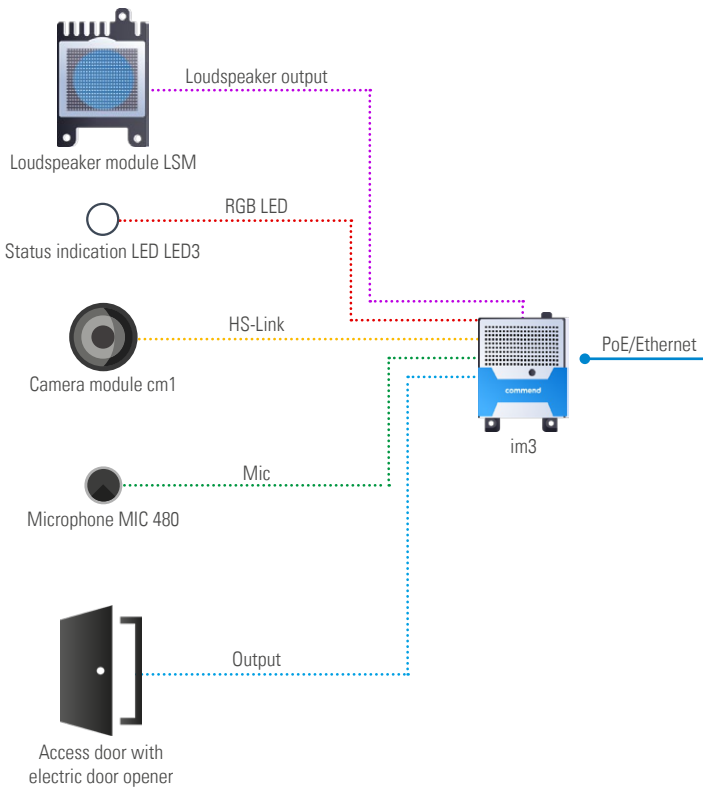
Operation with Symphony Mesh



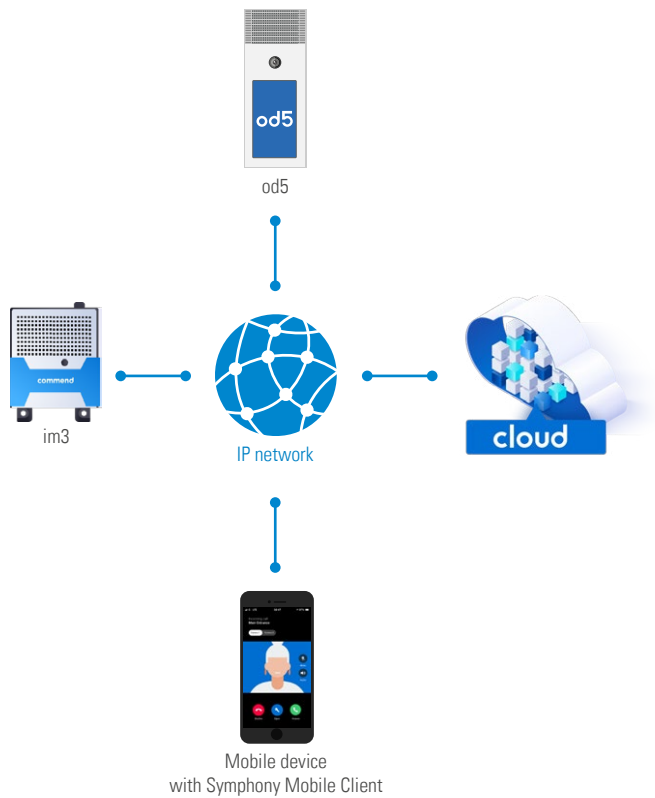
Operation with Symphony On-Prem

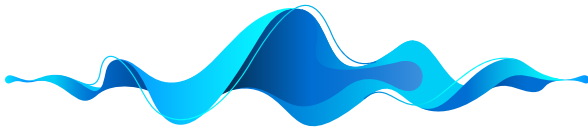


Application example



Operation with Symphony Cloud





CERTIFIED
ACC. TO
ISO 27001
IEC 62443-4-1

Passion meets audio

Ultimate speech intelligibility

Because every word matters, high speech intelligibility is crucial in security and communication solutions. In everyday life, it enables natural and brilliant communication; in operational processes, it ensures improved efficiency and in an emergency often buys life-saving time.

AI CLEANS VOICE FROM NOISE

Noise cancellation

Revolutionary **AI-based** noise cancellation, powered by our deep neural networks, transforms your audio experience. Genuine, device-specific audio training data enables us to easily distinguish between speech and background noise and effectively eliminate unwanted sounds (wind, traffic, background talk), providing you with pristine, uninterrupted communication.

Echo cancellation

Our advanced echo cancellation technology leverages the power of Commend's proprietary **deep neural networks** to deliver unparalleled clarity. Experience smooth and natural conversations without any noticeable echoes or delays, ensuring effective communication every time.

Dynamic volume adjustment

IVC (Intelligent Volume Control) automatically adjusts the loudspeaker volume of the Intercom station depending on the environment noise level – because both, too low and too high a volume, significantly reduces speech intelligibility and the user experience.

Hands-free communication through OpenDuplex®

This technology from Commend, combined with highly sensitive microphones as well as a high volume, allows natural and hands-free communication within a unique radius of several metres.

High volume

When there is ambient noise, the Intercom station has sufficient reserves to put out the audio signal of the other party at a higher volume than any distracting background sounds.

Audio functions adding value

- **Loudspeaker-microphone surveillance** – constant availability of Intercom stations while greatly reducing the manual testing effort.
- **Simplex mode** – for applications requiring controlled communication, e.g. security or industrial solutions based on the push-to-talk/release-to-listen principle.
- **Audio monitoring** – fully automated (emergency) call triggering at defined sound pressure levels for more security.
- **Live sound pressure level** – continuous measurement of ambient noise with optional transfer to a management system through SNMP or HTTP (e.g. to visualise noise volumes).
- **Equalizer** – for fine-tuning to ambient acoustic conditions.
- **Public address functions** – as an essential element of a holistic solution approach, announcements can be made or played back at every Intercom station as well as responded to directly.

For more information, visit:
audio.commend.com

Cyber security at Commend

Uncompromising protection against threats

IT infrastructures are facing a growing variety of cyber threats. This means that the defensive capabilities of each product in the system environment are key.

Security is above all a question of trust. At Commend, cyber security as a core competence has always been given a very high priority. From the initial product idea through implementation and operational support, privacy and security by design (PSBD) is the uncompromising target and promise to our customers against which product features and functions must be measured.

Cyber security as top priority

- Commend as well as the hardware and software development process is rigorously certified according to the standard **IEC/ISO 27001** and subject to a company-wide information security management system (ISMS)
- Commend is a member of the **Center for Internet Security (CIS)**
- Commend's Cyber Security Board ensures the handling and transparent communication of security vulnerabilities as well as the strategic hardening of Commend systems
- Commend is certified in accordance with the **IEC 62443-4-1** standard. The Commend development team implements secure communication and automation solutions in agreement with „Security by Design“ guidelines.
- Commend continuously publishes software updates with security patches and improvements

Physical security

- Robust devices and vandal-resistant product versions
- Tamper detection through electromechanical contacts
- USB and port-debugging protection

Network security

- **Standard IEEE 802.1x** for authentication (network access)
- **Standard IEEE 802.1q** for VLANs (network segmentation)
- Commend IP Secure Connector for automatic interruption of the network connection in the event of a tampering attempt

Data security

- **Encrypted and authenticated communication**
- **SIP over TLS v1.2** with secure cipher suites (> 128 bit)
- **SRTP** for tap-proof encryption of voice data
- **X.509 client certificates** for authentication and encryption
- TLS transport encryption for the protocols **HTTPS**, **SIPS** and **MQTT** to protect the web interface, APIs and video

Application security

- Mandatory change of the default password during the first login
- Minimum password length: 12 characters
- Detection of brute-force attacks at login
- Documentation and securing of network ports

Information about the cyber security of other Commend products can be found in the respective data sheets and product manuals.

For more information, visit:
trust.commend.com

im3

Technical specifications



Technical data

IP rating:	IP20 (acc. to EN 60529)
Mechanical impact resistance:	IK04 (acc. to EN 62262)
External LED:	possibility for connection of an RGB LED
Inputs:	2 inputs for floating contacts ¹⁾ (switches, push-buttons, relay outputs, etc.) input states: short, 560, 1k, 1k5, 2k2, 2k7, 3k3, 4k7, 6k8, 8k2, 10k, 15k, 22k, 33k, 56k, open
Outputs:	1 relay output max. switching voltage: 60 VDC, 30 VAC ²⁾ max. switching current (per output): 2 A max. switching power (per output): 60 W (DC), 37.5 VA (AC) expected electrical life: min. 10 ⁵ (30 VDC/2 A), min. 2 x 10 ⁵ (30 VDC/1 A)
Microphone input:	2 microphone inputs sensitivity (electret condenser microphone): -43 dBV/ Pa feeding voltage: 3.3 V at 4.3 kΩ
Loudspeaker output:	power: 5 W (RMS) at 8 Ω, 6.1 W (RMS) at 4 Ω, max. 10 W (peak) total harmonic distortion (THD+N): < 0,2% loudspeaker impedance: ≥ 4 Ω
Amplifier:	integrated, highly efficient Smart Audio Amplifier, 6.1 W
Audio bandwidth:	up to 20 kHz
Audio codecs:	Opus, G.722, G.711 a-law and G.711 u-law
Sound pressure level (with LSM):	max. 98 dB at 0.5 m (1.6 ft)/92 dB at 1 m (3.3 ft)
Camera resolution:	max. 1920 x 1080 px
Video streaming:	simultaneously up to 6 HTTP(S)/RTSP H.264 video streams with individual resolution or frame rate and simultaneously up to 6 HTTP(S) MJPEG video streams with the same resolution and frame rate
Video features ³⁾:	codecs: H.264 (SIP video and ONVIF), MJPEG (HTTP video and ONVIF) and RTSP ONVIF specification: ONVIF Profile S
IT security:	ISO-27001-certified manufacturer, SIP over TLS, SRTP, IEEE 802.1X, MJPEG via HTTPS, HTTPS for accessing the web interface and interfaces, X.509 certificates
Protocols:	IPv4, IPv6, TLS, TCP, UDP, HTTP (RFC 2617, RFC 3310), HTTPS (RFC 2818), RTP (RFC 3550), RTSP (RFC 2326), SIP over TLS, RTCP, DHCP, DHCPv6, DNSv4, DNSv6, mDNS, 802.1x EAP-TLS (RFC 5216), 802.1x EAP-MD5 (RFC 2284), SDP (RFC 2327, RFC 4566), SSDP, SIP (RFC 3261), SMTP, SNMPv2c, SNMPv3, SNTpv4 (RFC 5905, Section 14), STUN (classicstun), DTMF Decoding (RFC 2976, RFC 2833, SIP Info), ICMPv6 (Router discovery), MQTT (ISO/IEC 20922)
Operating temperature range:	-40 °C to +70 °C (-40 °F to +158 °F) ⁴⁾
Storage temperature range:	-40 °C to +70 °C (-40 °F to +158 °F)
Relative humidity:	up to 95%, not condensing
Connection ⁵⁾:	I/O connector with spring-type terminal (14-pin, conductor cross-section: 0.14-0.5 mm ² , stripping length: 7 mm/0.28 in) 2 x USB 2.0 (Type A) HS-Link or USB 2.0 ⁶⁾ RJ45 jack for Ethernet and PoE (10/100 Mbit/s)
Power supply:	PoE: IEEE 802.3af/802.3at Type 1 Class 3
Power consumption:	idle: typ. 2.4 W (standalone) max.: typ. 8.5 W ⁷⁾

Cabling:	min. Cat. 5e, shielded
Approvals and compliances:	EN 61000-6-2, EN 61000-6-3, EN 55032 Class B, EN 55035, FCC Part 15 Class B, ICES-003 Class B, EN 60529 IP20, EN 62262 IK04, EN 62368-1 IEC 62368-1 (CB Scheme), UL 62368-1 (Listed E351589)
Dimensions (H x W x D):	im3 only: 24 x 54 x 84.5 mm (0.94 x 2.13 x 3.33 in) with LSM: 39.5 x 54 x 84.5 mm (1.56 x 2.13 x 3.33 in)
Weight incl. packaging:	approx. 170 g (0.37 lbs)
Optional accessories:	LSM (loudspeaker module) LED3 (status indication LED) LS8, LS15 or AL 10-16 (loudspeaker) cm1 (camera module) AFIL-USB (induction loop kit) EB1E1A (USB I/O module) EB8E8A (USB I/O module) EB3E2A-AUD (expansion module) IP Secure Connector (safety switch box) PA 25W POE-DC (power injector) ET 901-HSH35 (top-hat rail clamp) MIC 480 (microphone)

¹⁾ For the input state "Short", the switch resistance has to be < 280 Ω.

²⁾ The relay output may only be used for ES1/PS2 or SELV circuits and with a wire cross section of min. 0.5 mm² (AWG 20) according to IEC 60332-1-2/3 or according to IEC 60695-11-21/UL2556 with the fire class VW-1. An ES1 circuit according to IEC/EN/UL 62368-1 or a SELV circuit according to IEC/EN 60950-1 must be safely separated (e.g. by double insulation) from a dangerous circuit (e.g. 230 V or 110 V mains circuit) and must not exceed the voltage values 60 VDC or 42.4 VAC_{peak} (30 VAC_{eff}) and 60W (DC), 37.5 VA (AC) PS2 circuit according to IEC/EN/UL 62368-1.

³⁾ When using a camera module cm1.

⁴⁾ From an operating temperature of > 60 °C (140 °F), additional cooling must be provided (see installation instructions).

⁵⁾ All USB connectors (including HS-Link) are declared and proved PS1 ports (acc. to EN/UL/IEC 62368-1).

⁶⁾ The HS-Link connection is intended only for the Commend camera module and Commend USB 2.0 modules. Do not connect any other devices to it.

⁷⁾ With cm1, microphone, loudspeaker (8 Ω), volume level "12" (1 kHz sinus signal), 2.5 W load on the USB 2.0 port and during a video call.

Extent of supply

- Intercom module
- I/O plug
- Thermal pad
- Device identification document
- Open source compliance information
- Short reference

System requirements

Server

- VirtuoSIS (min. version 5.0) or
- S3/S6 (min. version 7.1) or
- Compatible SIP server or
- Serverless operation

Configuration software

- Set-UP min. version 2.1

im3

Installation instructions

Installation instructions

- Do not install the device in locations where it may be wet or damp. Also avoid locations with increased dust formation, high humidity or high ambient temperature.
- Avoid direct sunlight to prevent the device from overheating.
- When mounting the device, its electrical connections should face downwards.
- Install or store this device out of the reach of children and do not allow persons unfamiliar with the device and these instructions to handle and operate the device.
- Use three screws with a suitable diameter to mount the device (see "Dimensions"). Fastening, screw type and screw length depend on the mounting ground.
- From an operating temperature of > 60 °C (140 °F), additional cooling must be provided (see also integration guide "im3").
- For optimal heat dissipation, it is recommended to connect a cooling surface to the device using the supplied thermal pad. For this, choose exclusively a flat metallic cooling surface with a size of min. 190 cm² (29.45 in²).
- For cabinet mounting, the top-hat rail clamp ET901-HSH35 can be used (available separately). The device can be mounted on the left side. Only use the screws in the extent of supply of ET901-HSH35 for this purpose.
- Use shielded Ethernet cables and a grounded PoE power supply only.
- Before using the device, ensure all cables are connected correctly and not damaged.
- To avoid mechanical stress on the sockets, it is recommended to provide a cable strain relief below the device.

Safety instructions

- This device shall be installed or replaced by trained and qualified personnel only.
- Observe the country-specific standards for installation, mounting and configuration.
- Only use Commend accessories that comply with the device's technical specifications.
- Devices belonging to another earthing network must not be connected to the device's connectors.
- All connected circuits shall fulfil the following requirements:
 - Safety Extra Low Voltage (SELV) and Limited Power Source (LPS) according to IEC/EN 60950-1 or
 - ES1, PS2 circuits and Annex Q (Limited Power Source) according to IEC/EN/UL 62368-1.
- Disconnect the Ethernet cable for any maintenance of the device.
- All changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
- 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.

Line lengths

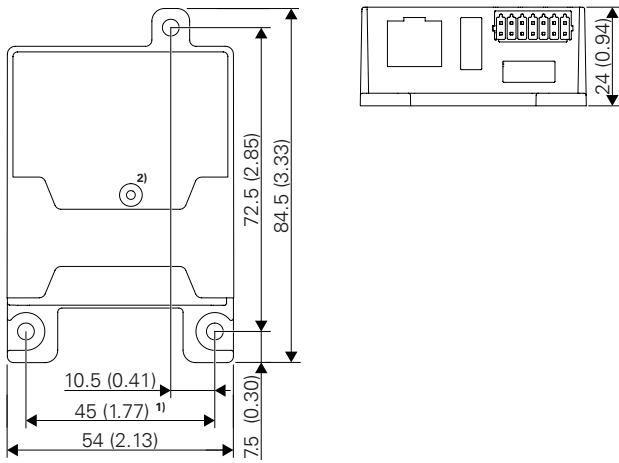
- The maximum line length of Cat. 5 cabling in a LAN is 100 m (328 ft) – e.g. from switch to device.
- The maximum line length of an input (IN1 and IN2), an output (OUT1) and a loudspeaker connection is 30 m (98 ft).
- The maximum line length of a USB connection is 5 m (16 ft).
- The maximum line length of an HS-Link cable is 3 m (9 ft).

Access

The device can be accessed through IPv4 (DHCP), IPv6 (link-local) and zeroconf. For information on accessing the web interface, see the product manual.

Dimensions im3

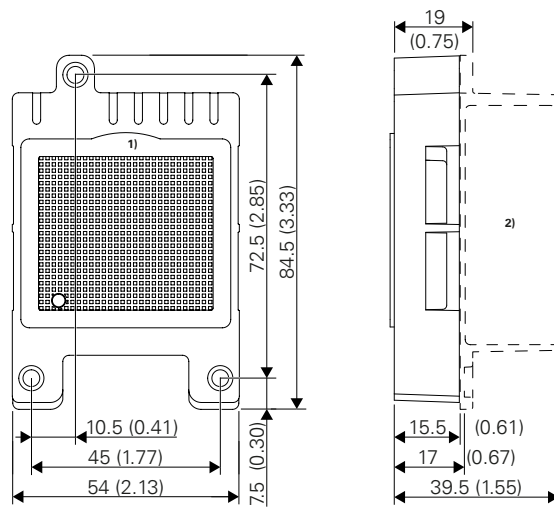
Measuring units in mm (in), not to scale!



- ¹⁾ Bore holes mounting, \varnothing 4 mm (0.16 in), screw head (M3): max. \varnothing 9 mm (0.35 in)
- ²⁾ Reset button/activity LED

Dimensions im3 with LSM

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

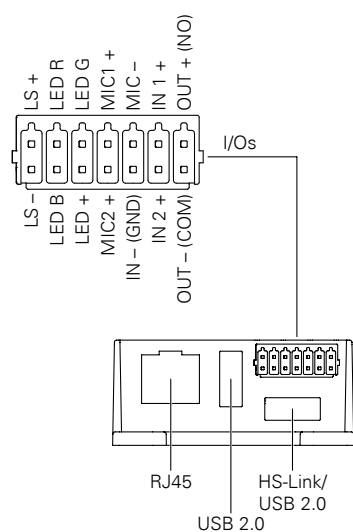


- ¹⁾ Loudspeaker gasket
- ²⁾ im3

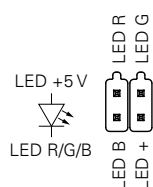
Behaviour activity LED

- **Steady green light:** The device is supplied with voltage.
- **Flickering orange light:** Data are transmitted.

Connection



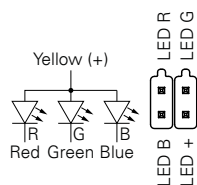
RGB-LED



NOTE

The internal resistance of the RGB connections is 100 Ω.

LED3



Quality tested. Reliable. Smart.

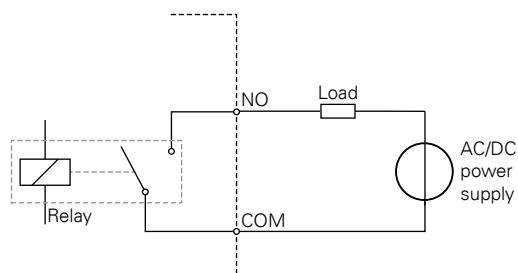
COMMEND products are developed and manufactured by Commend International in Salzburg, Austria.

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



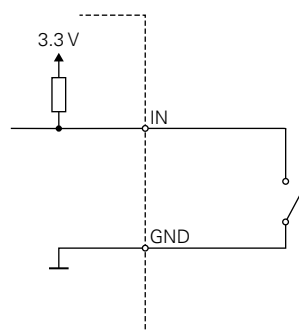
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Output circuit

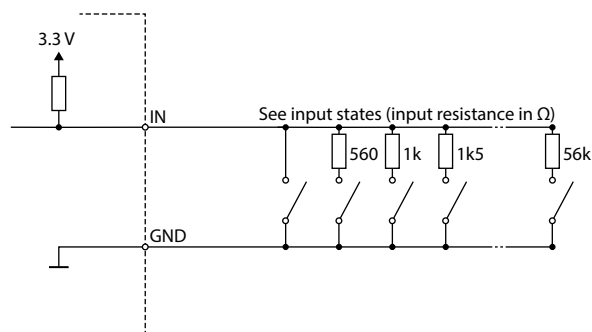


Input circuit

Connection example: one button per input



Connection example: multiple buttons (max. 15 buttons per input)



A strong worldwide network

COMMEND is represented all over the world by local Commend Partners and helps to improve security and communication with tailored Intercom solutions.

www.commend.com