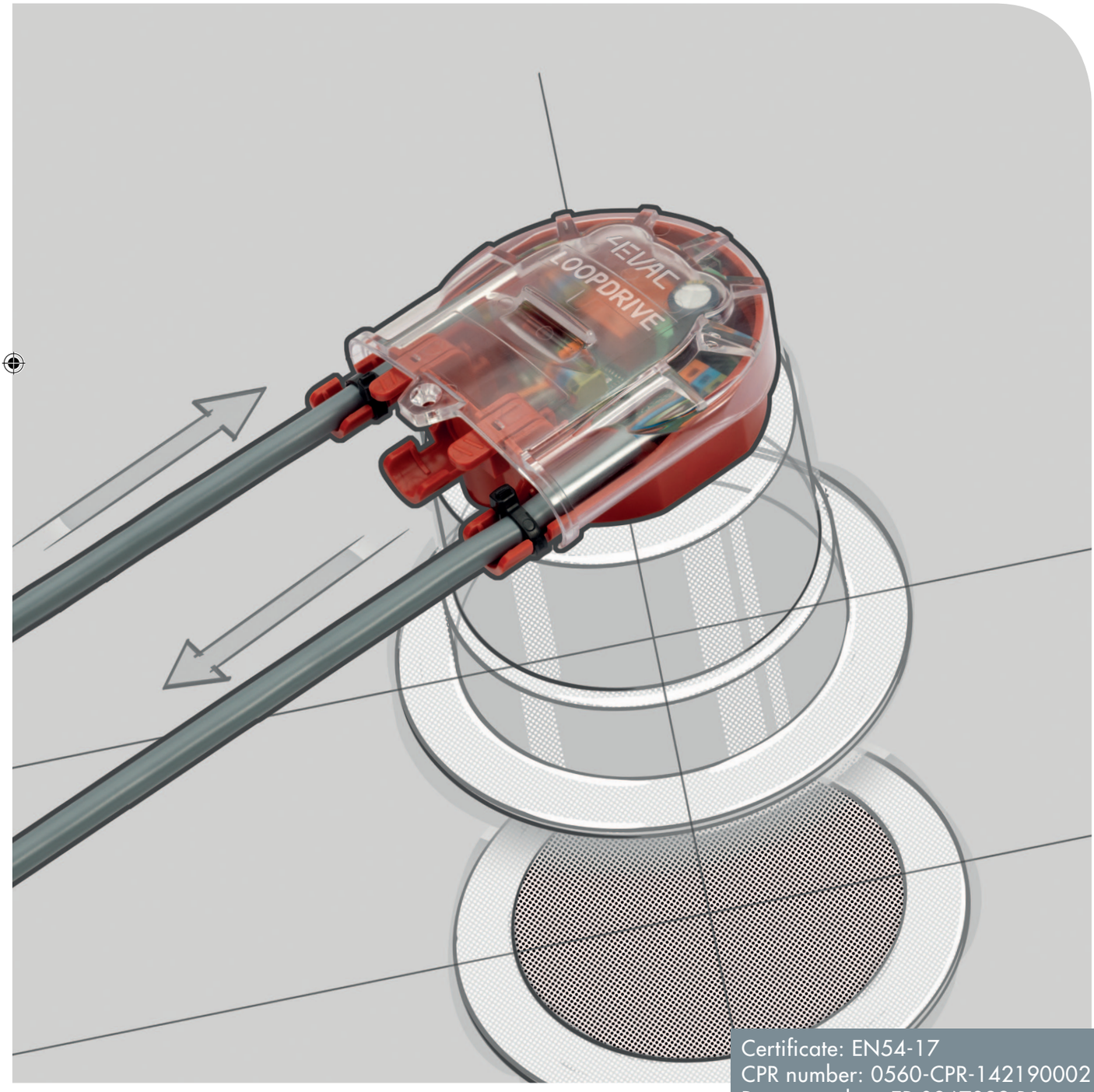
4EVAC

DETECT, LOCATE AND ISOLATE IN LESS THAN 4 SECONDS... WE BROADCAST



LOOPDRIVE

Certificate: EN54-17
CPR number: 0560-CPR-142190002
Patent number: EP 0967833 B1

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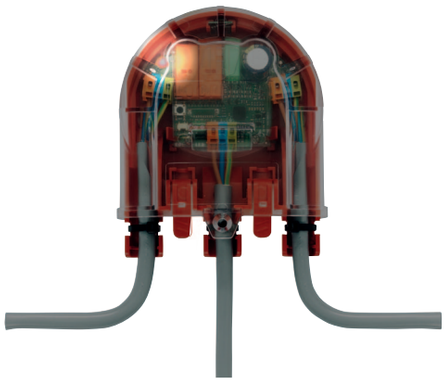


FIM - Fault Isolator Module

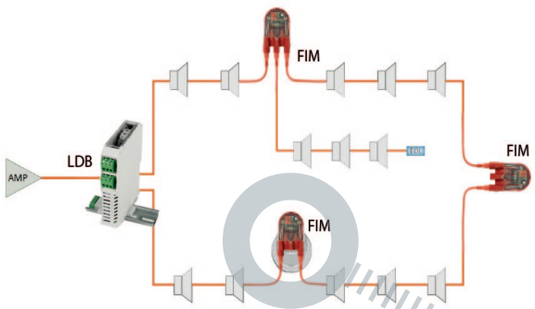
The Fault Isolator Module (FIM) is the successor in our range of loudspeaker loop-isolator devices that are using our patent technology to deliver a higher level of availability of evacuation loudspeaker lines that are installed according to the return-loop principle.
A loudspeaker failure in a faulty section between any two FIM's in the loop is automatically detected and isolated in order to ensure maximum availability of the remaining loudspeakers on that same loop. The FIM protects the loop integrity against any open and wire-to-wire short circuits.

LOOPDRIVE

Operation

Automatically opens circuit when the DC-voltage carrier drops below threshold on loop. Fault Isolator Modules (FIM) should be spaced between groups of loudspeakers (maximum 25, please refer to your national standards organisation for detailed information) in a loop to protect the rest of the loop. If an open or a short occurs between any two isolators, than both isolators immediately switch to an open circuit state and isolate the faulty group of loudspeakers between them. The remaining isolators, the T-branch loudspeakers of the affected FIM's and the loudspeakers on the loop remain fully operational. During fault status, the Loopdrive Booster, LDB, is feeding both loop-branches simultaneously and the fault is indicated by the status LED's on both FIM's and LDB's.
(Optional: Detailed information is provided via dedicated PC application over RS485 from the LDB)

ALTERNATIVE STYLE LOOPS: **The FIM is used at it's T-Branch to feed a single loudspeaker or a group of loudspeakers to limit the on-going effect to the devices on the main loop.**



NOTE: **The maximum number of loudspeakers between FIM's is not limited within the maximum LOOP-load of 800W, however, National standards may limit the amount of loudspeakers between Isolators.**

The LED indicator(s) on the FIM and LDB are flashing with intervals to indicate the error. The FIM restores the faulty partition of the Loop-branch-lines to normal condition when the short or open circuit condition is removed and a general reset command is given by pressing the RESET button on the corresponding LDB.

The FIM is equipped with a power capacitor that is charged by the LDB and has enough capacity to run at least two measurement cycles without the need for re-charging.

Features and benefits

General

- EN54-17 certified;
- At least two measurement cycles without the need for re-charging;
- Patent Redundant loop Technology using sophisticated Field Isolator Modules – FIM - and central Loop-Drive-Boosters – LDB;
- Considerable cost savings in cabling and installation because in most cases fire-retardant cabling and installation (E-XX) is not needed and/or speaker loops can be extended with preservation of the systems integrity;
- Isolates and reinstalls the loop maximum functionality within 4 seconds after detection of a fault;
- Using ordinary 2-wire loudspeaker cabling. (Ground wire connection is available – depending on national standards requirements);
- Higher level of system availability for VACIE applications;
- Works with all commercial 100 Volt loudspeaker with DC-blocking capacitor and VACIE systems;

Operational

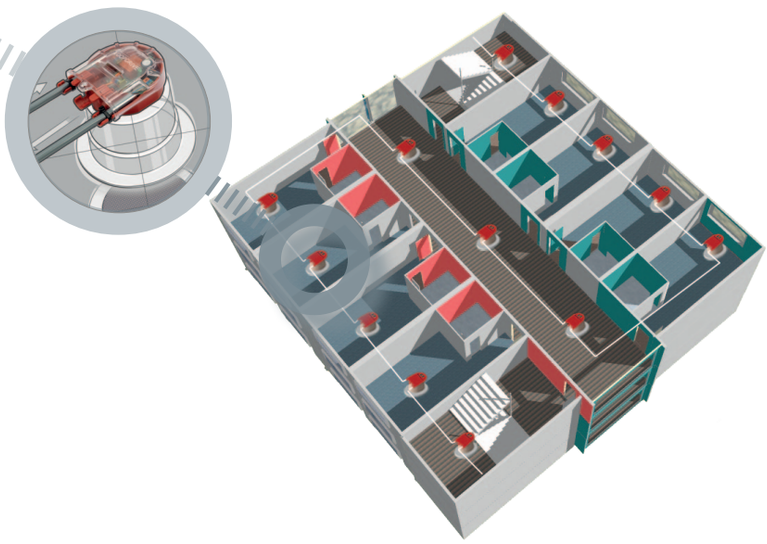
- Service mode for live FIM installation and testing;
- FIM-Tracking mode for exact fault locating;
- GUI PC-interface with enhanced monitoring fields.

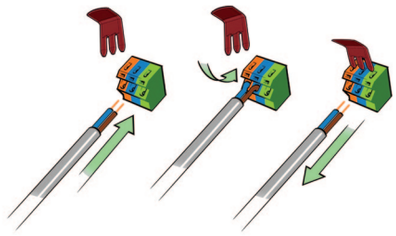
Electrical

- Protection against cable short, wire-to-wire, and cable open;
- Protection against EARTH leakage to ground and EARTH loop fault;
- Maximum of up to 200 FIM's on a single LDB;
- Maximum of 255 LDB's in one system;
- Maximum of 32 LDB's sharing a single DIN-rail;
- Maximum audio ring-load: 100 V(RMS)/800 Watt (Audio).

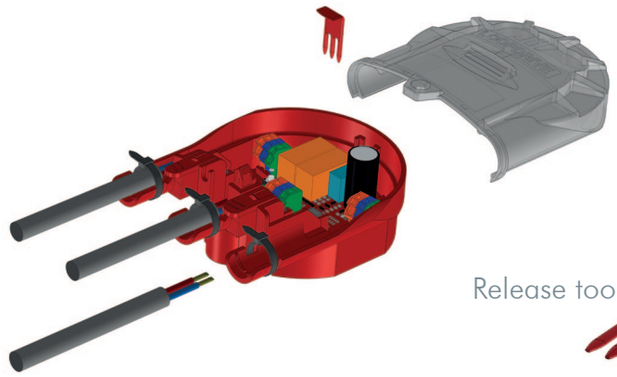
Mechanical

- Cost saving WAGO push-terminal installation connectors on FIM;
- Maximum cable core diameter of installation cable: 2 x 2,5 mm^2;
- Maximum loop length: 1000 m.

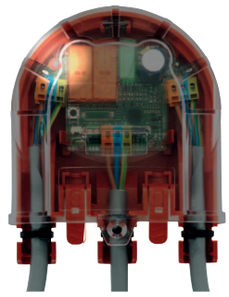




Loopdrive assembly - FIM-01



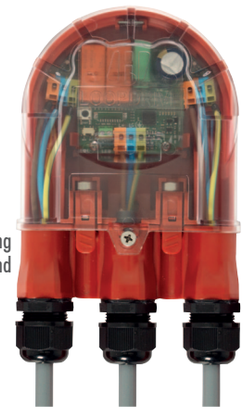
Release tool



IP21

The Loopdrive originally designed housing in combination with colored WAGO push-terminals are a guarantee for a fast and correct installation of the device. The transparent cover enhances the emitting light signals from the on-board status indicators of the FIM. Fault indications can be easily identified during installation.
An external General Fault indicator output can drive a remote indicator where visual status feedback of the FIM is requested.

The WAGO push terminals used on the FIM accept from 0,8 to 2,5 mm2 core installation cable. A simple but effective tie-wrap quickly secures the cable onto the loopdrive housing.



IP33

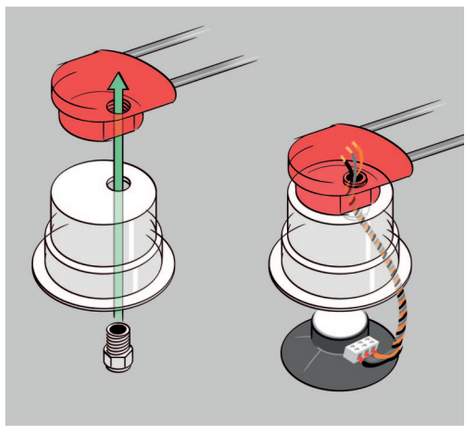
An additional adapter can be ordered to the unit that increase the IP - rating **from IP21 to IP33** by adding compression glands that take up 8 to 13 mm sized installation cable.

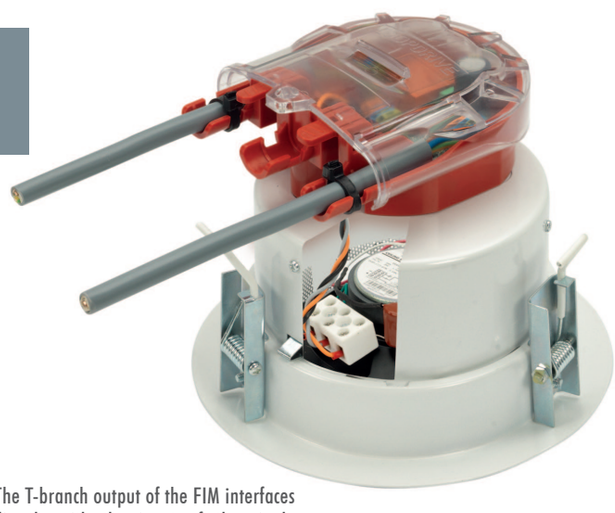
The additional adapter comes with fitting screws and three compression-glands and can be ordered seperately.

Complementary 20 mm gland allows for quick and easy installation onto the firedome of the loudspeaker using one of the existing cable gland entries of the loudspeaker. (See installation guide below).

LOOPDRIVE

No extra cable !
No extra junction box !





The T-branch output of the FIM interfaces directly with the input of the single loudspeaker through the fixing-hole of the Loopdrive housing and the compression gland.

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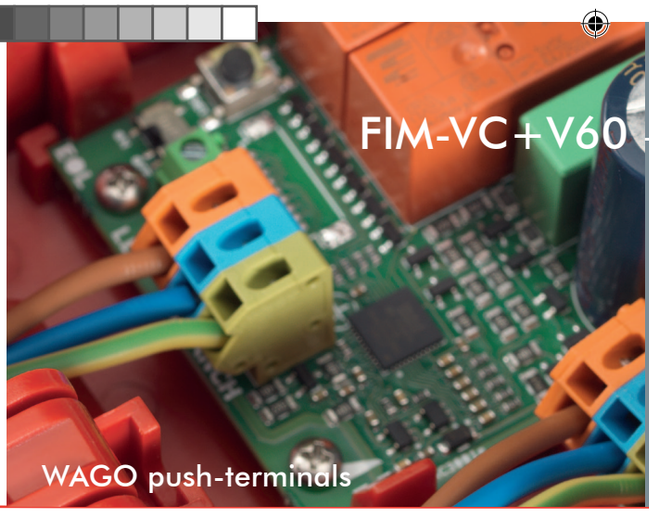


FIM-VC+V60 - Loopdrive Volumecontroller

The FIM is equipped with WAGO push-terminals that accept up to 2,5 mm² core installation cable. A Tie-wrap quickly fixates the cable to the loopdrive housing.

LOOPDRIVE

Playing backgroundmusic is a necessity for i.e. shopping-malls, restaurants, hotels and fashion stores. But you might not want to have the same level everywhere in the building.
Loopdrive FIM-VC provides you with local volumecontrol of the backgroundmusic in combination with paging-override using existing 2-wire infrastructure.

The FIM-VC can handle up to 50Watt of loudspeaker load on its T-branch and provides 8-step volume control plus an AUXILAIRY input for a local audio source. Ideal for shops where they like to select from in-house entertaining feed to their own in-store music player. In case of an emergency, the FIM-VC will automatically override the in-store music player and broadcast the emergency messages coming form the in-house voice-evacuation system.

The FIM-VC follows the Loopdrive concept and acts as an isolator in cause of cable short and/or cable open faults. The override function is triggered by the additional 20kHz carrier that is mixed with the paging/emergency broadcast.

Main benefits:

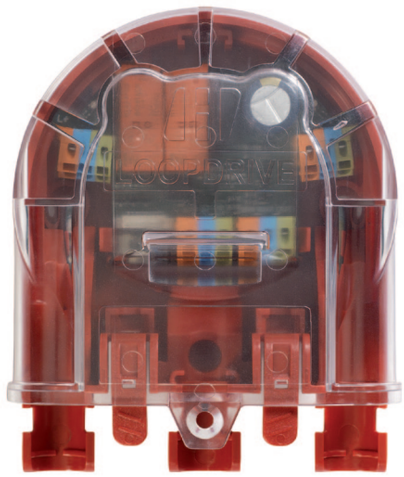
* Emergency paging and BGM over a 2-wire system
* No need for any additional 24VDC override cable
* Local volumecontrole and local music entry (AUX)
* Quick and simple to install.

Technical data:

* Trigger threshold: 7.5Vrms (20kHz)
* Inrush period for override: 0.3sec
* Fade-out period after override: 1.0sec.

FIM-VC contains:

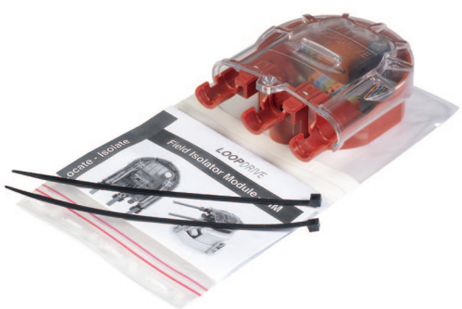
* 1 x single gang flushmount Volume controller V60 (60W).
* 1x surfacemount FIM-VC controller.

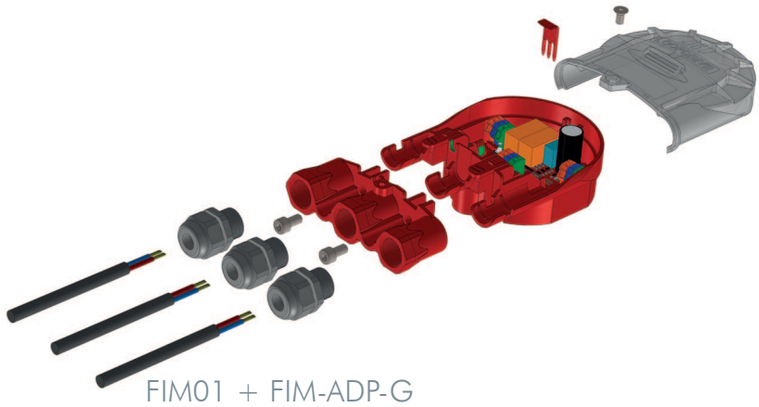


FIM - VC

V60

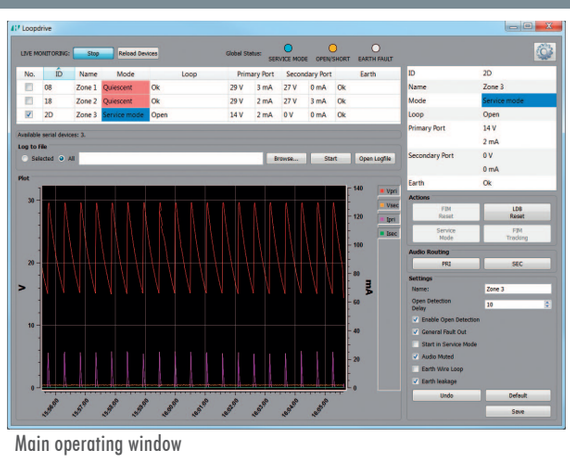
Single-gang flushmount box (optional)



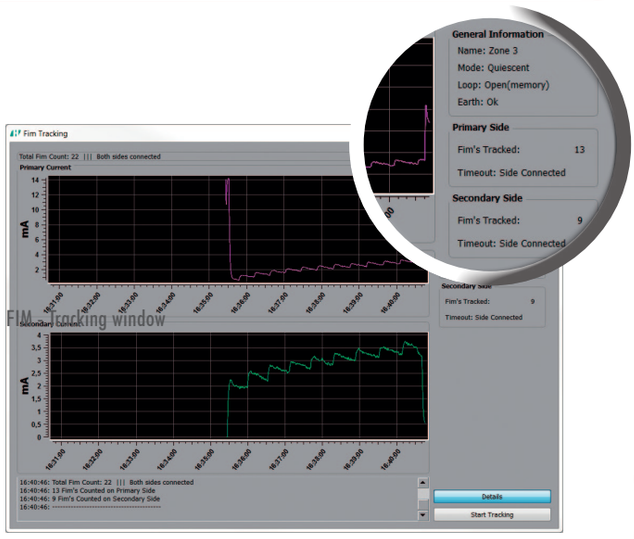


Loopdrive assembly FIM01 + FIM-ADP-G

Loopdrive SNIFFER



Main operating window



FIM - Tracking window

SNIFFER is a comprehensive Graphical User Interface (GUI) that let you automate the commissioning and installation of a Loopdrive system with up to 256 LDB-units over a single RS485 connection.

Sniffer is not only visualizing the various commissioning procedures but also provide streamlined methods for fault-finding and device allocating without the direct need for a digital communication protocol over the 2-wire audio line's. It fulfills the user's needs and expectations by far.

Settings and commands that are available from the various menu's are:

- FIM reset
- LDB reset

Basic settings like:

- General Fault Contact status
- Audio mute
- Earth-loop detection

And special service functions such as:

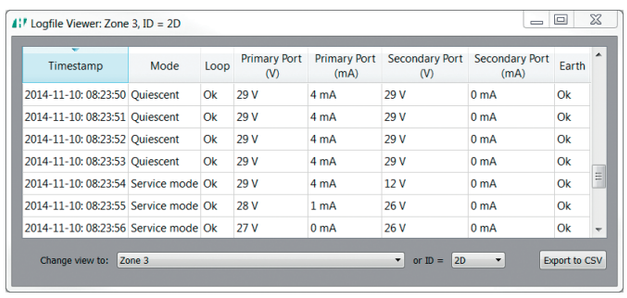
- Service mode
- Audio output switching
- FIM Tracking mode

Loopdrive. With a click on the button the system is instructed to activate the FIM's in sequential order, tracking the number of FIM's on both the PRIMARY (send) and SECUNDARY (return) line during first commissioning by measuring, registering and counting the inrush current.

Tracking-mode will generate a notifying signal when the loop is successfully closed and ready for operation. The total amount of FIM's that were Tracked are shown in the information fields and stored with the corresponding LDB for later verification.

In case a faulty section in the line is detected during Tracking-mode operation, the operator is notified and the exact location of the faulty section is listed by the number of the last successful initialized FIM on either Primary or Secondary side of the loop.

Sniffer app detects single and multiple twisting in cabling, providing the correct signal phase along entire loop.



Logfile Viewer: Zone 3, ID = 2D

Timestamp	Mode	Loop	Primary Port (V)	Primary Port (mA)	Secondary Port (V)	Secondary Port (mA)	Earth
2014-11-10: 08:23:50	Quiescent	Ok	29 V	4 mA	29 V	0 mA	Ok
2014-11-10: 08:23:51	Quiescent	Ok	29 V	4 mA	29 V	0 mA	Ok
2014-11-10: 08:23:52	Quiescent	Ok	29 V	4 mA	29 V	0 mA	Ok
2014-11-10: 08:23:53	Quiescent	Ok	29 V	4 mA	29 V	0 mA	Ok
2014-11-10: 08:23:54	Service mode	Ok	29 V	4 mA	12 V	0 mA	Ok
2014-11-10: 08:23:55	Service mode	Ok	28 V	1 mA	26 V	0 mA	Ok
2014-11-10: 08:23:56	Service mode	Ok	27 V	0 mA	26 V	0 mA	Ok

Change view to: Zone 3 or ID = 2D Export to CSV

Log-file window

FIM-Tracking-Mode is one of the best features on

Loop Drive Booster LDB

LDB - Loop Drive Booster

The Loop Drive Booster (LDB) is the heart of the Loopdrive system. This device drives up to 200 FIM's over a dual-core cable. A single LDB can pass 800 W of audio signal from an amplifier and injects at the same time DC to the loop for powering and managing FIM modules. One amplifier channel can be split into multiple LDB in parallel, creating multi-loop with individual surveillance for multi-zone paging applications.

The housing clicks on a DIN-rail that provides DC-power and accommodate for the RS485 data connection and General-Fault contact to a maximum of 32-LDB's on a single DIN-rail. Front buttons and indicators allow for quick access to the various functions and indications of the Loopdrive system.

Specifications / Loop Drive Booster (LDB)

LOOPDRIVE

Electrical

DC Power supply	18 – 36 VDC, nominal 24 VDC
DC Power consumption	
idle current (200 x FIM, full load)	100 mA continuous
max. power consumption	2.4 W
AMP input (100V audio)	
max. AC voltage	max cont. 100 VRMS, 300 VPP
max. AC current	max cont. 8 A
frequency range	40 Hz ~ 20 kHz (-3dB)
LOOP output	
AC	same as AMP output
DC voltage	30 V
DC current	max. cont. 130 mA
Wiring	2-wire: 0.8 - 2.5 mm^2 loop max. length 1 km
Grounding	Earth loop through third connection-pin
Loop relay contact rating	max. 250 VAC / 8 A (Dual-state type)
Maximum total loop load	800 W
Loudspeaker type	only with DC blocking capacitor
Maximum number of FIM connected, single loop	200
Short detection	Yes
Open detection	Yes
Ground leakage detection	Yes

Functional

Interfacing	
Status indicators	3 x LED indicator
User buttons	Reset button + Service button
General Fault contact	Pin-to ground (programmable)
Serial data communication	RS-485
Maximum supply current, single DIN rail	8 A
Bus address range	00 – FF (0 – 255)
Audio recovery time	
Loop short	< 4 s
Other faults	0 s (no audio interruption)

Mechanical

Housing	Bopla CombiNorm-Connect
Protection rating	IP 30
Dimensions (WxHxD)	17,5 x 114,5 x 99 mm
Mounting	Quick-snap on DIN-rail, inside rack housing

Compliant standards

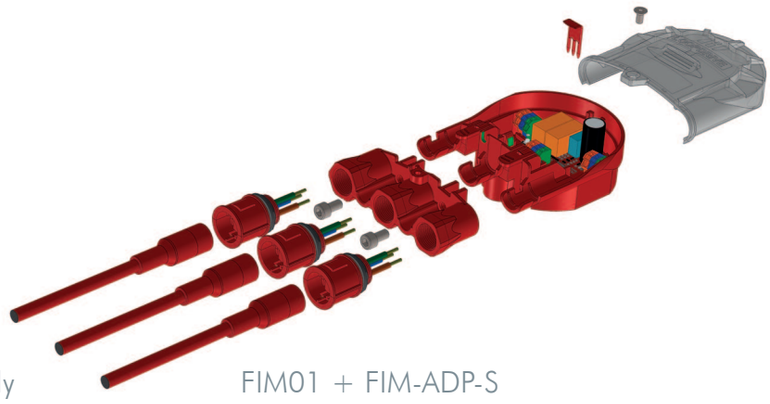
Voice evacuation	EN 54-16 NEN 2575 NPR 2576
Safety	EN 60065
EMC immunity	EN 50130-4

Ordering information

Part No.	LDB-03

Includes:

5-pole DIN-rail bus connector
5-pole screw connector for DIN-rail bus connector
2x 3-pole screw connector (Loop PRI and SEC)
1x 2-pole screw connector (Amplifier)



Loopdrive assembly FIM01 + FIM-ADP-S

3) Specifications / Fault Isolator Module (FIM)

Electrical

DC Power supply (powered via loop from LDB)	19 ~ 30 VDC, nominal 30 VDC
DC Power consumption	
idle current	100 µA continuous
max. power consumption	20 mW
LOOP connection	
DC	30 V, max. cont. 130 mA
AC Voltage	max cont. 100 VRMS, 300 VPP
AC Current	max cont. 8 A
AC Frequency range	40 Hz ~ 20 kHz (-3dB)
T-branch output	
DC	560 mV, max. 15 µA, cont. 1 µA
AC	same as LOOP
maximum AC load	50 W
Wiring	2-wire, max. 2.5 mm², loop max. length 1 km, outer cable diameter max. 13 mm
Grounding	optional earth loop through third connection pin
Loop relay contact rating	max. 250 VAC / 8 A (Dual-state type)
Maximum total loop load	800 W
Loudspeaker type	only with DC blocking capacitor
Maximum number of FIM's, single loop	200
Maximum number of loudspeakers	
between FIM's	Infinite within the maximum loop-load of 800W (National standard may limit the number of loudspeakers between FIM's)
T-branch	Infinite within the maximum T-branch load of 50W (National standard may limit the number of loudspeakers)
Short detection	Yes
Open detection (only T-branch with EOL monitoring)	Yes

Functional

Interfacing	
Status indicators	2 x two-colour LED (orange/blue), 1 x output to optional external fault LED
User buttons	Reset + EOL detection switch
Fault report	Open relays
Audio recovery time	
Loop short	< 4 s
Other faults	0 s (no audio interruption)

Mechanical

Housing	PP plastic with transparent cover
Protection rating	IP 21, IP 33
Dimensions (WxHxD)	
IP 21 housing	110 x 130 x 55 mm
IP 33 housing	110 x 180 x 55 mm
Mounting	Surface mounting, on-speaker mounting
Connections	
LOOP / T-branch	3-way 5 mm WAGO push-in terminal block (L+,L-,GND) 0.8 – 2.5 mm²
Ext. LED	2-way 3.5 mm screw terminal block

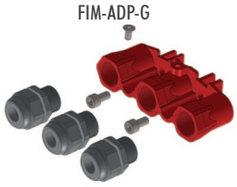
Compliant standards

Short-circuit isolators	EN 54-17 (0560-CPR-142190002)
Voice evacuation	NEN 2575 NPR 2576
Safety	EN 60065
EMC	EN 55103

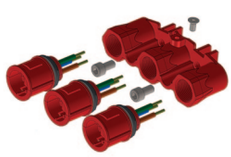
Ordering information

FIM-01

FIM-ADP-G



FIM-ADP-S



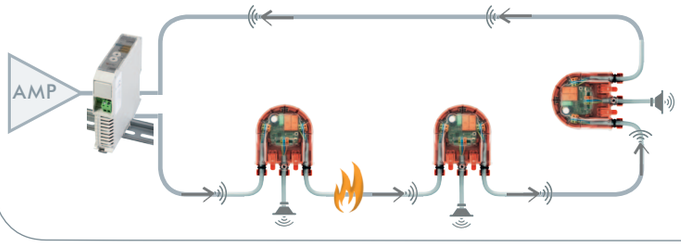
Part No.	**FIM-01**
Includes: 1x IP21 housing with transparent cover and PCB 1 x release tool 1 x compression gland for speaker mounting	
Part No.	**FIM-ADP-G**
IP33, Adapter with 3 x compression glands	
Part No.	**FIM-ADP-S**
IP33, Adapter with 3 x Plug & Play socket	

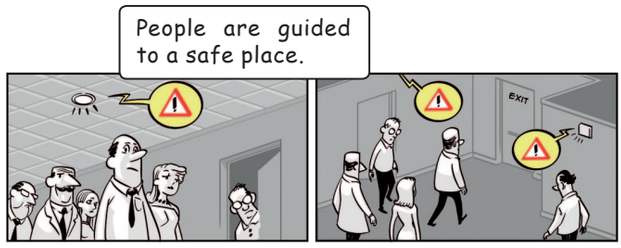
LOOPDRIVE

We Broadcast !

1 DETECT
Evacuation signal is broadcast in the zone.

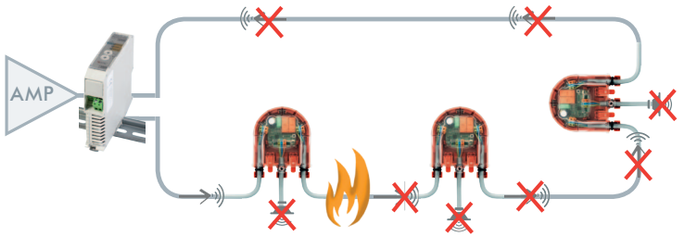
Loopdrive system is in quiescent mode. A maximum of 200 isolators are guarding over the audio-transmission path. All zones are broadcasting the evacuation signal.

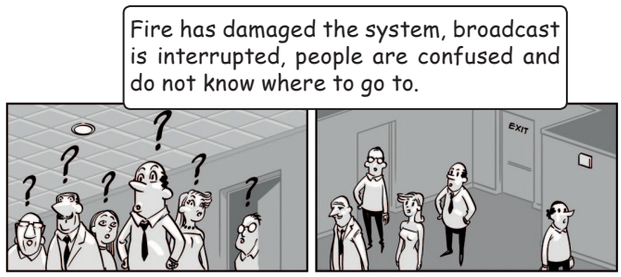




2 LOCATE
Broadcast is interrupted.

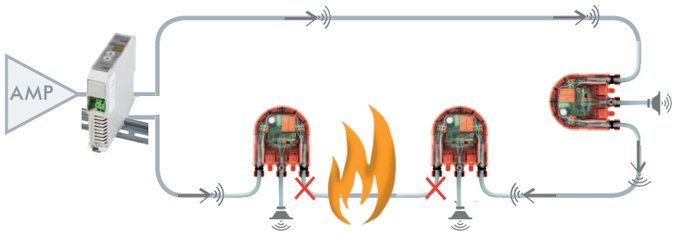
The audio-transmission path is affected by the hazard. Broadcast is interrupted, people are confused and do not know where to go to. All isolators take immediate action by isolating from the transmission path and start measuring to locate and isolate the hazard.

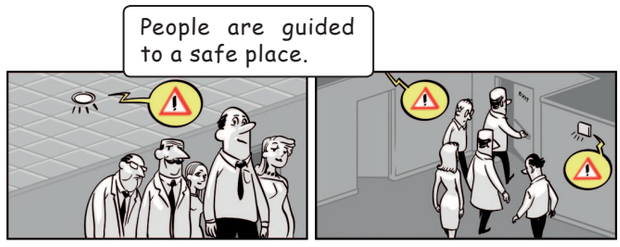




3 ISOLATE
Evacuation signal is broadcast in the zone.

In less than 4 seconds the hazard has been detected and isolated from the transmission path. Broadcast continues.





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