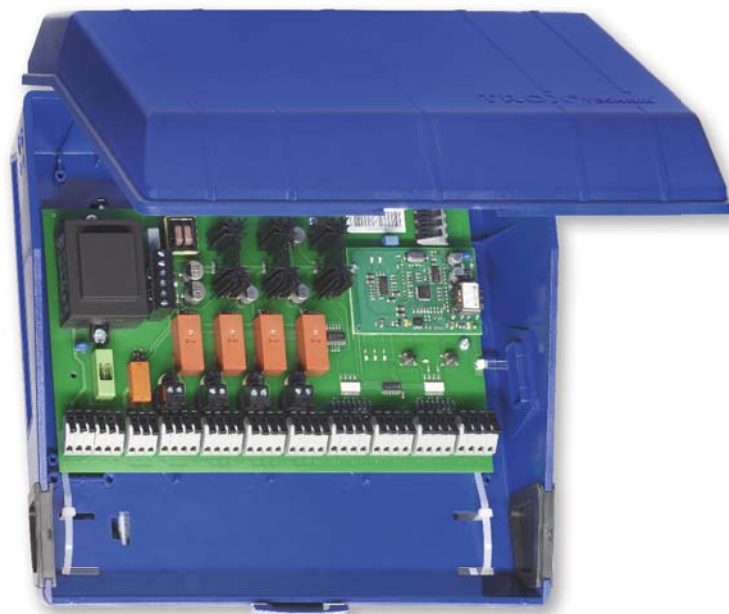


# TROXNETCOM LON

## Type Modules



### Communication interface for exchanging variables via LonWorks

Functional modules designed for the monitoring of motorised fire dampers

- Easy integration into higher level systems due to standard network variables (SNVT)
- Programming is based on LonMark functional profile 110.01, 'Fire and Smoke Damper Actuator'
- Direct communication between modules (decentralised intelligence)
- High transmission reliability and data integrity
- Network can easily be expanded (free topology)



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	Special information – LON-WA1/B2-AD	6.1 –
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### Description



TROXNETCOM LON  
type modules

### Application

- LON modules are used for the control of motorised fire dampers (24 V or 230 V) and for capturing the end positions.
- The modules are mounted either onto the dampers or anywhere else, as required.
- These modules can provide the central BMS with all fire damper signals for control purposes.

### Order code

#### LON module

<b>LON – WA1 / B2</b>
1

#### 1 Type

<b>LON-WA1/B2</b>	Module for controlling up to two actuators
<b>LON-WA1/B2-AD</b>	Connection box for connecting the second actuator
<b>LON-WA1/B2-AD230</b>	Connection box with integral 24 V power supply unit for connecting the second actuator
<b>LON-WA1/FT3</b>	Module for controlling up to four actuators
<b>LON-WA4/B</b>	Module for capturing up to four damper end positions

**Description**



LON-WA1/B2

**Application**

- LON-WA1/B2 is a functional module designed for the monitoring of fire dampers that are equipped with a plug-in 24 V actuator (e.g. Belimo); this simplifies installation
- The module is installed on a fire damper and connected to the 24 V actuator by a plug connection
- Two motorised fire dampers can be controlled with a LON-WA1/B2
- Easy integration into higher level systems due to standard network variables (SNVT)
- Based on LonMark functional profile 110.01, Fire and Smoke Damper Actuator
- The module is certified by LonMark

**Technical data**

<b>Supply voltage</b>	20 – 28 V AC/DC, 50/60 Hz; double terminals for looping through
<b>Power consumption</b>	3.12 VA or 1.32 W (without actuators)
<b>Inputs</b>	4 digital inputs for volt-free switches
<b>Outputs</b>	3 digital relay outputs; changeover relay for damper 1 (fire damper): max. switch rating at V AC: 120 VA (5 A resistive load); NO relay for damper 2 (second fire damper): max. switch rating at 24 V AC: 144 VA (6 A resistive load); NO relay for Fire Chain: max. switch rating AC: 1500 V A (250 V AC; 6 A resistive load)
<b>LON interface</b>	4 terminals, LON; FTT10 free topology
<b>IP protection level</b>	IP 54
<b>Operating temperature</b>	10 – 60 °C
<b>Relative humidity</b>	20 – 95 % (non-condensing)
<b>Connection terminals</b>	Actuator control: 3-pole AMP MATE-N_LOK socket
<b>Connection terminals</b>	Actuators for position indication: 6-pole AMP MATE-N_LOK socket
<b>Supply voltage for terminals</b>	Clamp terminals, 90°, for 0.08 – 2.5 mm <sup>2</sup>
<b>FireChainSignal</b>	Clamp terminals, 90°, for 0.08 – 1.5 mm <sup>2</sup>
<b>Software application</b>	xif/apb-files under <a href="http://www.trox.de">www.trox.de</a>
<b>Dimensions (B x H x T)</b>	≈ 90 x 160 x 54 mm
<b>Material</b>	Plastic

**Function****Functional description**

LON-WA1/B2 can be used to control two fire dampers. A second fire damper is connected with LON-WA1/B2-AD or LON-WA1/B2-AD230. If only one fire damper is connected, the 8-pole terminal block for the connection of the second fire damper must have a wire link between terminals 5 and 6 (end position OPEN). This is to prevent an alarm for the second, missing fire damper. Input variable ActuDrive is used to control the fire damper. Output variable ActuPosn is used to signal the current damper blade position.

The following applies:

- Normal = Fire damper is OPEN
- Fire = Fire damper is CLOSED

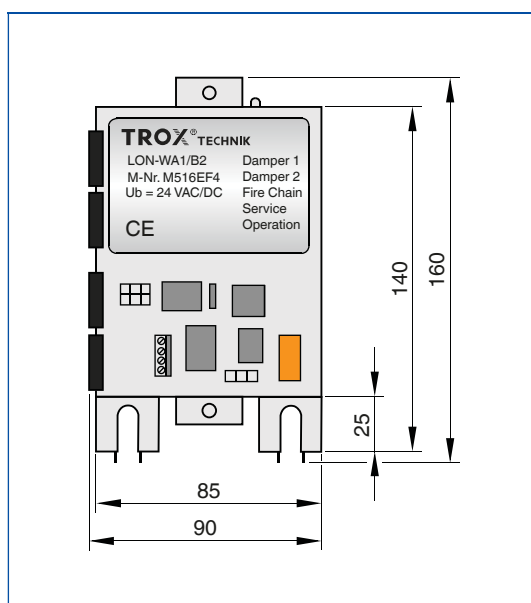
When LON-WA1/B2 is supplied with voltage, the connected dampers move into their respective normal position. Pressing the Test button moves the dampers to the Fire position, and after the OffTime + 10 s back into the Normal position.. In case of an error, VDMA sheet 24200-1 (Automated fire protection and smoke extract systems) applies:

Safe positions

- Fire damper = CLOSED

If LON-WA1/B2 is used, the heartbeat function should be activated (for safety reasons). Setting parameter MaxRcvTime for variable ActuDrive, and parameter MaxSendTime for variable ActuPosn, ensures that all LON-WA1/B2 modules regularly send and receive information. This ensures that the transmission path is being monitored. In case of an error, the damper moves to a safe position, and an alarm is emitted. Input variable FT\_Test can be used to initiate a functional test of the damper. The dampers are then moved to the 'Fire Position'. The output variable FT\_Test indicates whether a test is being carried out.

The module remains in the text condition for the entire TestHoldTime. The damper remains in the 'Fire Position' until a new command is issued using ActuDrive. If ActuDrive switches to 'Fire' during a test, the test is automatically aborted. If there is a chain of modules (and hence fire dampers), the FireChain variables can transmit a signal from the first to the last but will not release a damper. The FireChain relay in the LON-WA1/B2 module receives a signal and can be used for consolidated alarms or to switch off systems. The Pulse variables are used to check a LON network. If the input variable is set, the LON-WA1/B2 module will change the output variable after 1 second. If there is a chain of modules, a trigger pulse is generated which can be read out at the end of the chain after  $N \times 1$  seconds ( $N$  = number of LON-WA1/B2 modules).

**6****Dimensions****LON module LON-WA1/B2**

**Specification text**

**Standard description (characteristics)**

LON module for the control of up to two motorised fire dampers (24 V) The actuators for the dampers are connected with AMP Mate-N-LOK plugs. Can be attached to the fire damper with a mounting bracket. For controlling the dampers and capturing end positions OPEN and CLOSED. Transmission of all signals to higher level systems and control of motorised fire dampers via LON field bus and using standard network variables; transmission of system status; watchdog and heartbeat functions: compliance with LonMark specification 110.01, 'Fire and Smoke Damper Actuator', LonMark certificate.

The second motorised fire damper should be connected using LON-WA1/B2-AD or LON-WA1/B2-AD230 (accessories).

The following parameters can be defined:

- Maximum interval for sending data
- Minimum interval for receiving data
- Maximum interval for sending status
- Zone number
- Designation of the damper
- Installation date and time
- Date and time of the last inspection; maximum time required to CLOSE the damper
- Maximum time required to OPEN the damper – maximum time for test run

Connections

- 4 digital inputs including 2 with AMP Mate-N-LOK socket
- 3 digital relay outputs including 1 changeover contact via AMP Mate-N-LOK socket
- 8-pole terminal strip for the connection to LON-WA1/B2-AD or LON-WA1/B2-AD230
- 3-pole AMP-Mate-N-LOK socket
- 6-pole AMP-Mate-N-LOK socket
- 24 V AC/DC supply voltage
- Connection to LON bus via FTT10A transceiver
- IP protection level IP 54

**Description**



LON-WA1/B2-AD

**Application**

- Connection box LON-WA1/B2-AD is used to connect a second fire damper, that is fitted with a 24 V plug-in actuator, to the LON-WA1/B2 module
- The connection box is connected to the LON-WA1/B2 module with a 6-pole cable
- The terminals have numbers to facilitate wiring.

**Technical data**

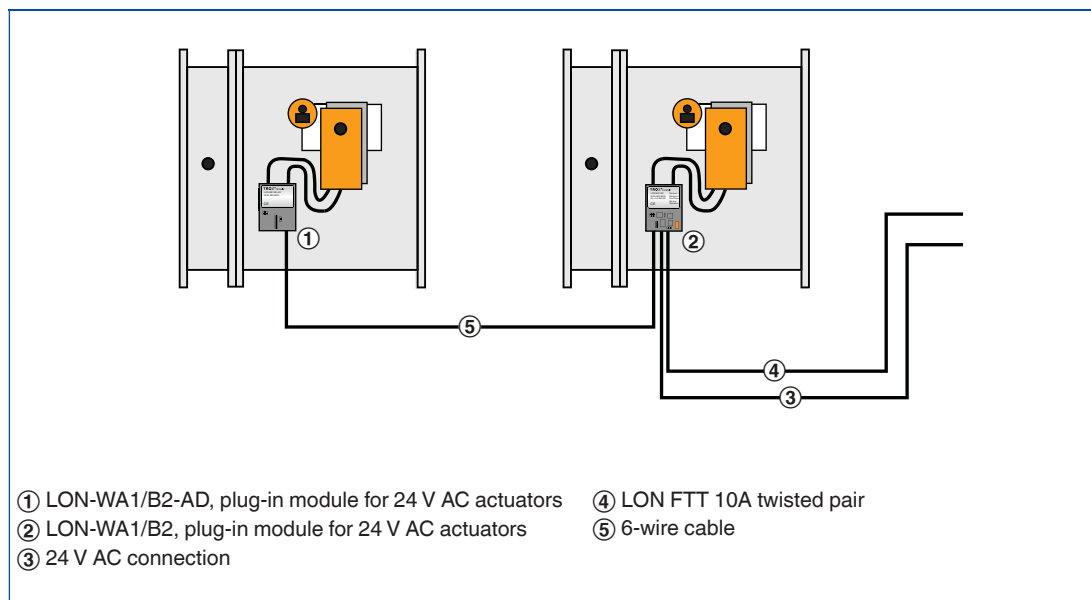
<b>Connection terminals</b>	Actuator control: 3-pole AMP MATE-N_LOK socket
<b>Connection terminals</b>	Actuators for position indication: 6-pole AMP MATE-N_LOK socket
<b>Connection LON-WA1/B2</b>	Clamp terminals, 90°, for 0.08 – 2.5 mm <sup>2</sup>
<b>Dimensions (B x H x T)</b>	≈ 90 x 160 x 54 mm
<b>Material</b>	Plastic

**Function**

**Functional description**

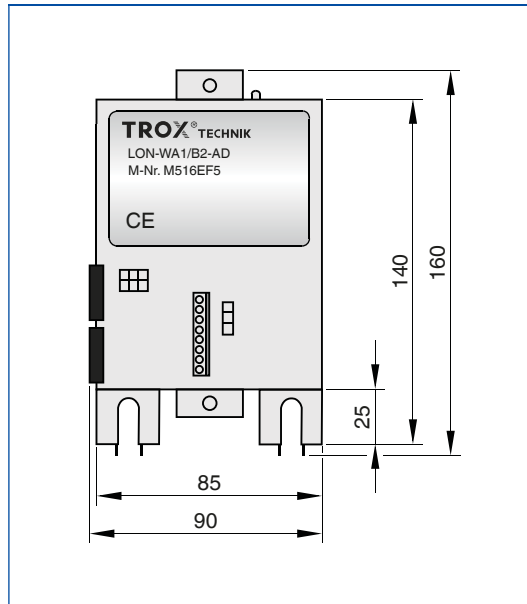
Connection box LON-WA1/B2-AD is used to connect a second fire damper, that is fitted with a 24 V plug-in actuator, to the LON-WA1/B2 module. A 6-pole cable is used to transmit information on the end positions between the components and to transmit the control input signal for the actuator. The second fire damper does not require a separate power supply. The LON-WA1/B2 software allows for each damper to be integrated independently with the LON network.

**Control input signal LON-WA1/B2**



Dimensions

Module LON-WA1/B2-AD



Specification text

**Standard description (characteristics)**

Connection box for the connection of a second motorised fire damper (24 V) to the LON-WA1/B2 module. The damper actuator is connected with an AMP Mate-N-LOK plug. Can be attached to the fire damper with a mounting bracket. A 6-pole cable (by others) is required to connect LON-WA1/B2-AD with LON-WA1/B2. The 24 V supply voltage for the actuator is provided by the LON-WA1/B2.

Connections:

- 8-pole terminal strip for the connection to LON-WA1/B2
- 3-pole AMP-Mate-N-LOK socket
  - 6-pole AMP-Mate-N-LOK socket
- IP protection level IP 54

## Description



LON-WA1/B2-AD230

## Application

- Connection box LON-WA1/B2-AD230, with an integral power supply unit, is used to connect a second fire damper, that is fitted with a 24 V plug-in actuator, to the LON-WA1/B2 module; the connection box is supplied with 230 V 50/60 Hz voltage from the mains.
- The connection box is connected to the LON-WA1/B2 module with an 8-pole cable.
- The terminals have numbers to facilitate wiring.

## Technical data

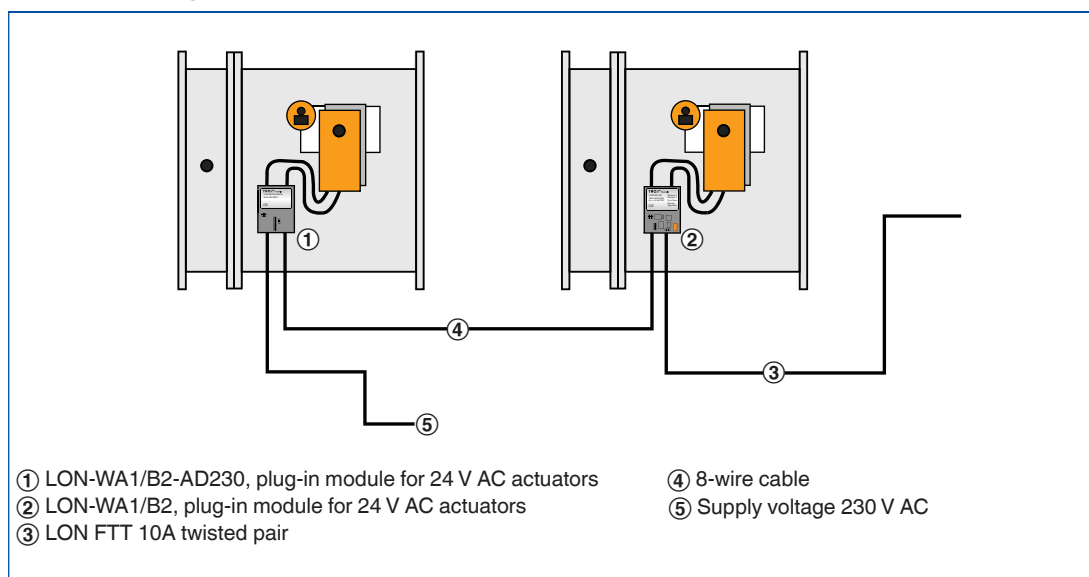
Input voltage	200 – 240 V AC, 50/60 Hz; double terminals for looping through
Output voltage	24 V AC
Output current	750 mA
IP protection level	IP 54
Operating temperature	–10 to 60 °C
Connection terminals	Actuator control: 3-pole AMP MATE-N_LOK socket; actuators for position indication: 6-pole AMP MATE-N_LOK socket
Connection LON-WA1/B2	Clamp terminals, 90°, for 0.08 – 2.5 mm <sup>2</sup>
Dimensions (B × H × T)	≈ 90 × 160 × 54 mm
Material	Plastic

## Function

## Functional description

Connection box LON-WA1/B2-AD230 is used to connect a second fire damper, that is fitted with a 24 V plug-in actuator, to the LON-WA1/B2 module. Connection box LON-WA1/B2-AD230 is supplied with 230 V 50/60 Hz voltage from the mains. The integral power supply unit provides the 24 V supply voltage for the actuators and for the LON-WA1/B2 module. An 8-pole cable is used to transmit information on the end positions between the components, to transmit the control input signal for the actuator, and to provide 24 V. The LON-WA1/B2 software allows for each damper to be integrated independently with the LON network.

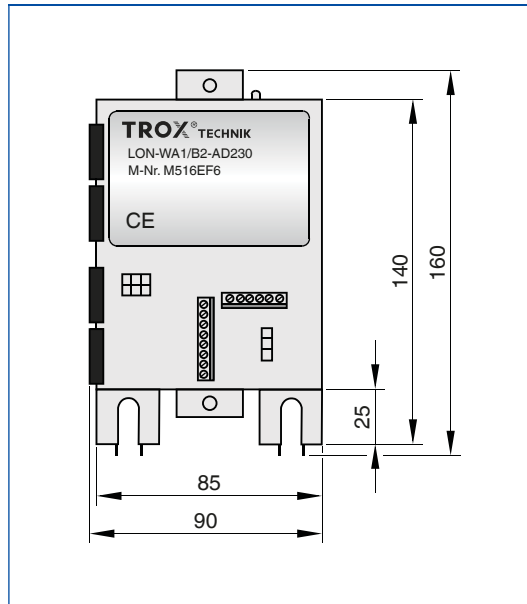
## Control input signal LON-WA1/B2-AD230





Dimensions

Module LON-WA1/B2-AD230



Specification text

**Standard description (characteristics)**

Connection box with integral 230 V/24 V AC/DC power supply unit for connecting a second motorised fire damper (24 V) to the LON-WA1/B2; the 24 V voltage for the actuators and the LON-WA1/B2 is provided by the integral power supply unit. The damper actuator is connected with an AMP Mate-N-LOK plug. Can be attached to the fire damper with a mounting bracket. An 8-pole cable (by others) is required to connect LON-WA1/B2-AD230 with LON-WA1/B2.

Connections:

- 8-pole terminal strip for the connection to LON-WA1/B2
- 3-pole AMP-Mate-N-LOK socket
- 6-pole AMP-Mate-N-LOK socket
- 6-pole plug connector for the mains (230 V)
- Supply voltage 230 V AC
- IP protection level IP 54

**Description**



LON-WA1/FT3

**Application**

- LON-WA1/FT3 is a functional module that has been specially developed for the monitoring of motorised fire dampers
  - Up to four motorised fire dampers can be controlled with a LON-WA1/FT3
  - Supply voltage: 230 V AC, 24 V AC/DC
  - The connections for the damper actuators are either designed for the respective supply voltage of volt-free
  - LON interface with FT5000 transceiver
- A separate LON standard bus is used as a communication line
  - Standard network variables (SNTV) have been used for all functions such that LON-WA1/FT3 can be integrated flexibly and easily with higher level systems
  - Based on the LonMark specification 'Fire and Smoke Damper Actuator'
  - LonMark functional profile 110.01, 'Fire and Smoke Damper Actuator', has been used

**Technical data**

<b>Supply voltage</b>	230 V AC $\pm 10\%$ , 50/60 Hz, 24 V AC or 24 V DC $\pm 10\%$ as an option; double terminals for looping through
<b>Power consumption</b>	Approx. 12 VA without actuators (4.8 VA or W)
<b>Inputs</b>	8 digital inputs for volt-free switches
<b>Outputs</b>	5 digital outputs, each with changeover relay
<b>LON interface</b>	4-pole spring-loaded terminals for 0.08 – 2.5 mm <sup>2</sup> ; FT5000 free topology
<b>IP protection level</b>	IP 20
<b>Operating temperature</b>	10 – 60 °C
<b>Relative humidity</b>	20 – 95 % (non-condensing)
<b>Connection terminals</b>	Actuator control: 4-pole spring-loaded terminals for 0.08 – 2.5 mm <sup>2</sup> ; actuators for position indication: 4-pole spring-loaded terminals for 0.08 – 2.5 mm <sup>2</sup>
<b>Supply voltage for terminals</b>	2 x 3-pole for 0.08 – 2.5 mm <sup>2</sup>
<b>FireChainSignal</b>	3-pole spring-loaded terminals for 0.08 – 2.5 mm <sup>2</sup>
<b>Software application</b>	xif/apb-files under www.trox.de
<b>Dimensions (B x H x T)</b>	285 x 270 x 150 mm
<b>Material</b>	ABS plastic, blue (RAL 5002)

Function

Functional description

LON-WA1/FT3 can be used to control up to four fire dampers. If less than four dampers are connected, the 4-pole terminal blocks must have a wire link between the respective 'OPEN position' terminals (E1, E3, E5, E7). This is to prevent an alarm for non-existing dampers. Input variable ActuDrive is used to control the fire damper. Output variable ActuPosn is used to signal the current damper blade position.

The following applies:

- Normal = Fire damper is OPEN
- Fire = Fire damper is CLOSED

When LON-WA1/FT3 is supplied with voltage, the connected dampers move into their respective normal position. In case of an error, VDMA sheet 24200-1 (Automated fire protection and smoke extract systems) applies:

Safe positions

- Fire damper = CLOSED

If LON-WA1/FT3 is used, the heartbeat function should be activated (for safety reasons). Setting parameter MaxRcvTime for variable ActuDrive, and parameter MaxSendTime for variable ActuPosn, ensures that all LON-WA1/FT3 modules regularly send and receive information. This ensures that the transmission path is being monitored. In case of an error, the damper moves to a safe position, and an alarm is emitted. Input variable FT\_Test or the test push button of the modul can be used to initiate a functional test of the damper.

This moves the dampers to the 'Fire Position' and back to the 'Normal' position (OPEN).

The output variable FT\_Test indicates whether a test is being carried out.

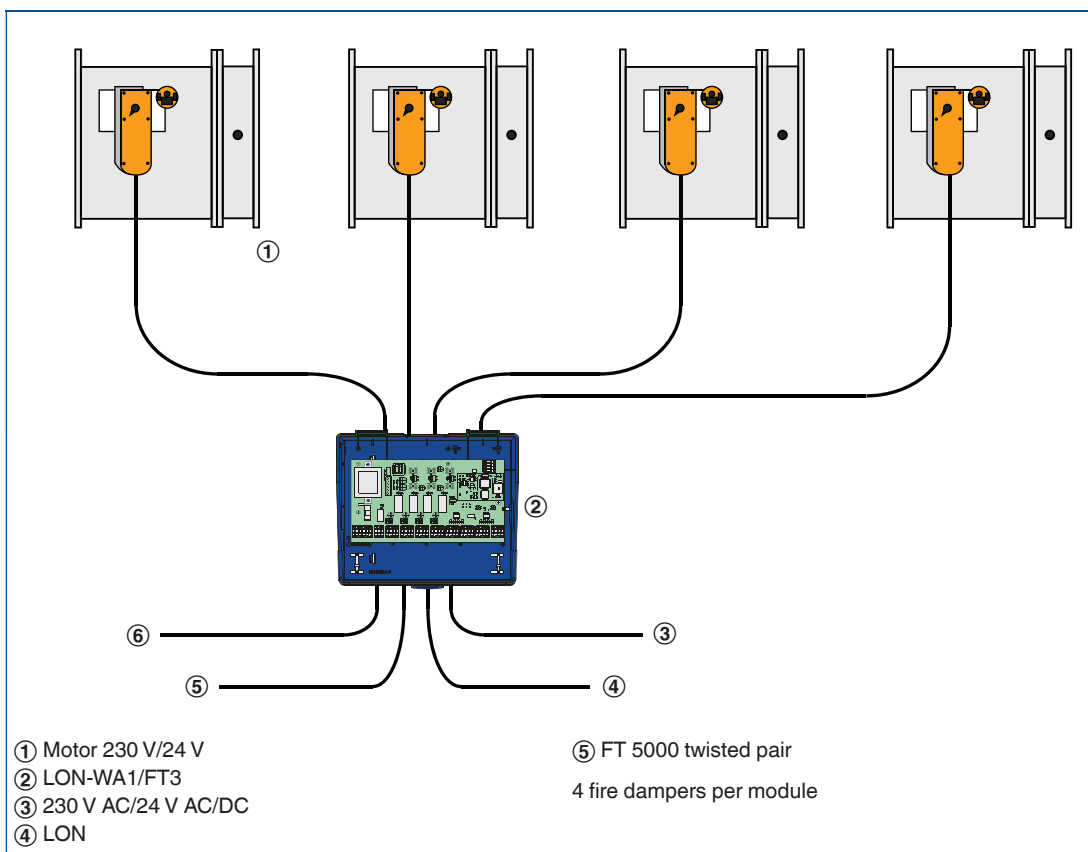
The module remains in the text condition for the entire TestHoldTime.

If ActuDrive switches to 'Fire' during a test, the test is automatically aborted.

If there is a chain of modules (and hence fire dampers), the FireChain variables can transmit a signal from the first to the last but will not release a damper. The FireChain relay in the LON-WA1/FT3 module receives a signal and can be used for consolidated alarms or to switch off systems.

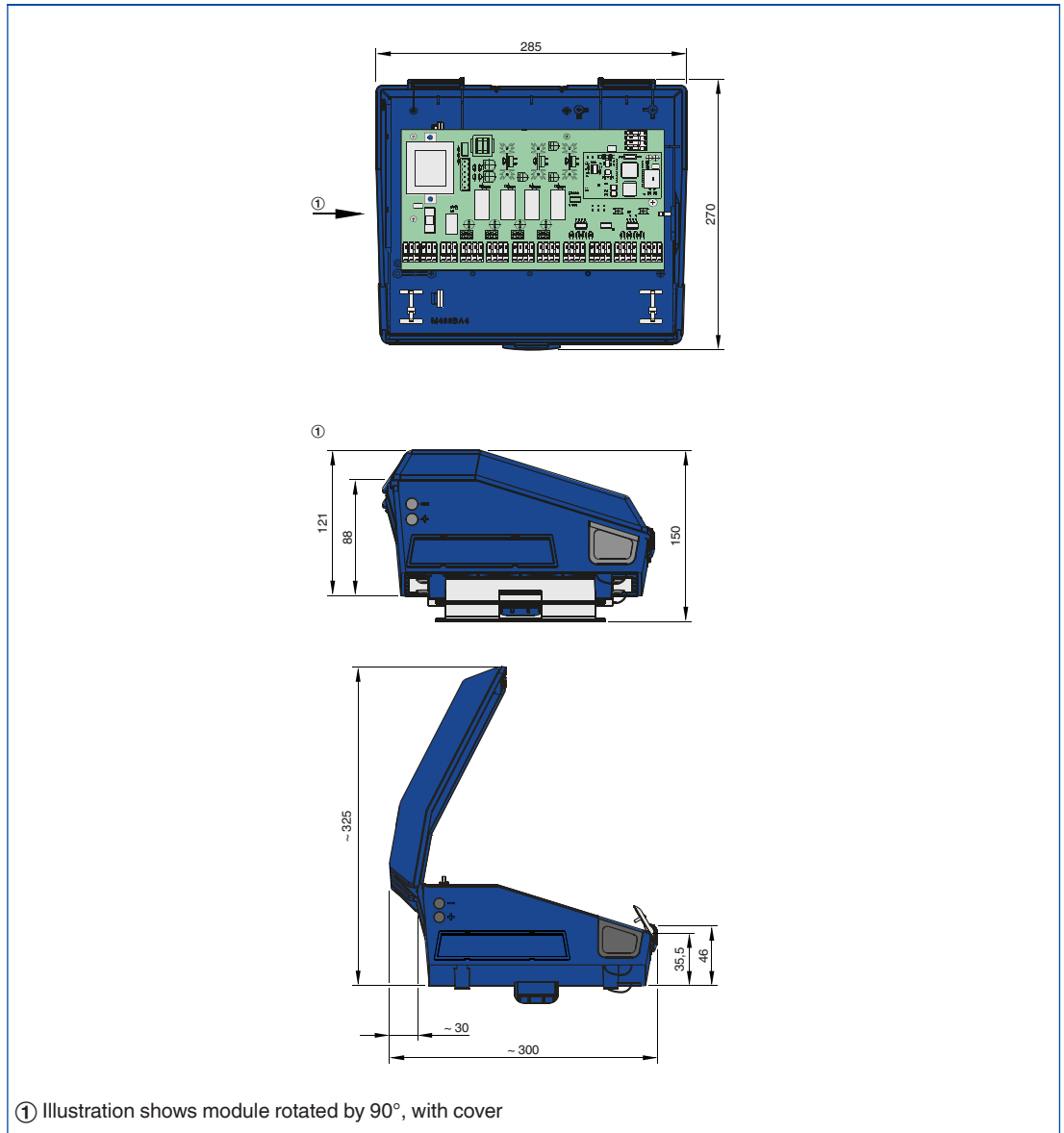
The Pulse variables are used to check a LON network. If the input variable is set, the LON-WA1/FT3 module will change the output variable after 1 second. If there is a chain of modules, a trigger pulse is generated which can be read out at the end of the chain after  $N \times 1$  seconds (N = number of LON-WA1/FT3 modules).

Control input signal LON-WA1/FT3



Dimensions

Module LON-WA1/FT3



**Specification text**

**Standard description (characteristics)**

LON module for the control of up to four motorised fire dampers (230 V or 24 V AC/DC).

For controlling the dampers and capturing end positions OPEN and CLOSED. Transmission of all signals to higher level systems and control of motorised fire dampers via LON field bus FT5000 and using standard network variables; transmission of system status; watchdog and heartbeat functions: compliance with LonMark specification 110.01, 'Fire and Smoke Damper Actuator', LonMark certificate.

The following parameters can be defined:

- Maximum interval for sending data
- Minimum interval for receiving data
- Maximum interval for sending status
- Zone number
- Designation of the damper
- Installation date and time
- Date and time of the last inspection;  
maximum time required to CLOSE the damper
- Maximum time required to OPEN the damper –  
maximum time for test run

Connections

- 8 digital inputs
- 5 digital relay outputs, changeover contact  
250 V/5 A
- Supply voltage 24 V AC/DC or 230 V AC
- Outputs either with supply voltage or volt-free
- Connection to LON bus via FT5000 transceiver

**Description**



LON-WA4/B

**Application**

- IO module with 4 digital inputs, used to capture the status of volt-free switches
- Due to additional link options and alarm signalling particularly suitable for monitoring fire dampers with electric limit switches

**Technical data**

<b>Supply voltage</b>	20 – 28 V AC/DC ± 10 %, 50/60 Hz
<b>Power consumption</b>	Approx. 45 mA/24 V DC
<b>Inputs</b>	4 digital inputs for volt-free switches or voltage inputs; input voltage depends on jumper setting (J), either A1 (24 V AC/DC) or A2 (GND)
<b>Outputs</b>	LON interface, standard network variables (SNVT)
<b>LON interface</b>	FT5000 free topology
<b>Neuron</b>	3120, 3 K EEPROM download-enabled
<b>IP protection level</b>	IP 65
<b>Operating temperature</b>	-5 to 55 °C
<b>Connection terminals</b>	Spring-loaded terminals for nominal diameter; 1.5 mm <sup>2</sup> , one wire; 1.0 mm <sup>2</sup> ultra-fine wire; AWG 16
<b>Cable glands</b>	8 × M12 or M16 cable glands
<b>Software application</b>	xif/apb-files under www.trox.de
<b>Dimensions (B × H × T)</b>	159 × 120 × 41.5 mm
<b>Material</b>	ASA (LURAN S KR 2867 C WU)

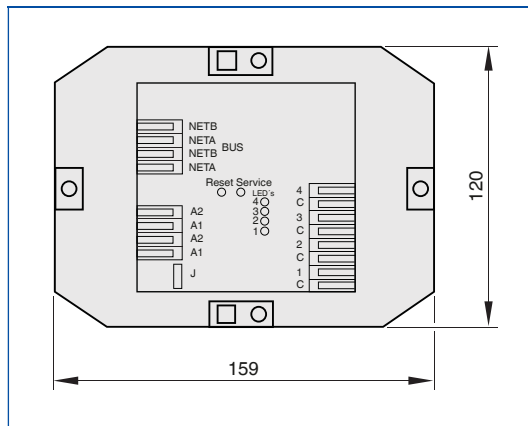
**Function**

**Functional description**

LON-WA4/B is used to control up to four fire dampers with one limit switch or two fire dampers with two limit switches each. The output variables of type SNVT\_switch and SNVT\_hvac\_emerg signal the current damper blade position. They are sent after the input condition has changed, at the end of the heartbeat time (nciDiHeartbeat), and after a module reset (1s + node number [ms]). If LON-WA4/B is used, the heartbeat function should be activated (for safety reasons). If input variable nviDoHeartbeat has been set (100.1 1), then the output variables nvoDiValue[0...3] and nvoDiAllValues are updated and sent in intervals set with configuration parameter nciDiHeartbeat. This ensures that the transmission path is being monitored. If there is a chain of modules (and hence fire dampers), the FireChain variables can transmit a signal from the first to the last. Variable nciInvertDiValue is used as a configuration parameter to invert the output values. The debounce time for digital inputs can be configured with the nciDiDebounce variable.

Dimensions

LON-WA4/B



Specification text

**Standard description (characteristics)**

LON module with 4 digital inputs, used to capture the status of volt-free switches, provides additional link options and alarm signalling for monitoring fire dampers with electric limit switches.

- Input: 4 digital inputs, maximum load 5 mA/10 V or volt-free
- Output: SNVT\_switch and SNVT\_hvac\_emerg; transceiver: FT5000
- IP protection level: IP 65
- Supply voltage: 20 – 28 V AC/DC

# TROXNETCOM

## Basic information and nomenclature



- Communication systems for fire protection systems
- Colour codes according to IEC 60757
- AS-Interface
- LON



### Description

Information and communication are becoming more and more important in today's world. People not only want more information, they also want more detailed information. This development is also visible in building automation, and there is no end in sight. A building becomes 'transparent' through distributed intelligence and new decentralised communication systems.

These new technologies allow us to develop bespoke system solutions for various building services and to integrate them with building management systems. In this way, the best solutions for the different building services can be combined to create the best possible overall solution. Decentralised communication systems offer you the most advanced technology for your application requirements.

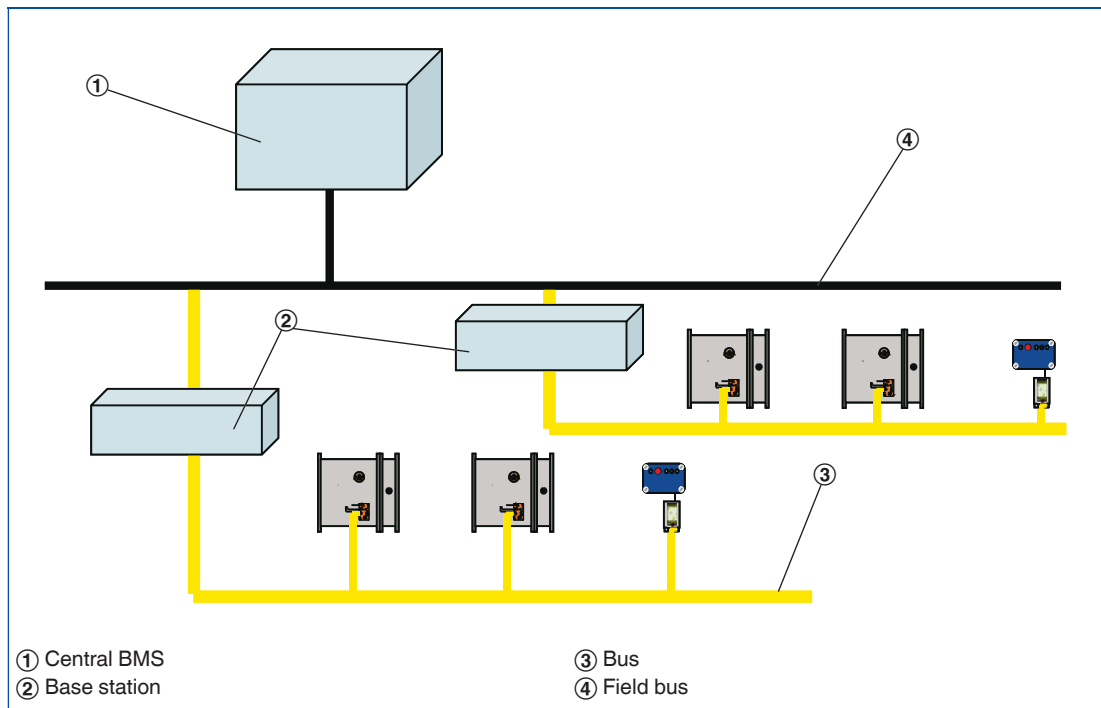
### Communication systems for fire protection systems

The functional safety of programmable electronic systems is becoming more and more important in fire protection and is implemented with regard to protection goals and risks. According to IEC 61508, the requirements for these systems are based on a risk analysis. Components are given an SIL rating (safety integrity level) and must meet the corresponding requirements to ensure safety even in case of a malfunction.

### General advantages of decentralised bus systems

It is no longer necessary to wire every single actuator and every single controller. Modern bus systems only need one bus cable, and in some cases a supply cable, to connect all components. This saves not only installation time but also cables, connectors, terminal blocks, and control cabinet space. It also drastically reduces the fire load and the installation costs. All signals from all components on a bus can be retrieved and recorded by the central unit. Inspection is simplified, and measurement and control can be optimised.

### Communications system



### Wiring

#### Colour codes according to IEC 60757

Code	Colour
BK	black
BN	brown
RD	red
OG	orange
YE	yellow
GN	green
BU	blue

#### Colour codes according to IEC 60757

Code	Colour
VT	violet
GY	grey
WH	white
PK	pink
TQ	turquoise
GNYE	green-yellow

### Description

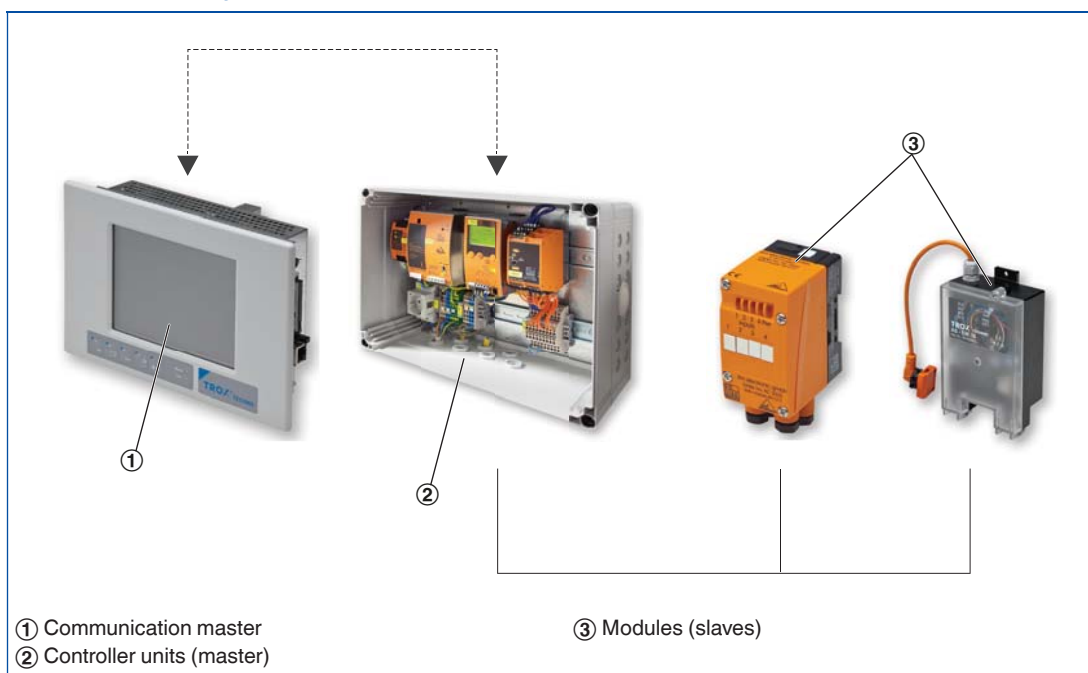
The AS interface is a world-standard bus system according to EN 50295 and IEC 62026-2. It enables the integration of different components (modules) in a network regardless of the manufacturer and the design. The modules control actuators and/or receive signals from sensors. TROX provides a system for controlling fire dampers, smoke protection dampers and smoke control dampers based on the AS-i standard. TROX modules are characterised by a wide spectrum of functions yet simple cabling.

### Special characteristics

- Data exchange and power supply with just one cable
- Central control of actuators and monitoring of damper blade positions and duct smoke detectors
- Simple commissioning using standardised software
- Automatic function test including data logging

### The system

#### Communications system



The communication master is the central display and control panel for the entire system.

- Connection of up to 28 controller and power units
- Display of operating status
- Operation of actuators
- Menu-driven operation in case of errors or malfunctions
- System configuration at the time of commissioning
- Logging of function tests and error messages

The controller and power unit combines the control functions, the power supply, and the data exchange for all components on the bus.

- The controller and power unit is installed near the modules, e.g. as a floor distributor
- With TNC Basic User Software for fire and smoke protection
- Communication interface to higher level systems (BACnet/Modbus)
- Display, also for operation
- Units with: 1 master – for 31 modules, 2 masters – for 62 modules

The modules establish the link between the measurement and control signals (sensors and actuators) and the network on the so-called field level. A module provides the supply voltage for the operation of actuators.

- Modules can be part of a fire damper or used separately to connect one or more fire dampers
- Integrated monitoring function, e.g. for running time
- Connection to the bus cable is with a flat cable insulation displacement connector

### Description

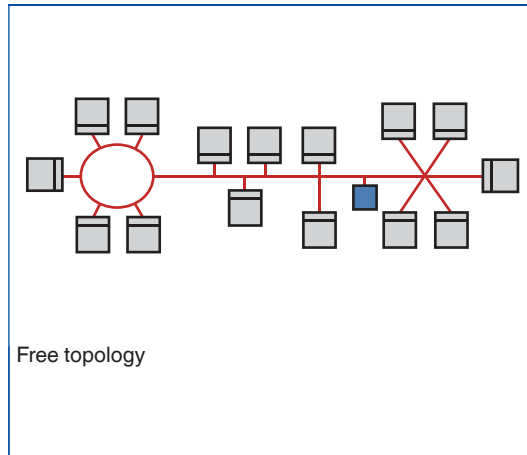
LON indicates a standard local operating network system with manufacturer-independent communications. Data is transferred by a microprocessor supplied by Echelon Corporation using a unified protocol. LonMark defines standards to ensure product compatibility. TROX offers components that meet LON standards. TROX modules are characterised by a wide spectrum of functions yet simple cabling.

### Special characteristics

- Data exchange and power supply can be achieved with just one cable
- Decentralised structure with high operational reliability
- Standardised data transfer
- Manufacturer-independent compatibility

### The system

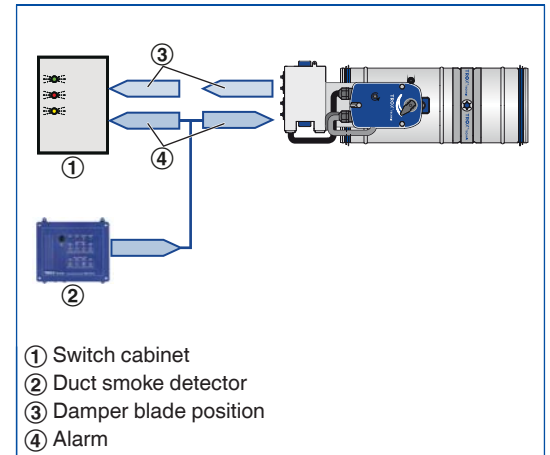
#### Network topology



#### Network

The local operating level (subnet) consists of the modules (nodes) and free topology data cables. A subnet can consist of up to 64 nodes or, alternatively, can be extended to 128 nodes using a repeater or router. Physical data transfer is via systems with or without a transfer of supply voltage. All nodes of a subnet must comply with the system. In larger networks the routers link the subnets with each other. The routers communicate with each other via the backbone, on a separate network level. Central monitoring of a LON network is possible and is connected to the backbone or above it.

#### Binding network variables



#### Data exchange

Network variables are used for the communication between the nodes. These variables ensure unambiguous data exchange between the nodes. For commissioning, it is necessary to link the network variables between the nodes (binding). Project software is used to link the outputs of a node to the inputs of other nodes. Binding information is transferred to the subnet. Binding is carried out by a system integrator.