

The system

TroxNetCom Easy is a straightforward, intelligent, cost-effective signalling and monitoring system for sampling limit switches (normally closed), e.g. limit switches for detecting the position of fire dampers, door or window contacts, etc...

The system comprises a central control unit of type TNC-Easy-Z, for the indication of a maximum of 16 end positions, the bus modules of type TNC-Easy-BM for interfacing a potential-free limit switch and, optionally, the expansion module of type TNC-Easy-S for expanding the central control unit by a further 16 end position indications.

The TNC-Easy-BM bus modules are connected in series using a two-core bus cable (e.g. IY(St)Y 2x2x0.8).

The maximum cable length is 2000 m.

A maximum of 32 bus modules, that means 32 limit switches, can be connected to a bus cable. The bus modules do not require a separate power supply.

A short-circuit or incorrect wiring does not result in the failure of the bus system.

The cycle time for sampling all bus users on a fully equipped system is 70 ms.

The TNC-Easy-Z central control unit manages the bus and cyclically samples the individual bus users. The signals from the users are decoded in the central control unit and indicated using LEDs. Using a group alarm relay and a relay for signalling system malfunctions, signals can be passed to superordinate systems.

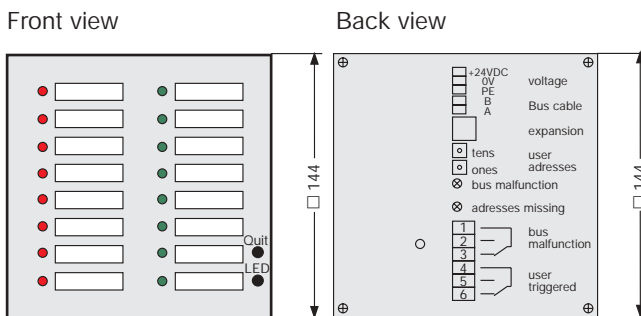
An alarm is signalled by means of an acoustic signal and the corresponding LED flashing. The alarm can be reset with the aid of the acknowledge button.

It is not necessary to assign addresses to the bus modules.

The sequence of the bus modules defined the allocation of the LEDs in the central control unit.

Components

Type TNC-Easy-Z central control unit



The TNC-Easy-Z central control unit manages the bus users, decodes the data protocols, and displays the information on the limit switches using LEDs.

The TNC-Easy-Z can be expanded by a further 16 LEDs using the TNC-Easy-S indication expansion module.

The power supply for the unit is 24 Vdc.

The number of bus users can be set using rotary switches.

Malfunctions, e.g. missing bus users, or a short-circuit are indicated on the rear of the unit using LEDs and can be signalled to superordinate systems using a relay.

A group alarm relay indicates whether a bus user has left its end position.

On the front of the TNC-Easy-Z there is a button for acknowledging an alarm and a button for the LED test.

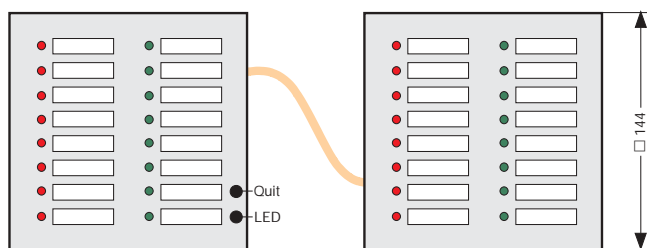
Technical data:

Supply voltage:	24 – 28 Vdc via clamping terminals
Max. current consumption (fully equipped system):	580 mA (max.)
Bus cable length:	2000 m (max.) via clamping terminals
Cable cross-section, bus cable:	2 x 0.8 mm ²
Cycle time for 32 bus users:	70 ms
Type of protection:	IP 20
Outputs:	Group alarm relay 1 x C/O; 230V/8A (group alarm = relay de-energised) Bus malfunction relay 1 x C/O; 230V/8A (bus malfunction = relay de-energised)
Settings:	Number of bus users via BSD rotary switch units/tens
Indication for bus modules:	16 two-colour LEDs
Indication in case of bus malfunction:	LED red
Indication of missing user:	LED yellow
Operation:	LED test button, Acknowledge button
Dimensions:	Switch panel built-in housing in accordance with DIN 43700 Dimensions (W x H x D) [mm]: 144 x 144 x 166.5

Type TNC-Easy-S expansion module

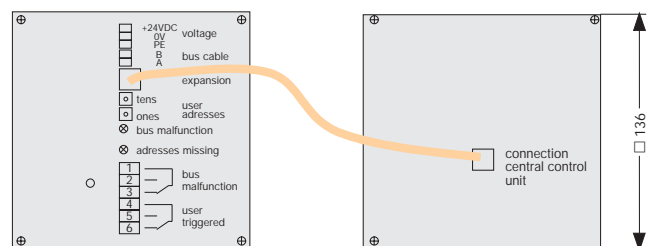
Front view

TNC-Easy-Z (Central control unit) TNC-Easy-S (Expansion)



The TNC-Easy-S expansion module is used to expand the TNC-Easy-Z central control unit by a further 16 LED indicators. The unit is connected to the central control panel using a pre-assembled cable with connectors.

Back view



Technical data:

Connection to the central control unit:

8-pole cable with connectors

Indication for bus modules:

16 two-colour LEDs

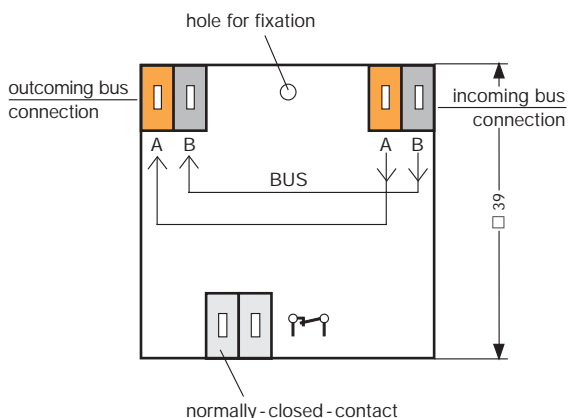
Type of protection:

IP 20

Dimensions:

Switch panel built-in housing in accordance with DIN 43700
Dimensions (W x H x D) [mm]:
144 x 144 x 166.5

Typ TNC-Easy-BM bus module



The TNC-Easy-BM bus module is used for sampling a limit switch contact (normally closed) and interfacing to the TNC-Easy bus system.

Technical data:

Connection to the bus cable:

Two 2-pole terminals 0.8 mm² bus input / bus output

Connection to the limit switch:

2-pole terminal max. 1.5 mm²

Max cable length between bus module and limit switch:

1 m

Max. contact resistance of the limit switch:

Less than 100 Ohm (gold contacts)

Type of protection:

IP 42

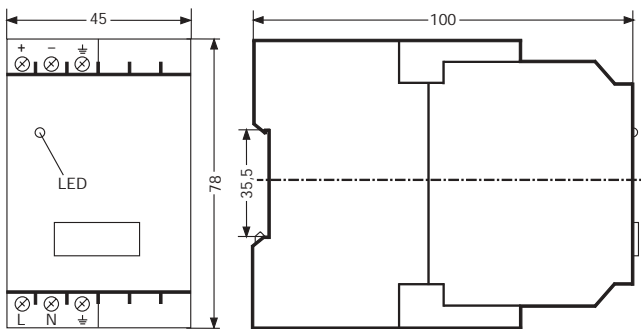
Mounting:

Can be bolted

Dimensions:

Dimensions (W x H x D) [mm]: 39 x 39 x 17

Typ TNC-D2010 switched mode power supply



The TNC-D2010 switched mode power supply is used to provide the 24 Vdc power supply to the TNC-Easy-Z central control unit.

Technical data:

Output current:	1 A
Nominal voltage, primary:	115 / 230 Vac
Input voltage range:	90...260 Vac
Nominal frequency:	47...440 Hz
Efficiency:	84 %
Type of protection:	Housing IP50, terminals IP20
Connection:	Terminals...2.5 mm ²
Temperature range:	0..+55 °C
Output voltage:	24 VDC ±3%
Residual ripple:	≤ 1.25
Mains power failure bridging time:	10 ms
Switch on current peak:	6.5 A
Short-circuit protection:	yes
Overload protected:	yes
No-load protected:	yes
EMC: Radiation of interference	EN 50081-2 / EN50082-2
EMC: Noise immunity	EN 55011, class A
Protection class (IEC 536):	1
Safety extra low voltage:	SELV
Mounting:	DIN mounting rail
LED indicators:	Green for output voltage

Function / commissioning

Installation and connection of the bus modules

Fasten the bus module to the limit switch or close to it.

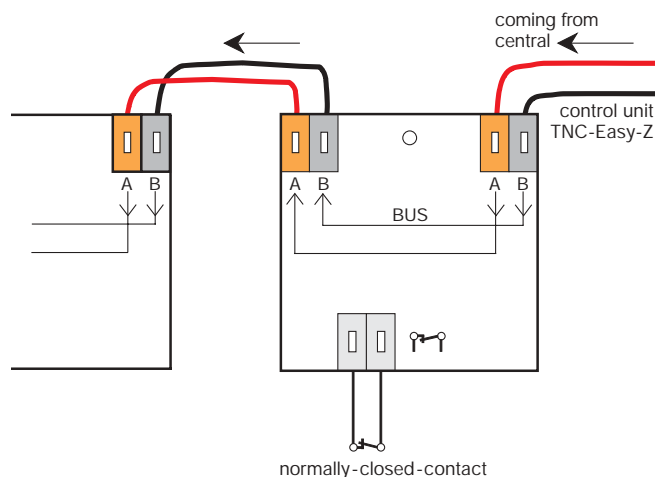
The module can be mounted with the aid of a screw in the hole provided for this purpose.

As an alternative, it is possible to fit the module in a junction box that can then be fitted near to the limit switch.

Connect the normally closed contact on the limit switch to the bus module (see drawing).

For this purpose a two-core cable with a maximum diameter of 1.5 mm² can be used.

The cable is to be kept as short as possible and must not exceed a length of 1 m.



Connect the two-core bus cable (0.8 mm²) to the terminals provided. During this process attention must be paid to correct connection.

Connect the incoming bus cable (coming from the central control unit) to terminals A and B with the arrow pointing inwards. Connect the outgoing bus cable (to the next bus module) to terminals A and B with the arrow pointing outwards.

Ensure that the polarity is correct (see drawing).

If possible, use a two-colour cable. In this case then connect, e.g., the red wire always to the terminal labelled A, and the black wire always to the terminal labelled B.

Comment: Reversal of the bus cable will not cause irreparable damage to the bus modules and/or the central control unit.

Laying the bus cable

So-called telephone cable can be used for the bus cable. It should have a diameter of 0.8 mm².

A standard cable is, e.g., IY(St)Y 2 x 2 x 0.8 mm².

The maximum cable length is 2000 m.

The wiring topology is fixed. It must follow the form of a line, bus users are connected in series (see drawing).

The distance of the bus cable towards power supply cable should not be less than 15 cm.

Installation, connection, and function of the central control unit

Installation

The TNC-Easy-Z central control unit has a built-in control panel housing in accordance with DIN 43700.

A corresponding cut-out in the control panel is required for installation. The unit is slid into this cut-out and fastened using the metal clamps provided.

Labelling

The fields on the front panel can be labelled as follows:

1. Undo front frame on the housing and remove.
2. Undo the screws on the back panel so that the front circuit board can be carefully pressed a few mm forward out of the housing.
3. Labelling strips can be pulled out from the top of the front.
4. Label as required and re-insert strips.
5. Slide front circuit board back into the housing and tighten bolts on the back panel.
6. Fit front frame.

Bus cable connection:

Connect the bus cable to the terminals labelled „Buskabel A und B“ (bus cable A and B), ensure that the polarity is correct (see bus modules).

Setting number of users:

With the aid of a screwdriver, set the number of bus modules connected (user addresses) on the „Zehner und Einer“ (tens and units) rotary switches.

Example:

Number of bus modules = 16, i.e. set the upper rotary switch labelled „Zehner“ (tens) to position 1, and the lower rotary switch labelled „Einer“ (ones) to position 6.

A notch in the pin on the rotary switch indicates the current position.

Relay outputs, bus malfunction:

The built-in relays are used for signalling malfunctions and are equipped with change-over contacts. The top three terminals labelled „Bus Störung“ (bus malfunction) are used for the malfunction signalling relay.

In the normal case, the contact between terminal 1 and 3 is closed. If there is a malfunction, then the relay is de-energised and the contact between terminal 1 and 2 is closed.

A bus malfunction is also indicated using LEDs on the back panel. In the case of a short-circuit and/or a bus cable break, the LEDs for the user that can no longer be reached by the central control unit, but are installed and initialised using the rotary switch, flash red.

In addition, the malfunction signalling relay and the corresponding LED on the back panel are set appropriately by the central control unit. Following rectification or the error(s), the system automatically resets itself.

Alarms

Type of malfunction	Relay contacts	red LED	yellow LED	LED panel
Short-circuit	1 – 2 closed	On	Off	All LEDs, except for the first one, flash red
Cable break	1 – 2 closed	Off	On	LEDs for the missing users flash red
Incorrect wiring	1 – 2 closed	Off	On	LEDs for the missing users flash red

The lower three terminals labelled „Teilnehmer ausgelöst“ (user triggered) are used for the group alarm that is generated if a bus user has left its end position, e.g., a fire damper has closed.

In the normal case, the contact between terminals 4 and 6 is closed. If there is an alarm, then the relay is de-energised and the contact between terminals 4 and 5 is closed.

Power supply:

The 24 Vdc power supply is connected to the terminals labelled with the word "Spannung" (power). The first terminal is for +24 Vdc, the second for \perp (ground, or 0V) and the third for the protective earth (PE), if fitted.

Ensure that the connections are made correctly!!!

Function, acknowledge button, LED test:

After the supply voltage is switched on, the states of the limit switches connected are indicated immediately.

The LED illuminates green if the contact is closed, and flashes red if it is open.

If limit switches are open, then at the same time an acoustic signal is given and the relay for the group alarm is de-energised.

The alarm can be reset with the aid of the acknowledge button. For this purpose the button must be pressed for approx. 2 sec. Once the alarm has been acknowledged, the acoustic alarm is muted, the group alarm relay is re-energised and the corresponding alarm LED is illuminated red continuously.

In the case of a further change in state (contact is closed again), the red LED changes to green.

With the aid of the LED test button, the function of all user LEDs set previously using the rotary switches on the back panel can be checked.

In the case of modifications to the system, e.g., new users, changes to the number of users, etc..., a reset must always be performed. This is performed by briefly switching off the supply of power to the central control unit.

The TNC-Easy-S expansion module should be installed close to the TNC-Easy-Z central control unit, as the connecting cable supplied is only approx. 30 cm long. The ready to use connecting cable is to be inserted in the socket on the central control unit labelled with the word „Erweiterung“ (expansion).

Commissioning

1. Install bus modules near the limit switches and connect to the limit switches. During this process always use the normally closed contacts.
2. Lay the bus cable starting from the switch cabinet, connect the bus modules in series. The first bus user is assigned the first LED, the second user the second LED etc.... A maximum of 32 bus modules can be connected to a bus cable.
The maximum bus cable length is 2000 m.
3. Provide cut-outs in the control panel for the central control unit and any expansion module.
4. Label the fields on the central control unit and any expansion module.
5. Install the indication units in the switch cabinet.
6. Set the bus users on the central control unit.
7. Connect bus cable to the central control unit.
8. Wire relay outputs, if necessary.
9. Fit 24 Vdc power supply in the switch cabinet and connect power supply to the TNC-Easy-Z central control unit.

Installation and connection of the expansion module

The TNC-Easy-S expansion module is fitted in a built-in control panel housing in accordance with DIN 43700. A corresponding cut-out in the control panel is required for installation. The unit is slid into this cut-out and fastened using the metal clamps provided.

Faultfinding and error messages

Description of fault	Cause
No LED is illuminated	<ul style="list-style-type: none"> - 24 Vdc power supply missing - 24 Vdc power supply + and - reversed - Perform LED test
All LEDs illuminate, red running light visible	Number of users set to 0 Set the number of users on the rotary switch and then briefly switch off the power supply.
First LED green and all others set flashing red. Yellow LED on the back panel illuminated.	Users missing Bus cable not connected or bus cable incorrectly connected to the central control unit or the first user
First LED green and all others set flashing red. Red LED on the back panel illuminated.	Short-circuit on the bus cable
First LEDs green or red and other LEDs flashing red Yellow LED on the back panel illuminated.	<ul style="list-style-type: none"> - Number of users set does not match the actual number - Incorrect bus wiring or open circuit after the first bus modules that are continuously illuminated
LEDs on the expansion module not illuminated	<ul style="list-style-type: none"> - Connecting cable to the expansion module missing - Number of users set incorrectly

Specification text

TNC-Easy intelligent signalling system for indicating the position of limit switches and signalling alarms and system malfunctions. Data transfer is performed using a 2-core bus cable of 0.8 mm² diameter. The bus cable has a line topology and can be up to 2000 m long. The system detects short-circuit and cable break with fault localisation.

Area of application:

- Fire dampers
- Multileaf dampers
- Windows
- Doors and gates
- Fans etc....

TNC-Easy is a stand-alone system. Interfacing to superordinate BMS systems is performed using a group alarm relay and malfunction signalling relay. It is possible to install TNC-Easy in a switch cabinet or a control panel.

Comprises the central control unit of type TNC-Easy-Z with bus management function and integrated indication unit for the indication of the position from up to 16 limit switch modules of type TNC-Easy-BM. To expand the system, the central control unit can be expanded by 16 further position indications using the TNC-Easy-S expansion module. In the case of a defective TNC-Easy-BM, short-circuit, overload, or cable break, automatic fault localisation, fault logging, and indication via LED is performed. There is a potential-free group alarm signal and potential-free malfunction signal in the central control unit for interfacing to superordinate DDC/BMS system.

The TNC-Easy-Z unit is protected against reverse polarisation and over-voltage. The maximum bus cable length is 2000 m.

Manufacturer: TROX type TNC-Easy-Z

Expansion module for the connection of a further 16 limit switch modules of type TNC-Easy-BM.

Manufacturer: TROX type TNC-Easy-S

Switched mode power supply for supply of power to the central control unit. Short-circuit proof and protected against overload.

Operating voltage: 230 VAC
Housing: Clamping rail housing
Optical function indication: Green LED, operating voltage
Output voltage: 24 VDC (+/-2%), stabilised
Output current: 1 A
Type of protection: IP 20
Connection: 6 terminals....2.5 mm²

Manufacturer: TROX type TNC-D2010

Limit switch module of type TNC-Easy-BM for the connection of conventional potential-free limit switches or for the sampling of external malfunction signals via relay contacts. A maximum of 32 limit switches can be connected to a central control unit.

Manufacturer: TROX type TNC-Easy-BM