Manual

on the

TroxNetCom-Basic-User-Software
for fire dampers and smoke detectors
Variant 3 (Profibus DP)

System TroxNetCom / AS-interface
for AS-i ControllerE

TNC-A1305/06

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Introduction

The TroxNetCom-Basic-User-Software for fire dampers and smoke detectors is used to cover the most important basic functions in fire damper and ventilation systems. Variant 3 provides the option to set up large networks of AS-i controllerE devices via Profibus DP without adapting the software. The number of the AS-i controllerE devices as DP slaves depends on the performance of the Profibus DP master. Applications for the TroxNetCom-Basic-User-Software, variant 3 are as follows:

1. Up to max. 126 AS-i controllerE devices (depending on the performance of the network master) in the Profibus DP network with 1 or 2 AS-i masters and up to 31 or 62 AS-i participants each (depending on the version a total of up to 124 or 248 fire dampers.[1]) Max. 32 AS-i controllerE devices can be networked as DP slaves per Profibus DP. For further DP slaves Profibus DP repeaters must be used.
2. Grouping (see 3.1) by taking RM-O-VS-D smoke detectors and input/output modules with relay contacts into account
3. Transmission of centralised error messages and group error messages via relay contacts.
4. Visualisation and operation of the plant via an integrated display of the AS-i controllerE

The functionality of this system can cover approx. 90 % of the fire damper systems. Special functions can be implemented on the basis of standardised program blocks. The scope and use of the functions of the TroxNetCom-Basic-User-Software are described in the following text.

[1] The different types of participants are described in the following text.

1 Module types

In fire damper systems the following connections are possible:

1.1 Fire damper with one mechanical limit switch

AS-EP4 connection

The operating mode for detecting four dampers with only one end position is called AS-EP4. This operating mode is the default setting. It is possible to use an NC or NO contact per damper. This is set via the operating and display panel of the AS-i controllerE or the Profibus DP master system.

The setting is the same for all AS-EP4 modules connected to this AS-i controllerE. It is not possible to combine AS-EP and AS-EP4.

A combined use with all other modules described in this manual on an AS-i controllerE is possible.

The AS-EP4 module is one of the possible 31 or 62 bus participants of the system. So 31x4=124 (for TNC-A1305, 1 AS-i master with 31 slaves) or 2x31x4=248 (TNC-A1306, 2 AS-i masters with 31 slaves each) fire dampers can be connected to an AS-i controllerE using AS-EP4.

Figure 1.1.1: AS-EP and AS-EP4 connection

1.2 Fire damper with two mechanical limit switches

AS-EP connection

Here the same connection as described in the preceding section is used. However, two fire dampers with two limit switches each are connected to the module. An intermediate position of the damper (timeout error due to missing end position) or an error by actuating both limit switches (manipulation) is detected and evaluated.
The operating mode is called AS-EP and is set via the operating and display panel of the AS-i controllerE or the Profibus DP master system.

The setting is the same for all AS-EP modules connected to this AS-i controllerE. It is not possible to combine AS-EP and AS-EP4.

A combined use with all other modules described in this manual on an AS-i controllerE is possible.

The AS-EP module with the two fire dampers is one of the possible 31 or 62 bus participants of the system.
So 31x2=62 (for TNC-A1305, 1 AS-i master with 31 slaves) or 2x31x2=124 (TNC-A1306, 2 AS-i masters with 31 slaves each) fire dampers can be connected to an AS-i controllerE using AS-EP.

1.3 Fire damper with inductive dual sensor to detect both end positions

AS-E connection

Using the inductive dual sensor both end positions are detected without wear.
The AS-E module is one of the possible 31 or 62 bus participants of the system.
The AS-E module is directly connected to the (yellow) bus cable.
An intermediate position of the damper (timeout error due to missing end position) or an error by actuating both limit switches (manipulation) or maladjustment is detected and evaluated.
The AS-E module is a bus participant per damper.
A combined use with all modules described in this manual on an AS-i controllerE is possible.

Figure 1.3.1: AS-E connection

1.4 Fire damper with spring-return actuator

AS-EM/B connection

The spring-return actuator enables a remote actuation of the fire damper. With the actuator the damper can be opened and closed via remote actuation for test purposes. Via the AS-EM/B module which is connected to the spring-return actuator the actuator is triggered and the two end positions are detected. Closing the dampers can also be triggered by alarm messages (e.g. smoke detector or higher-level system[2] via relay contacts). The evaluation options: incorrect position, timeout (depending on the direction), error by switching both limit switches (manipulation).
The AS-EM/B module is a bus participant per damper.
A combined use with all modules described in this manual on an AS-i controllerE is possible.

Figure 1.4.1: AS-EM/B connection

[2] BSA/DDC (Building System Automation/Direct Digital Control)

1.5 RM-O-VS-D smoke detector

AS-RM/BD connection

With the AS-RM/BD module a plug-in connection of the corresponding RM-O-VS-D smoke detector is possible.

The AS-RM/BD module is particularly important as it enables **grouping** of fire dampers (see chapter 3.1).

The errors "smoke detected" and "RM-O-VS-D system error" as well as the warning "pollution of the sensing head >70%" and the message "airflow" are detected. The test function of the RM-O-VS-D can be triggered with the module.

The AS-RM/BD module supplies the smoke detector with energy and is directly connected to the bus cable.

The AS-RM/BD module is one bus participant per smoke detector.

A combined use with all modules described in this manual on an AS-i controllerE is possible.

Figure 1.5.1: AS-RM/B(D) connection

1.6 Signal contacts and control signals

Input/output module connection (e.g. TNC-A2258)

The input/output module is mainly used to receive commands and transmit messages. Like the module AS-RM/BD the input/output module can be used for grouping fire dampers (see point 3.1). In addition centralised messages and commands can be assigned to the input/output module.
The module is a participant of the bus system and has four signal contacts.

1.6.1 Centralised messages and commands

With the slave address *31* centralised error messages of the system are given via potential-free contacts.

- O1: system ok
- O2: no fire damper CLOSED
- O3: no smoke
- O4: maintenance run not active

With the slave address 31 the following *control signals* can be transmitted to the module via potential-free contacts.

- I1: acknowledgement (reset of stored errors)
- I2: opening of all fire dampers
- I3: closing of all fire dampers (priority, NC contact)
- I4: start or stop pulse for the maintenance run (damper test)

1.6.2 Commands and messages for groups

With the slave addresses *1 .. 30 group error messages* of the system are given via potential-free contacts.

O1: group OK
O2: no fire damper in the group CLOSED
O3: no smoke in the group
O4: maintenance run of the group not active

With the slave addresses *1 .. 30* the following *group control signals* can be transmitted to the module via potential-free contacts.

I1: acknowledgement (reset of stored errors)
I2: opening of all fire dampers of the group
I3: pulse to reset all smoke detectors of the group
I4: free (not used)

Figure 1.6.2.1: Input/output module with relay contacts

1.7 Illuminated pushbutton module

TNC-A2018 connection

Via light indicators centralised error messages of the system are indicated and the system can be operated via pushbuttons (e.g. acknowledgement).

Light indicators:

Light indicator green:	system OK, no error
Light indicator red (flashing):	system error (not acknowledged)
Light indicator red (continuously on):	system error (present and acknowledged)

Pushbutton:

Pushbutton red (pressed > 200 ms):	acknowledgement (reset of stored errors)
Pushbutton green (pressed > 200 ms):	open all fire dampers
Pushbutton red (pressed > 5s):	close all fire dampers (priority)
Pushbuttons red and green (pressed > 3s)	test/reset of the RM-O-VS smoke sensor

The module is a participant of the bus system.

Figure 1.7.1: Illuminated pushbutton module

2 General system structure

Short description AS-interface

The structure of fire damper systems under the name "TroxNetCom AS-i" is based on the **a**ctuator **s**ensor **i**nterface (AS-interface or AS-i).
AS-interface is a manufacturer-independent standard for industry offered by the companies TROX GmbH and ifm electronic gmbh as wiring and field bus system for fire damper systems in building system automation.
To reduce installation and set-up cost the ventilation and fire damper components of TROX GmbH are fitted in the factory with the AS-interface system components from ifm electronic gmbh.

2.1 System principle

The system is based on the master-slave principle. The modules indicated above (AS-EP, AS-E, AS-EM/B, AS-RM/BD, etc) which are premounted on the fire dampers and smoke detectors are distributed in the system. These are the so-called AS-i slaves. They are connected via a 2-wire profiled yellow cable (AS-i flat cable) with a wire cross-section of 2 x 1.5 mm² in an open tree structure. An easy and quick insulation displacement technology – similar to that used in lighting – is applied. Other cable types, e.g. NYM-J 3x1.5 mm² can also be used but this eliminates the advantage of the easy insulation displacement technology. Terminating resistors are NOT required! The max. cable length including all branches is **100 m**. To save cable length the AS-i master controlling the communication with the AS-i slaves should be installed in direct vicinity of the AS-i slaves in small control cabinets or control boxes. The so-called AS-i master can be a module/plug-in card of a PLC. To reduce cost the AS-i master from ifm electronic gmbh is integrated in the AS-i controllerE.

The AS-i controllerE has three tasks or functions:

1. Control of the communication with the AS-i slaves in the field (e.g. AS-EM/B)
2. Interface for coupling with other systems via networks (e.g. operating and control panel, BSA, DDC, PLC).
3. Integrated programmable PLC functionality

2.2 System supply

To ensure the communication of the AS-i slaves with the AS-i master as well as the voltage supply of the AS-i slaves via the AS-i flat cable or other cable types one AS-i power supply per AS-i master must be installed. The AS-i power supply provides the AS-i voltage (29.5 ... 31.6 V DC) and includes the required data decoupling for communication. The AS-i power supplies are rated depending on the requirements. The AS-i controllerE must be supplied with operating voltage via a 24 V DC power supply.

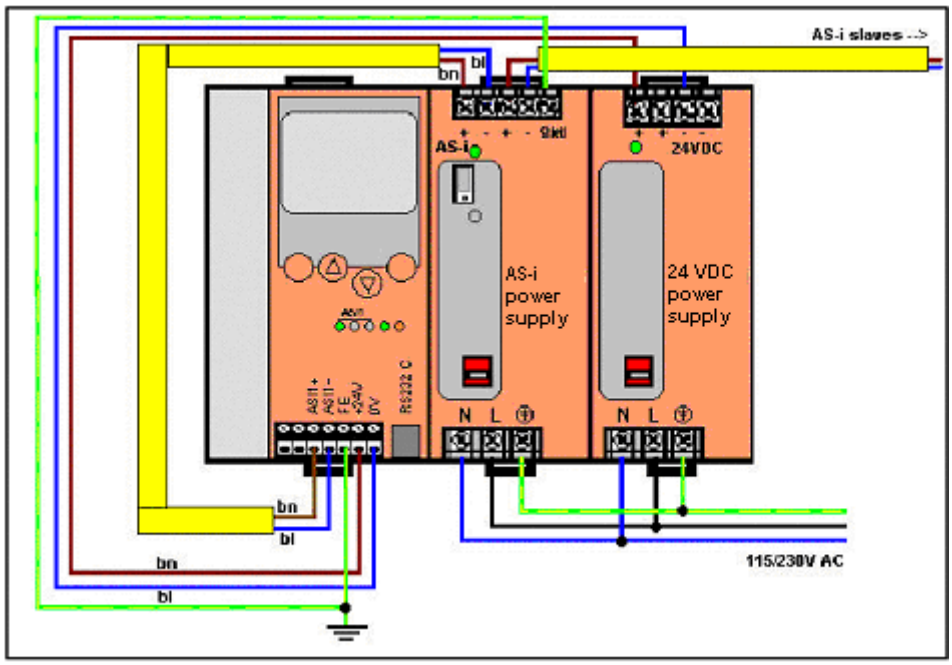

Figure 2.2.1:
Wiring example of an AS-i controllerE with 1 AS-i Master, AS-i power supply and 24 V DC power supply

2.3 Cable length, signal amplification

If the cable length of 100 m (total length including all branches of the tree structure) is not sufficient, it can be extended via a signal amplifier. This signal amplifier is called AS-i repeater. The AS-i line from the AS-i master is connected to the input (line 1) of the AS-i repeater. The output of the AS-i repeater (line 2) must be supplied with AS-i voltage via another AS-i power supply. Another AS-i line of 100 m can now be connected to this repeater line. If this length is not sufficient either, the first AS-i repeater can be followed by another repeater. Another length of 100 m is then available. It is NEVER allowed to use more than 2 AS-i repeaters connected in series. Further repeaters must be connected again to the master line.
Master and repeater lines must be electrically separated.

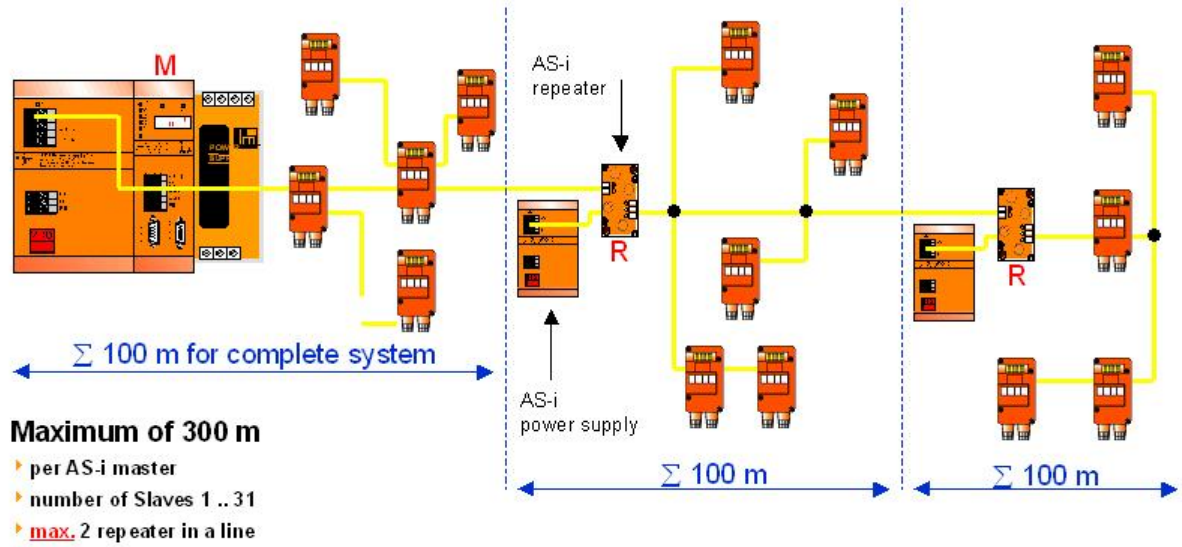

Figure 2.3.1: Structure of an AS-i system with AS-i repeaters

2.4 Further information about the system

More details like technical data of the components and graphic representations concerning the design of fire damper systems with AS-interface are provided in the system manual "TroxNetCom". It can be obtained on a data carrier from TROX GmbH or downloaded at www.trox.de.

3 Design of a fire damper system

The electric design of a fire damper system is detailed in the system manual "TroxNetCom". As the functions of the TroxNetCom-Basic-User-Software are defined by assigning the AS-i slave addresses, the following definitions apply:

3.1 Grouping

Fire dampers which are used together in a plant or plant section are considered to be a group if they are assigned to and triggered by one or several smoke detectors or input/output modules (slave address 1 ... 30).

If no smoke detectors or input/output modules (slave addresses 1 ... 30) are used in the plant, all fire dampers integrated in the system form one group.

1 to 31 or 62 motor-driven fire dampers or – when AS-EP modules are used for end position detection – up to 124 or 248 fire dampers can be combined in a group.

Grouping is made by assigning the AS-i slave addresses: Every group begins with one or several smoke detectors or input/output modules which have the lowest addresses in the group. A new group can also be formed by one or several input/output modules, also in combination with smoke detectors, at the lowest slave addresses within this group. AS-EM/B, AS-E and AS-EP or AS-EP4 then follow in rising order.

Gaps are allowed in the addressing of the modules AS-EM/B, AS-E and AS-EP or AS-EP4 of a group if for example installation of bus participants in such a group is planned at a later point in time.

If a group is to be operated without smoke detectors or/and input/output modules, it can be formed starting with address 1. This group has the number 0. The end of this group is defined by the next smoke detector which then starts group 1.

The individual fire dampers connected to AS-EP or AS-EP4 are always assigned together to one group which depends on the slave assignment.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
AS-EM/B	AS-EM/B	AS-EM/B			AS-RM/BD	AS-EM/B	AS-EM/B	AS-EM/B	AS-EM/B	AS-E	AS-E			AS-RM/BD	I/0 module	AS-RM/BD	AS-EM/B	AS-EM/B	AS-EM/B	AS-EM/B	AS-EM/B	AS-EM/B	AS-EM/B							
group 0					group 1									group 2																

Bild 3.1.1: Grouping

3.2 Sequence of the module types

The TroxNetCom-Basic-User-Software expects modules within a group which are NOT sorted by types. The module types can be freely assigned.

3.3 Documentation by Excel list

It would be useful to create the complete documentation of the AS-i fire damper system via an Excel list. This list should contain:

- AS-i addresses of the modules
- AS-i master (1 or 2)
- AS-i controllerE no.
- Assignment of the fire dampers to smoke detectors/ventilation systems (groups)
- PLC configuration of the AS-i system
- Data points of the individual fire dampers
- Data points for the operating and display panel
- Assignment of external commands to inputs and centralised messages for external systems (relay contacts) to outputs

4 Basic function of the system

Programming covers the basic functions for fire damper systems which are described below. Special functions requested by the end user exceeding the scope of the basic functions can be implemented by qualified personnel. Special functions can for example be further types of motor-driven dampers (e.g. multileave dampers) or customer-specific group assignments of dampers to ventilation systems without smoke detectors or input/output modules.

In general it can be said that a failure in the system or error messages remain stored until they have been acknowledged. So one acknowledgement option (e.g. relay contact, illuminated pushbutton module, operating and display panel) must be definitely provided for a fire damper system.

4.1 Functionality in case of thermal release

4.1.1 AS-EP and AS-EP4 connection

If a fire damper is closed by manual actuation (e.g. for maintenance) or by a fusible link release (fire), the mechanical limit switch mounted at the damper signals the state of the damper to the AS-i controllerE via the AS-EP module. The centralised error message (e.g. relay contact or red light indicator) is switched via the program and the signal "damper closed" is given (e.g. via a relay contact). The operating and display panel of the AS-i controllerE indicates a detailed text message for the closed damper. A visualisation of the message via the Profibus DP master system is also possible.

4.1.2 AS-E connection

If a fire damper is closed by manual actuation (e.g. for maintenance) or by a fusible link release (fire), the AS-E module mounted at the damper signals the state of the damper to the AS-i controllerE. The centralised error message (e.g. relay contact or red light indicator) is switched via the program and the signal "damper closed" is given (e.g. via a relay contact). The operating and display panel of the AS-i controllerE indicates a detailed text message for the closed damper. A visualisation of the message via the Profibus DP master system is also possible.

4.1.3 AS-EM/B connection

If a fire damper is closed by manual actuation (e.g. for maintenance) or by releasing the thermo-electric release mechanism (fire), the AS-EM/B module mounted at the damper signals the state of the damper to the AS-i controllerE. The centralised error message (e.g. relay contact or red light indicator) is switched via the program and the signal "damper closed" is given (e.g. via a relay contact). The operating and display panel of the AS-i controllerE indicates a detailed text message for the closed damper. A visualisation of the message via the Profibus DP master system is also possible.

4.2 Functionality in case of smoke detection

If smoke is detected by one or several smoke detectors of a group, the assigned motor-driven fire dampers (AS-EM/B module) are closed. The centralised error message (e.g. relay contact or red light indicator) is switched via the program and the signal "smoke" is given (e.g. via a relay contact). The operating and display panel of the AS-i controllerE indicates a detailed text message for smoke detection. A visualisation of the message via the Profibus DP master system is also possible. After smoke detection the system must be acknowledged to delete the stored smoke signal. Only then can the motor-driven fire dampers be opened again.

4.2.1 Global release of all smoke detectors

If an acknowledgement > 5 s is made by an illuminated pushbutton module, all smoke detectors can be released at the same time.
The Profibus DP master system also has a key function to release all smoke detectors.

4.2.2 Individual release of smoke detectors (manual operation)

Smoke detectors can be released individually via the operating and display panel of the AS-i controllerE or the Profibus DP master system.

4.2.3 Release of smoke detectors in groups

Smoke detectors of a group can be released via a relay contact of an input/output module. A group-based release via the Profibus DP master system can be set up by qualified personnel.

4.3 Functionality in case of a pollution warning

If a pollution warning is given by one or several smoke detectors of a group, the centralised error message is switched via the program (e.g. relay contact or red light indicator). The operating and display panel of the AS-i controllerE indicates a detailed text message for the pollution warning. A visualisation of the message via the Profibus DP master system is also possible.

4.4 Closing and opening of motor-driven fire dampers

4.4.1 Global closing and opening of all motor-driven fire dampers

All motor-driven fire dampers can be closed via a relay contact or operation via an illuminated pushbutton module. All motor-driven fire dampers can also be triggered globally via the Profibus DP master system. If no input/output modules or illuminated pushbutton modules have been installed, all motor-driven fire dampers are opened via acknowledgement. At the program start an automatic acknowledgement is given.

4.4.2 Individual triggering of motor-driven fire dampers (manual operation)

Motor-driven fire dampers can be triggered individually via the operating and display panel of the AS-i controllerE. Triggering via the Profibus DP master system can be set up by qualified personnel. If the individual operation (manual operation) is enabled, the sequential interlocking is deactivated during this enable period.

4.4.3 Closing and opening of motor-driven fire dampers in groups

If input/output modules have been set up as modules with group assignment (slave addresses 1 .. 30), the assigned motor-driven fire dampers (AS-EM/B module) can be opened by an input signal (signal present) or closed (signal not present). The centralised error message (e.g. relay contact or red light indicator) is switched via the program in case of closed fire dampers and the signal "damper closed" is given (e.g. via a relay contact).

4.4.4 Closing of motor-driven fire dampers by sequential interlocking

If motor-driven fire dampers and other module types are divided in groups via slave assignment (by smoke detectors or input/output modules) or if all fire dampers are independent of a group, it is possible to activate a so-called sequential interlocking. The effect of this sequential interlocking is that if one fire damper of a group closes, all other motor-driven fire dampers must also close. The type of the "first closing" fire damper (AS-EP or AS-EP4, AS-E, AS-EM/B) is unimportant. Even if for example a fire damper with a mechanical limit switch of a group closes, the motor-driven fire dampers of this group must also close due to the sequential interlocking.
The centralised error message (e.g. relay contact or red light indicator) is switched via the program in case of closed fire dampers and the signal "damper closed" is given (e.g. via a relay contact).
Only after acknowledgement of the error message the motor-driven fire dampers open again.
The sequential interlocking can be set in the TroxNetCom-Basic-User-Software. The setting is made via the operating and display panel of the AS-i controllerE or the Profibus DP master system. The default setting is a deactivated sequential interlocking.

4.4.5 Closing of motor-driven fire dampers via a network message or command

If the AS-i controllerE devices are connected to a Profibus DP master system via a network, group messages and commands can be exchanged between several controllerE devices. The following messages or commands can be transmitted via the network per group (ventilation system):

- Fire damper CLOSED (as a command for motor-driven fire dampers in case of sequential interlocking)
- Smoke signal (as a command for motor-driven fire dampers)
- Control via a relay contact (as a command for motor-driven fire dampers)
- Test/reset of smoke detectors (as a command for smoke detectors)
- Pollution message
- System error of smoke detectors
- Timeout error
- Manipulation / switch error

If commands, e.g. smoke signals, are transmitted via the network to close fire dampers connected to other AS-i controllerE devices, the correct function of the network is monitored for reasons of safety. In case of a network failure the motor-driven fire dampers are brought to the safety position (CLOSED). The parameters for transmitting the group messages and commands are set in the Profibus DP master system.

The default setting is a deactivated transmission of the group messages and commands.

4.5 Maintenance run of motor-driven fire dampers (damper test)

All motor-driven fire dampers can be tested for example by an input pulse at an input/output module (slave address 31) or by a pulse from the operating and display panel of the AS-i controllerE or by the Profibus DP master system via an automatic maintenance run.

A maintenance run cannot be started until all fire dampers with two end positions are in the OPEN position.

4.5.1 Maintenance run of motor-driven fire dampers for AS-i controllerE devices

For this automatic maintenance run all motor-driven fire dampers connected to the AS-i controllerE are CLOSED and OPENED again one after the other.

4.5.2 Maintenance run of motor-driven fire dampers by groups

A maintenance run by groups (ventilation systems) is also possible. Only one group can be tested. The group to be tested is determined via the operating and display panel of the AS-i controllerE or the Profibus DP master system. For the automatic maintenance run by groups all motor-driven fire dampers of the group are also CLOSED one after the other and then OPENED again. An operating signal of the active maintenance run of the group is transmitted via the NC contact of a group-related input/output module (slave address 1..30).

4.5.3 Maintenance run of fire dampers one after the other or simultaneously

If the default setting is activated, a maintenance run is always carried out one after the other. However, it is also possible to carry out a maintenance run of fire dampers simultaneously. All fire dampers connected to an AS-i ControllerE or a group of fire dampers of an AS-i ControllerE are then CLOSED and OPENED in parallel. If special types of motor-driven fire dampers are connected to the system, they canNOT be tested by carrying out a simultaneous maintenance run.

4.5.4 Maintenance run in general

If during opening or closing of the tested fire dampers a timeout error occurs, this can be evaluated as an indication of a mechanical failure of the fire dampers by the operating and display panel of the AS-i controllerE or the Profibus DP master system. A manipulation or switch error (both end positions are switched) can also be evaluated as an error during the maintenance run. The errors can be acknowledged only after the maintenance run has been finished. The maintenance run can be interrupted by a further input pulse on the input/output module (slave address 31), by a pulse from the operating and display panel of the AS-i controllerE or by the Profibus DP master system. An operating signal of the active maintenance run is transmitted via the NC contact of the input/output module (slave address 31).

With the default setting a failure of a fire damper during the maintenance run leads to an automatic closing of the fire damper. Checking the faulty fire damper on site is thus absolutely necessary!

This default setting of the maintenance run can also be deactivated. The setting is made via the operating and display panel of the AS-i controllerE or the Profibus DP master system.

4.6 Diagnosis

The connections AS-EP (2 fire dampers with 2 end positions each), AS-E, AS-EM/B provide the option for an enhanced diagnosis due to their 2 end positions. The diagnostic options are as follows.

4.6.1 Manipulation

Manipulation or switch error means that both limit switches (AS-EP, AS-EM/B) are actuated or both end positions of the inductive sensor (AS-E) are damped. Normally only one end position is allowed to be signalled. The manipulation can be monitored via the program and transmitted as an error message (centralised error message). The operating and display panel of the AS-i controllerE indicates a detailed text message for the manipulation. A visualisation of the message via the Profibus DP master system is also possible.

4.6.2 Exceeded timeout

It is possible that the timeout of the fire damper is too long, e.g. due to mechanical wear of a fire damper or voltage drops on the cables. This can be monitored via the program and transmitted as an error message (centralised error message). For motor-driven fire dampers the timeout for opening and closing the fire dampers is different (opening: 180 s, closing: 25 s). The operating and display panel of the AS-i controllerE indicates a detailed text message for the exceeded timeout. A visualisation of the message via the Profibus DP master system is also possible.

4.7 Deactivation / Ignoring of smoke signals

To set up and clean fire damper systems it is usual to remove the sensing heads of the RM-O-VS-D smoke detectors. As a result of this, the smoke detectors indicate smoke and so the assigned motor-driven fire dampers close or cannot open. For set-up and cleaning a forced opening (emergency operation) is required to continue the operation of the ventilation system during this process. This means that in case of a forced opening the fire dampers are open or in the process of opening and the signals of the smoke detectors are ignored. As this state does **not** correspond to the normal state the centralised error message is given in case of a forced opening. A forced opening of the fire damper system can be released via a command (relay contact).

Due to safety regulations forced opening (ignoring of smoke detector signals) must be set up by a qualified company.

With the forced opening being active the installation has NO APPROVAL!

5 Setting options

The AS-i controllerE devices can be set for the different applications using the TroxNetCom-Basic-User-Software for fire damper systems. For AS-i controllerE devices the settings are made via the integrated operating and display panel. Furthermore the settings can be made via the Profibus DP master system.
The following settings can be made:

5.1 AS-EP or AS-EP4

With this setting the type AS-EP (2 fire dampers with 2 mechanical limit switches each) or the type AS-EP4 (4 fire dampers with 1 mechanical limit switch each) can be selected for the complete AS-i controllerE. It is NOT possible to combine AS-EP and AS-EP4 modules within an AS-i controllerE.
The factory default setting is AS-EP4.

5.2 AS-EP with inverted contacts

This setting distinguishes between type AS-EP and type AS-EP4. If type AS-EP (2 fire dampers with 2 mechanical limit switches each) is used, NC contacts can be used instead of NO contacts with the setting being active (inverted contacts ON). If type AS-EP4 (4 fire dampers with 1 mechanical limit switch each) is used, NO contacts can be used instead of NC contacts with the setting being active (inverted contacts ON). It is NOT possible to combine NO and NC contacts within an installation!
The factory default setting is OFF.

5.3 Text selection for AS-EP4

If this setting is activated, the messages “NOT CLOSED” when the fire damper is not closed and “CLOSED” when the fire damper is closed are indicated on the integrated display of the AS-i controllerE. This setting can be used when the CLOSED position is monitored by means of an NC contact. If the OPEN position is monitored by means of an NO contact, this setting can be deactivated. If this setting is deactivated, the messages “OPEN” when the fire damper is open and “NOT OPEN” when the fire damper is not open are indicated on the integrated operating and display panel of the AS-i controllerE.

The factory default setting is ON.

5.4 Sequential interlocking

The effect of an activated sequential interlocking (ON) is that if a fire damper of a group closes, all other motor-driven fire dampers of this group must also close. The motor-driven fire dampers can be opened again by acknowledgement.

The factory default setting is OFF.

5.5 Control via a relay contact

If the setting for control via a relay contact is activated (ON), signals which are present at the inputs of the group-related input/output modules (slave addresses 1..30) for opening or closing motor-driven fire dampers are directly evaluated. If this setting is deactivated (OFF), only signals for closing motor-driven fire dampers can be evaluated. The signals/commands for opening motor-driven fire dampers must be provided via the central input/output module or via the integrated operating and display panel of the AS-i controllerE while this setting is deactivated. Signals of central (slave address 31) or group-related (slave addresses 1 .. 30) input/output modules have priority over commands of higher-level systems like "open all fire dampers" or "close all fire dampers".

The factory default setting is:

For the first set-up of installed input/output modules: ON, otherwise OFF

5.6 Close faulty damper during the maintenance run

A failure of a fire damper during a maintenance run by exceeding the timeout or manipulation (both end positions) leads to the automatic closing of the fire damper with the setting being activated (ON). This default setting of the maintenance run can also be deactivated.

The factory default setting is ON.

5.7 Maintenance run one after the other or simultaneously

With this setting being activated, a maintenance run of fire dampers is always carried out one after the other. When deactivated, a simultaneous maintenance run of fire dampers can be carried out. A simultaneous maintenance run is only possible for motor-driven fire dampers and NOT when special types of motor-driven dampers are integrated.

The factory default setting is ON.

5.8 Manual operation

When manual operation is activated, a single control of motor-driven dampers or smoke detectors is possible via the integrated operating and display panel of the AS-i controllerE. Single control in manual operation is for example necessary for maintenance. The signals of input/output modules for the opening and closing of dampers are ignored when this setting is activated. The centralised error message of the system is active when this setting is activated.

For legal reasons, setting of this function via the operating and display panel of the AS-i controllerE is secured by an additional locking. This setting can only be made by "simultaneously" pressing the buttons "↑" and "OK".

The factory default setting is OFF.

5.9 Deactivation / Ignoring of smoke signals

This function enables a forced opening (emergency operation) of motor-driven fire dampers to set up or clean ventilation systems. With the setting being activated the smoke signals of smoke detectors are ignored so that the motor-driven fire dampers can be opened. The sensing heads of the RM-O-VS-D smoke detectors can thus be removed for cleaning the ventilation system and the motor-driven fire dampers can be opened.

With the forced opening being active the installation has NO APPROVAL!

For legal reasons, setting of this function via the operating and display panel of the AS-i controllerE is secured by an additional locking. This setting can only be made by "simultaneously" pressing the buttons "↑" and "OK".

The factory default setting is OFF.

5.10 Group A for ventilation systems, group B for smoke detector groups

This setting can only be used in combination with manual adaptations in the TroxNetCom-Basic-User-Software. With this setting fire dampers or smoke detectors can be assigned to a ventilation system via a group A and smoke detectors can be assigned to motor-driven fire dampers via group B.

The factory default setting is OFF.

5.11 Activate group B (2nd group assignment)

This setting can only be used in combination with manual adatations to the TroxNetCom Basic-User-Software. Via this setting a motor-driven fire damper or a smoke detector can be assigned a second group.

The factory default setting is OFF.

5.12 Transmission of messages via the network to control motor-driven fire dampers

If a Profibus DP network superior to the AS-i controllerE devices is installed, group messages and commands (e.g. smoke detection) can be exchanged between several controllerE devices. If these group messages and commands are to have safety-related effects on other AS-i controllerE devices, e.g. closing of motor-driven fire dampers, the correct function of the network must be monitored. In case of a network failure the motor-driven fire dampers are brought to the safety position (CLOSED).

The factory default setting is ON.

5.13 Ventilation system specific locking in case of network failure

This setting is an extension of the setting described in 5.12. If the setting for ventilation system specific locking is activated, only those motor driven fire dampers are closed - in case of a network failure - which receive commands from group-specific smoke detectors and/or input/output modules of other AS-i controllerE devices in the network.

The factory default setting is ON.

5.14 Network monitoring

If the setting described in point 5.12 is activated, the correct function of the network is monitored. In case of a network failure the motor-driven fire dampers are brought to the safety position (CLOSED). Network monitoring can be deactivated for test purposes. **Deactivation is only allowed to be carried out by qualified companies!**

The factory default setting is ON.

5.15 Gateway mode of IO modules

If a network system superior to the AS-i ControllerE is installed, the signals of the IO modules can be **passed through** to the higher-level system by the AS-i ControllerE without signal preprocessing (without automatic grouping, without preassigned inputs and outputs) in the active gateway mode. The assignment of functions of the inputs and outputs then has to be carried out via the higher-level system.
The factory default setting is OFF.

5.16 Change standard type of motor-driven damper

The standard type of motor-driven damper is the motor-driven fire damper with AS-EM/B AS-i connection. As an alternative, motor-driven smoke extraction dampers with AS-EM/S AS-i connection can be automatically detected. In general the performed setting applies to all motor-driven dampers connected to the AS-i controllerE. The setting of motor-driven smoke extraction dampers can only be used in combination with manual adaptations in the TroxNetCom-Basic-User-Software.
The factory default setting is ON (AS-EM/B).

6 Operating and display panel of the AS-i controllerE (UserMenu)

The integrated operating and display panel of the AS-i controllerE is used to display and operate the connections of the TroxNetCom AS-i system for fire damper systems described in the preceding chapters. All messages of the individual fire dampers and smoke detectors can be displayed in detail via the integrated display of the AS-i controllerE (UserMenu). Stored messages can be acknowledged via the display. Furthermore, motor-driven fire dampers and smoke detectors can be controlled or triggered for test purposes via the display. For motor-driven fire dampers a maintenance run can be initiated via the display. The settings necessary for the TroxNetCom-Basic-User-Software can also be made via the display. For messages to be shown via the display of the AS-i controllerE (UserMenu), the program in the AS-i controllerE must be active (yellow LED PLC RUN permanently lit).

Figure 6.1: UserMenu display – correct operation

6.1 Standard page of the AS-i controllerE

The standard page is always shown when the AS-i controllerE is switched on. It is the main page of the internal menu of the AS-i controllerE (page 0). This menu can be accessed by pressing the “MENU” button. By pressing the “USER” button the so-called “UserMenu” for the TroxNetCom AS-i application can be accessed.

Figure 6.1.1: Standard page

The menu navigation of the internal menu as well as the associated functions are not described in more detail here. They are presented in the manual of the AS-i controllerE of ifm electronic gmbh. (www.ifm-electronic.com)

6.2 Pushbutton operation of the UserMenu

The pushbuttons for the control of the display (UserMenu, not in the standard menu) are programmed so that the next possible message can be shown by briefly pressing the buttons. If the buttons are pressed longer, the next messages are automatically displayed one after the other until the buttons are released. So several messages can be conveniently displayed one after the other and the buttons of the AS-i controllerE are only subjected to minimum wear.

6.3 Brightness / Contrast adjustment

If the text in the display of the AS-i controllerE (UserMenu) is difficult to read, the contrast can be adjusted by simultaneously pressing the right button and the "↑" button (display too bright) or the "↓" button (display too dark).

6.4 Language selection

The text in the standard menu and in the UserMenu of the AS-i controllerE can be displayed in German and in English. By pressing the buttons "↑" and "↓" simultaneously, the menu navigation changes between German and English. In order to protect the selected language against power failure it has to be stored in the standard menu of the AS-i controllerE. The storage is carried out as follows:

1. Power on the AS-i controllerE.
2. Wait until the AS-i controllerE has completely started up.
3. Is the standard page shown on the display of the AS-i controllerE ("ifm electronic, AS-i controllerE" (standard page, no. 0) or "Exx AS-iX" displayed)? If "no" go to point 4, if "yes" go to point 7 **à**
4. Is the "ESC" field displayed?
   If "no" go to point 5, if "yes" go to point 6 **à**
5. Press the left button and the "↓" button simultaneously for 3 seconds until the "ESC" field is displayed. (unlocking of the program lock)
6. Press the "ESC" button (right button) of the AS-i controllerE until "ifm electronic, AS-i controllerE" (standard page, no. 0) or "Exx AS-iX" is displayed.

7. If “ifm electronic, controllerE” (standard page, page 0) or “Exx AS-iX” is displayed, press the “MENU” button (left button) of the AS-i controllerE in order to access the internal menu.
8. Select the menu point **System Setup** using the “↑“ and “↓” buttons of the AS-i controllerE and acknowledge with “OK” (left button).
9. Select **Store System** using the “↑“ and “↓” buttons of the AS-i controllerE and acknowledge with “OK” (left button).
10. Using the “ESC” button (right button) you can return to the main menu.
11. If no button is pressed and if the program is running in the AS-i controllerE (yellow LED PLC RUN flashes) you automatically return to the fire damper visualisation after a certain predefined time.

6.5 Main page for menu navigation

Every further page (menu) of the UserMenu can be accessed from this page. You can scroll through the menu by pressing the buttons “↑“ and “↓“. A page with dark highlighted text can be selected by pressing the “OK” button. By pressing the “ESC” button you return to the standard page of the AS-i controllerE. The main page is automatically loaded by the program several seconds after the program start. If no button is pressed for a longer time, the message page is automatically loaded (see chapter 6.7).

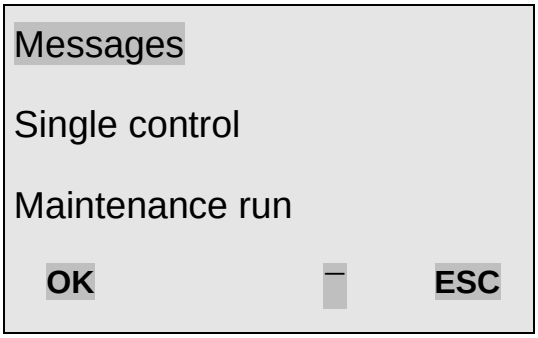

Figure 6.5.1: Menu navigation – top of the list

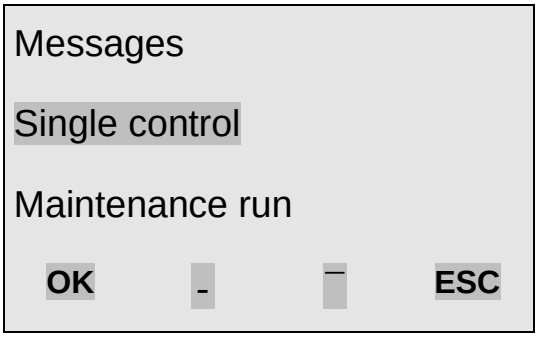

Figure 6.5.2: Menu navigation – middle of the list

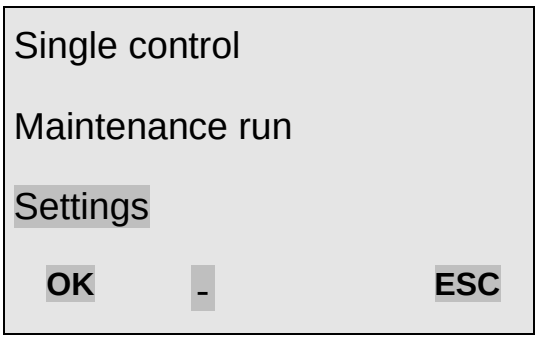

Figure 6.5.3: Menu navigation – end of the list

The following menu points can be selected:

- Messages
- Single control
- Maintenance run
- Settings

The other pages and their contents, which can be selected via the menu points, are described below.

6.6 Locking / Safety function

If no button is pressed on the AS-i controllerE for a longer time, the message page is automatically loaded. Furthermore, a locking of the display (UserMenu) is activated and the “ESC” button becomes inactive. By simultaneously pressing the “Reset” and the “↓” buttons for 3 seconds, the locking can be deactivated. The “ESC” button is then visible again.

When the display is locked, it is protected against unauthorised manipulation.

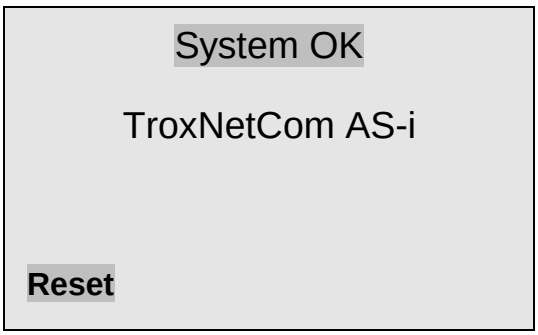

Figure 6.6.1: Locked display without "ESC" button

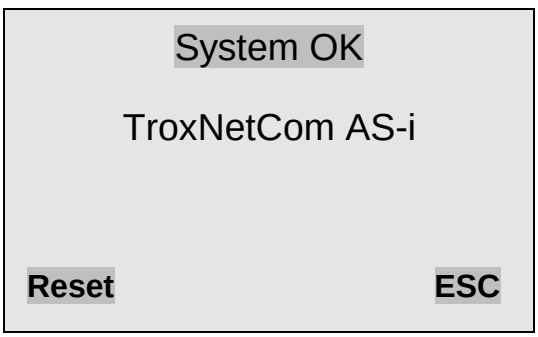

Figure 6.6.2: Unlocked display with "ESC" button

6.7 Message page

All messages are displayed on this page. Furthermore the total amount of messages and the sequential number of the current message are displayed. For every participant or for every smoke detector and fire damper a specific designation is displayed. Section 6.12 describes how the corresponding designations can be adapted.

By pressing the "↑" and "↓" buttons, further fire dampers and smoke detectors can be displayed. Only a selection of possible messages is presented below. By pressing the "Reset" button, messages or error messages stored by the program can be acknowledged.

Messages that can be displayed for fire dampers:

CLOSED, Time out error, Manipulation / Switch error

Messages that can be displayed for duct smoke detectors are:

Smoke detected, Airflow OK, Pollution, System error RM-O-VS-D

Global messages:

Manual operation via higher-level system, Fire alarm, AS-i system error, etc.

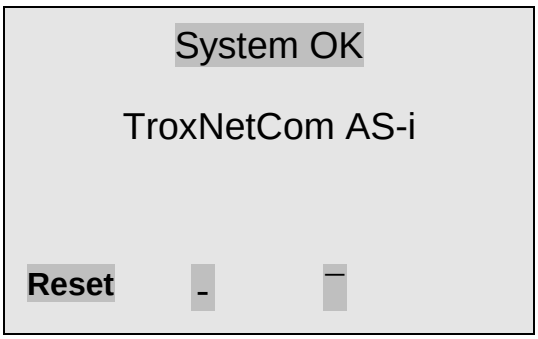

Figure 6.7.1: Correct operation

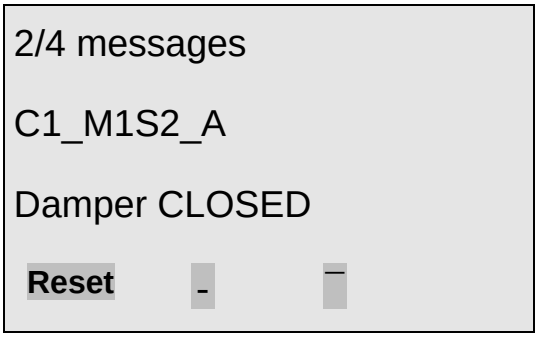

Figure 6.7.2: Closed fire damper with 2 end stops

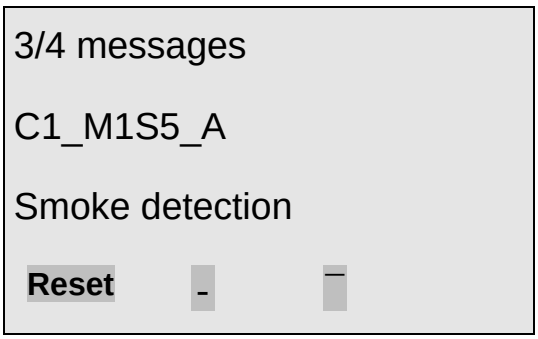

Figure 6.7.3: Smoke detection of a duct smoke detector RM-O-VS-D

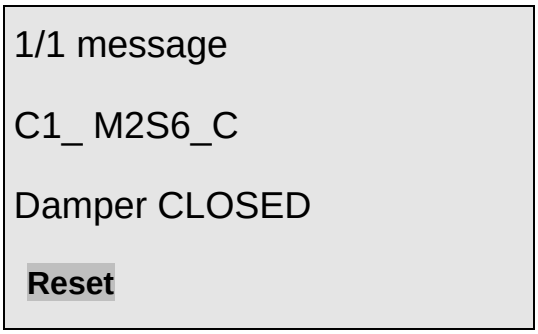

Figure 6.7.4: Closed fire damper with 1 end stop

By pressing the “ESC” button you return to the main page of the UserMenu.

6.8 Page for single control

On this page the status of the individual fire dampers and smoke detectors can be displayed. Furthermore, motor-driven fire dampers and smoke detectors can be individually triggered by pressing the “CTRL” button. By pressing the “↑“ and “↓“ buttons, further fire dampers and smoke detectors can be displayed. If a connection for smoke detectors or motor-driven fire dampers can be triggered, this is indicated by the visible “CTRL” button. If a motor-driven fire damper is triggered, this is indicated by means of dark highlighted text (ON). A motor-driven fire damper which is not triggered is visualised by means of brightly highlighted text (OFF). **The system is in manual operation while the page for single control is active. This means that the user himself is responsible for opening and closing the motor-driven fire dampers or testing/triggering the smoke detectors.** When this page is left, the motor-driven fire dampers are moved back to the positions assigned to them by the program. If smoke detectors have been triggered during single control in manual operation, the smoke messages must be acknowledged in order to be able to open the motor-driven fire dampers again.

Messages that can be displayed for fire dampers:
OPEN, CLOSED, NOT CLOSED (or OPEN, NOT OPEN), Time out error, Manipulation / Switch error

Messages that can be displayed for duct smoke detectors:
Smoke detected, Airflow OK, Pollution, System error RM-O-VS-D

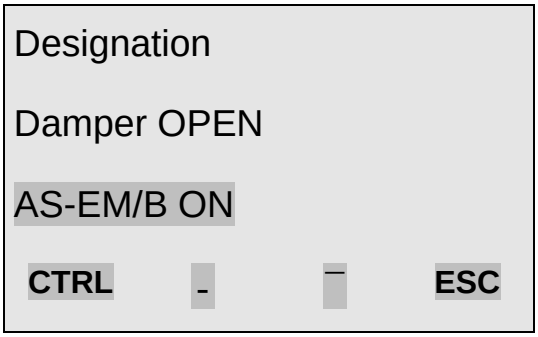

Figure 6.8.1: Single control of a triggered fire damper

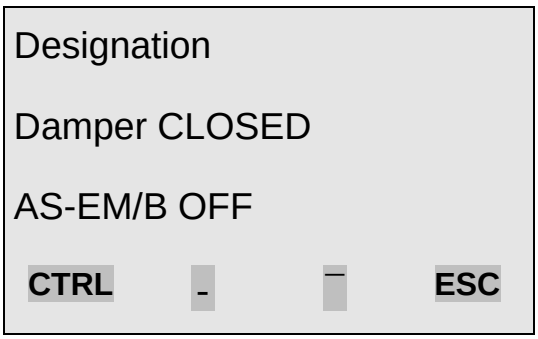

Figure 6.8.2: Single control of an untriggered fire damper

By pressing the “ESC” button you return to the main page of the UserMenu.

6.9 Page for maintenance run

Via this page, a group of fire dampers to be maintained or all groups simultaneously can be selected by means of the “+” and “-“ buttons. Using the “START” button a maintenance run can be started. A maintenance run can only be started if all fire dampers connected to the AS-i controllerE are open. This is indicated by the visible or non visible “START” button. Using the “STOP” button a maintenance run can be stopped. If the maintenance run is finished without manual intervention, the display changes to the message page after a predefined time. There it is indicated whether a maintenance run has been finished with or without error. This message can be cancelled by pressing the “ESC” button.

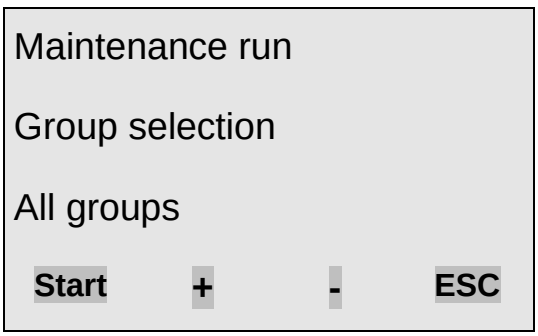

Figure 6.9.1: Maintenance run can be selected for all groups

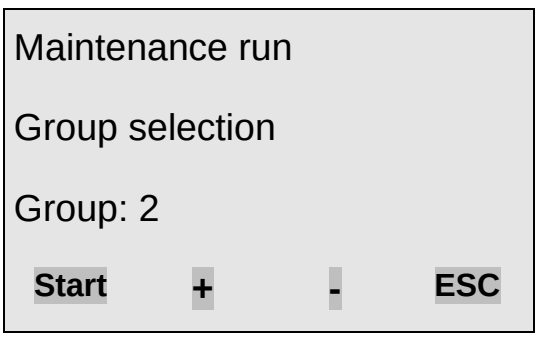

Figure 6.9.2: Maintenance run can be selected for one group

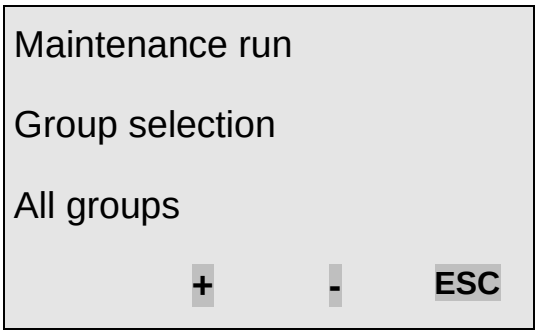

Figure 6.9.3: Maintenance run cannot be activated because fire damper is closed

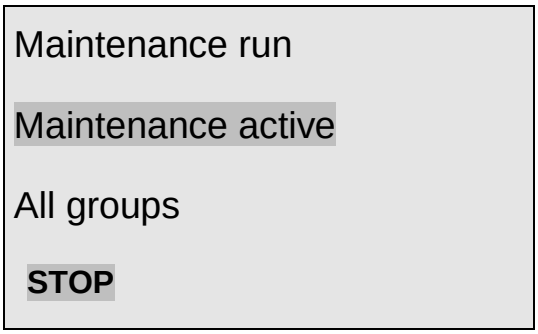

Figure 6.9.4: Maintenance run for all groups active

By pressing the “ESC” button on the maintenance run page you return to the main page of the UserMenu.

6.10 Page for settings

There is a menu navigation on this page to make settings. You can scroll through the setting menu by pressing the buttons "↑" and "↓". A setting with dark highlighted text can be selected by pressing the "OK" button.

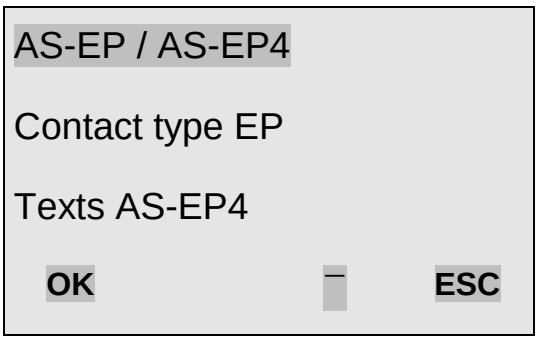

Figure 6.10.1: Menu navigation – top of the list

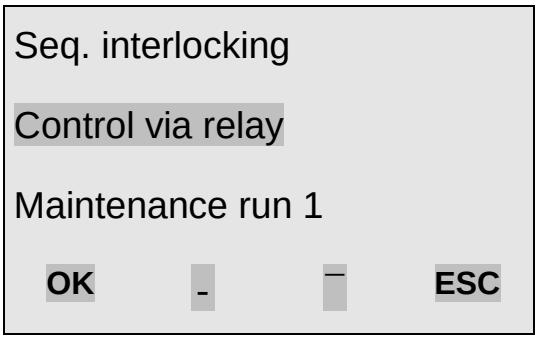

Figure 6.10.2: Menu navigation – middle of the list

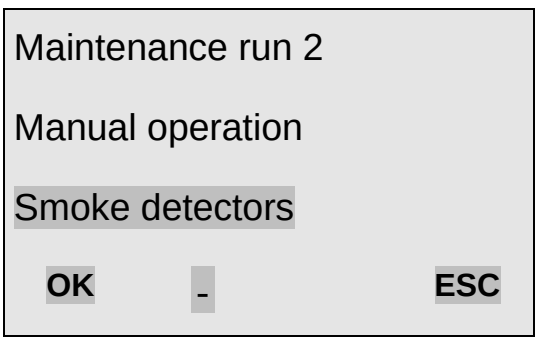

Figure 6.10.3: Menu navigation – end of the list

By pressing the "ESC" button you return to the main page of the UserMenu.

The following settings can be made:

- Module type AS-EP or AS-EP4 (1 or 2 limit switches per fire damper)
- Contact assignment of AS-EP/AS-EP4 as NC or NO contacts
- Text selection for AS-EP4: CLOSED, NOT CLOSED or NOT OPEN, OPEN
- Sequential interlocking ON/OFF
- Control via a relay contact ON/OFF
- Maintenance run 1, close or open again the fire damper in case of an error
- Maintenance run 2, maintain all dampers one after the other or simultaneously
- Manual operation ON/OFF
- Activate/deactivate smoke detectors

If a setting is selected using the “OK” button, the current status of the setting is indicated by means of dark highlighted text. Another setting can be selected using the “↑“ or “↓“ button. This selection must be acknowledged using the “OK” button. **Exceptions are manual operation and the deactivation of the smoke detectors (forced opening, ignoring of smoke signals). These can only be activated by simultaneously pressing the “OK” button and the “ - “ button.** The settings can be deactivated like all other settings. They can be checked by returning to the menu page for settings by means of the “ESC” button and by reloading the previously selected menu item. Only some of the possible settings are presented below. The functions behind these settings are described in detail in chapter 5.

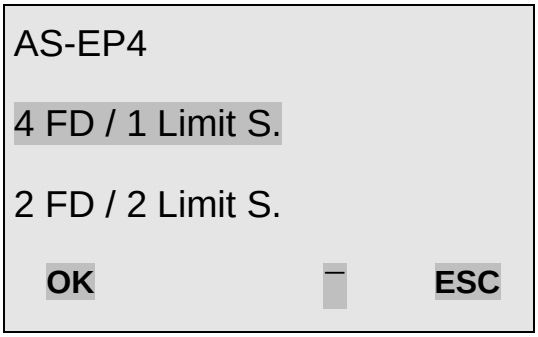

Figure 6.10.4: Selection of the module type AS-EP4 or AS-EP

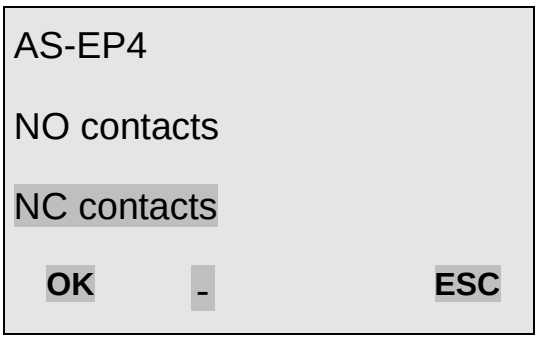

Figure 6.10.5: Setting of NO or NC contacts

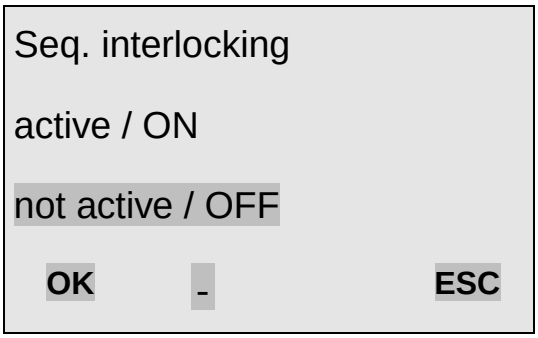

Figure 6.10.6: Setting of sequential interlocking

By pressing the “ESC” button you return to the menu page for settings.

6.11 Structure of the standard designations

To be able to assign the messages in the display to the different AS-i modules/slaves, standard designations are programmed by default. The structure of the standard designations is as follows:

e.g. **C1_M2S14_A**

Cx: Number of the AS-i ControllerE
(important when using several AS-i ControllerE devices, e.g. in networks)

Mx: Number of the AS-i master (1 or 2) of the AS-i ControllerE

Sxx: Number of the AS-i slave/module (1 to 31)

A, B, C, D:
Channel designation of the AS-i slave/module
Except for the module types AS-EP and AS-EP4 there always is only 1 channel (A). For AS-EP there are 2 channels (A and B, for 2 dampers with 2 limit switches). For AS-EP4 there are 4 channels (A, B, C, D for 4 dampers with 1 limit switch).

System-specific or customer-specific modifications to the designations can be carried out. For more information please read the following section 6.12.

6.12 Adaptation of the designations

The designations for the respective AS-i participants/slaves or for the respective fire dampers can be freely assigned. This can for example be carried out at the factory to customer specifications. Furthermore, programming of designations can be made by a Trox system integrator.

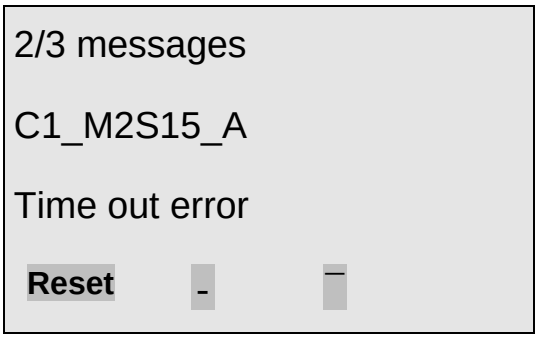

Figure 6.12.1: Fire damper message with the standard designation in line 2

Figure 6.12.2: Fire damper message with a customer-specific designation in line 2

7 Operation and set-up

To enable set-up of a fire damper system using AS-interface the steps described below must be taken.

The general procedure is as follows:

- Install the fire dampers and smoke detectors incl. AS-i modules.
- Install the control boxes for AS-i controllerE and power supplies.
- Lay and connect the 230 V AC voltage supply for the power supplies in the AS-i control boxes.
- Power on the AS-i control boxes.
- Lay the profiled AS-i cable (AS-i flat cable).
- Connect the AS-i modules to the AS-i cable (first separate the FC insulation displacement connectors).
- Assign the addresses 1 to 31 to the AS-i modules (AS-i slaves).
- Document the AS-i addresses and the inputs/channels of input modules (for AS-EP and AS-EP4) in a list in combination with the ventilation-related designation of a damper or a smoke detector.
- Carry out the projection adaptation of the AS-i PLC configuration.
- Start the software.
- Carry out settings (e.g. sequential interlocking) via the integrated operating and display panel of the AS-i controllerE (or later via the Profibus DP master system).
- Lay and connect the network cable.
- Assign the network address of the AS-i controllerE devices.
- Set up the network (activate the terminating resistors at the cable ends!).
- Profibus DP master system reads the data from the AS-i controllerE devices.
- Carry out the settings (e.g. sequential interlocking) of the AS-i controllerE devices via the Profibus DP master system.
- Test the functions of the system specified by the engineering consultants or customer.

7.1 Cable and fuse protection for power supplies

Due to the system the power supplies required for an AS-i controllerE (AS-i power supplies and 24 V DC power supply) must be supplied with 230 V AC via one cable (e.g. NYM-J 3x1.5 mm²) and protected by a fuse.

7.2 Installation and connection of the AS-i slaves

To minimise installation work for AS-i modules it is useful to order them premounted at the fire dampers in the factory (module types AS-E, AS-EM/B) from TROX GmbH. If they are not premounted, a mounting bracket for the module type AS-EM/B for mounting on Trox fire dampers can be obtained from TROX GmbH.

7.2.1 AS-i flat cable insulation displacement connectors

Important mounting note: When connecting the AS-i modules (e.g. module types AS-E, AS-EM/B, AS-RM/BD) to the AS-i flat cable using the flat cable insulation displacement connector note that upper and lower parts must be separated before mounting. The orange lower part of the flat cable insulation displacement connector is only snapped onto the AS-i flat cable after separation from the upper part. Only after snap-on the upper part is screwed into the orange lower part. If the flat cable insulation displacement connector is erroneously attached unseparated, e.g. using pliers, contacting is NOT possible. This would also bend the contact pins. The flat cable insulation displacement connector must not be used as a connection element for two cable ends. The flat cable insulation displacement connector is to be solely used for connection to the AS-i module.

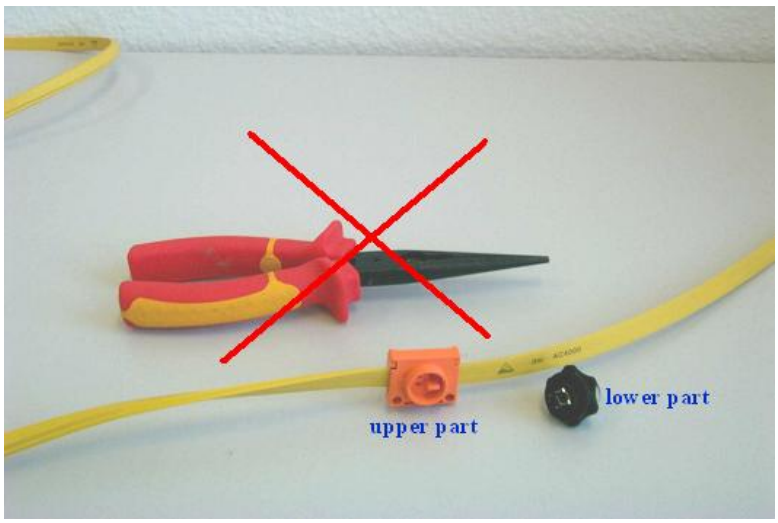

Figure 7.2.1.1: AS-i flat cable insulation displacement connector with separated components

7.2.2 Cable branching

As junction box for branching cables a standardised AS-i module lower part with cover (TNC-A5000 + TNC-A3000), a special AS-i splitter (TNC-70200 when motor-driven fire dampers are used) or a common splitter can be used.

Figure 7.2.2.1: AS-i splitter

7.2.3 AS-i module lower parts

AS-i module lower parts can be used as connection elements between the AS-i flat cable and the AS-i module upper part and as junction box. If the module lower part is to be used only for cable branching, a cover is mounted instead of the module upper part (e.g. AS-EP).

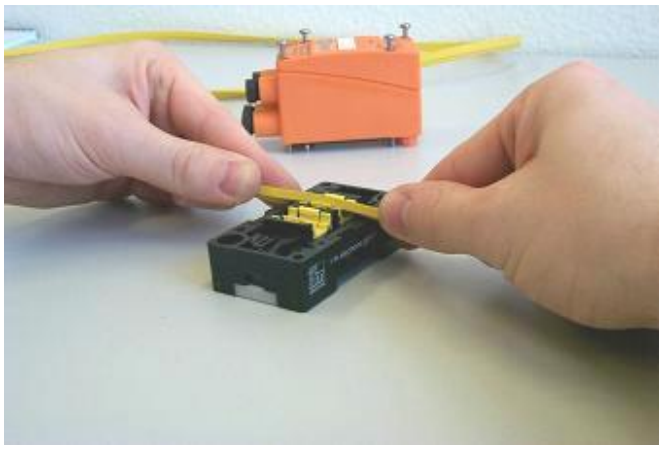

Figure 7.2.3.1: Insertion of the AS-i flat cable in the black AS-i module lower part

Important mounting note: To ensure a good contact in the module lower part the AS-i flat cable is inserted in the module lower part with the profile lug first in a half-round movement. The flat cable back is then pressed into the cradle with your finger. The electrical contact is established by screwing an AS-i module upper part (e.g. AS-EP consisting of 2 orange components) or a cover. When the screws are tightened the flat cable is pressed into the pins.

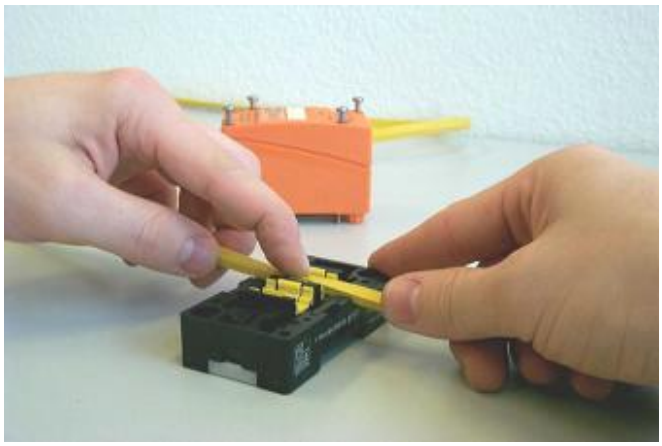

Figure 7.2.3.2: Pressing the AS-i flat cable into the yellow cradle

If after removing the AS-i flat cable a yellow flat cable cradle is to be used a second time for contacting, it has to be brought back to its initial position with a screwdriver.

7.2.4 Connection of input/output modules (e.g. TNC-A2258)

For voltage supply and communication with the AS-i master the terminals A+ and A- of the module must be connected to the corresponding AS-i line (AS-i +, AS-i -). External command contacts must be supplied via the terminal I+ and connected to the corresponding input (I1 to I4). Do not connect any of the terminals I-, I+, I1, I2, I3, I4 to an external potential as they are electrically connected to the AS-i cable. The voltage supply of sensors or mechanical switches must come from the corresponding AS-i module to which they are connected.

The output signals are programmed so that OK signals are given via the NO contacts (e.g. 11/14, 21/24, etc.). Plant sections can thus be switched off easily. Several output signals can be combined per series connection.

For the assignment of the input and output signals see chapter 1.6.

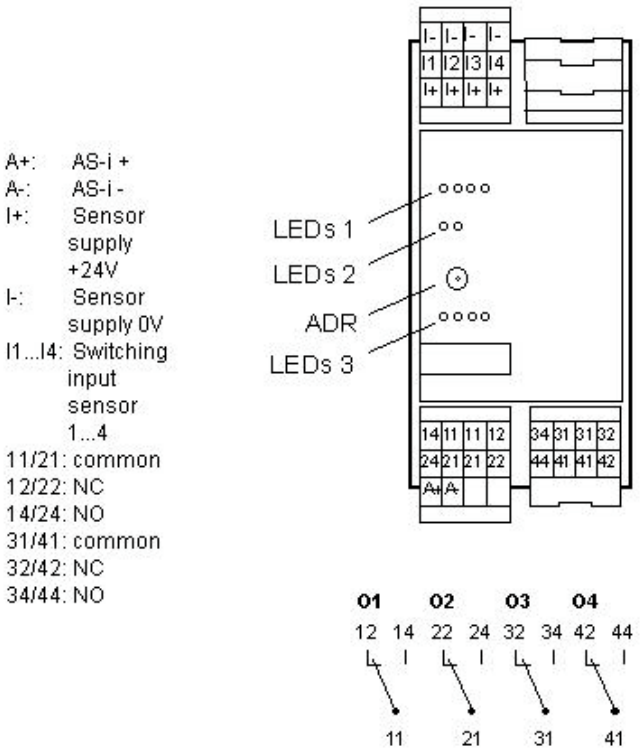

Figure 7.2.4.1: Wiring of input/output modules

7.2.5 Opening of motor-driven fire dampers by assigning commands (jumpers) to the input/output modules

If digital input/output modules are integrated into the AS-i fire damper system, it is *imperative* to take into account the two following points:

- The setting "Control via a relay contact" (see chapter 5, setting options) must always be activated.
- There must be commands for opening (or NOT closing) of the motor-driven fire dampers at the inputs of the input/output modules. Without external commands, the motor-driven fire dampers can NOT be opened. If it is not possible to generate commands from external systems during the first set-up, they can be simulated by means of jumpers.

The assignment of the commands or jumpers for opening the motor-driven fire dampers is described below.

When the slave address 31 (centralised messages and commands) is used:

- Contact I+ to I2
- Contact I+ to I3

When the slave addresses 1...30 (commands and messages for groups) are used:

- Contact I+ to I2

7.3 Addressing of the AS-i slaves / modules

The AS-i slaves can be addressed via the standard menu of the operating and display panel of the AS-i controllerE or via a handheld addressing unit. For reasons of flexibility we recommend a handheld addressing unit. The handheld addressing unit can be connected to the AS-i slaves by means of an addressing plug. It is also possible to directly connect the AS-i slaves (e.g. AS-E or module upper part of the AS-EP) to the addressing unit by insertion. The addressing procedure using the handheld addressing unit is as follows:

1. Read the address (when delivered the address is 0).
2. Set the address to the requested address with the +/- buttons of the unit.
3. Write the address.
4. Read the address again to check it.

Figure 7.3.1: Addressing of an AS-i module via the addressing plug

Figure 7.3.2 Addressing of an AS-i module upper part by direct insertion

7.4 Documentation of the system

Every module which is addressed must be documented in a list with the assigned AS-i address and the ventilation-related designation of the damper or smoke detector connected to the AS-i module. Furthermore the assignment of the inputs with regard to the ventilation-related designation must be documented when using AS-EP (2 fire dampers with 2 mechanical limit switches each) or AS-EP4 (4 fire dampers with 1 mechanical limit switch each). An example of such a list is given below and can also be obtained from TROX GmbH.

The following points must be documented:

- Ventilation-related designation of fire dampers or smoke detectors
- AS-i controllerE no.
- AS-i master no.
- AS-i slave address (AS-i module no.)
- AS-i line
- Type of the AS-i slave (AS-i module)
- Ventilation system
- Mounting location
- Note on mounting

7.5 Linking unused inputs for AS-EP and AS-EP4

If for AS-EP modules only one instead of two fire dampers with two end positions is connected, a jumper must be used for the second channel for the end position OPEN (jumper between terminal I+ and terminal Ix). The input to be selected depends on the switch type (NO/NC contacts). If fire dampers with one end position are connected to AS-EP4 modules, the inputs which are not used for limit switches must be linked (jumper between terminal I+ and terminal Ix).

7.6 Checking of connected slaves

If all slaves are addressed and connected to the AS-i line, the list of the detected slaves (LDS) can be indicated via the standard menu of the AS-i controllerE. The preset and current situation of the AS-i system can thus be easily checked.

The procedure is as follows:

1. Power on the AS-i controllerE.
2. Wait until the AS-i controllerE has completely started up.
3. Is the standard page shown on the display of the AS-i controllerE ("ifm electronic, AS-i controllerE" (standard page, no. 0) or "Exx AS-iX" displayed)?
   If "no" go to point 4, if "yes" go to point 7 -->
4. Is the "ESC" field displayed?
   If "no" go to point 5, if "yes" go to point 6 -->
5. Press the left button and the "↓" button simultaneously for 3 seconds until the "ESC" field is displayed (unlocking of the program lock).
6. Press the "ESC" button (right button) of the AS-i controllerE several times until "ifm electronic, AS-i controllerE" (standard page, no. 0) or "Exx AS-iX" is displayed.
7. If "ifm electronic, controllerE" (standard page, page 0) or "Exx AS-iX" is displayed, press the "MENU" button (left button) of the AS-i controllerE in order to access the internal menu.
8. Select the menu point **Slave lists** using the "↑" and "↓" buttons of the AS-i controllerE and acknowledge with "OK" (left button).
9. Select the requested **AS-i master** using the "↑" and "↓" buttons of the AS-i controllerE and acknowledge with "OK" (left button).
10. Select the menu point "LDS Master x" using the "↑" and "↓" buttons of the AS-i controllerE and acknowledge with "OK" (left button).
11. Existing slaves are indicated by a dot. (S stands for single slaves which occupy a whole address. A/B stands for slaves with A/B capability which share an address.) Further slaves of this AS-i master can be displayed using the "↑" and "↓" buttons.
12. Using the "ESC" button (right button) you return to the main menu.
13. If no button is pressed and if the program is running in the AS-i controllerE (yellow LED PLC RUN lights) you automatically return to the fire damper visualisation after a predefined time.

7.7 Projection adaptation

The projection of the PLC configuration (activated AS-i slaves) must be adapted so that the AS-i masters of the AS-i controllerE detect the slaves connected to the AS-i line and can trigger them via the program. The procedure is as follows:

1. Power on the AS-i controllerE.
2. Wait until the AS-i controllerE has completely started up.
3. Is the standard page shown on the display of the AS-i controllerE ("ifm electronic, AS-i controllerE" (standard page, no. 0) or "Exx AS-iX" displayed)?
   If "no" go to point 4, if "yes" go to point 7 -->
4. Is the "ESC" field displayed?
   If "no" go to point 5, if "yes" go to point 6 -->
5. Press the left button and the "↓" button simultaneously for 3 seconds until the "ESC" field is displayed (unlocking of the program lock).
6. Press the "ESC" button (right button) of the AS-i controllerE several times until "ifm electronic, AS-i controllerE" (standard page, no. 0) or "Exx AS-iX" is displayed.
7. If "ifm electronic, controllerE" (standard page, page 0) or "Exx AS-iX" is displayed, press the "MENU" button (left button) of the AS-i controllerE in order to access the internal menu.
8. Select the menu point **Quick Setup** using the "↑" and "↓" buttons of the AS-i controllerE and acknowledge with "OK" (left button).
9. Select the menu point **Config all** using the "↑" and "↓" buttons of the AS-i controllerE and acknowledge with "OK" (left button).
10. Acknowledge the question on projection adaptation for the AS-i masters 1 and 2 with "OK" and wait for the message **WAIT**.
11. Using the "ESC" button (right button) you return to the main menu.
12. If no button is pressed and if the program is running in the AS-i controllerE (yellow LED PLC RUN lights) you automatically return to the fire damper visualisation after a predefined time.

After a successful projection adaptation via quick setup, no red LED for CONF / PF and no yellow LED for PROJ are allowed to light.

7.8 Start/Stop of the AS-i controllerE program

To activate or deactivate the program described above the following steps must be taken:

1. Power on the AS-i controllerE.
2. Wait until the AS-i controllerE has completely started up.
3. Is the standard page shown on the display of the AS-i controllerE ("ifm electronic, AS-i controllerE" (standard page, no. 0) or "Exx AS-iX" displayed)?
   If "no" go to point 4, if "yes" go to point 7 -->
4. Is the "ESC" field displayed?
   If "no" go to point 5, if "yes" go to point 6 -->
5. Press the left button and the "↓" button simultaneously for 3 seconds until the "ESC" field is displayed (unlocking of the program lock).
6. Press the "ESC" button (right button) of the AS-i controllerE several times until "ifm electronic, AS-i controllerE" (standard page, no. 0) or "Exx AS-iX" is displayed.
7. If "ifm electronic, controllerE" (standard page, page 0) or "Exx AS-iX" is displayed, press the "MENU" button (left button) of the AS-i controllerE in order to access the internal menu.
8. Select the menu point **PLC Setup** using the "↑" and "↓" buttons of the AS-i controllerE and acknowledge with "OK" (left button).
9. Select either **Run** or **Stop** using the "↑" and "↓" buttons of the AS-i controllerE and acknowledge with "OK" (left button).
10. Using the "ESC" button (right button) you return to the main menu.
11. If no button is pressed and if the program is running in the AS-i controllerE (yellow LED PLC RUN lights) you automatically return to the fire damper visualisation after a certain predefined time.

If the yellow LED PLC RUN does not light although the instructions have been carried out correctly, it must be assumed that no program has been loaded to the AS -i controllerE or that it has been deleted manually.

7.9 Settings

For a complete set-up of the system settings must be made. To do so, use the operating and display panel of the AS-i controllerE.
The following settings can be made:

- Module type AS-EP or AS-EP4 (1 or 2 limit switches per fire damper)
- Contact assignment of AS-EP/AS-EP4 as NC or NO contacts
- Text selection for AS-EP4: CLOSED, NOT CLOSED or NOT OPEN, OPEN
- Sequential interlocking ON/OFF
- Control via a relay contact ON/OFF
- Maintenance run 1, close or open again the fire damper in case of an error
- Maintenance run 2, maintain all dampers one after the other or simultaneously
- Manual operation ON/OFF
- Activate/deactivate smoke detector

For further general details concerning the functionalities assigned to the settings see chapter 5 of this manual.
For further details concerning settings via the UserMenu (operating and display panel of the AS-i controllerE) please refer to section 6.10 of this manual.

7.10 Setting the network address

If AS-i controllerE devices are used in a Profibus DP network, every AS-i controllerE must be assigned a network address. Every network address is allowed only once. Addresses from "003" to "126" can be set. For Profibus DP PLC masters the addresses "001" and "002" are reserved for the master and the network.

The procedure for setting the network address is as follows:

1. Power on the AS-i controllerE.
2. Wait until the AS-i controllerE has completely started up.
3. Is the standard page shown on the display of the AS-i controllerE ("ifm electronic, AS-i controllerE" (standard page, no. 0) or "Exx AS-iX" displayed)? If "no" go to point 4, if "yes" go to point 7 -->
4. Is the "ESC" field displayed?
5. If "no" go to point 5, if "yes" go to point 6 -->
6. Press the left button and the "↓" button simultaneously for 3 seconds until the "ESC" field is displayed (unlocking of the program lock).
7. Press the "ESC" button (right button) of the AS-i controllerE several times until "ifm electronic, AS-i controllerE" (standard page, no. 0) or "Exx AS-iX" is displayed.
8. If "ifm electronic, controllerE" (standard page, page 0) or "Exx AS-iX" is displayed, press the "MENU" button (left button) of the AS-i controllerE in order to access the internal menu.
9. Select the menu point **Fieldbus Setup** using the "↑" and "↓" buttons of the AS - i controllerE and acknowledge with "OK" (left button).
10. Select the address using the "↑" and "↓" buttons of the AS-i controllerE and acknowledge with "OK" (left button).
11. Using the "ESC" button (right button) you return to the main menu.
12. If no button is pressed and if the program is running in the AS-i controllerE (yellow LED PLC RUN lights) you automatically return to the fire damper visualisation after a predefined time.

The network address can also be assigned via the Profibus DP master system.

7.11 Network cable

The network cable for networking the AS-i controllerE devices via Profibus DP with a Profibus DP master system must be a Profibus DP cable which complies with the Profibus standard, e.g. concerning the wave resistance. ON NO ACCOUNT must for example a screened telephone cable be used. The cable type LEONI "L45467-G16-C145“ for example can be used. Suitable network plugs are Phoenix Contact, "Subcon-Plus-Profib/SC art.: 27 44 584" (plugs with terminating resistors that can be activated and 2 cable entries).

7.12 Structure of a Profibus DP network

The network cable for Profibus DP systems must be "passed through" from participant to participant (AS-i controllerE or Profibus DP master system). Spurs are NOT allowed! Laying the network cable via terminals other than the integrated terminal is NOT allowed either! The Profibus DP master system can be positioned at any point in the network.

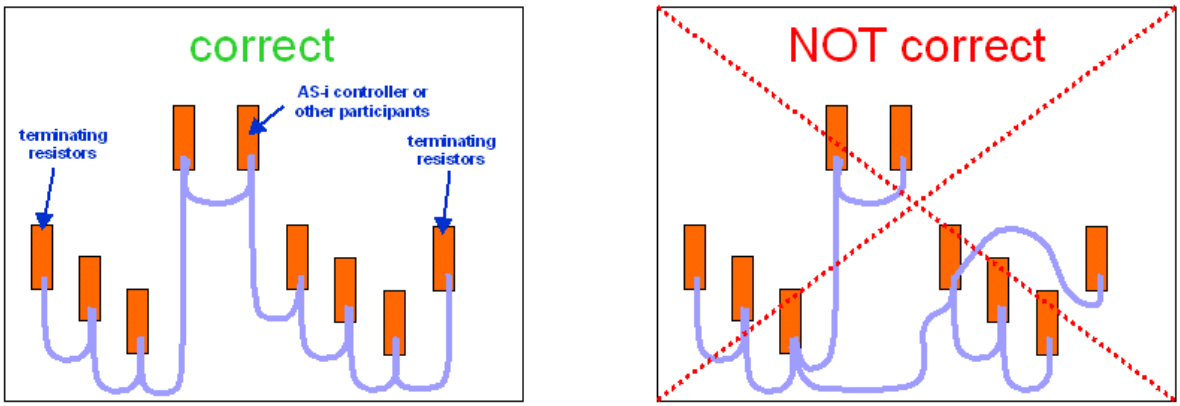

Figure 7.12.1: Structure of a Profibus DP network system

7.12.1 PIN connection

The pins A and B of the AS-i controllerE interfaces or the pins A and B of the Profibus DP master system must be passed through from participant to participant via the network plugs.

7.12.2 Terminating resistors

Terminating resistors must be activated via a slide switch at the beginning and end of the network cable.

7.12.3 Screen of the network cable

The screen of the network cable should be connected to all network participants.

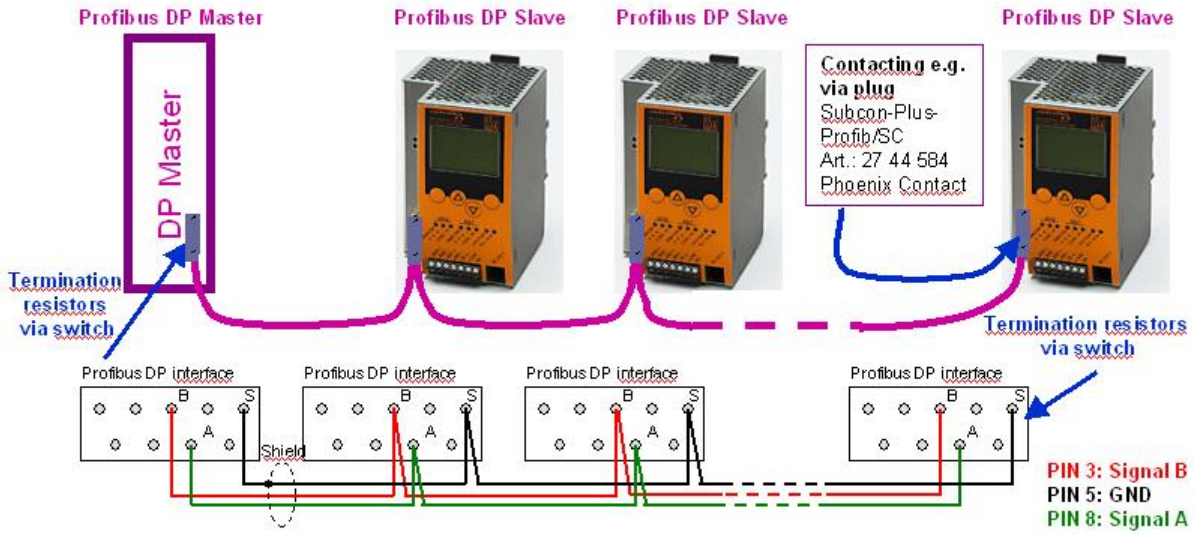

Figure 7.12.3.1: Structure of a Profibus DP network system

7.13 Set-up of the DP slave via the GSD file in the DP master

To ensure that the Profibus DP master system detects the AS-i controllerE devices as Profibus DP slaves they must be set up in the master system via a so-called GSD file. The procedure is as follows:

Via the GSD file "ifm_04D8.GSD“ the AS-i controllerE is set up as a slave in the Profibus DP master. To do so, the following fields must be transferred from the "ID list" in the Profibus configuration ("current configuration") if only the data used by the AS-i controllerE program is read or written via the Profibus DP master.

Configuration details:

Field 1:	No (A)Slaves AS-i Master 1
Field 2:	No (A)Slaves AS-i Master 2
Field 3:	No B-Slaves AS-i Master 1
Field 4:	No B-Slaves AS-i Master 2
Field 5:	No AS-i Analog MUX IN
Field 6:	No AS-i Analog MUX OUT
Field 7:	No AS-i command channel
Field 8:	32-word PLC IN for AS-i controllerE with 1 AS-i master ***or***
	64-word PLC IN for AS-i controllerE with 2 AS-i masters ***or***
Field 9:	32-word PLC IN for AS-i controllerE with 1 AS-i master ***or***
	64-word PLC IN for AS-i controllerE with 2 AS-i masters ***or***
Field 10:	No Analog IN
Field 11:	No Analog OUT

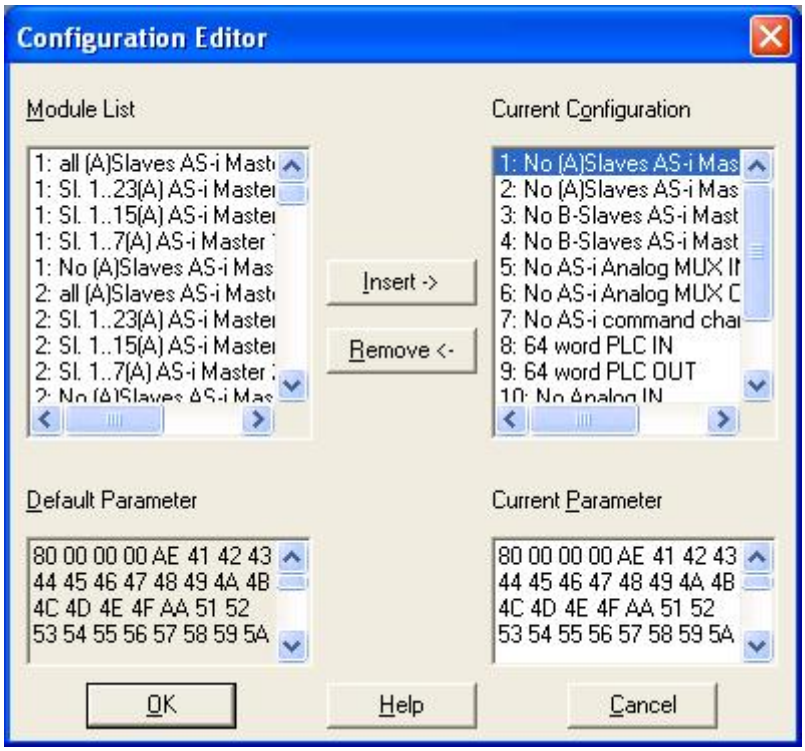

Figure 7.13.1: Profibus DP master configuration window with GSD data

7.14 Settings

For a complete set-up of the system settings must be made. To do so, use the Profibus DP master system. For the settings also see section 7.9.

8 Functional test

Once all of the steps described above have been completed it is necessary for the user/commissioning engineer to perform a functional test of the system.

The user/commissioning engineer is personally responsible for the safe and reliable functioning of the whole system.

Please ensure you have read and observe the important note given at the end of this manual.

General notes

The TroxNetCom Basic-User-Software user manuals are detailed training manuals and may be used as operating instructions.
Technical support and instruction by telephone for the TroxNetCom Basic-User-Software is therefore not provided free of charge.

We reserve the right to make technical alterations without prior notice!

No manual can be entirely free of errors.
Some mistakes may have been overlooked despite repeated proof reading. We therefore welcome your comments concerning any errors you may notice in these manuals.

Important note

The software purchased with this system may only be used in combination with the TroxNetCom system.

Any other use, especially in combination with products of other manufacturers is not allowed and results in a loss of all warranty claims.

Every user has to ensure by qualified personnel that the required safe functionality of the system according to the operating instructions is guaranteed.

Only qualified companies expressly authorised by TROX GmbH are allowed to make the required software adaptation.

Reproduction with and without changes of the program as well as the documentation is not allowed and will be prosecuted.

May 2006

TROX GmbH

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