Lindab **Fire Damper Steering System**

User manual

Version 1.2 - August 2018

Lindab®

Content

Click on the text or the page to go to the related section of the manual.

1. Description of the system

The Fire Damper System (FDS) allows to feed, monitor and test up to 60 fire dampers. Smoke detectors can be connected and monitored, as well. The system is designed to feed only 24V fire dampers.

The system is composed of:

FDS-M	FDS-S	FDS-P	FDS-R	FDS-RB	FDS-DD	FDS-CD	WH	WK
Master unit	Slave unit	Power supply	Signal repeater	Relay module	Smoke detectors		Fire dampers	

230 V
Communication (2 input)
24 V (2 input)
Communication + 24 V (4 input)

FDS-M
Master unit

4 fire dampers
4 smoke detectors
can be connected locally
to the master unit.

1 FDS-P
10 FDS-S
10 WH/WK
10 FDS-CD/DD

If the communication cable is more than 300 m, a signal repeater, FDS-R, is required This is also required if the number of FDS-S exceeds 30.

FDS-R
Signal repeater
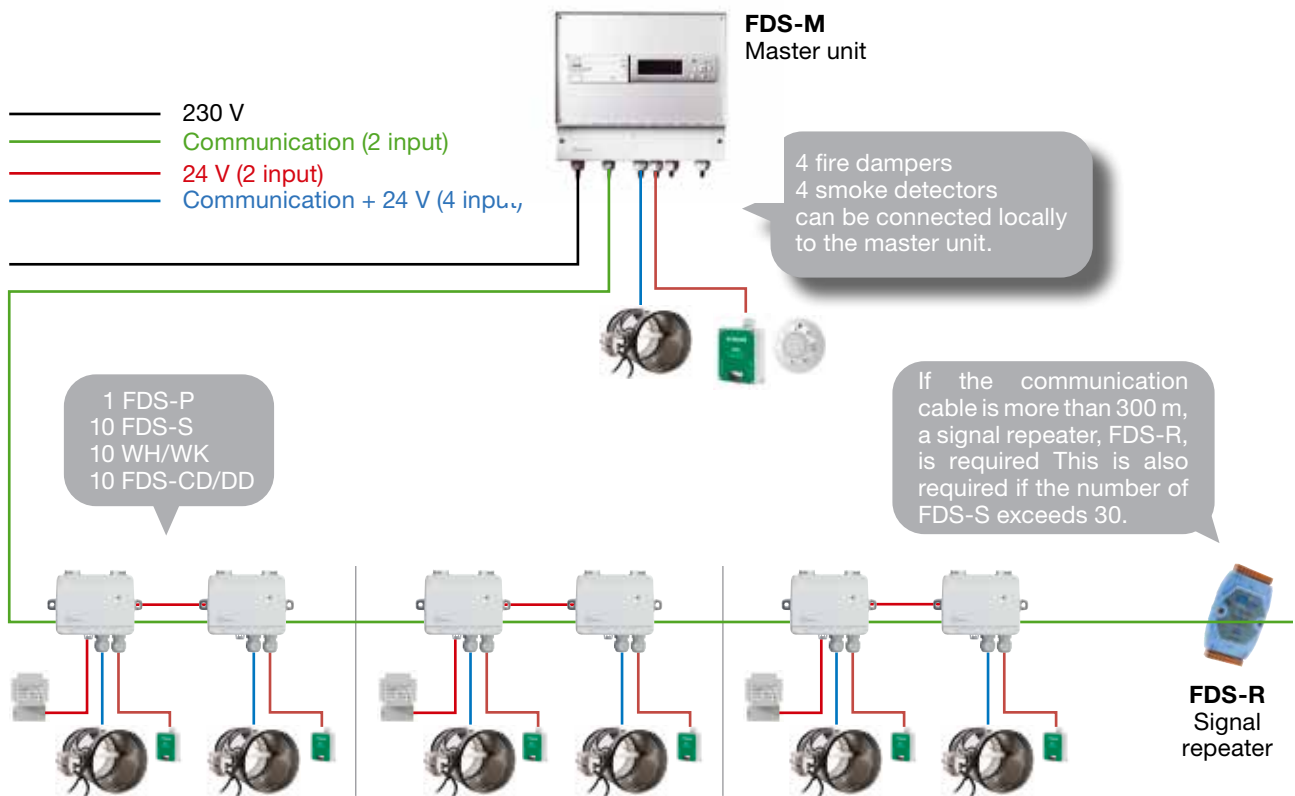
Fig. 1. FDS - Operating diagram

2. Components

For more details about each component, click on the image and see related catalogue page.

FDS-M Master unit	FDS-S Slave unit	FDS-P Power supply for FDS-S	FDS-R Signal repeater
It's the main unit (master unit) of the system. It can communicate with up to a total of 60 fire dampers and 60 smoke detectors. Four fire dampers and four smoke detectors can be connected directly (locally) to FDS-M.	This is the "slave unit" that would be needed if you have more than four dampers. It can provide one fire damper and one smoke detector	The Power Supply unit is required when you use slave units, it can provide 10 FDS-S. Depending on cable and lenght.	It is required if more than 30 slave dampers are connected to the system or if the communication cable is longer than 300 m.

FDS-RB Relay module	WH/WK Fire dampers	FDS-DD/FDS-CD Smoke detectors
Relay module used for: - Connect "Stop AHU" signal - Conect External alarms See installation guides within the FDS manual.	Circular and rectangular fire dampers equipped with 24V actuators	Optical smoke detectors for mounting in all types of premises. FDS-CD: ceiling smoke detector FDS-DD: duct smoke detector

2.1 FDS-M Master unit

FDS-M master unit is a pre-programmed controller with internal display. The display is backlit and the menus are easy accessible and controlled by pushbuttons on the front together with two LED indicators for alarm and write indication.
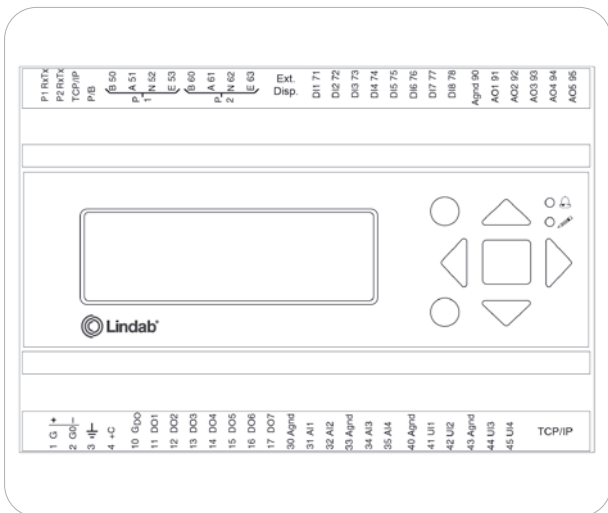
Fig. 2. Master unit FDS-M
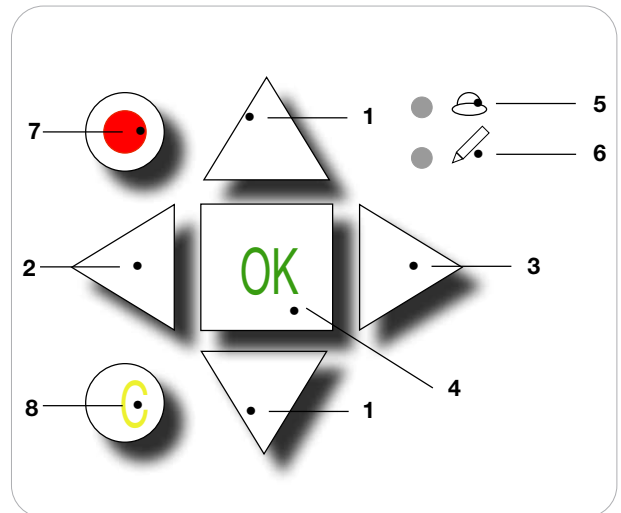
1. Up/Down buttons: allows to navigate through menus

2. "Back" button: takes back to the previous page

3. "Enter" button: enter menu page

4. OK button: allows to change value

5. Red alarm LED blinks in case of alarm

6. Yellow write LED blinks when values can be changed on current page

7. Red button: Takes to the alarm acknowledgment page

8. C button: exit value editing

The PCB at the bottom of the unit allows to easily wire components with no need to open the FDS-M box.
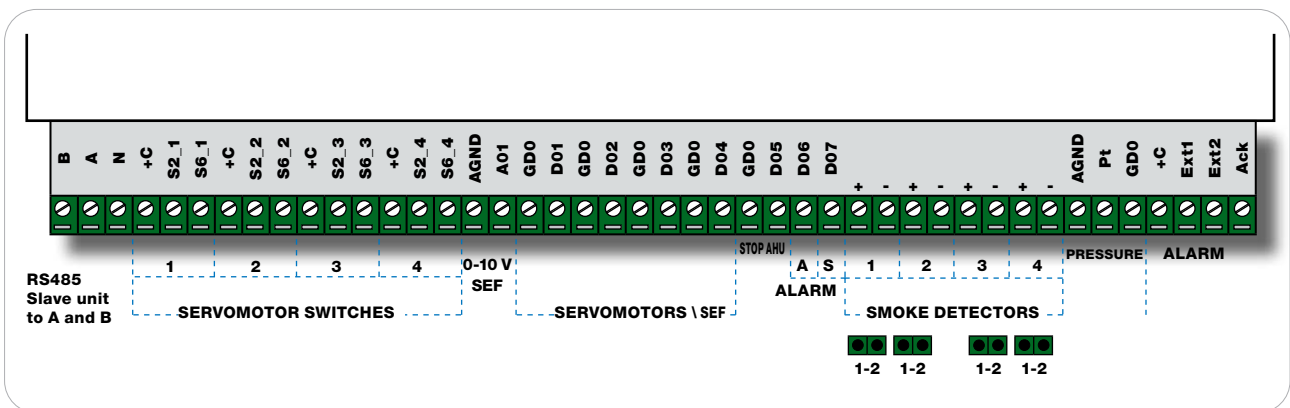
Fig. 3. PCB about FDS-M

2.2 FDS-S Slave unit

FDS-S slave unit is a module controlled by hidden pushbuttons together with one LED.

1. � **Steady green:** unit is addressed and working. No alarm reported.

2. ▮ **Steady orange:** service alarm (communication or dirty smoke detector)

3. ▮ **Steady red:** A (fire) alarm

Fig. 4. Slave unit

The internal PCB allows to connect one fire damper power supply, two position switches and one smoke detector. The external quick connector allows to easily link power and communication of slave units together.
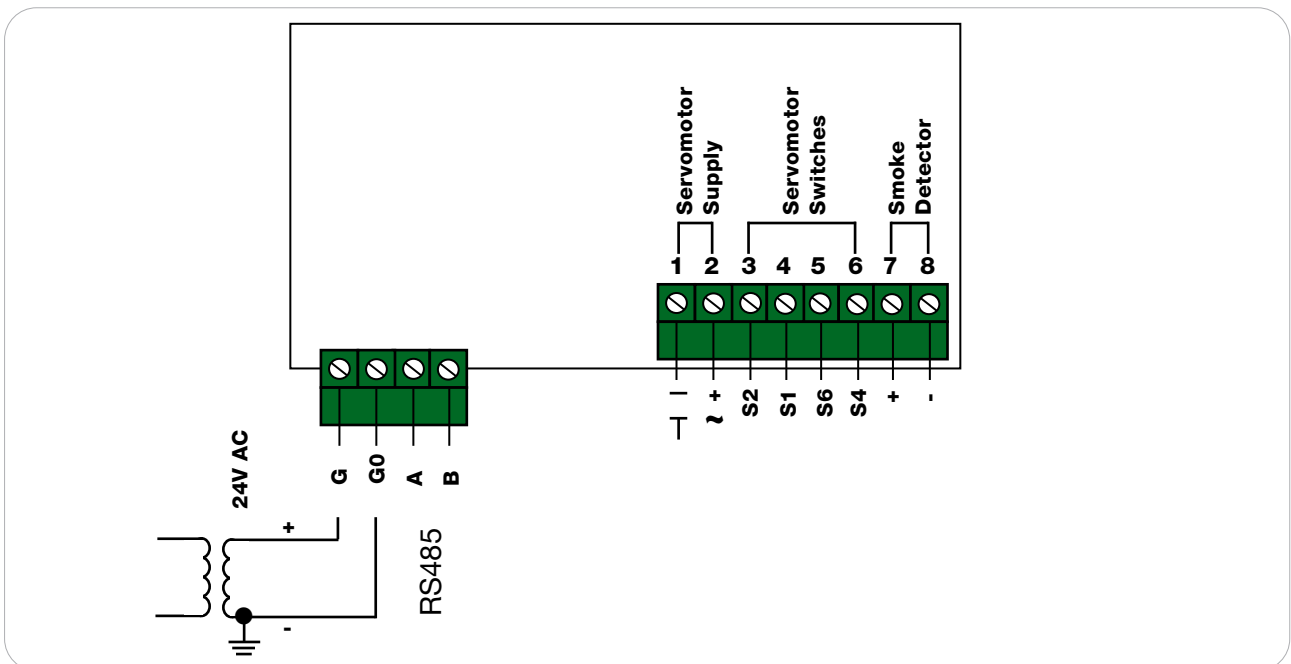
Fig. 5. Internal PCB about FDS-S

3.1 Power supply to master unit

Provide 230 V power supply to master unit.

L N ⏚
230V AC
Fuse 6,3A

FDS-M   L   N   G
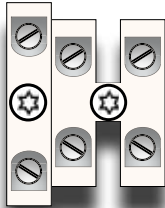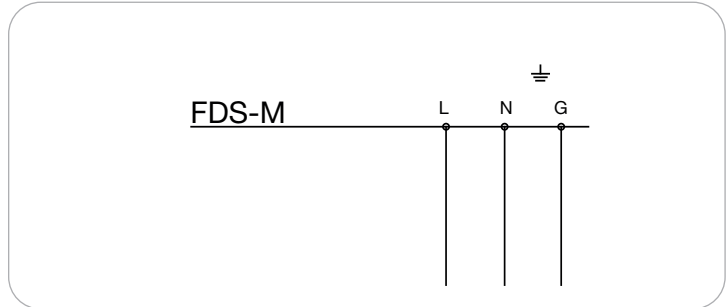
3.2 Connect local fire dampers (up to 4)

Connect local fire dampers power supply and position switches to master unit.
Maximum 4 fire dampers could be connected directly to the master unit (FDS-M).

Fire damper's cables

Supply 24V

Switches

Attention!

Color cables could change depending on motor version. Numbering cables (1-2 for supply 24V, 1 to 6 for switches) stays the same on all motor versions.

FDS-M   +C   S2_1   S6_1   +C   S2_2   S6_2

Fire damper 1
S1   S4   S2   S6

Fire damper 2
S1   S4   S2   S6

+C | S2_1 | S6_1 | +C | S2_2 | S6_2 | +C | S2_3 | S6_3 | +C | S2_4 | S6_4

1   2   3   4

SERVOMOTOR SWITCHES

FDS-M   GD0   D01   GD0   D02   GD0   D03

Fire damper 1
1   2

Fire damper 2
1   2

GD0 | D01 | GD0 | D02 | GD0 | D03 | GD0 | D04

SERVOMOTORS \ SEF
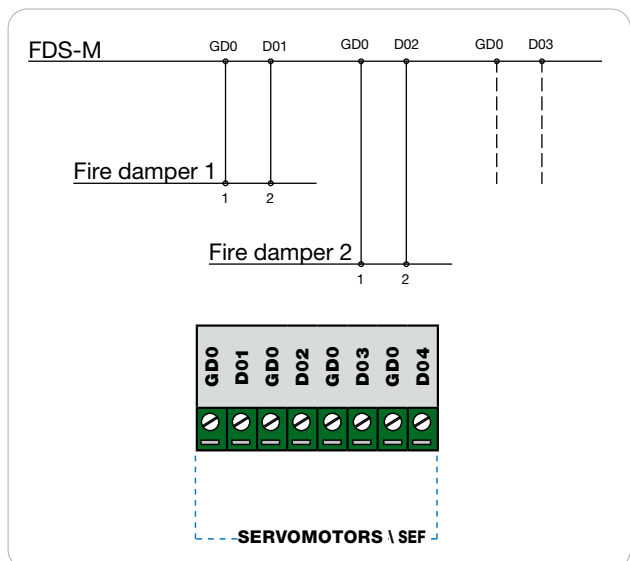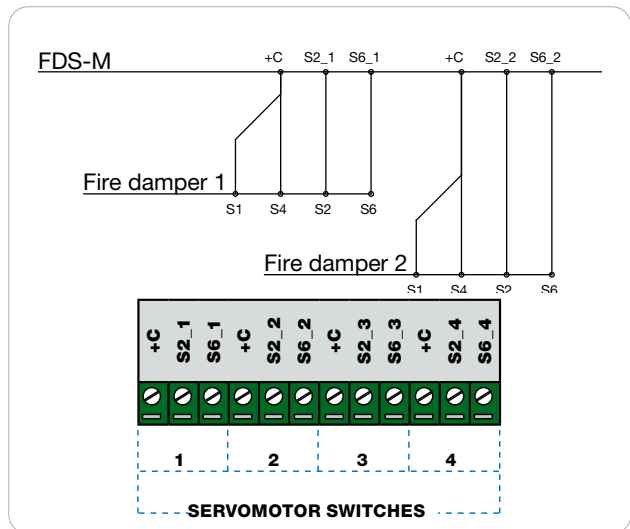
3.3 Connect local smoke detectors (up to 4)

Connect local smoke detectors to master unit.
Maximum 4 smoke detectors could be connected directly to the master unit (FDS-M).

Ceiling smoke detector

FDS-M

2,2 kΩ

Smoke detector

L1in   L2   L1out

Duct smoke detector

FDS-M

2,2 kΩ

Smoke detector

1   2   3   4   5

+ - + - + - + -

1   2   3   4

SMOKE DETECTORS

1-2   1-2   1-2   1-2
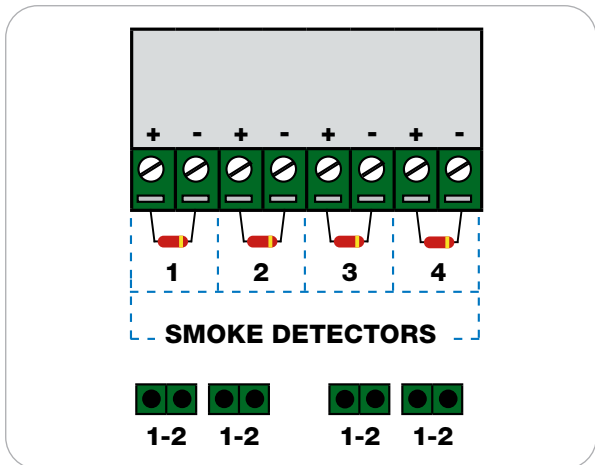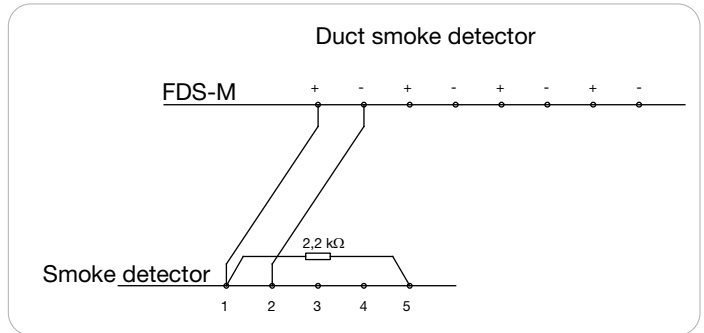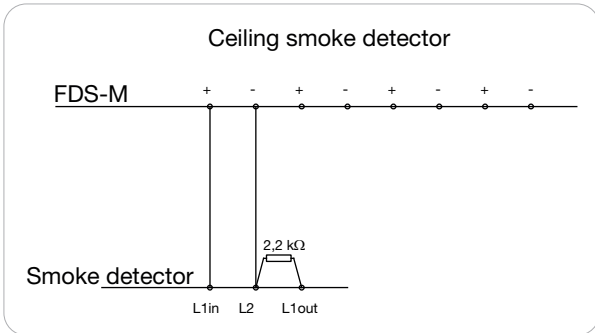
The FDS-M switchboard have four 2.2 kΩ resistors on each smoke detector connection.
Remove the resistor if you add a smoke detector and move the resistor to smoke detector.
The resistor is still required, see image 2 and 3.

2

FDS-CD

3

FDS-DD
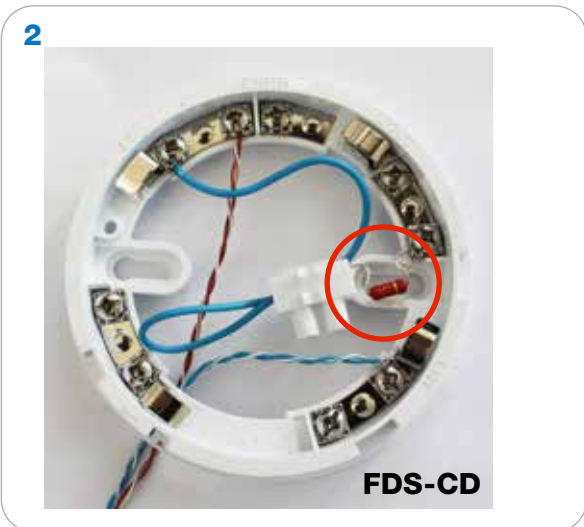
4. Installation with slave unit

If in the system there are slave unit (FDS-S) the first slave must be supplied with power supply unit (FDS-P).

4.1 Connect slave unit to master unit and first power supply

- Provide 230 V power supply to FDS-M as described in point 3.1 p. 7
- Provide 230 V power supply to transformer FDS-P
- Supply power to the first slave unit through G0 and G pins
- Connect the signal from master unit FDS-M to A and B pins
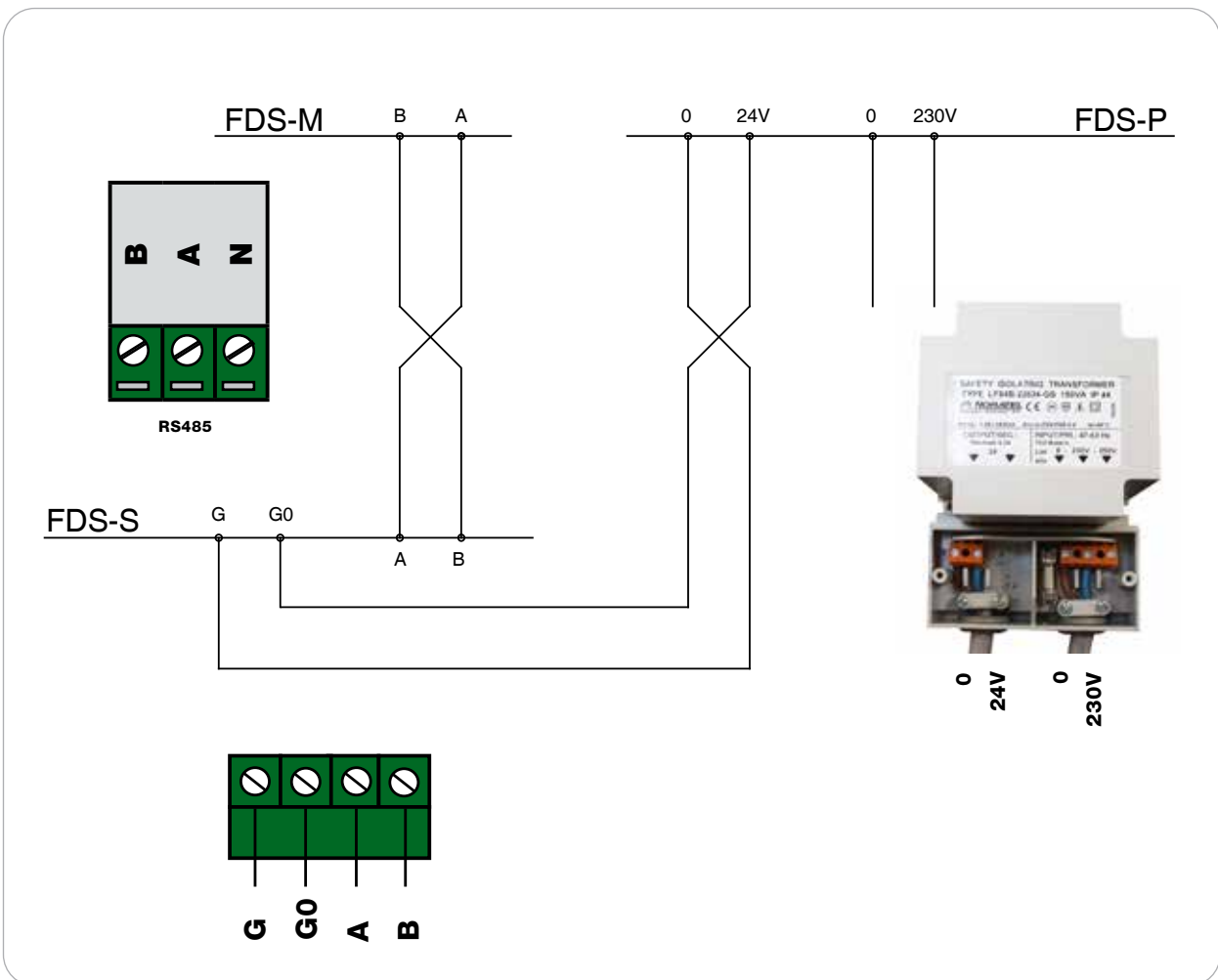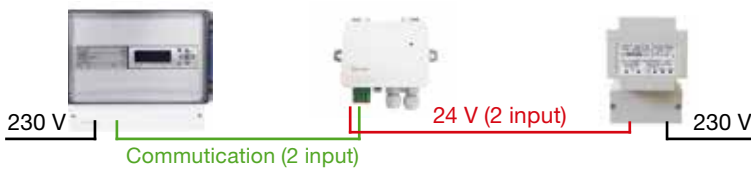
4.2 Connect fire damper to slave unit

One fire damper per slave unit is allowed.
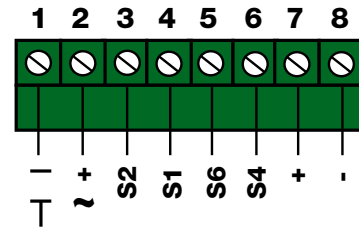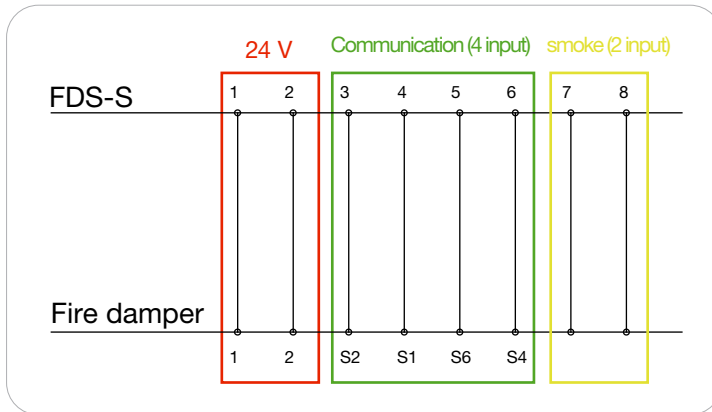
4.3 Connect smoke detector to slave unit

One smoke detector per slave unit is allowed.

Ceiling smoke detector

FDS-S 1 2 3 4 5 6 7 8

2,2 kΩ

Smoke detector

L1in   L2   L1out

Duct smoke detector

FDS-S 1 2 3 4 5 6 7 8

2,2 kΩ

Smoke detector

1   2   3   4   5

1

1	2	3	4	5	6	7	8

⊥   ~+   S2   S1   S6   S4   +   -
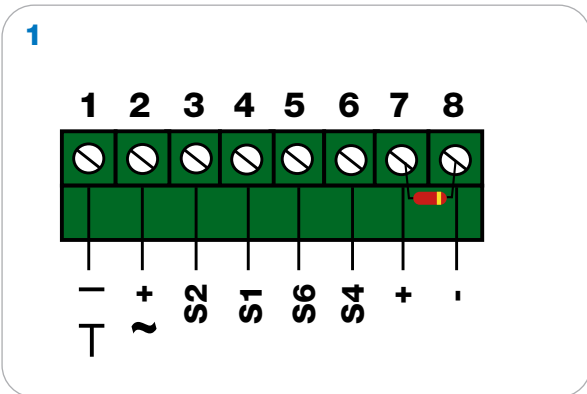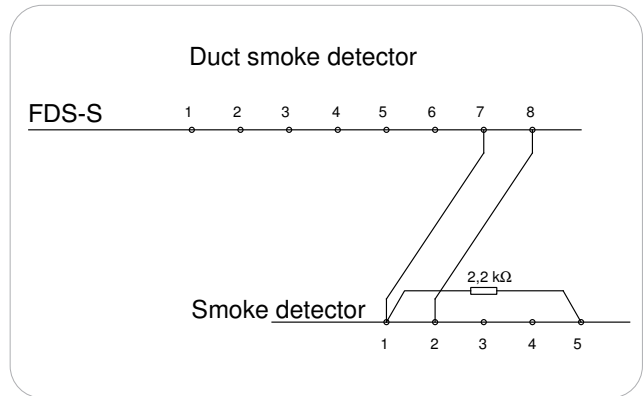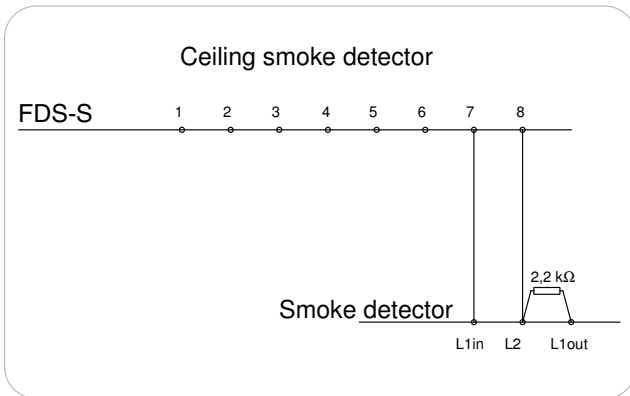
The FDS-S have one 2.2 kΩ resistors.

Remove the resistor if you add a smoke detector and move the resistor to smoke detector, see image 2 and 3.

2

FDS-CD

3

FDS-DD
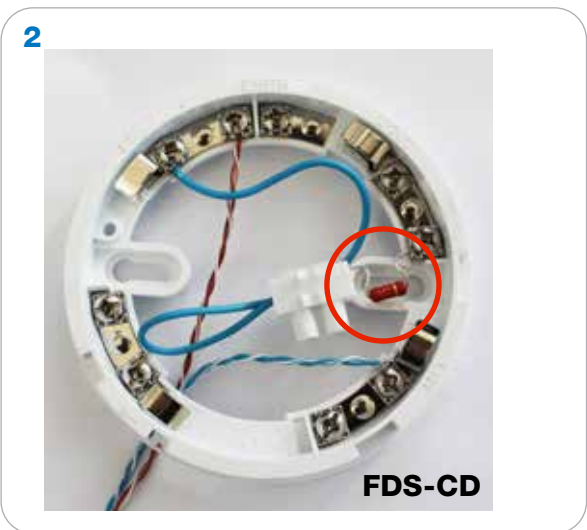
4.4 Connect slave unit to slave unit

230 V

Commutication (2 input)

24 V (2 input)

230 V
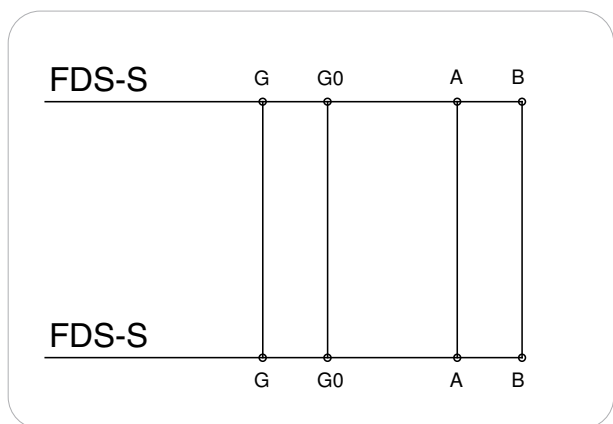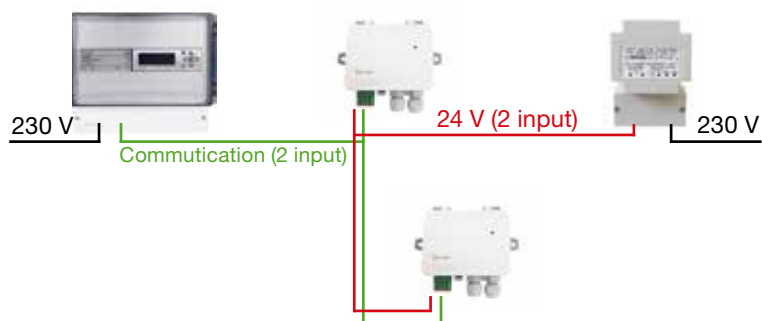
NOTE
For RS485 connection (A and B), it is recommended to use RS485 standard cable, **2-wire shielded twisted pair**. Please see next page for cable cross section suggestion. Installer should always verify according to actual installation environment.

ATTENTION!
The 2-wire shielded twisted pair RS485 cable needs to be connected to G0 in FDS-S every first slave after the transformer as displayed in below wired scheme.
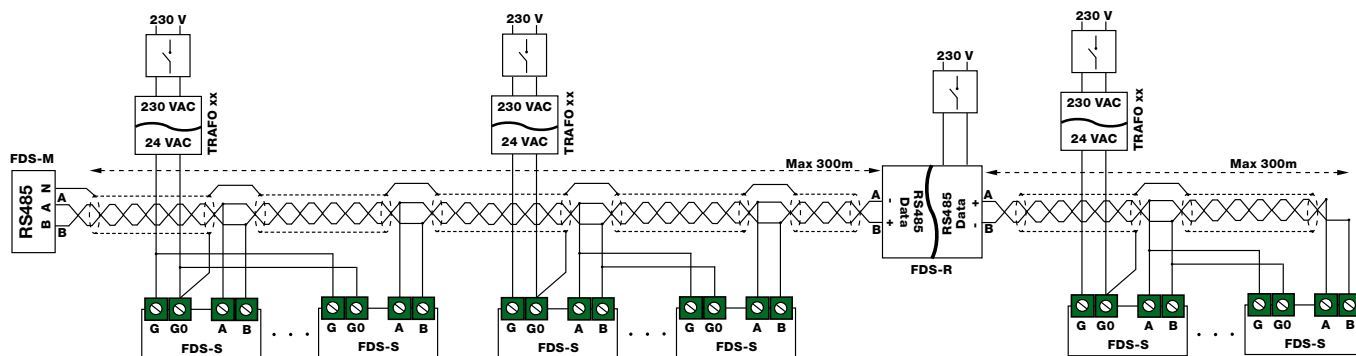
Supply cable sizing

The wire size of the supply cable can be determined by calculating the resistance pr meter R.
The calculation presupposes that a voltage drop of e.g. 2V is accepted in the supply cable:

R(per m) = U$_{drop}$ / (I * L) [Ω/m]

where: **U$_{drop}$** is the accepted voltage drop (2V) in the cable [V]
                        I is the current [A]
                        L is the longest distance of supply cables from transformer to a component [m]

Example:
U$_{drop}$ = 2V, I = 4A, L = 20m
R (per m) = 2V / (4A * 20m) = **0,025 Ω/m**
In the diagram a Wire cross section Area of 0,7 mm^2 can be read.

Wire cross section area as a function of resistance per m for copper wire
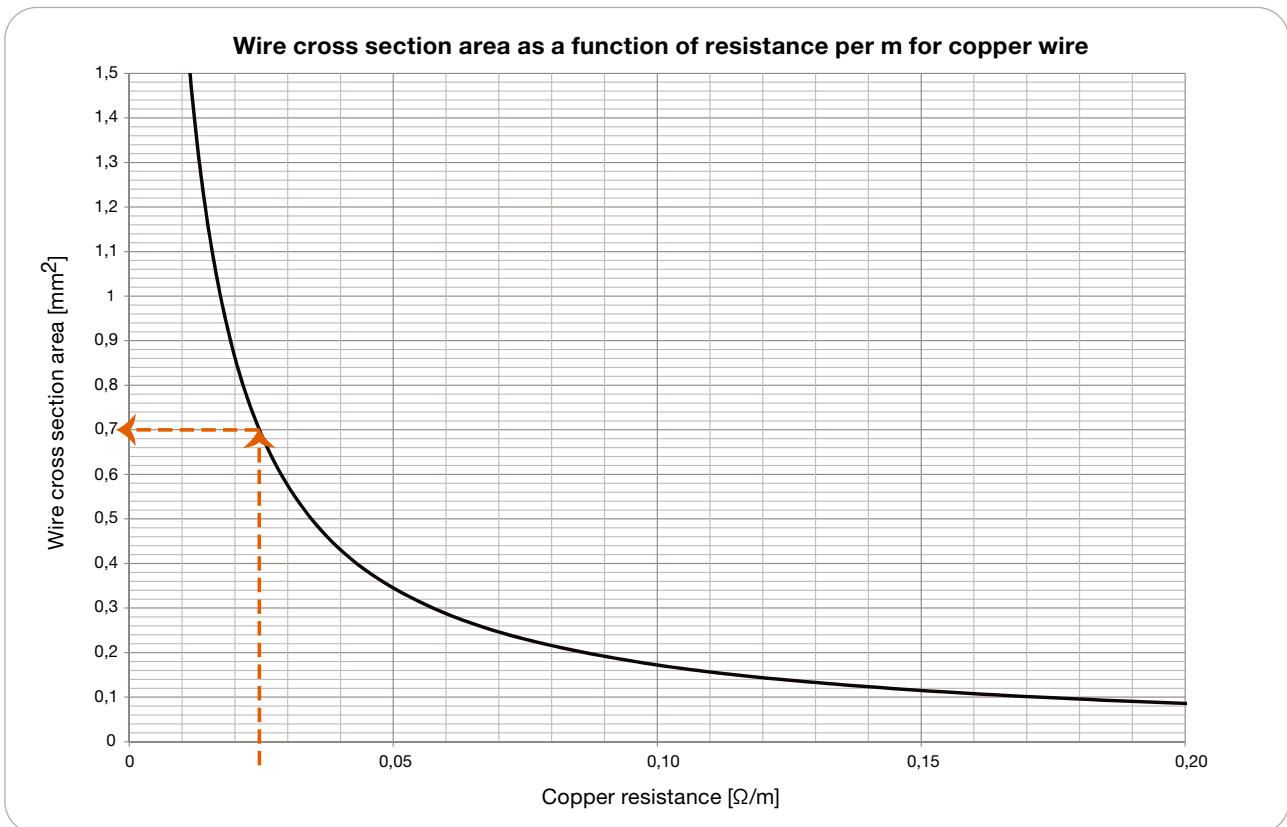
4.5 Connect signal repeater to slave unit

Connect signal repeater (FDS-R)

230 V

Commutication (2 input)

24 V (2 input)

230 V

230 V

230 V

no.30 FDS-S

FDS-S	G	G0	B	A		FDS-S	G	G0	B	A

FDS-R										
	L	N	DATA0+	DATA0-					DATA1+	DATA1-

FDS-S G G0 B A

FDS-S G G0 B A

Data+ Data-

Output DC 24V 0,5A

Data+

Data-

Input AC 100-240V

230V

Data+ Data-

V+ GND
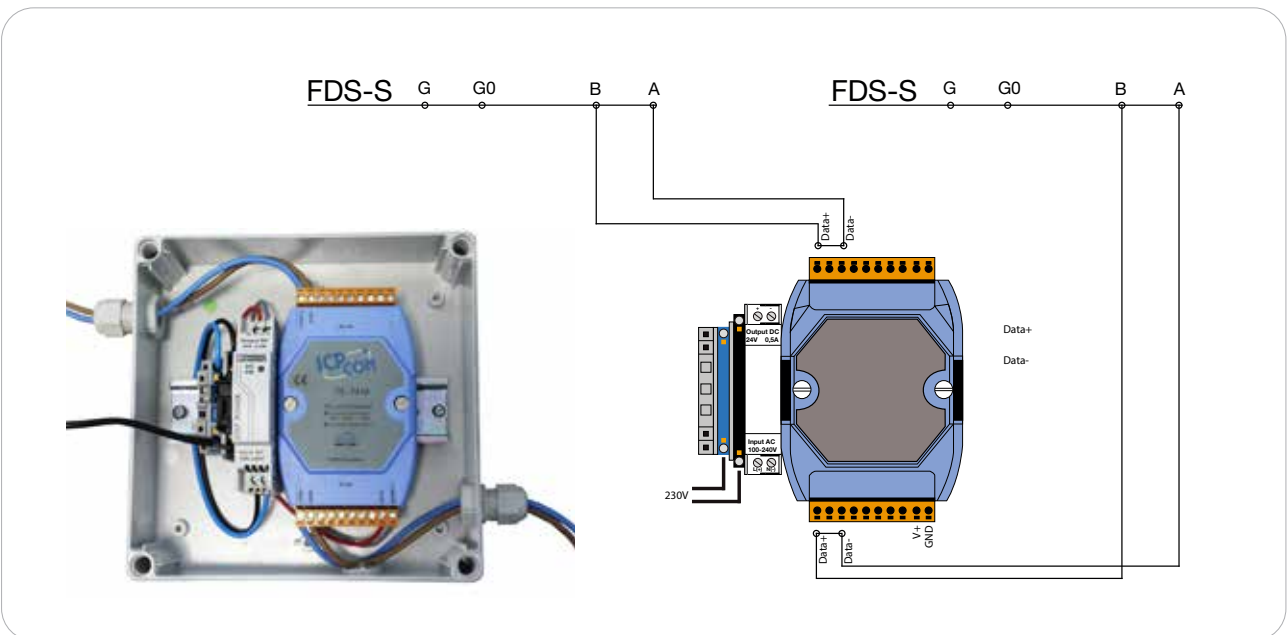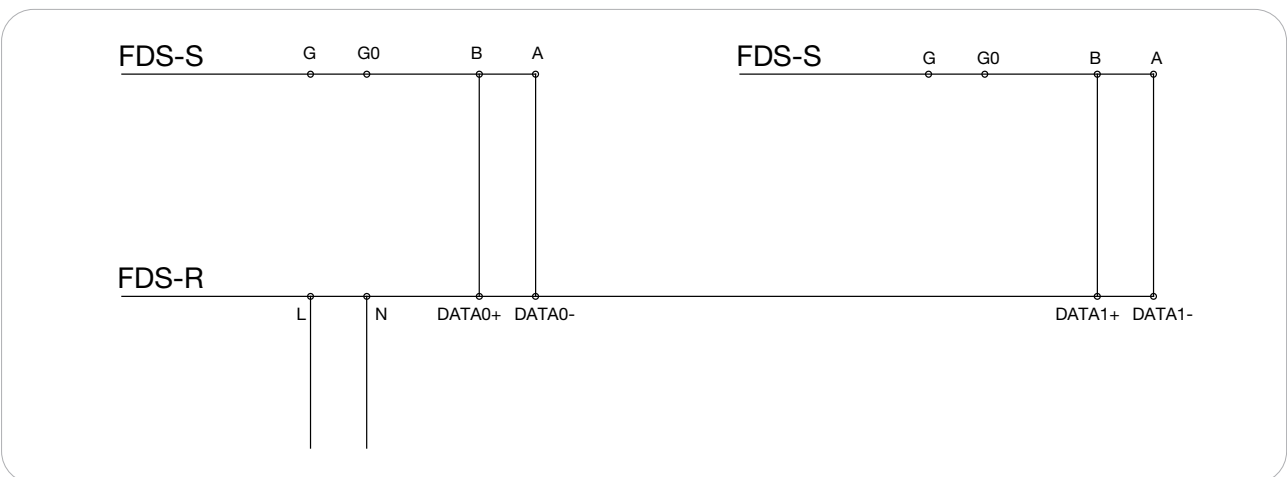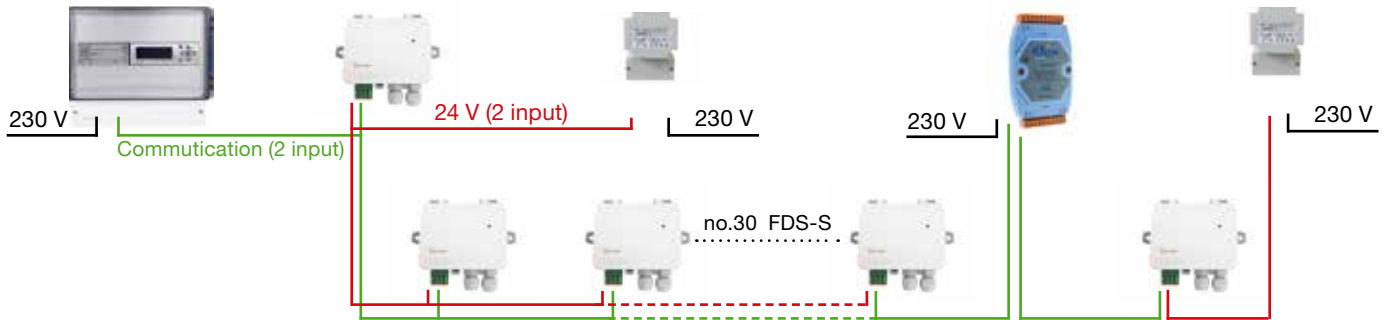
5. External signals

5.1 External incoming alarms

The master unit FDS-M can receive no.2 external alarms (Standard NO contact, possible to change to NC in FDS-M configuration). These alarms can be remotely acknowledged as well.
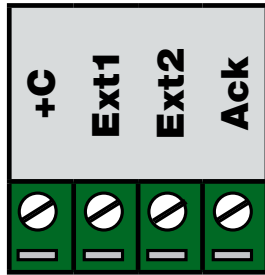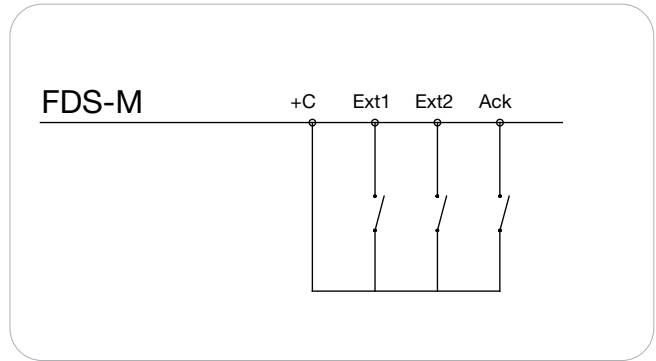
5.2 External outgoing alarms

The master unit FDS-M can send no.2 external alarms, a fire alarm (A) and a service alarm (S), through 24V driven relays (relay module FDS-RB, NC contact).

12 Control input relay I
13 Control input relay II
14 Control input relay III
20 Control input common 24 V AC
30 Control input 24 V AC
31 Output relay I
32 Output relay II
33 Output relay III
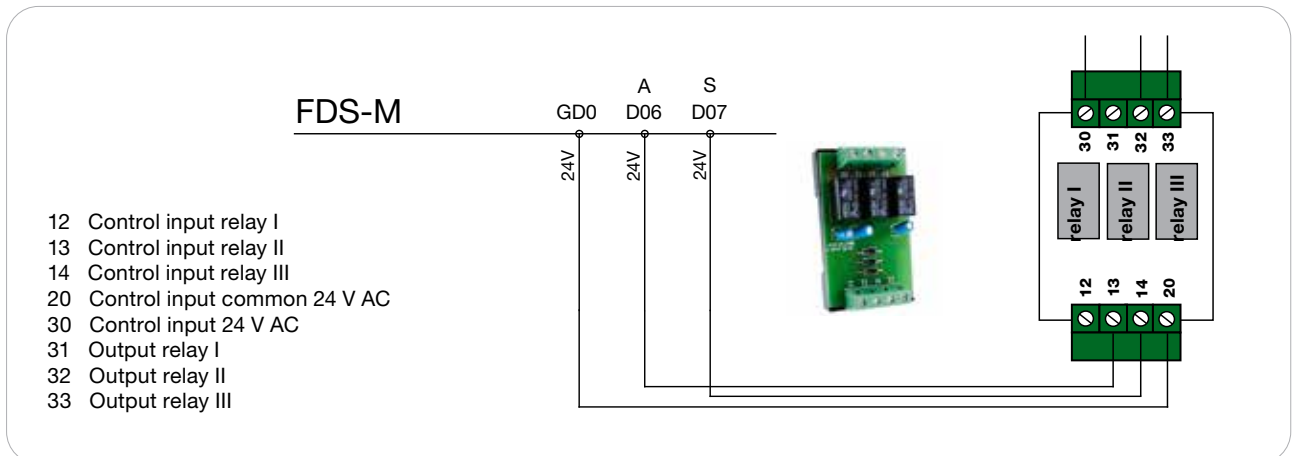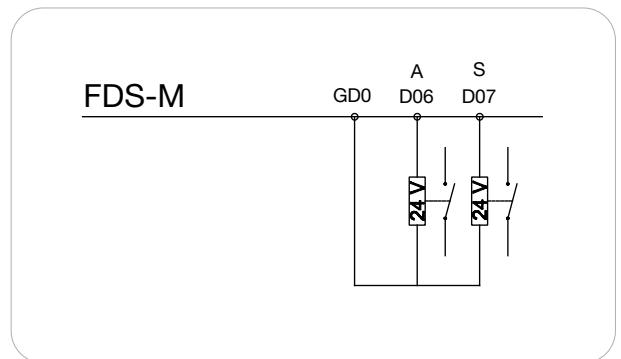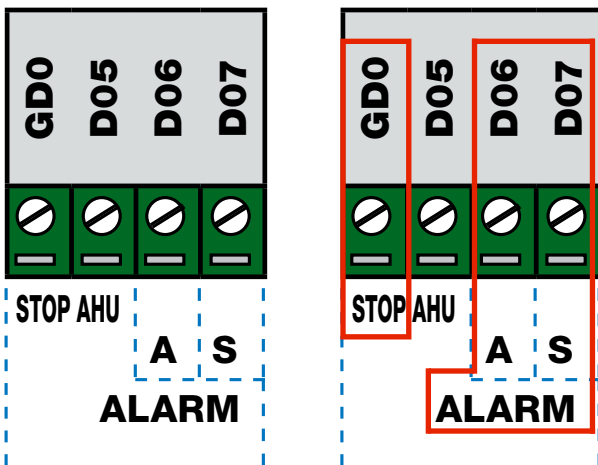
5.3 Connect "Stop AHU" signal

The master unit can stop an AHU through a 24 V driven relay (relay module FDS-RB).
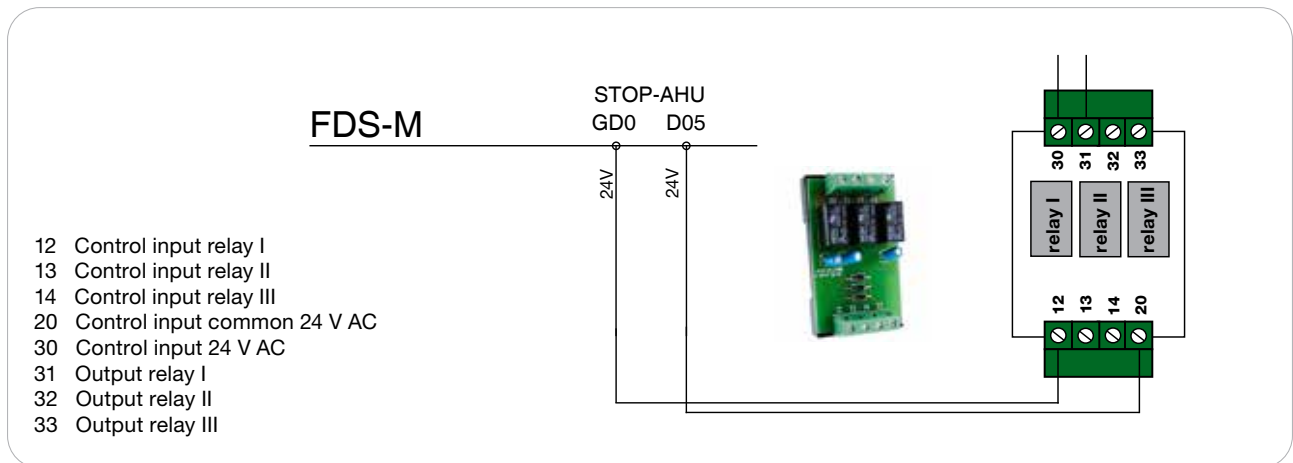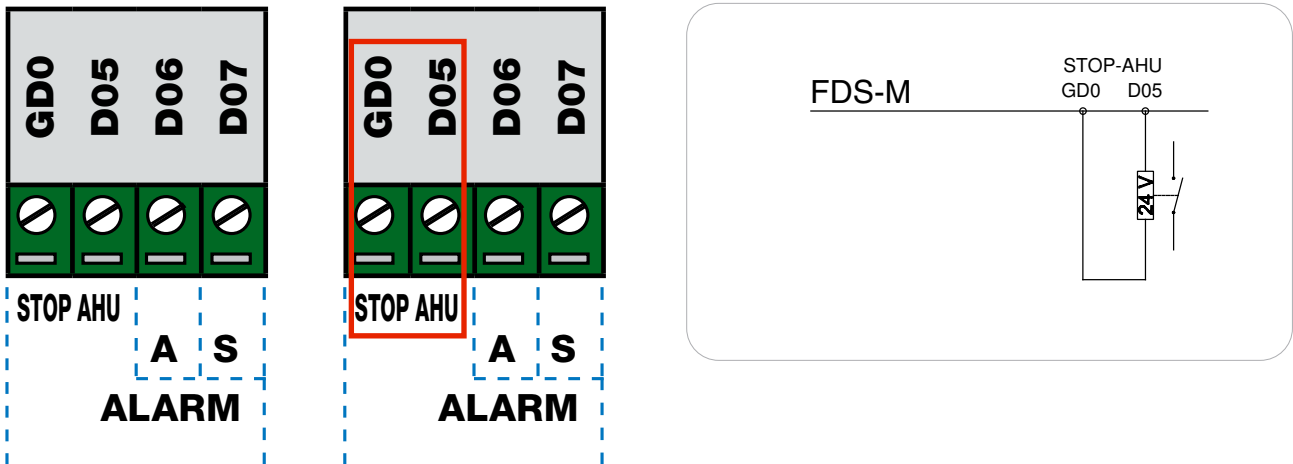
5.4 Configuration example

If you have...	you need...	
No. 14 fire dampers: - 3 dampers connect directly to FDS-M - 11 connect with slave units FDS-S + AHU connection	FDS-M....... FDS-S....... FDS-P....... FDS-R....... FDS-RB.......	1 11 2 0 1
No. 36 fire dampers: - 2 dampers connect directly to FDS-M - 34 connect with slave units FDS-S + AHU connection + External outgoing fire alarm	FDS-M....... FDS-S....... FDS-P....... FDS-R....... FDS-RB......	1 34 4 1 1 *if the logic (NO or NC) is the same for both connections (AHU and external outgoing alarm)* 2 *if the logic (NO or NC) is different between connections (AHU and external outgoing alarm)*

6. Configuration

Display buttons
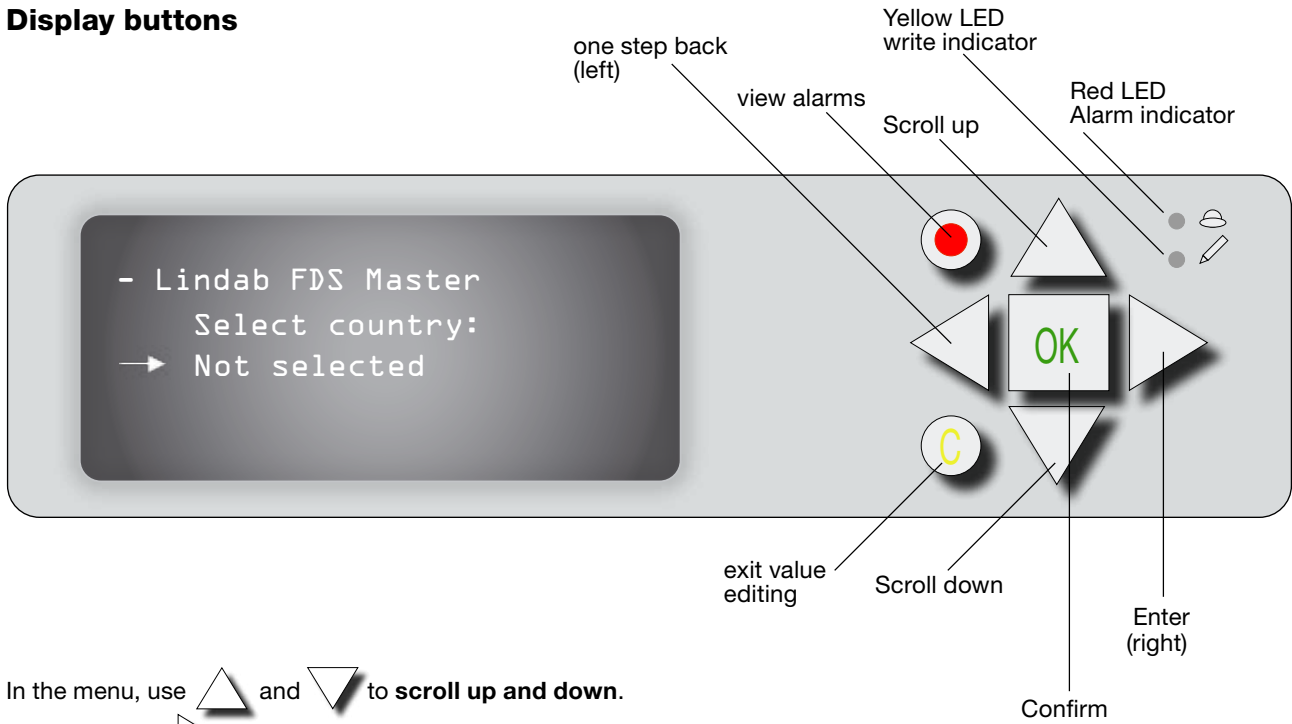
In the menu, use △ and ▽ to **scroll up and down**.

To select, use ▷ button.

To go one step back, use ◁ button.

Edit, by pressing OK button, and then use △ and ▽ .

6.1 Choose country
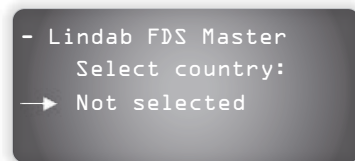
Press OK and move △▽ to **choose the country**.

Press OK to confirm.

The MAIN DISPLAY show the status of the system.


```
- Lindab FDS Master
  A alarms      : 0
  Service alarms : 0
  Idle*
```
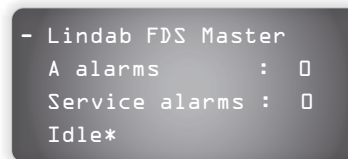
Press ▷ to see the **firmware version and IP adress.**

Press again ▷ to see the **date and time.**

Press ◁ in order to go back to the main display

*NOTE
*NOTE
The status of the system can be:
- Idle
- Normal operation
- Test procedure

6.2 Access right

```
-  Lindab FDS Master
   A alarms        :  0
   Service alarms  :  0
   Idle*
```

```
→ Access right
```

```
→ Log in
```

```
-  Lindab FDS Master
   A alarms        :  0
   Service alarms  :  0
   Idle*
```

— Use OK ▷ to enter password.

```
   Log in
   Enter password:xxxx

   Cur. level: none
```

NOTE

Default USER password: 1332
Only read function with access to status, setting and event log menu.

Default SERVICE password: 2132
Access to the complete functions.

Cur. level automatically change status depending on type of password entered.

6.3 Main display tree

After the first LOG IN press ▽ to show the main display tree.

```
→ Access right
  Status
  Commissioning
  Settings
```

```
  Event log
```

6.4 Status

In the menu, use △ and ▽ to **scroll up and down**.

To select, use ▷ button.

To go one step back, use ◁ button.

Edit, by pressing OK button, and then use △ and ▽.

```
  Access right
→ Status
  Commissioning
  Settings
```
▷
```
Fire damper status
```
▷
```
Choose fire damper
Damper: 1-60
```
▷
```
Fire damper: 1
Position: In Between
Pos. error: Yes
Pos. Alarm: Yes
```

```
Detector status
```
▷
```
Choose detector
Detector: 1-60
```
▷
```
Detector: 1

Det. Status: OK
Det. Alarm: No
```

```
Section status
```
▷
```
Section status
Section: 1
Status: OK
Damper 1 - 6
```

```
I/O
```
▷
```
DI
```
▷
```
DI1:OFF    DI5:ON
DI2:ON     DI6:OFF
DI3:OFF    DI7:OFF
DI4:ON     DI8:OFF
```
▽
```
UI1:OFF
UI2:ON
UI3:OFF
UI4:ON
```

```
DO
```
▷
```
DO1:ON     DO5:ON
DO2:ON     DO6:OFF
DO3:ON     DO7:OFF
DO4:ON
```

```
AI
```
▷
```
AI1:0.0   UI1:0.0
AI2:0.0
AI3:0.0
AI4:0.0
```

```
                                          ┌──────────────────┐      ┌──────────────────┐
                                          │                  │      │ A01:0.0  A05:0.0 │
                                          │ A0               │─────▷│ A02:0.0          │
                                          │                  │      │ A03:0.0          │
                                          └──────────────────┘      │ A04:0.0          │
                                                                    └──────────────────┘

  ┌──────────────────┐      ┌──────────────────┐      ┌──────────────────┐
  │                  │      │ Choose damper    │      │ Damper unit: 1   │
  │ Damper Durat. Times │──▷│ unit: 1-40    --> │──▷│ Duration Times:  │
  │                  │      │                  │      │ Close    Open    │
  └──────────────────┘      └──────────────────┘      │  8       23   sec │
                                                      └──────────────────┘

                                                      ┌──────────────────┐
                                                      │ Damper unit: 1   │
                                                      │ Orig. Dur. Times: │
                                                      │ Close    Open    │
                                                      │  7       25   sec │
                                                      └──────────────────┘

  ┌──────────────────┐      ┌──────────────────┐
  │                  │      │ Reset detector(s) │
  │ Reset detectors  │────▷│ Detector #: 0    │
  │                  │      │ (# 0 means all)  │
  └──────────────────┘      │ Reset: NO        │
                            └──────────────────┘
```

6.5 Commissioning

```
Access right
Status
→ Commissioning
Settings
```
```
Country
Addressing
Sections
Communication
```
```
Activate/Deactivate
Resets
Miscellaneous
```

6.5.1 Country

```
→ Country
```
```
Country
Other countries
```

Press OK and move △▽ to **choose the country**.

Press ◁ to go back.

6.5.2 Automatic addressing

Automatic addressing means that number of damper and its IP address are automatically assigned to the system in sequence by pressing the right button in the FDS-S as described below.

ATTENTION!

Dampers connected to the slave units FDS-S can be addressed in AUTOMATIC mode as well as in MANUAL mode.

Dampers connected directly to the master unit FDS-M can be only addressed in MANUAL mode.

Go to the ADDRESSING display on master unit.
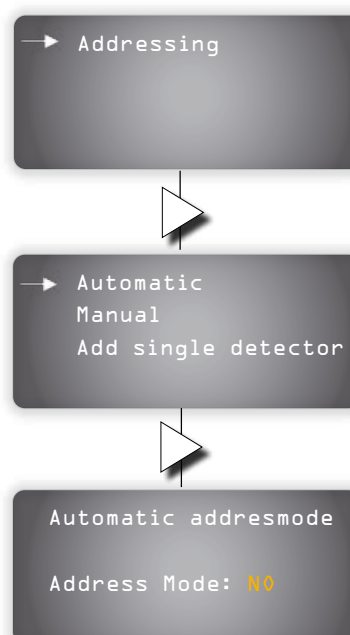
```
→ Addressing
```
```
→ Automatic
  Manual
  Add single detector
```
```
Automatic addresmode

Address Mode: NO
```

Press OK and use △ and ▽ to move ADRESSMODE from NO to **YES**

```
Automatic addresmode

Address Mode: NO
```
OK

```
Automatic addresmode

Address Mode: YES
```
OK

Inside each slave unit connected to the system, press the **RIGHT BUTTON**: units will be assigned the first free address.

Back to the display on master unit.

Press OK and use △ and ▽ to move ADRESSMODE from YES to **NO**

```
Automatic addresmode

Address Mode: YES
```
OK

```
Automatic addresmode

Address Mode: NO
```
OK
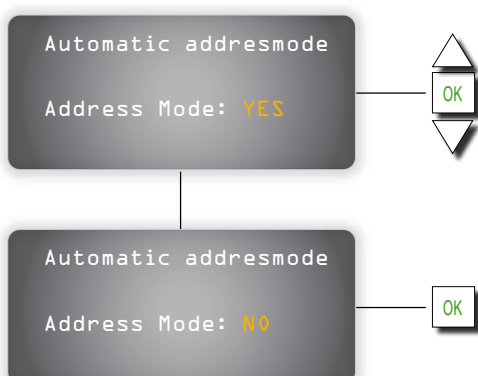
6.5.3 Manual addressing

Manual addressing mode means that number of damper and its IP address are manually assigned to the user by pressing buttons in the FDS-S as described below.

Go to the ADDRESSING display on master unit.

```
→  Addressing
```

```
   Automatic
→  Manual
   Add single detector
```

```
Choose unit
Unit: 1-60        -->
```
OK

```
Unit: 1-60
Ser.no:
Activate?YES
Confirm?--
```
OK
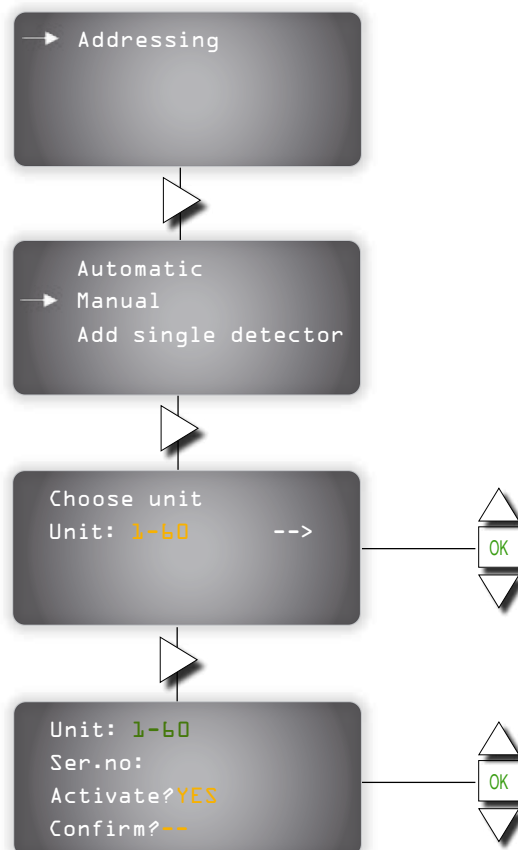
Inside each slave unit connected to the system keep **LEFT BUTTON** pressed to edit address and use **UP/DOWN/RIGHT BUTTONS** to set the new address.
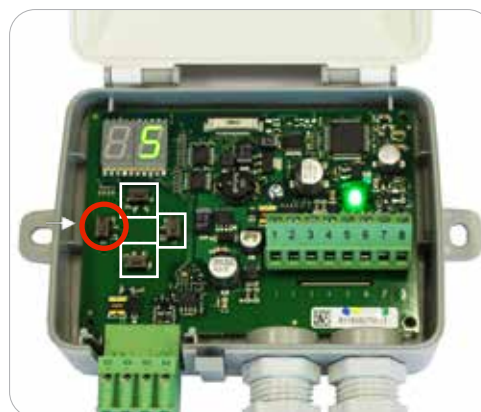
6.5.4 Add single detector

It is possible to connect locally single smoke detector to FDS-M unit without any fire damper.

```
→  Addressing
```

▽

```
   Automatic
   Manual
→  Add single detector
```

▽
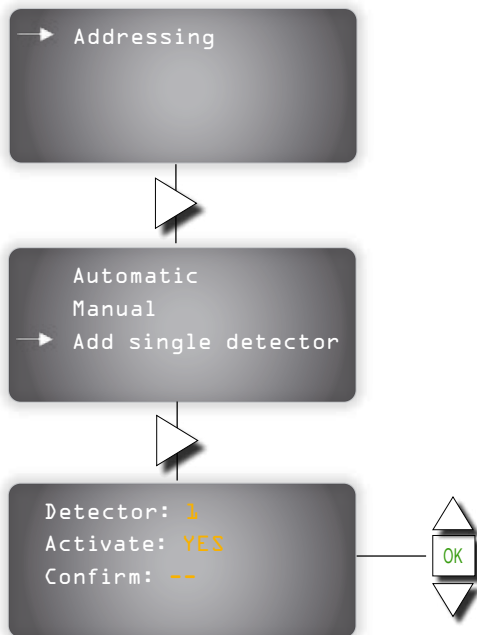
```
Detector: 1
Activate: YES
Confirm: --
```  OK

## 6.5.5 Sections

Fire dampers/smoke detectors can be grouped into sections.

```
→  Sections
```

▽

```
   Sections divider
   Section: 1    -->
```

▽

```
Section divider: 1
First damper: 0
Last damper: 0
Confirm: --
```  OK

▽

```
Clear section:
NO
Confirm:
NO
```  OK

Press ◁ to go back and return to the main display.

## 6.5.6 Communication

**TCP-IP**

In the menu, use △ and ▽ to **scroll up and down**.

**To select**, use ▷ button.

**To go one step back**, use ◁ button.

**Edit**, by pressing OK button, and then use △ and ▽.

```
→ Communication
```

▷

```
→ TCP-IP
  Modbus TCP/RTU
```

▷

```
DHCP: YES
Set static IP-->
Running IP:
  0 .0 .0 .0
```

▷

```
IP:    Write  -->
192.168.1 .234
Subnet Mask:
255.255.255.0
```

▷

```
Write IP config.:
OK
```

▽

```
Running Subnetmask:
0 .0 .0 .0
Running Gateway:
0 .0 .0 .0
```

▽

```
DNS:    Write  -->
0 .0 .0 .0
Default Gateway:
192.168.1 .234
```

▷

```
Write IP config.:
OK
```

▽

```
Running DNS:
0 .0 .0 .0
MainComputer Status:
Not connected
```

▽

```
Activate connection
to Main Computer
 NO
```

▽

```
Activate connection
to Main Computer
 NO
```

▽

```
TCP port routing
to Main Computer
 1
```

▽

```
EXOline address
PLA: 1
ELA: 241
```

Modbus TCP/RTU

```
→  Communication
```

```
   TCP-IP
→  Modbus TCP/RTU
```

```
   Modbus TCP/RTU
   Slave address: 15
```

```
   Modbus RTU
   Activate: YES
   Speed: 9600  bps
   Parity: NO
```

6.5.7 Activate/Deactivate (System)

In **ACTIVATE SYSTEM** mode:

```
→  Activate
```

```
   Activate sys:
   YES
   Confirm: YES
```

OK

In **DEACTIVATE SYSTEM** mode:

```
→  Deactivate
```

```
   Deactivate sys: NO
   Dampers: open
   Confirm: NO
```

OK

6.5.8 Resets

```
→  Resets
```

```
   Fabrication Reset:
   NO
   Confirm:
   NO
```

OK

```
   Application Reset:
   NO
   Confirm: NO
```

OK

6.5.9 Miscellaneous

| → Miscellaneous |

| → I/O |

| DO5 Status: NO/NC |
| DO6 Status: NO/NC |
| DO7 Status: NO/NC |
| EXT1 Status: NO/NC |

OK

| EXT2 Status: NO/NC |

OK

NOTE
DO5 is for the interaction with AHU.
If using FDS-B (NC contact), set DO5 status on NC.
If other relay (NO contact) is used, set DO5 status on NO.

DO6-DO7 contact set depending on logic of the system.

| → Damper Durat. times |

| Max durat. time: |
| Opening: 180 sec |
| Closing: 60 sec |

OK

| Save current times |
| as orig. times? |
| |
| Confirm: NO |

OK

| → Detector values |

In order to change sensitivity of smoke detectors

| Detector Limits |
| High: 9.5 V |
| Smoke: 6.0 V |
| Dirty: 4.0 V |

OK

| Synch. parameters |
| Synchronize: NO |
| Confirm : NO |

OK

6.6 Settings

In the menu, use △ and ▽ to **scroll up and down**.

To select, use ▷ button.

To go one step back, use ◁ button.

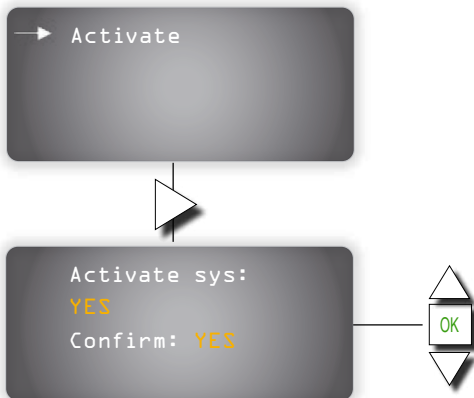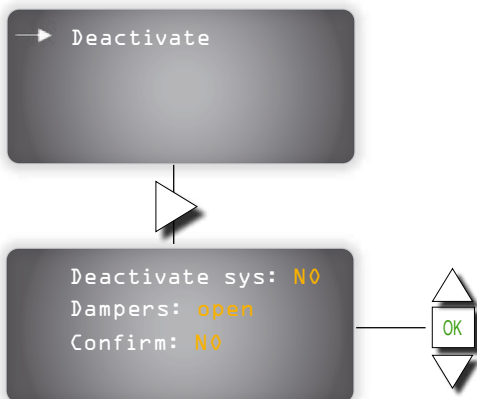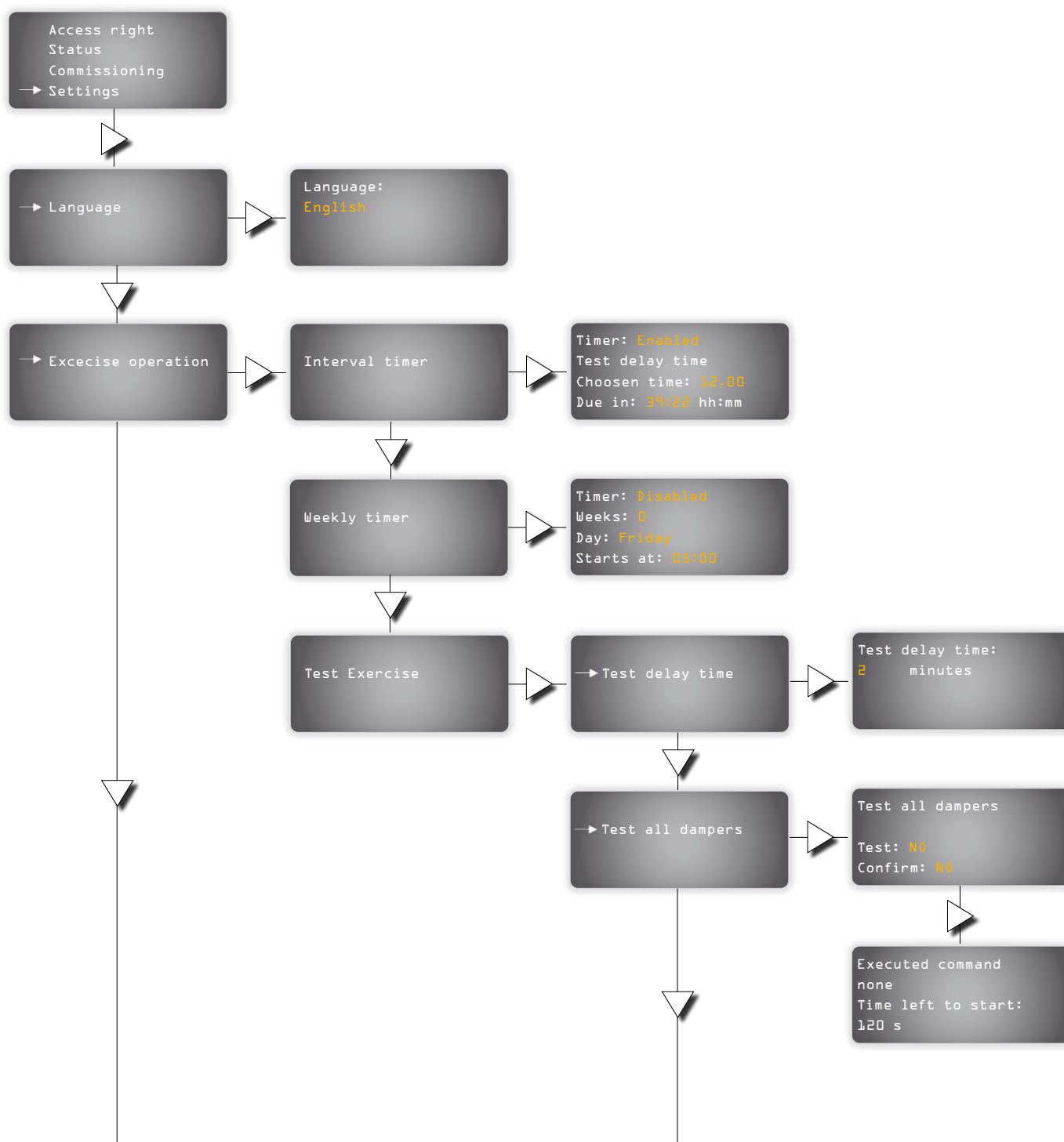**Edit**, by pressing OK button, and then use △ and ▽ .

```
   Access right
   Status
   Commissioning
→  Settings
```

```
→ Language
```

```
Language:
English
```

```
→ Excecise operation
```

```
Interval timer
```

```
Timer: Enabled
Test delay time
Choosen time: 12:00
Due in: 39:22 hh:mm
```

```
Weekly timer
```

```
Timer: Disabled
Weeks: 0
Day: Friday
Starts at: 05:00
```

```
Test Exercise
```

```
→ Test delay time
```

```
Test delay time:
2      minutes
```

```
→ Test all dampers
```

```
Test all dampers
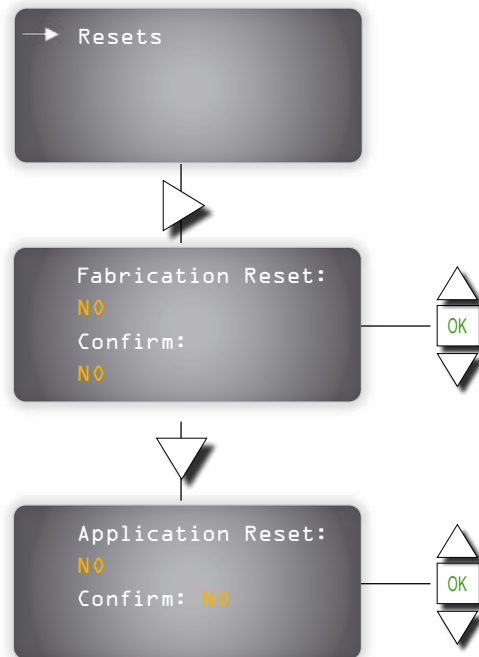
Test: NO
Confirm: NO
```

```
Executed command
none
Time left to start:
120 s
```

Test ind. damper

Test ind. dampers
Damper: 0
Test: NO
Confirm: NO

Executed command
none
Time left to start:
120 s   NA

Test status

A alarm test

Test A alarm

Confirm: NO

Damper test

→ Test delay time
  Test all dampers
  Test ind. damper

NOTE
Please see Text Excercise display on
previous page.

Manual operation

Oper. all dampers

Oper. all dampers
Oper: AUTO
Confirm: NO
None

Oper. all dampers

Oper. damper 1
Oper: AUTO
Confirm: NO   NA
None

Date & Time

Date and Time
2018-01-01
13:24

Duration Times

Save current times
as orig. times?

Confirm: NO

6.7 Event log

A-alarm (fire alarm) and Service alarm are listed in the **Event log** display.

```
→  Event log



```

```
→  Alarm events
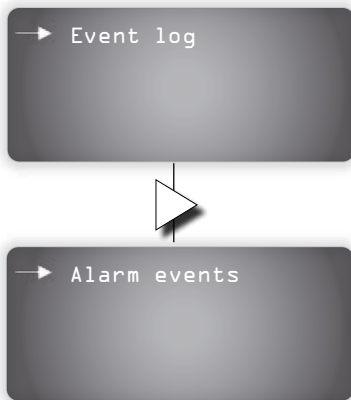


```

Use △ and ▽ to scroll up and down the list of alarm events.

Good Thinking

At Lindab, good thinking is a philosophy that guides us in everything we do. We have made it our mission to create a healthy indoor climate – and to simplify the construction of sustainable buildings. We do that by designing innovative products and solutions that are easy to use, as well as offering efficient availability and logistics. We are also working on ways to reduce our impact on our environment and climate. We do that by developing methods to produce our solutions using a minimum of energy and natural resources, and by reducing negative effects on the environment. We use steel in our products. It's one of few materials that can be recycled an infinite number of times without losing any of its properties. That means less carbon emissions in nature and less energy wasted.

We simplify construction

Lindab®