SIEMENS

Fire Control Panel

FC121-ZA / FC122-ZA / FC123-ZA / FC124-ZA

Technical Manual

A6V10393190_h_en_--
2019-09-01

Smart Infrastructure

Legal notice

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Edition: 2019-09-01
Document ID: A6V10393190_h_en_--

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1 About this document

Goal and purpose

The information provided in this manual is a summary of the key procedures and functions required to assemble, install, operate, commission and repair the system. It is intended to provide experienced and qualified personnel a guide on the required processes.

Scope

The technical manual applies to the Cerberus FIT fire control panel FC12x series.

Target groups

The information in this document is intended for the following target groups:

Target group	Activity	Qualification
Installation personnel	Assembles and installs the product components at the place of installation. Carries out a performance check following installation.	Has received specialist training in the area of building installation technology or electrical installations.
Commissioning personnel	Configures the product at the place of installation according to customer-specific requirements. Checks the product operability and releases the product for use by the operator. Searches for and corrects malfunctions.	Has obtained suitable specialist training for the function and for the products. Has attended the training courses for commissioning personnel.
Maintenance personnel	Carries out all maintenance work. Checks that the products are in perfect working order. Searches for and corrects malfunctions.	Has obtained suitable specialist training for the function and for the products.

Document identification

Position	Information
Title page	Product picture Product type Product designation Document type
Footers	Pages Document ID Edition date
Last page	Document ID Edition date Manual Register

Reference document and source language

- The source language of this document is English (en)
- The reference version of this document is the international version in English. The international version is not localized.

The reference document has the following designation:

ID_x_en_--

x = version, en = English, -- = international

Applicable documents

The list below is used as a reference for the fire control panel FC12x and as a supplement to this document.

Number	Name
A6V10393192	'List of compatibility for FC12x'
A6V10393169	Installation of FC121-ZA / FC122-ZA
A6V10393171	Installation of FC123-ZA / FC124-ZA
A6V10371354	Data sheet of FC12x

Abbreviations

Abbreviations	Explication
AVC	Alarm verification concept
EOL	End of line
MCP	Manual call point
PSU	Power supply unit

Modification history

Version	Edition date	Brief description
h	2019-09-01	- Chapter '8.1.1 Tool installation'
g	2018-10-30	- Updated the company address
f	2015-09-09	- Screenshot in appendix A replaced with language dependent screenshot.
e	2015-07-07	- Chapter '4.3.4 Short = Alarm' updated - Chapter '10.3 Device test': Information about the detector test in collective mode added
d	2015-02-12	- Chapter '3.3.1 Electrical data' - Chapter '7.2.10 Manned / unmanned'
c	2014-05-28	- Chapter '1 About this document': Information about reference document and source language added - Chapter '3.3.1 Electrical data': Values for Line resistance / capacitance changed - Chapters '11.3 FC123-ZA calculation' and '11.4 FC124-ZA calculation': Value of threshold for requirement of external power supply changed from 1200 mA to 1000 mA - Editorial changes made
b	2014-04-15	- On Page 11, Change color of housing&cover ('grey, ~RAL 7035' to 'grey ~RAL-Design 000 50 00') - On Page 12/50/55, Change device coincidence inhibit time (10→15) - On Page 18, Change mixed zone drawing (delete diode) - Change 'Line resistance / capacitance' - Add warning for ‘Short=alarm’ zone function
a	2014-02-19	First version

2 Safety regulations

Signal words

The signal word classifies the danger as defined in the following table:

Signal word	Danger level
DANGER	DANGER identifies a dangerous situation, which **will result directly in death or serious injury** if you do not avoid this situation.
WARNING	WARNING identifies a dangerous situation, which **may result in death or serious injury** if you do not avoid this situation.
CAUTION	CAUTION identifies a dangerous situation, which **could result in slight to moderately serious injury** if you do not avoid this situation.
NOTICE	NOTICE identifies possible damage to property that may result from non-observance.

Symbols

The symbols listed below indicate the nature and origin of the danger.

General danger

Electrical voltage

How risk of injury is presented

Information about the risk of injury is shown as follows:

	⚠ **WARNING**
	Nature and origin of the danger Consequences if the danger occurs ● Measures / prohibitions for danger avoidance

How possible damage to property is presented

Information about possible damage to property is shown as follows:

!	***NOTICE***
	Nature and origin of the danger Consequences if the danger occurs ● Measures / prohibitions for danger avoidance

Safety–relevant instructions

National standards, regulations and legislation

Siemens products are developed and produced in compliance with the relevant European and international safety standards. Should additional national or local safety standards or legislation concerning the planning, assembly, installation, operation or disposal of the product apply at the place of operation, then these must also be taken into account together with the safety regulations in the product documentation.

Electrical installations

⚠ WARNING

Electrical voltage
Electric shock
Work on electrical installations may only be carried out by qualified electricians or by instructed persons working under the guidance and supervision of a qualified electrician, in accordance with the electro technical regulations.

- Wherever possible disconnect products from the power supply when carrying out commissioning, maintenance or repair work.
- Lock volt-free areas to prevent them from being switched back on again by mistake.
- Label the connection terminals with external voltage using a 'DANGER External voltage' sign.
- Route mains connections to products separately and fuse them with their own, clearly marked fuse.
- Fit an easily accessible disconnecting device in accordance with IEC 60950-1 outside the installation.
- Produce earthing as stated in local safety regulations.

Assembly, installation, commissioning and maintenance

- The panel is designed for operation in a closed room, please note the environmental conditions in this technical manual.
- Please check the country specific regulations and guidelines during installation and programming of the fire control panel.
- Only operate the fire control panel with housing closed due to the danger of an electric shock.
- If you require tools such as a ladder, these must be safe and must be intended for the work in hand.
- When starting the fire control panel ensure that unstable conditions cannot arise.
- Ensure that all points listed in the 'Testing the product operability' section below are observed.
- You may only set controls to normal function when the product operability has been completely tested and the system has been handed over to the customer.

Testing the product operability

- Prevent the remote transmission from triggering erroneously.
- If testing building installations or activating devices from third-party companies, you must consult with the appointed people.
- The activation of fire control installations for test purposes must not cause injury to anyone or damage to the building installations. The following instructions must be observed:
  – Use the correct potential for activation; this is generally the potential of the building installation.
- Inform people before testing the alarm control devices and allow for possible panic responses.
- Inform people about any noise or mist which may be produced.
- Before testing the remote transmission, notify the appropriate alarm and fault signal receiving stations.

Modifications to the system layout and products

Modifications to the system and to individual products may result in faults, malfunctioning and safety risks. Written confirmation must be obtained from Siemens and the corresponding safety bodies for modifications or additions.

Modules and spare parts

- Components and spare parts must comply with the technical specifications defined by Siemens. Only use products specified or recommended by Siemens.
- Only use fuses with the specified fuse characteristics.
- Wrong battery types and improper battery changing lead to a risk of explosion. Only use the same battery type or an equivalent battery type recommended by Siemens (refer to Chapter 13).
- Batteries must be disposed of in an environmentally friendly manner. Observe all national guidelines and regulations.

Disregarding safety regulations

Before they are delivered, Siemens products are tested to ensure they function correctly when used properly. Siemens disclaims all liability for damage or injuries caused by the incorrect application of the instructions or the disregard of danger warnings contained in the documentation. This applies in particular to the following damage or injury:

- Personal injuries or damage to property caused by improper use and incorrect application.
- Personal injuries or damage to property caused by disregarding safety instructions in the documentation or on the product.
- Personal injury or damage to property caused by poor maintenance or lack of maintenance.

Disclaimer

We have checked that the content of this document matches the hardware and software described. Despite this, we cannot rule out deviations and therefore assume no liability for them matching completely. The details in this document are checked regularly and any corrections needed included in subsequent editions.

We are grateful for any suggestions for improvement.

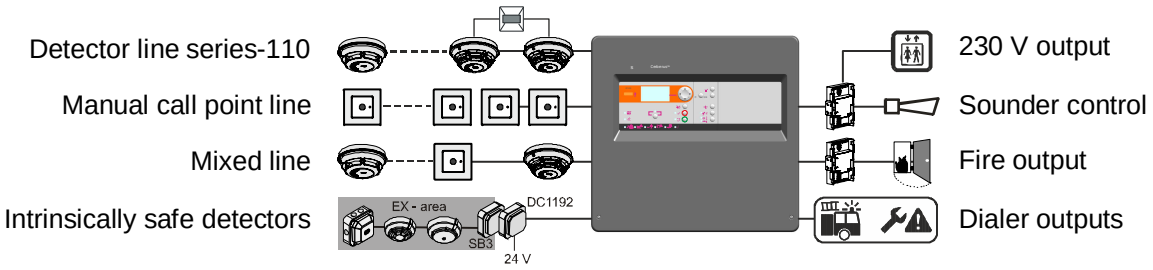
3 System description

3.1 System overview

The conventional fire control system comprises all the components required for detection, evaluation and alarming in the event of fire.

The integrated operating unit processes signals from conventional and collective detectors. See list of compatibility A6V10393192.

The panel FC12x is self-contained with integral power supply and simple to operate, offering exceptional flexibility and comprehensive features.



3.2 Features

System

- Stand-alone fire control panel
- Switch mains to AC 115 V (FC123-ZA / FC124-ZA only)
- Monitored detector and sounder lines
- Collective and conventional devices can be combined within the same zone
- Display with 7 lines, max. 20 characters per line
- Country specific settings
- Multilingual variants
- Up to 1000 events can be stored in history log with stamped date and time
- Alarm counter for up to 9999 alarms
- One man walk test

Optional hardware

- Output cards
- Zone indication module (FC123-ZA / FC124-ZA only)
- EVAC module
- Key switch set

Periphery

- Compatible with 110-series / SynoLINE300
- Compatible with DS11 / SynoLINE600
- Mixed lines with detectors and MCPs

Programmable parameters

- Individual customer text for each zone
- Automatic summer / winter time change
- Alarm Verification Concept (AVC)
- Cross zoning (Zone coincidence)
- Detector coincidence for false alarm suppression

3.3 Technical data

You will find information on approvals, CE marking, and the relevant EU directives for this device (these devices) in the following document(s); see 'Applicable documents' chapter:

- Document A6V10371354

	FC121-ZA	FC122-ZA	FC123-ZA	FC124-ZA
Zones				
Number of zones	2	4	8	12
Number of detectors per zone	Up to 32		Up to 32	
Inputs				
Number of inputs	2		3	
Outputs				
Number of monitored outputs				
- Mainboard	2		2	
- Output cards (Optional)	2		4	6
Number of relay outputs				
- Mainboard	1		1	
- Output cards (Optional)	2		4	6
Number of optional output cards	1		2	3
Alarm counter	9999 alarms		9999 alarms	
History log	1000 events		1000 events	

3.3.1 Electrical data

	FC121-ZA	FC122-ZA	FC123-ZA	FC124-ZA
Zone				
Operating voltage - Standard zone - GB continuity zone	DC 16.5…19 V DC 21…28.6 V		DC 16.5…19 V DC 21…28.6 V	
Line resistance / capacitance Collective & Conventional device - GB continuity - Mixed zone Used Conventional device - Standard - Short=alarm Collective & Conventional device - Standard - Short=alarm zone	⩽50 Ω / ⩽1 µF [1,2,4,6] ⩽50 Ω / ⩽1 µF [1,2,4,6] ⩽100 Ω / ⩽1 µF [1,2,4,5] ⩽100 Ω / ⩽1 µF [1,4] ⩽80 Ω / ⩽1 µF [1,2,3,4,5,6] ⩽80 Ω / ⩽1 µF [1,3,4]		⩽50 Ω / ⩽1 µF [1,2,4,6] ⩽50 Ω / ⩽1 µF [1,2,4,6] ⩽100 Ω / ⩽1 µF [1,2,4,5] ⩽100 Ω / ⩽1 µF [1,4] ⩽80 Ω / ⩽1 µF [1,2,3,4,5,6] ⩽80 Ω / ⩽1 µF [1,3,4]	

[1]Detector 110-series; [2] Detector FDOOT241-X, OOH740, FDF221-9, FDF241-9, FDL241-9;
[3] Detectors series DS11, Synova Series 600C; [4]Synova Series 300C; [5] Conventional MCP; [6] Collective MCP

Alarm trigger	Z-Diode 5.6 V or resistor 410…820 Ω	Z-Diode 5.6 V or resistor 410…820 Ω

	FC121-ZA	FC122-ZA	FC123-ZA	FC124-ZA
EOL element - Standard zone - Short=alarm - Mixed zone - GB continuity zone	18V TVS 18V TVS 18V TVS 10 µF capacitor		18V TVS 18V TVS 18V TVS 10 µF capacitor	
Monitored output mainboard				
Voltage / Current (max.)	24 V / 0.5 A		24 V / 1.0 A	
EOL element	Diode (1N4007)		Diode (1N4007)	
Relay output mainboard	1.0 A @ DC 30 V		1.0 A @ DC 30 V	
AUX. power output (max.)	DC 24 V / 200 mA		DC 24 V / 500 mA	
Power supply				
Mains voltage	AC 196…253 V		AC 196…253 V or AC 97…127 V	
Mains fuse F1	AC 250 V @ 1.6 AT		AC 250 V @ 2.5 AT AC 115 V @ 2.5 AT	
Power consumption	25 W		70 W	
Max. nominal output current with battery charging, $I_{max\,a}$	max. 0.3 A		max. 0.9 A	
Max. nominal output current without battery charging, $I_{max\,b}$	max. 0.9 A		max. 2.5 A	
Min. output current I_{min}	0.1 A		0.1 A	
System supply voltage	DC 21…28.6 V		DC 21…28.6 V	
Mains failure delay	0…30 min. / default 5 min.		0…30 min. / default 5 min.	
Battery low discharge cut off	DC 20.5 V…DC 21 V		DC 20.5 V…DC 21 V	
Temperature compensation	Yes		Yes	
Battery				
Operation time	Up to 72 h		Up to 72 h	
Battery size	2 x 12 V, 4.5 Ah / 7 Ah, lead acid		2 x 12 V, 7 Ah / 12 Ah / 17 Ah, lead acid	
Voltage	DC 21…28.6 V		DC 21…28.6 V	
Load resistance R_{imax}	max. 2.5 Ω		max. 1.0 Ω	

3.3.2 Mechanical data

	FC121-ZA	FC122-ZA	FC123-ZA	FC124-ZA
Terminals	0.2...2.5 mm^2			
Dimensions (W x H x D)	360 x 310 x 85 mm		430 x 399 x 124 mm	
Weight	2.0 kg without batteries		4.5 kg without batteries	
Color - Housing, Cover	grey, ~RAL-Design 000 50 00			

3.3.3 Environmental conditions

	FC121-ZA	FC122-ZA	FC123-ZA	FC124-ZA
Operating temperature	-5…+40 °C		-5…+40 °C	
Storage temperature	-20…+60 °C		-20…+60 °C	
Humidity (no condensation permitted)	⩽95 % rel.		⩽95 % rel.	
Protection category	IP30		IP30	

3.4 Standard and options EN 54

The fire control panel is designed to comply with the requirements of EN 54 part 2 / 4.

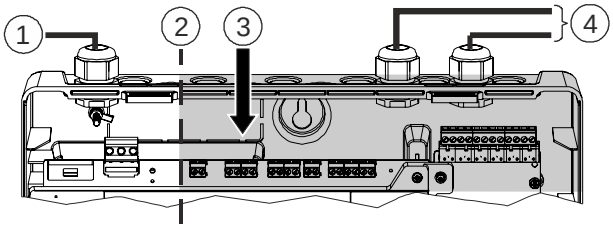
EN 54-2 Definitions		**The EN 54-2 options are fulfilled if the following configurations are used.**		
		Installation	**Configuration / Operation**	**Chapter**
7.8	Output to fire alarm device EN 54-1 / C	Monitored output e.g. OUT 1	Sounder control	7.1.2 6.4.2 7.2.6
7.9.1	Output to fire alarm routing equipment EN 54-1 / E	Monitored output e.g. OUT 2	Alarm dialer	7.1.2 7.2.4
7.9.2	Alarm confirmation input from fire alarm routing equipment	Input	Dialer device confirmation signal; LED fire brigade activated via input	7.1.3 7.2.4
7.10.1	Outputs to fire protection equipment EN 54-1 / G	Monitored output e.g. OUT 4	Fire output	7.1.2
7.11.1	Delays to outputs V1 / V2 timer for alarm organization		Alarm Verification Concept; Manned / unmanned	6.1.3 7.2.10
7.11.2	Switch on /off delays to outputs, V1 / V2 timer for alarm organization		Button 'Manned/unmanned'	6.4.1 7.2.10
7.12.1	Dependencies on more than one alarm signal. Type A dependency from the same detector, or another in the same zone		Detector coincidence inhibit time 15 - 60 sec. Reset of the first alarm after 90 sec.	7.1.1 7.2.5
7.12.2	Dependencies on more than one alarm signal Type B dependency cross zoning		Zone coincidence (= cross zoning)	7.1.1
7.13	Alarm counter (option with requirement)		Alarm counter	6.3.3 7.4
8.8	Output to fault warning routing equipment	Relay output e.g. OUT 3	Fault dialer	7.1.2
8.9	Output to fault warning routing equipment according EN 54-1 / J	Monitored output e.g. OUT 4	Fault dialer	7.1.2
10	Test condition (option with requirements)		Test zone	6.4.8

EN 54-13 Definitions		**The EN 54-13 standard is achieved, if the following system functions are fulfilled:**	
		Installation	**Chapter**
5.3.4.2	Open and short circuit on a transmission path	Zone mode 'standard'	7.1.1
		Outputs card supervised Card 1, OUT A / B: 4 / 5 Card 2, OUT A / B: 8 / 9 Card 3, OUT A / B: 12 / 13	4.4.2 7.1.2
		Fault dialer Card 1, OUT A: 4 Card 2, OUT A: 8 Card 3, OUT A: 12	4.4.4

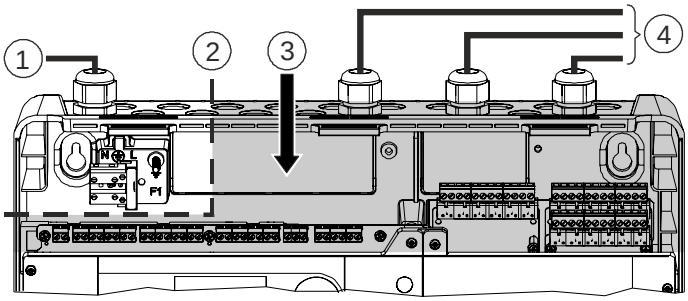
4 Installation

4.1 Power supply – mains voltage connection

	**⚠ WARNING** **Electrical voltage** Electric shock • Before connecting the mains cable, make sure that the cable is current-free. • Ensure that the mains is secured against inadvertently being switched on.



FC121-ZA / FC122-ZA



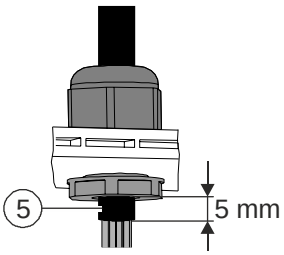
FC123-ZA / FC124-ZA

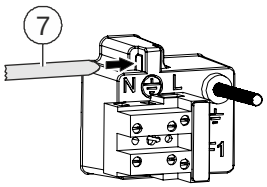
Explanation

1. Mains supply
2. Boundary of mains zone
3. Safety zone (no high-voltage power permitted)
4. Signal and control lines

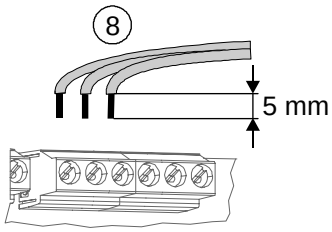
- The cables must be inserted from above. Use only the provided cable openings.
- The mains lead must be placed along the left side of the housing (observe boundary of mains zone).
- Signal and control lines must only be fed into the housing on the right from above or from the rear.
- Batteries must be installed so that they cannot leak.
- Open cable entries must be closed completely.

To avoid the risk of a connected wire become loose and can come in contact with the mains terminal, a single wire must not be so long that it can come into contact with the mains terminal or tie at least two such wires together so that the free end of a single wire cannot reach the mains terminal!

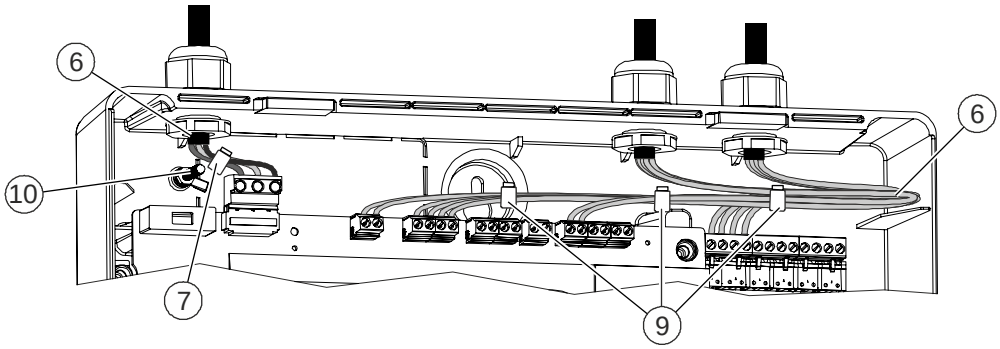




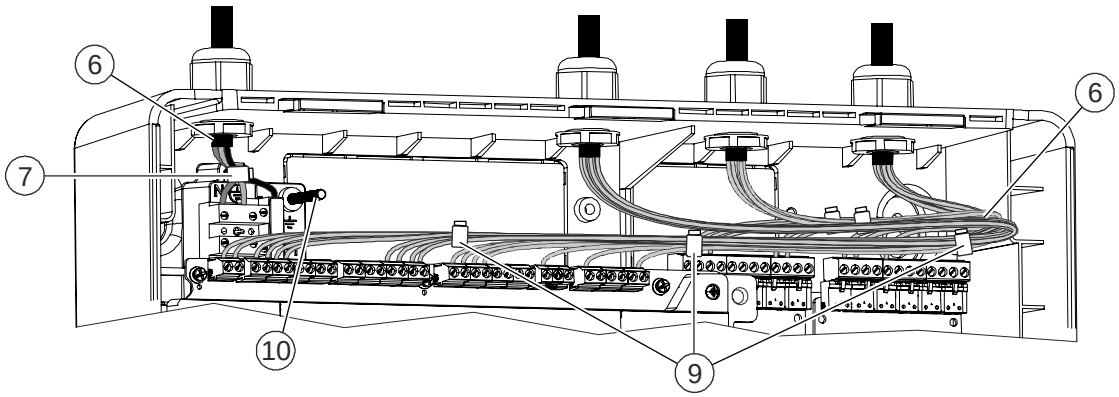
FC123-ZA / FC124-ZA fixing mains wire



Strip the insulation from the wire



FC121-ZA / FC122-ZA secure wires



FC123-ZA / FC124-ZA secure wires

Explanation

5. Fixing cables and removing the outside isolation.
6. Lay the mains cable along the left side and signal and control lines to the right side of the housing.
7. Fix the mains wire with cable ties.
8. Insulate the mains, signal and control lines wires as needed and connect it to the terminals according to the pin assignment specified in chapter 4. Use mains cable with cross section of 3*1.5 mm^2 up to 3*2.5 mm^2.
9. Fix the signal and control lines with cable ties.
10. Shield connection terminal.

4.2 Instruction

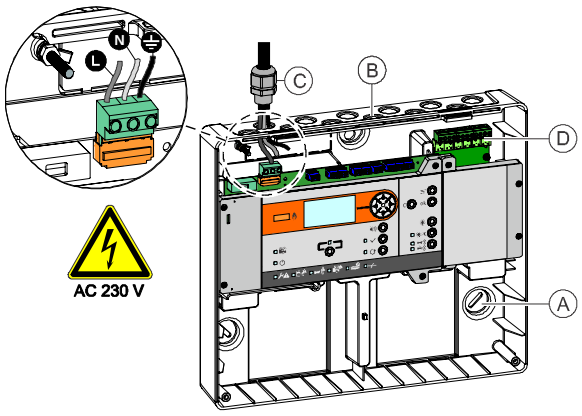
Follow the instructions and consider the power calculation.

	**⚠ WARNING**
	Voltage Electric shock Assembly and installation work may only be undertaken by qualified staff and when the system is de-energized.

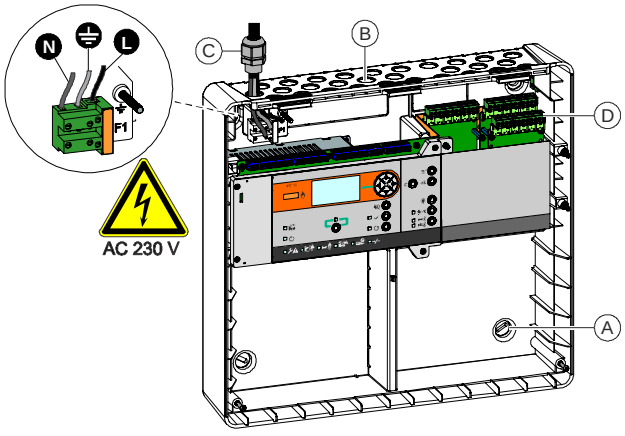
!	***NOTICE***
	Electrostatics Damage to electronics Suitable protective measures must be taken when working with electronics modules.

Steps:

1) Remove the cover.
2) Define the mounting location.
3) Mark position of mounting holes (A).
4) Cut out the cable entries (B) and cover all open entries with cable glands (C) (not included).
5) Optional: Mount accessories (D). See chapter 4.6.
6) Install chassis on the wall / screws (∅ min. 5 mm) and plastic dowels are not included.
7) Switch off the mains supply and connect the power cable.
8) Connect signal and control lines of installed field device (zones, outputs and inputs).
9) Initial start-up, see chapter 4.7.



FC121-ZA / FC122-ZA

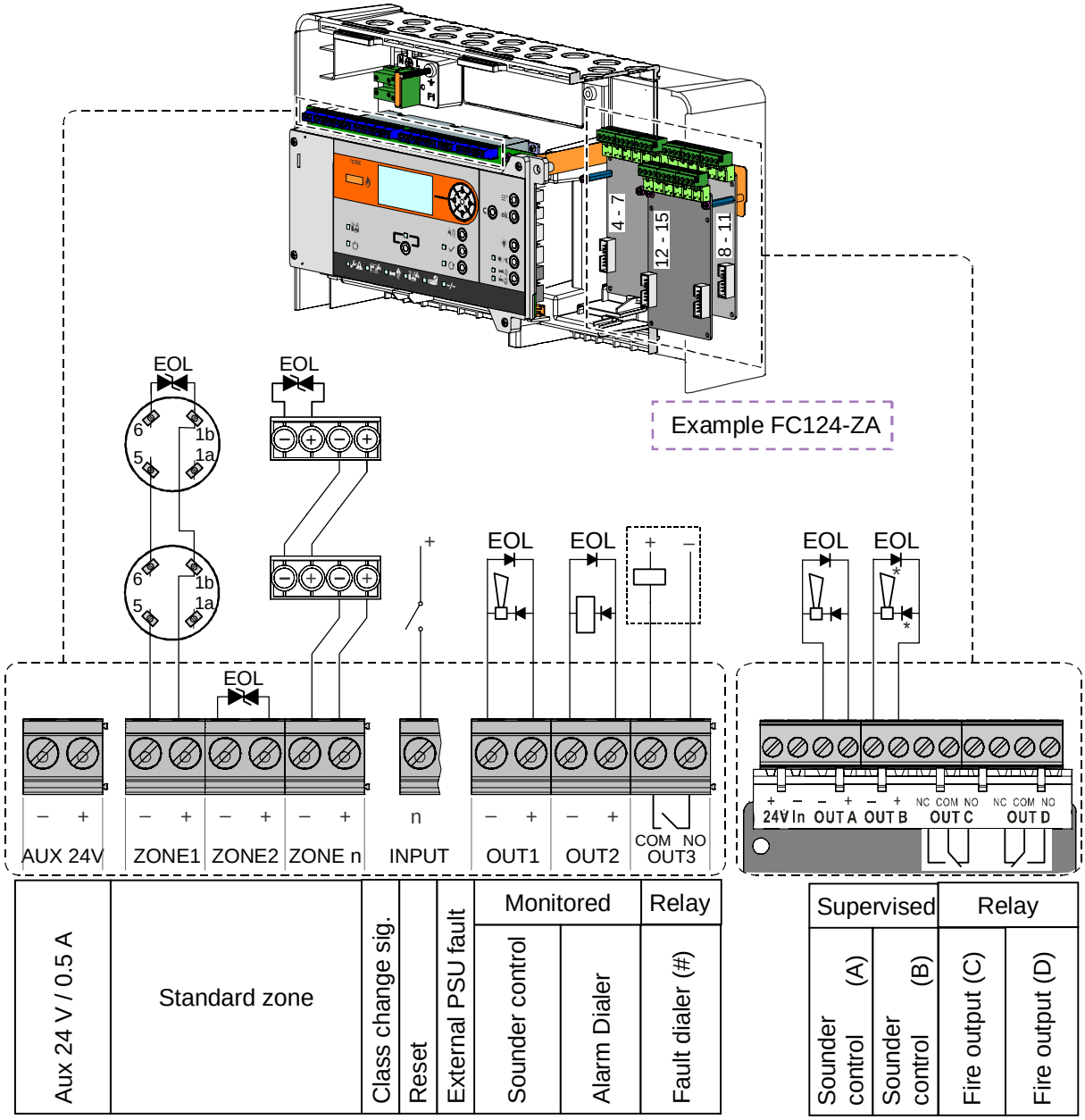


FC123-ZA / FC124-ZA

4.2.1 Connection overview

The graphic below shows the default configuration of the panel.

Available zones, outputs and inputs are considered in the chapter 3.3.



(#) 'Fault dialer' contact is open as long as the panel is in fault condition.

Provided EOL elements:

Picture	EOL element		Function
	Transzorb diode (18 V TVS)		EOL element for all zones except GB continuity
	Capacitor 10 µF		EOL element for GB continuity
	Diode 1N4007		EOL element for monitored and supervised outputs

4.3 Zone modes

4.3.1 Standard

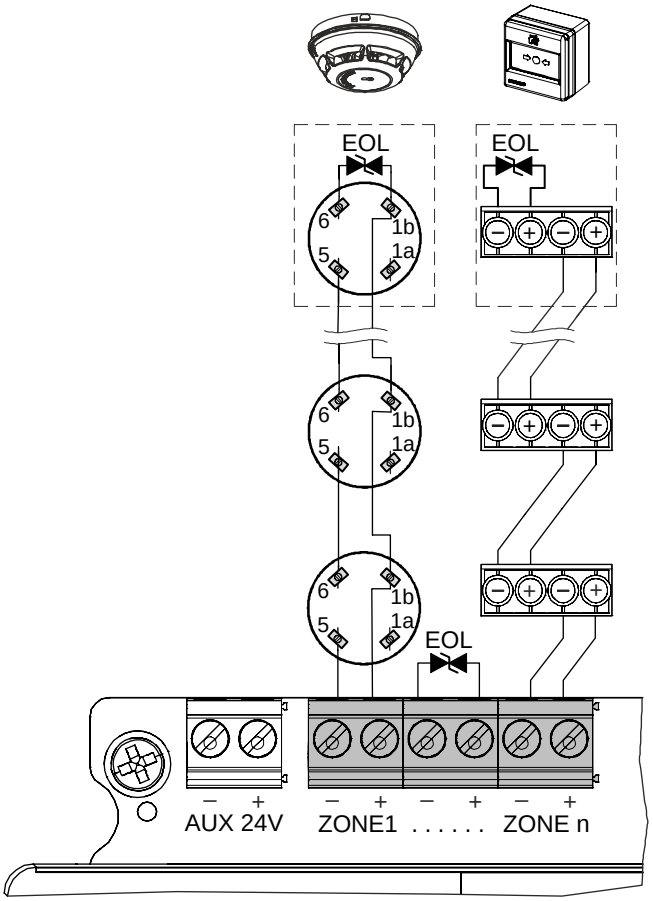
The Standard line supports collective and conventional devices within the same zone.

Technical:

- Each line must be terminated with EOL element Transzorb diode (18 V TVS).
- Max. 32 devices on each line

Programming:

- Configure → Zone → Zone 1 – n → Mode → Standard



Zone mode 'Standard' complies with EN 54-2 and EN 54-13.

4.3.2 Mixed

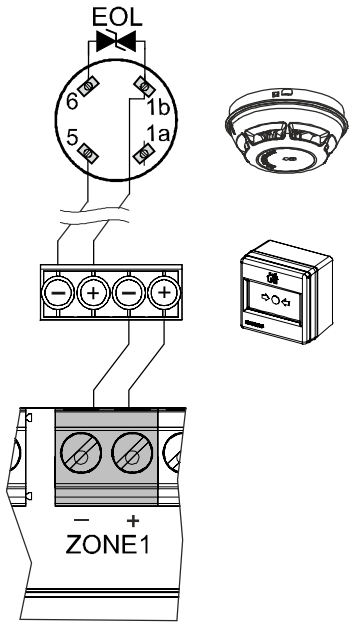
The mixed line allows a mixture of detectors and manual call points within the same zone. Moreover it can distinguish between direct and delayed alarming.

Technical:

- Siemens detectors 110-series or detectors with an alarm resistor are required for delayed alarming (AVC, V1 / V2).
- MCPs require a Z-diode for direct alarming (AVC).
- Max. 32 devices on each line.
- Each line must be terminated with EOL element Transzorb diode (18 V TVS).

Programming:

- Configure → Zone → Zone 1 – n → Mode → Mixed MCP & det.
- Configure → Zone → Zone 1 – n → AVC → Via AVC timer MCP direct



Zone mode 'Mixed' does NOT comply with EN 54-13.
Behavior of MCP in zone coincidence with function 'direct alarming' is not supported.

4.3.3 GB continuity

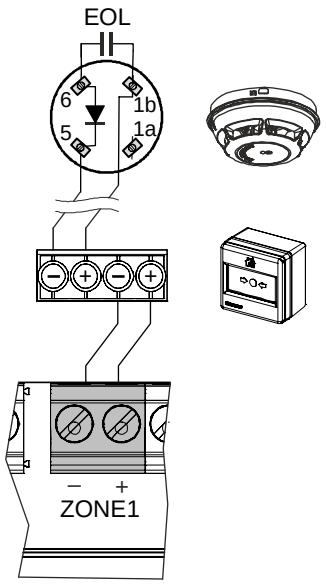
The GB continuity line allows a mixture of MCPs and detectors within the same zone. In addition this mode supports a reliable operation, even though one or more detectors are removed from its base. The CIE detect the removed detector and report a zone fault.

Technical:

- Special detector bases equipped with a diode (1N5819):
  DB110D part number S54372-F6-A1 or DB110RD part number S54372-F8-A1
- MCPs require a Z-diode for direct alarming (AVC).
- Siemens detectors 110-series or detectors with an alarm resistor are required for delayed alarming (AVC, V1 / V2).
- Each line must be terminated with EOL element Capacitor 10 µF.
- Limitation: Max. 18 detectors per line is allowed due to voltage drop on the detector base.
- MCPs have no limitation and can be installed to reach the maximum of 32 devices.

Programming:

- Configure → Zone → Zone 1 – n → Mode → GB continuity
- Configure → Zone → Zone 1 – n → AVC → Via AVC timer MCP direct



!	***NOTICE***
	See details of the specification in chapter 3.3.1.

Zone mode ‘GB continuity’ does NOT comply with EN 54-13.
Behavior of MCP in zone coincidence with function 'direct alarming' is not supported.

4.3.4 Short = alarm

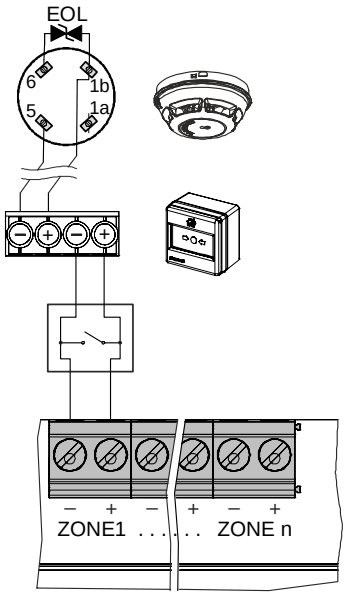
This line supports a mixture of detectors and MCPs within the same zone.
In addition, this line supports devices with a closed contact for alarm.
Only automatic fire detectors can be switched off. Manual call points with the alarm criterion 'Short = Alarm' are always switched on and cannot be switched off.

Technical:

- Short in the line is detected as an alarm and not as a fault.
- Max.32 devices on each line.
- Each line must be terminated with EOL element Transzorb diode (18 V TVS).
- Does not fulfill EN 54-2.

Programming:

- Configure → Zone → Zone 1-n → Mode → Short = alarm



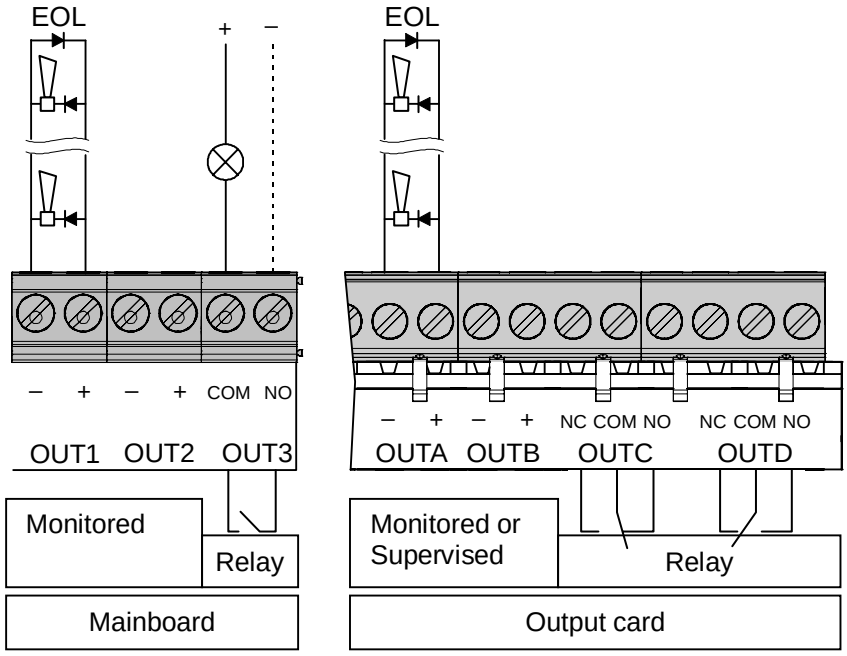
Zone mode 'Short = alarm' does NOT comply with EN 54-2 and EN 54-13.

Special detectors FDOOT241-9, OOH740, FDF221-9, FDF241-9, FDL241-9 NOT compatible with the zone mode 'Short = alarm'.

Even if a zone is switched off, a short is evaluated as an alarm.

4.4 Outputs

Outputs are used to transmit system status information. As a result three different types are available: Monitored, Supervised and Relay.



4.4.1 Mainboard (OUT1 / OUT2)

Functionality 'Monitored line':

The panel monitors the line in terms of open and short circuits from the panel to the EOL element.

Application:

Sounder controls, fire outputs and dialer

Technical:

- Max. current
  FC121-ZA and FC122-ZA → 24 V / 0.5 A
  FC123-ZA and FC124-ZA → 24 V / 1 A
- Each line must be terminated with EOL element (Diode 1N4007)
- Supervised functionality: Not available

Programming:

- Configure → Output → Output 1 – n → Mode → Sounder control

4.4.2 Output card (OUTA / OUTB)

The output can be either programmed as 'Monitored' or 'Supervised'.

Functionality 'Monitored line':

The panel monitors the line in terms of open and short circuits from the panel to the EOL element.

Application:

Sounder controls, fire outputs and dialer

Technical:

- Max. current 24 V / 1 A
- Each line must be terminated with EOL element (Diode 1N4007)

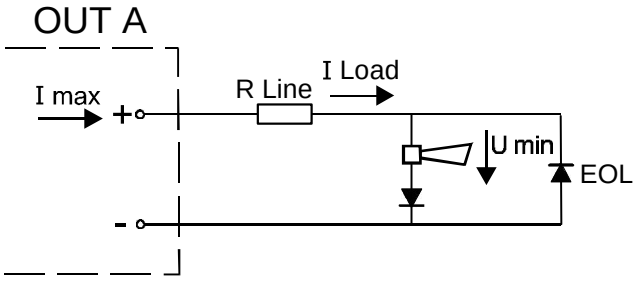
Programming:

- Configure → Output → Output 4 – n → Mode → Sounder control

Functionality 'Supervised line':
The panel monitors the line in terms of open and short circuits from the panel to the EOL element.
In addition to the line monitoring, the panel will recognize a change of line resistance. Due to aging or other circumstances (creeping effect), the transition resistance on contacts may increase, which in turn leads to voltage drop.

In order to detect the creeping effect (supervision), the line must be calibrated during the commissioning process. A line fault is indicated if the resistance is higher than 35 Ω.

Checking the line resistance depending on the required current
It is calculated that the supply of the connected devices is met.
The picture shows the dependence of the line resistance (R Line) in relation to the device voltage (U_{min}) and the available output current (I_{max}) and the minimum required current of the connected devices (I Load).



Procedure for determining the maximum available device current (I Load):

1) Determine the line resistance R Line.
Programming: see chapter 7.2.1 (Calibration)
Configure → Output → Output 4 – n → Calibrate line

2) Detecting the voltage U_{min} according to the device datasheet.

3) Verification: Are all parameters satisfied for the correct operations?
Table 1 can be used for this check, here are maximum values shown.
Details are individual to calculate.

Table 1

	R Line			
I_{max}	U_{min} = 9 V	U_{min} = 14.5 V	U_{min} = 16.8 V	U_{min} = 18 V
1 A	0 ~ 7 Ω	0 ~ 3.5 Ω	0 ~ 2 Ω	0 ~ 1 Ω
0.5 A	0 ~ 14.5 Ω	0 ~ 7.5 Ω	0 ~ 4.5 Ω	0 ~ 3 Ω
0.3 A	0 ~ 25 Ω	0 ~ 13 Ω	0 ~ 8 Ω	0 ~ 5.5 Ω
0.1 A	0 ~ 35 Ω	0 ~ 35 Ω	0 ~ 26 Ω	0 ~ 18.5 Ω
0.05 A	0 ~ 35 Ω	0 ~ 35 Ω	0 ~ 35 Ω	0 ~ 35 Ω

Counteractive measures: Reduction of I Load or of R Line.

Functionality 'Supervised line for fault dialer and relay':

The line is supervised, from the terminal including the activated relay in the fault dialer, in terms of open and short circuit. In addition to the line supervising, the panel will recognize a change of line resistance. Due to aging or other circumstances (creeping effect), the transition resistance on contacts may increase, which in turn leads to voltage drop.

In order to detect the creeping effect (supervision), the line must be calibrated during the commissioning process. A line fault is indicated if the resistance is higher than calibrated.

The range of the line resistance including the relay is between 200-1000 Ω.

Application:

With EOL diode: Sounder controls, fire outputs and alarm dialer.

With monitored relay for fault dialer: Only OUT A is specified to supervise the device relay, see details in chapter 4.4.4.

Technical:

- Max. current 24 V / 1 A
- Line resistance max. 35 Ω
- Each line must be terminated with EOL element (Diode 1N4007)

Programming:

- Configure → Output → Output 4 – n → Mode → e.g. Sounder control
- Configure → Output → Output 4 – n → Supervision EN 54-13
- Configure → Output → Output 4 – n → Calibrate line

4.4.3 Relay

Relay outputs are used for controls without line monitoring.

Application:

LED indication on a remote terminal

Technical:

- Max. current 30 V / 1 A

Programming:

- Configure → Output → Output 6 – n → Mode → Fire output

4.4.4 Dialer connection

The FC12x fire control panel provides 'monitored' and 'supervised' dialer connections:

Application 1

- 'Alarm dialer' output (OUT2) monitors the line to the dialer.
- 'Fault dialer' output (OUT3) has no line monitoring to the dialer.
  (Does not fulfill chapter 8.9 in EN 54-2)

Programming:

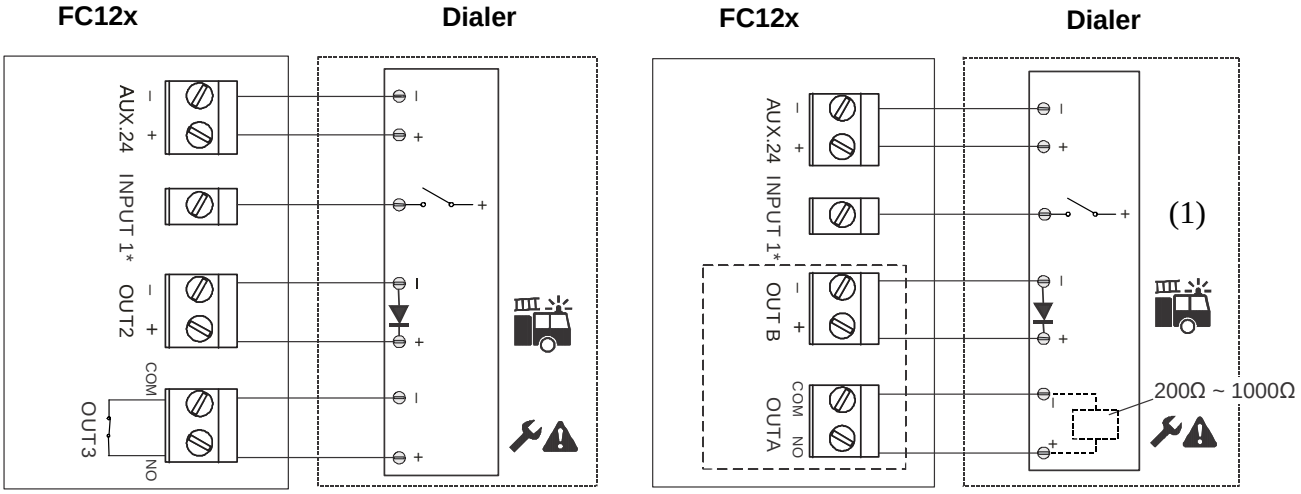
- Configure → Outputs → Output 2 → Alarm dialer →
  Activation condition 'General Alarm'
- Configure → Outputs → Output 3 → Fault dialer → Activation condition 'Any fault'

Application 2

- 'Alarm dialer' output (OUTB) supervises the line to the dialer.
- 'Fault dialer' output (OUTA) supervises the line and the build in relay of the dialer.
  The relay takes over EOL element functionality, if the resistance is between 200-1000 Ω.

Programming:

- Configure → Outputs → Output 5 → Alarm dialer →
  Supervision EN 54-13 / Calibrate line / Activation condition 'General Alarm'
- Configure → Outputs → Output 4 → Fault dialer →
  Supervision EN 54-13 / Calibrate line / Activation condition 'Any fault'



Application 1 Application 2

(1) Dialer device confirmation signal

As an option, the panel can receive the dialer activation if desired.

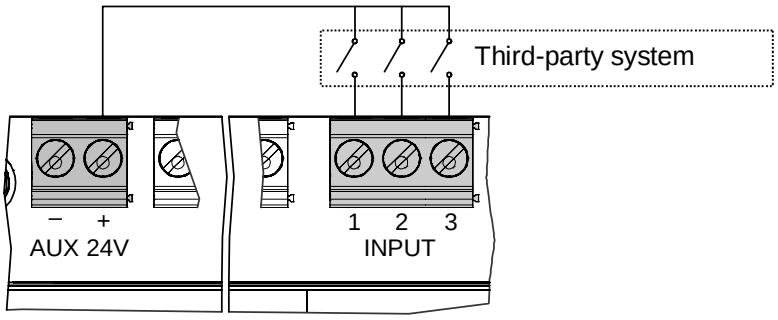
The output 'fault dialer' is closed (Inverse function) in quiescent mode.
In case of fault, the output opens.

4.5 Input

The programmable input function allows control of the panel by a third-party system.

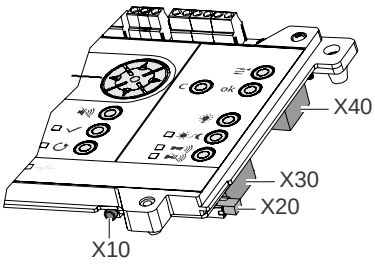
Programming:

- Configure → Input → Input 1-n → Mode → e. g. Class change signal

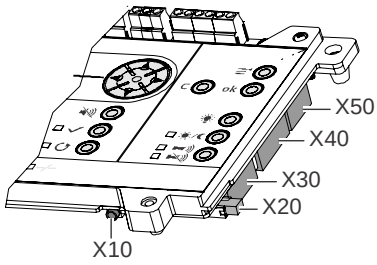


4.6 Accessories

Connect the accessories as shown.



FC121-ZA / FC122-ZA



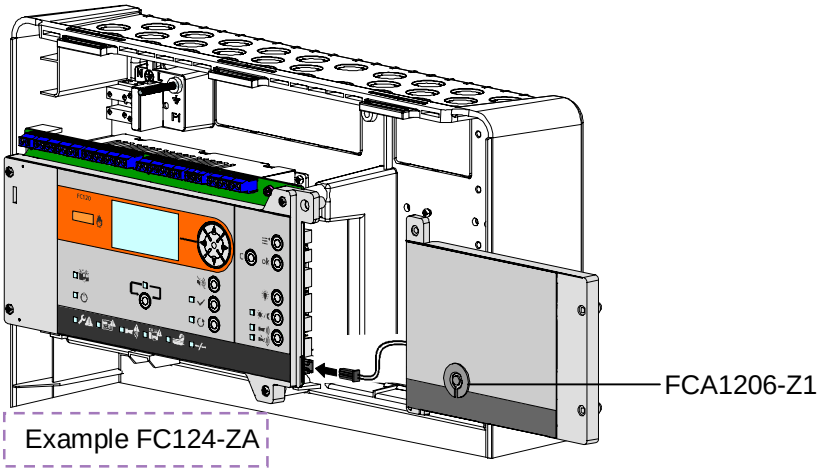
FC123-ZA / FC124-ZA

Terminals	Accessories
X50	not used
X40	FTO1201-H1 EVAC Module (NL 2&4 Z) FTO1203-H1 EVAC Module (NL 8&12 Z) FTO1202-Z1 Zone ind. field 12x2LED
X30	FCA1203-Z1 Output card 2M 2R
X20	FCA1206-Z1 Key switch set (Nordic SE)
X10	FDUZ221 MCL-USB adapter FDUZ227 MCL-USB adapter (radio)

4.6.1 Key switch set

The key switch set is available for the following panels.

	FC121-ZA	FC122-ZA	FC123-ZA	FC124-ZA
FCA1206-Z1	☑	☑	☑	☑



Example FC124-ZA

Function:

The key switch enables 'access level 2' (see chapter 6.4) without password.

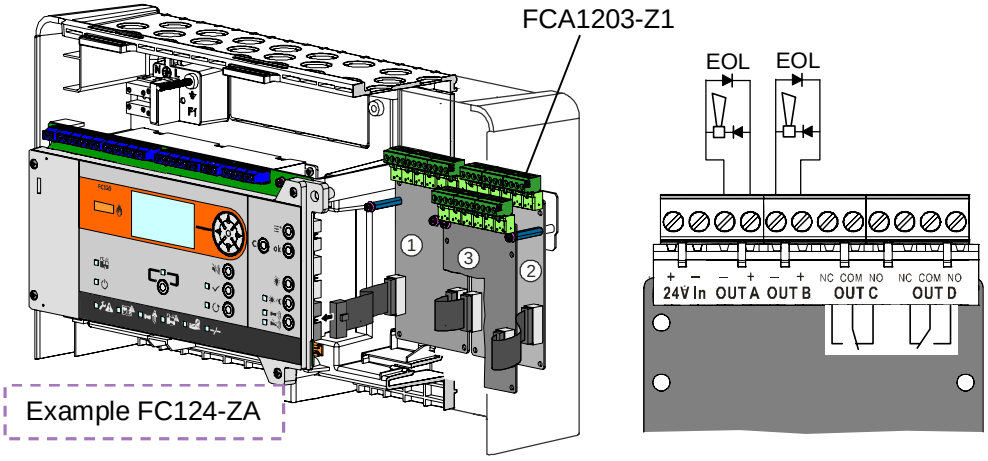
Programming:

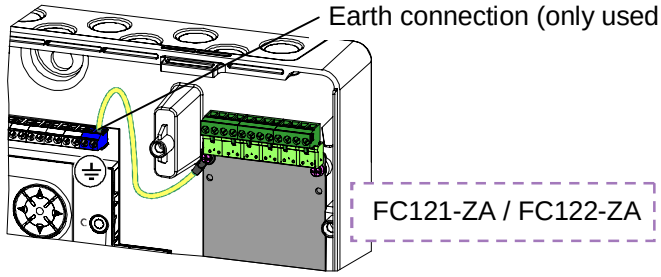
- No programming is required.

4.6.2 Output card

The output card is available for the following panels.

Output card	Mounting slot	FC121-ZA	FC122-ZA	FC123-ZA	FC124-ZA
FCA1203-Z1	①	☑	☑	☑	☑
	②			☑	☑
	③				☑





Function:
Each output card provides four outputs and one power input 24 V for external powering of the outputs A and B. Check power calculation in chapter 11 whether you have to power those outputs internally or externally.

Internal:
By default, output A and B are supplied by the internal PSU.

External:
Connect the wires from an external PSU to the terminal '24V In'.
The output card switches automatically from internal to external supply.

Programming:
- Output cards are automatically enabled if plugged in before initial start-up.

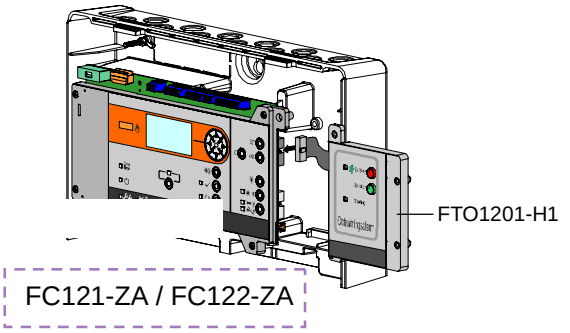
Output:
The output numbers include a reference to the respective output cards:

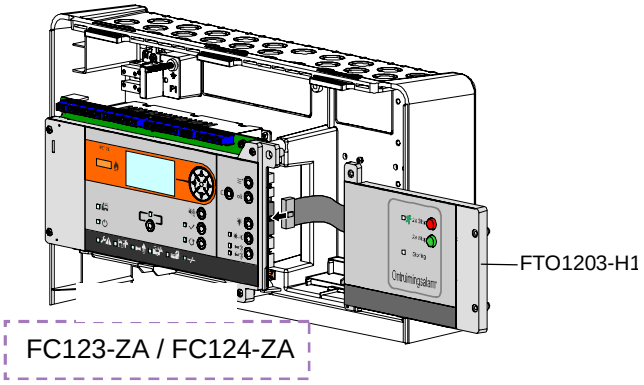
Mounting slot	Outputs for programming			
	A	B	C	D
①	4	5	6	7
②	8	9	10	11
③	12	13	14	15

4.6.3 EVAC module (NL)

The EVAC module is available for the following panels.

EVAC Module (NL)	FC121-ZA	FC122-ZA	FC123-ZA	FC124-ZA
FTO1201-H1	☑	☑		
FTO1203-H1			☑	☑





Function:

The EVAC module NL provides the Dutch special function.
All sounder controls are changed to EVAC sounder NL.

Mounting module before initial start-up:

- If the module is connected before the initial start-up, the NL presetting and language is pre-selected automatically.
- The functionality and EVAC sounder NL are available if the pre-selected setting is used.

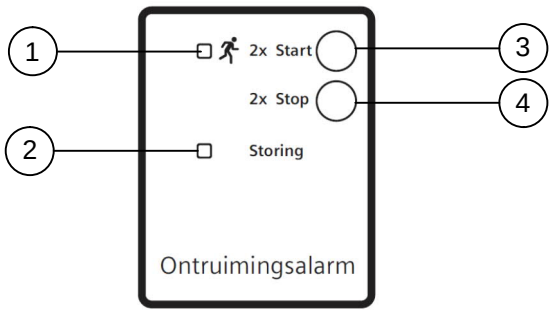
Mounting module after initial start-up:

- Enable the EVAC module in the programming.
- Change all programmed sounder outputs to EVAC sounder NL.

Programming: Configure → Accessory → EVAC module
Configure → Output → Output n → Mode → EVAC Sounder NL

Operating:

All programmed outputs to 'EVAC Sounder NL' are activated by pressing the start button twice.

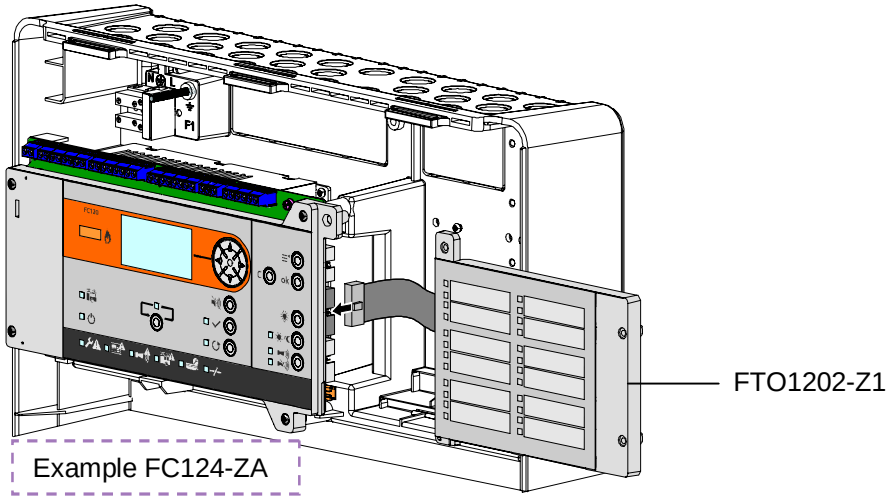


No.	Description	Status	Function
1	LED: EVAC zone active	ON	Evacuation is activated.
2	LED: EVAC fault	Flashing	Fault on the EVAC sounder lines(s) has occurred.
3	Button: START		Press twice to start the evacuation.
4	Button: STOP		Press twice to stop the evacuation.

4.6.4 Zone indication field

The zone ind. field FTO1202-Z1 as shown in the graphic below.

	FC121-ZA	FC122-ZA	FC123-ZA	FC124-ZA
FTO1202-Z1			☑	☑



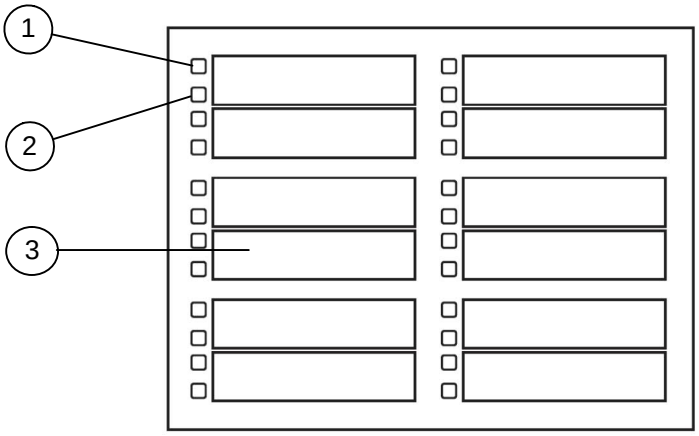
Function:

The zone ind. field shows the actual status of each zone.

- LEDs are fixed assigned and cannot be changed.

Programming:

- No programming is needed.



No.	Description	Status	Function
1	Zone alarm (Red)	ON	The zone is in alarm state.
		Flashing	The zone is in first alarm state.
2	Zone fault (Yellow)	ON	The zone is disabled.
		Flashing	Zone is in fault.
3	Inscribable fields		Inscription of zone number and customer text.

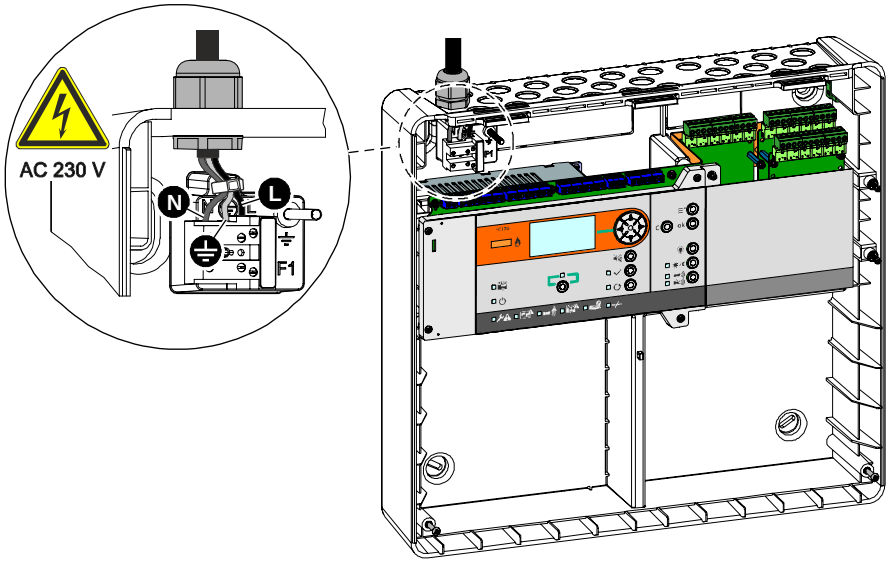
4.7 Initial start-up

The initial start-up is required with every new installation.

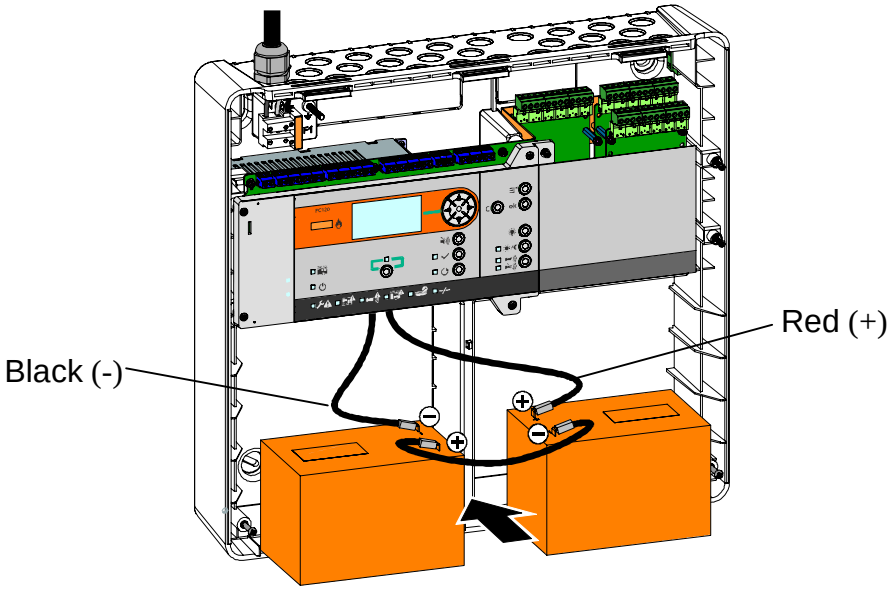
4.7.1 Prepare the panel

Make sure that the installation instructions, steps 1-8 are fulfilled (chapter 4.2) and all accessories are connected (chapter 4.6).

1) Switch on the mains supply.

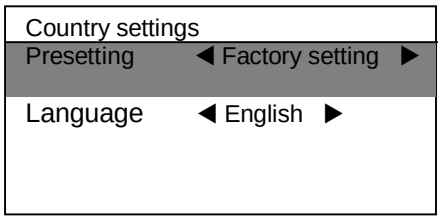


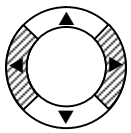
2) Connect the battery.



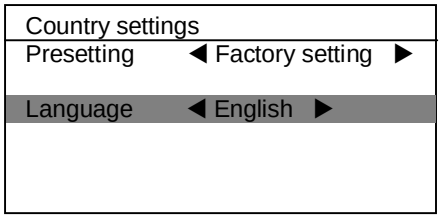
4.7.2 Pre configuration

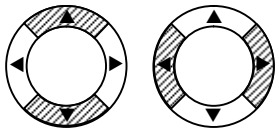
After the panel is powered up, the following display is shown.





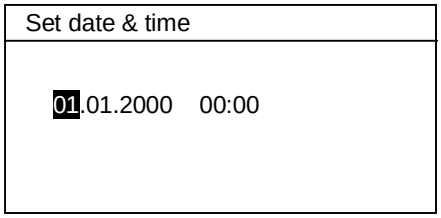
Change country setting by the navigation key <▶>.

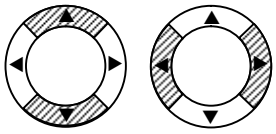




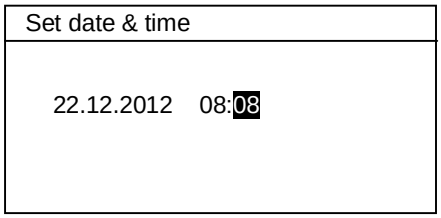
Move to the second line with <▼> and select the appropriate Language with <▶>.

Confirm the entry by the <ok> button.
The panel will restart with the country specific presetting.





Change the first value ‘day’ with <▲> / <▼> and move to the next with <▶> and so on.



Confirm the entry by the <ok> button.
The system is now ready for individual programming (see chapter 7).

Relevant to NL with EVAC module only:
If the EVAC module is mounted, the country setting is automatically selected by the system.

5 Function overview

5.1 Operating functions

The operating functions are related to the following topics.

Alarm	Disable / Enable	System test
- Acknowledge - Reset - Silence sounder - Manned / unmanned - Cancel alarm delay	- Zone - Sounder control - Fire output - Alarm dialer - Fault dialer	- Mode walk test with sounder activation for 1 second - LED test

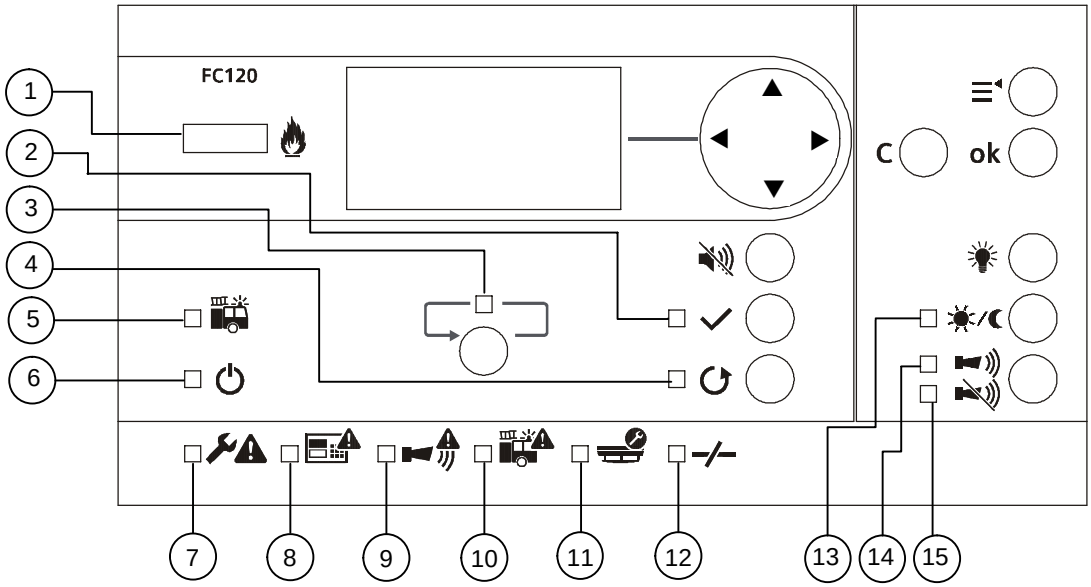
5.2 Access levels

The FC12x provides four different access levels.

Access level	Password	Function
1	No need	End user to view pending events.
2	5555 or key switch	Instructed and authorized end user: - Switch on / off zones and outputs. - Automatic logout after 2 minutes of no operation. - Password is not necessary if a key switch is used.
3	6666	Commissioning personnel: - System programming. - Automatic logout after 10 minutes of no operation. - The basic function of panel will not continue.
4	6666 and front cover open	Commissioning personnel: - Save and restore site configuration. - Upload history log. - Update firmware.
	6669	- Reset alarm counter.

5.3 LED indication

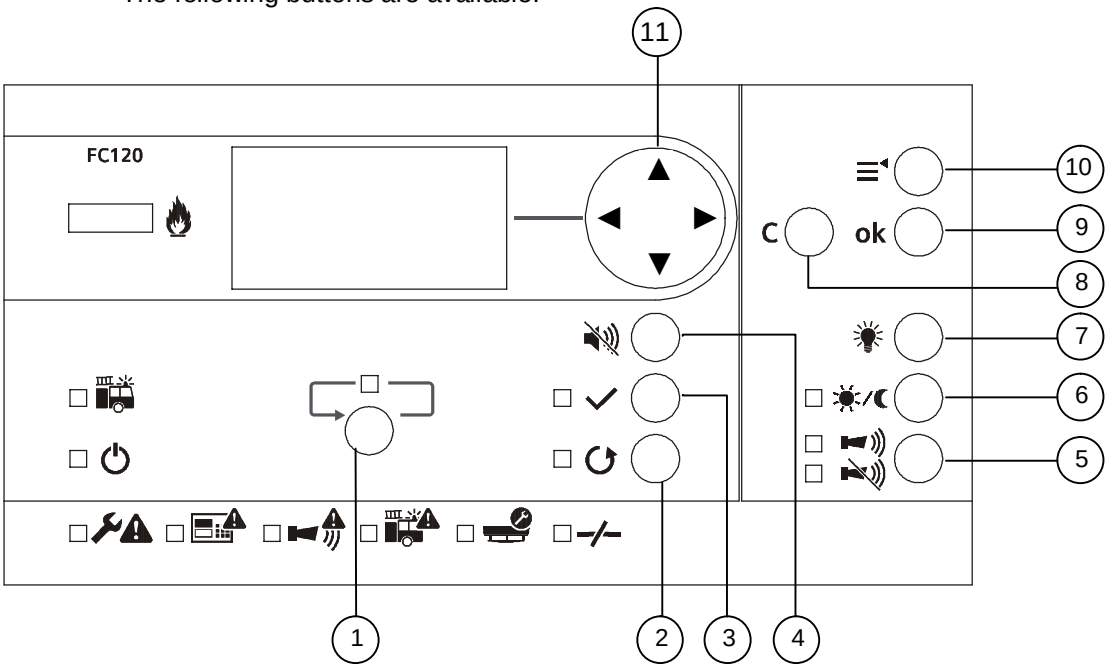
The following LED indications are available:



No.	Description	Colour	Status	Function
1	Alarm	Red	ON	The fire control panel is in 'Alarm' condition.
2	Acknowledge	Yellow	Slow	Indicates where action is expected.
3	More alarm	Red	Slow	More than two zones have triggered a fire alarm.
4	Reset	Yellow	Slow	Indicates the action in case of an alarm or fault.
5	Fire brigade	Red	ON	Depending on the programming mode. Option 1: Call the fire brigade, panel is in alarm mode. Option 2: Call the fire brigade, output Alarm dialer is active. Option 3: Fire brigade is called.
6	System on	Green	ON	The system is in operation.
7	General fault	Yellow	ON	Indicates any fault in the system.
8	System fault	Yellow	ON	Indicates CPU failure.
9	Sounder fault	Yellow	ON	Sounder lines are disabled.
			Slow	Sounder line is in fault state.
10	Alarm dialer fault	Yellow	ON	Alarm dialer output is disabled.
			Slow	Alarm dialer output is in fault state.
11	Test condition	Yellow	ON	At least one zone is in test state.
12	Isolation	Yellow	ON	At least one zone or output is disabled.
13	Manned / Unmanned	Yellow	ON	Manned operation (AVC).
			OFF	Unmanned operation (AVC).
			Fast 2 Hz	Reaction time V1 is running (AVC).
			Slow 1 Hz	Investigation time V2 is running (AVC).
14	Resound	Red	ON	Sounder lines are activated.
15	Silence	Yellow	ON	Sounder lines are silenced.

5.4 Buttons

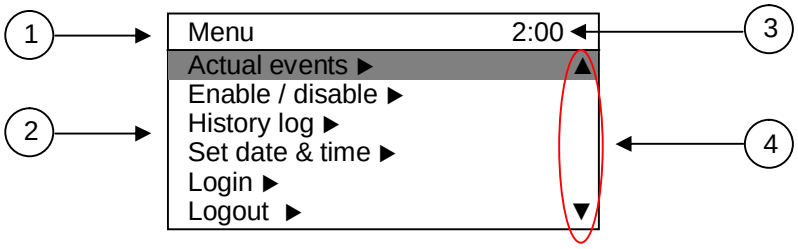
The following buttons are available:



No.	Description	Function
1	MORE ALARM	Move to the next 'fire alarm'.
2	RESET	Reset the fire control panel to quiescent condition.
3	ACKNOWLEDGE	• Starts the investigation time V2 (AVC). • Silence the buzzer until a new alarm event occurs. • Silence the sounder until a new event occurs (if programmed).
4	SILENCE BUZZER	Silence the buzzer until a new event (alarm, alert or fault) occurs.
5	SILENCE	• Silence the sounder control(s) in the event of alarm.
	RESOUND	• Manually re-activate the sounder control(s) during alarming. • If programmed, activation of all sounder control(s) (activation mode only in quiescent condition).
6	MANNED / UNMANNED	• Switch between manned / unmanned. • Cancel the alarm delay V1 / V2 when V1 / V2 is running.
7	LAMP TEST	Activate all LEDs, the buzzer and the display on the PMI.
8	CANCEL	Move one step back without saving the change.
9	OK	Confirm the selected value.
10	MENU	Enter the main menu.
11	NAVIGATION	• Select the menu or change the time: <▲> and <▼>. • Change the selection: <◀> and <▶>. • Change to the next level or select value in the checkbox: <▶>.

5.5 Display

The display is divided into 4 sections.



1: Title
This line displays the main menu.

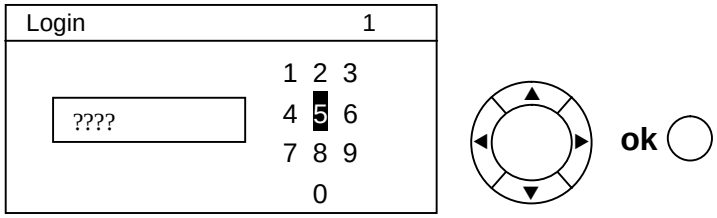
2: Window
This window displays the sub menus and its parameters.

3: AVC timer or access level
- Countdown of the AVC timer V1 and V2
- Indication of the access level

4: Scrollbar
Scrollbar is provided if more information is visible in a second window.

5.6 Password entry

How to get access to the fire control panel.



- Select the 1st number of the password by the navigation button and confirm with <ok>.
- Repeat until the last '?' is replaced.
- If the password is correct, the respective access level is granted.

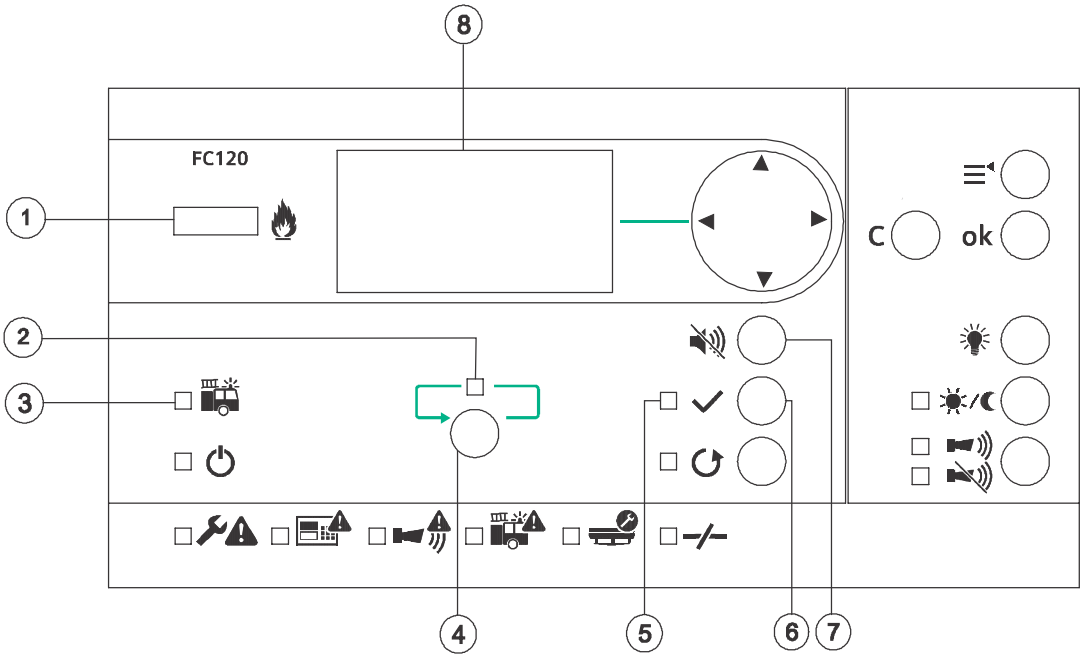
Access levels according to chapter 5.2.

6 Operation

6.1 General fire alarm procedure

In case of a fire alarm, the following indication is shown on the panel:

- The fire alarm is indicated by the LEDs (1).
- The first and last alarm zone are displayed (8).
- Further fire alarms are indicated by the flashing LED (2). In order to move to the next alarm event, press the button (4).
- The internal panel buzzer indicates a fire condition acoustically. As an option, the buzzer can be silenced by pressing the button (7). A new alarm event will reactivate the buzzer again.
- Output alarm dialer is activated when LED (3) is ON. (Call the fire brigade.)
- Programmed system outputs, including connected audible and visual notification appliances, get activated.
- The flashing acknowledge LED (5) indicates the possible action to acknowledge by pressing the button (6).



6.1.1 Procedure without Alarm verification

The Alarm dialer is activated in the event of a fire alarm.

Fire alarm	1
Zone 1 Meeting room 1	1/1

Press the <ACKNOWLEDGE> button.

If the alarm event is acknowledged, the panel turns off the panel buzzer.

➔ Access level 2 password is required.

Optional: Silence the sounder lines by pressing **<**RESOUND / SILENCE**>** button.

MAJOR INCIDENT: A real fire emergency

Fire alarm	1
Zone 1 Meeting room 1	1/1

Check if the fire brigade called.

MINOR INCIDENT: No fire alarm

	1
Normal Operation Siemens FC12X 22.12.2012 08:08	

Reset the system to quiescent mode by pressing <RESET> button.

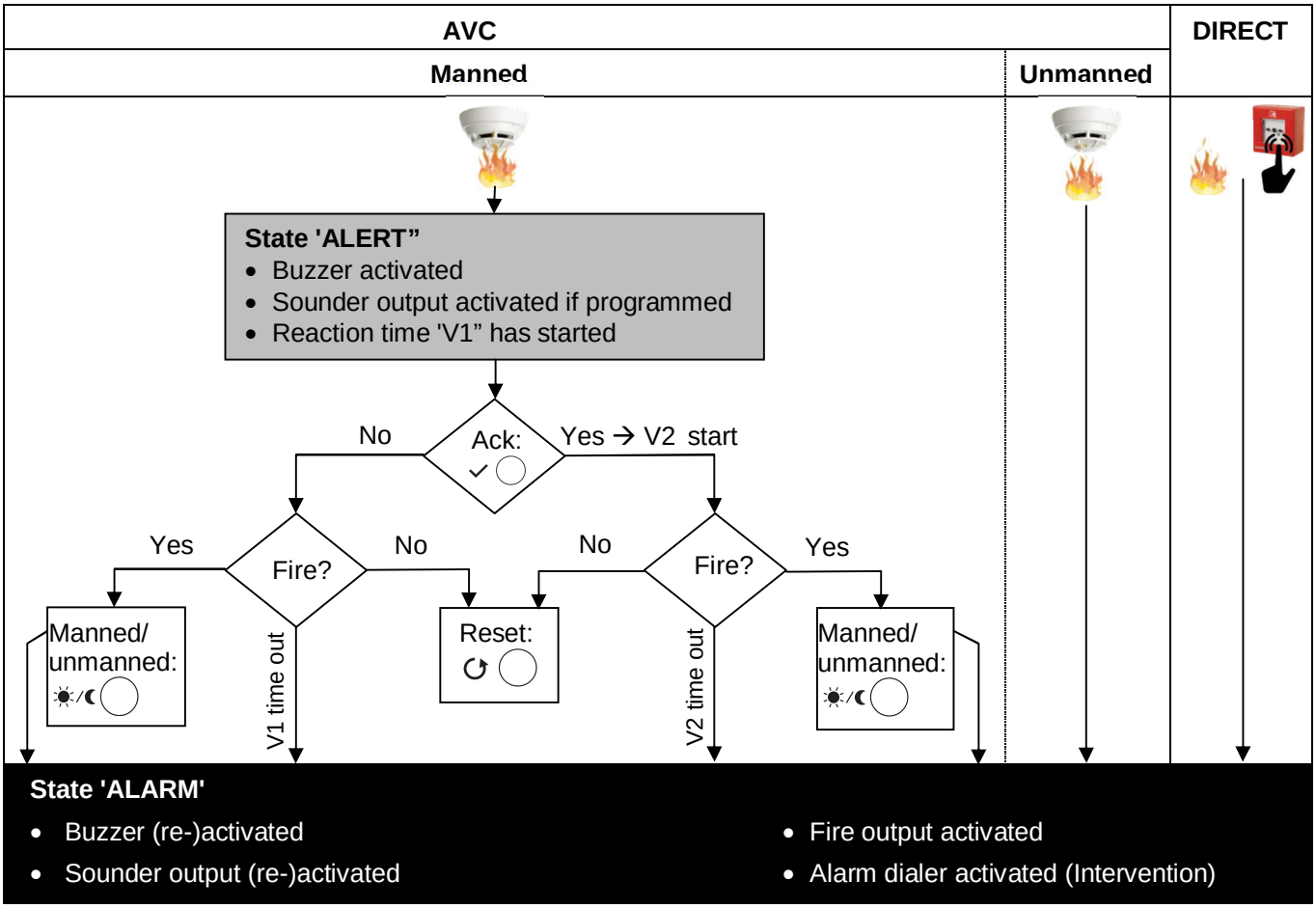
➔ Access level 2 password is required.

Inform the fire brigade about the actual situation.

	Notice
	The fire alarm reoccurs if any device remains in fire condition.

6.1.2 Alarm Verification Concept (AVC)

The graphic below illustrates the difference between the AVC and the DIRECT alarm procedure. The AVC concept takes the interaction of personnel into consideration.



Manned operation

Manned operation enables the responsible personnel to examine the fire alarm before initiating the intervention force. This may avoid hassles in case of false alarms.

Reaction time (V1)

In case of a fire incident, the responsible personnel must confirm the alert at the fire control panel by pressing the acknowledge button (ACK).
Investigation time V2 starts if activated. If nobody confirms the alert state, the V1 timer expires and the panel automatically goes to 'ALARM' state.

In the event of a major incident (emergency), the nearest 'Manual call point' [1] or <Manned/Unmanned> button must be pressed to turn the fire control panel into 'ALARM' state. ([1] function depends on programming)

Investigation time (V2)

During the investigation time V2 the operating personnel may examine the location of fire:

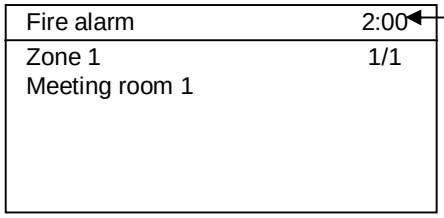
In the event of a major incident (emergency), the nearest 'Manual call point' [2] or <Manned/Unmanned> button must be pressed to turn the fire control panel into 'ALARM' state. ([2] function depends on programming)

The panel goes to 'ALARM' state if the investigation is not confirmed within time V2.

The operator may reset the panel in the case of a minor incident or false alarm.

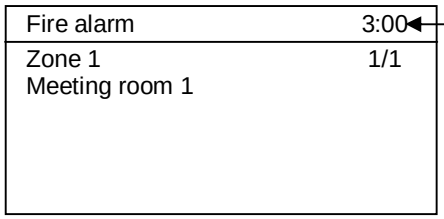
6.1.3 Procedure with Alarm Verification

In the event of a fire alarm, the reaction timer V1 gets started.



Press the <ACKNOWLEDGE> button to confirm the attendance. If the alarm event is acknowledged, the buzzer turns off.

➔ Access level 2 password is required.

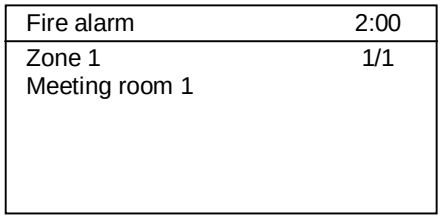


The investigation timer V2 is started.

Optional:
Silence the sounder by pressing **<**RESOUND / SILENCE**>** button.

!	*Action is requested*
	During the investigation time, examine the location of the fire and decide whether it is a **MAJOR INCIDENT or MINOR INCIDENT.**

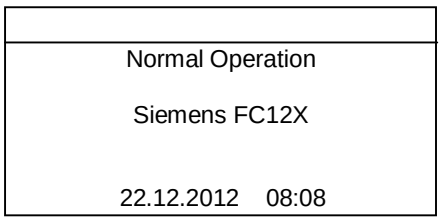
MAJOR INCIDENT: A real fire emergency



Cancel the investigation time by pressing the **<**MANNED / UNMANNED**>** button.

➔ Access level 2 password is required.

MINOR INCIDENT: No fire alarm



Reset the system to normal operation by pressing <RESET> button.

➔ Access level 2 password is required.

!	*Notice*
	The fire alarm reoccurs if any device remains in fire condition.

6.2 Fault procedure

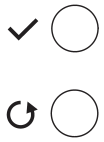
In the event of a fault, the panel displays the fault.
As an option, programmed outputs can be activated (e.g. fault dialer).

Fault	1
Battery	1/2
Zone 1	2/2

Press the <SILENCE BUZZER> button.
Buzzer is turned off.

!	*Action is requested.*
	Solve the cause of the fault.

Normal Operation
Siemens FC12X
22.12.2012 08:08



Acknowledge and reset the system to normal operation by pressing the <ACKNOWLEDGE> and <RESET> button.

➔ Access level 2 password is required.

!	*Notice*
	The fault reoccurs if acknowledged but not resolved.

A list of possible 'Faults' can be found in chapter 12.

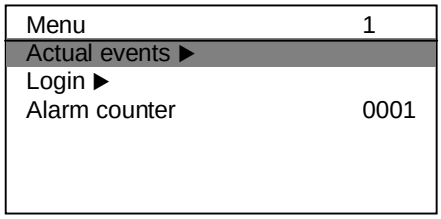
6.3 Access level 1

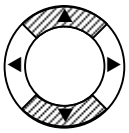
Operation is available **without** password.

6.3.1 Actual events

The actual events will display all pending events.

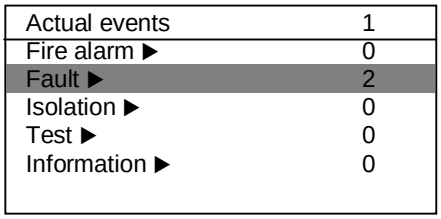
Push button <MENU>.

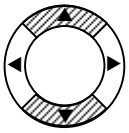




ok

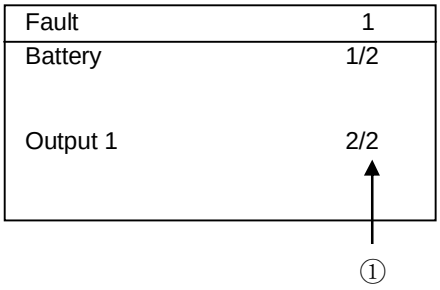
Select ‘Actual events’ with navigation button and confirm with <ok>.

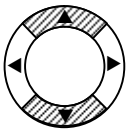




ok

The left picture shows the 5 entry points.
Select one event type and confirm with <ok>.





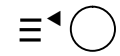
The details are visible with the number of events indicated for the category.
e.g. ① two events exist in this category.

C

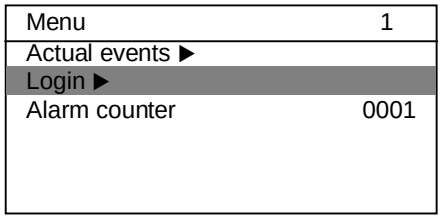
Go back to the main menu with <C>.

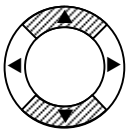
6.3.2 Login

The panel is protected against unauthorized user operation.
Therefore enter the password or turn the key switch (optional).



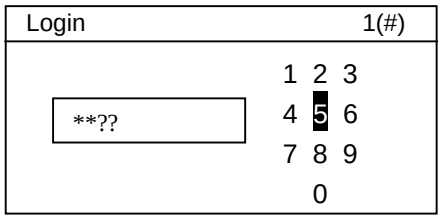
Push button <MENU>.

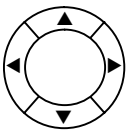




ok

Select ‘Login’ and confirm with <ok>.





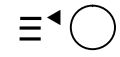
ok

- Select the digit using the navigation button and confirm it with <ok>.
- The ‘?’ is replaced by ‘*’ with every entered digit.
- Press <C> to cancel the input.

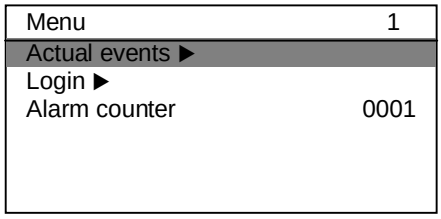
(#) shows the actual access level.

6.3.3 Alarm counter

The alarm counter counts all fire alarms.



Push button <MENU>.



The number of counted alarms is shown.

C

Exit with <C>.

6.4 Access level 2

Operation is available **with** password or key switch.

6.4.1 Manned / unmanned

In case of attendance switch the fire control panel to manned operation.

Information	2
Manned operation Manned mode activated	1/1

Press the <MANNNED / UNMANNED> button to toggle.

Manned mode – LED ON
Unmanned mode – LED OFF

6.4.2 Silence / resound

Sounders are activated in the event of a fire alarm.

Press the <SILENCE / RESOUND> button to silence the sounders.
It is possible to reactivate the sounders in the event of a fire alarm at any time.

Every new alarm event will reactivate the sounders again, if programmed.

Optional: The sounders can be activated at any time 'Toggle function' (no alarm event is required) if programmed.

6.4.3 LED, display and buzzer test

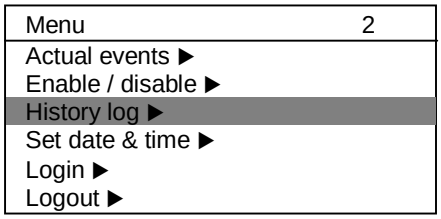
Test the panel indication.

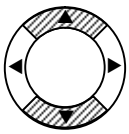
Press the button <LAMP TEST> and all LEDs, the display and the internal buzzer are activated for a period of 5 seconds.

6.4.4 Display history log

All events such as alarm(s), fault(s), isolation(s), input(s) and output(s) activation are stored in a history log.

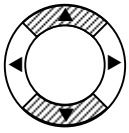
Push button <MENU>.





ok

Select ‘History log’ and confirm with <ok>.



All events are visible.
Fast scrolling is possible by holding <▲> / <▼> navigation button.

C

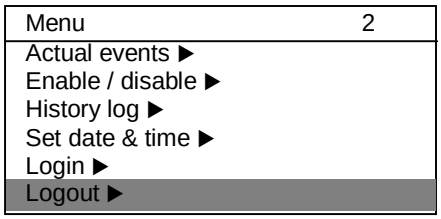
Go back to the main menu with <C>.

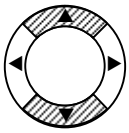
6.4.5 Logout

Manual logout to access level 1.

Panel automatically logs out if no action is taken within 2 minutes.

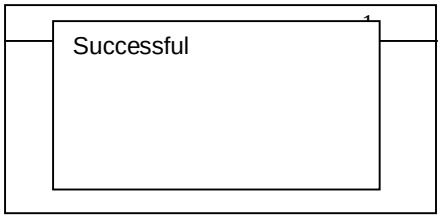
Push button <MENU>.





ok

Select ‘Logout’ and confirm with <ok>.

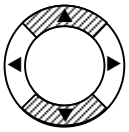


The panel is logged out successfully to previous access level.

6.4.6 Set date and time

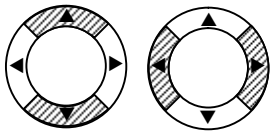
Push button <MENU>.

Menu	2
Actual events ▶	
Enable / disable ▶	
History log ▶	
Set date & time ▶	
Login ▶	
Logout ▶	



ok ◯ Select ‘Set date & time’ and confirm with <ok>.

Set date & time
01.01.2000 00:00



Change the first value with <▲> / <▼> and move to the next with <▶> and so on.

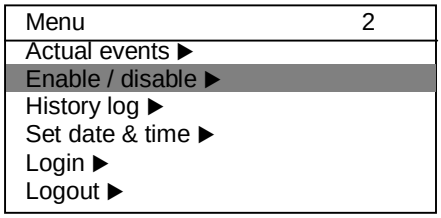
Set date & time
22.12.2012 08:08

ok ◯ Confirm with <ok>.

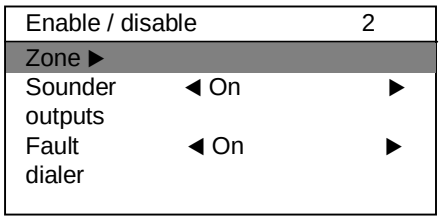
6.4.7 Enable / disable zone

Each zone can be isolated individually.

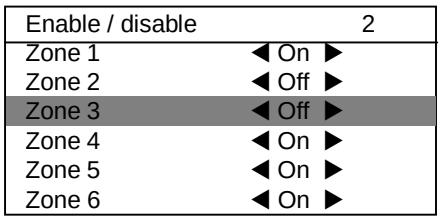
Push button <MENU>.

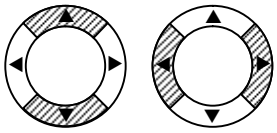


Select ‘Enable / disable’ and confirm with <ok>.



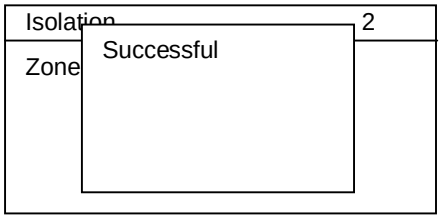
Select ‘Zone’ and confirm with <ok>.



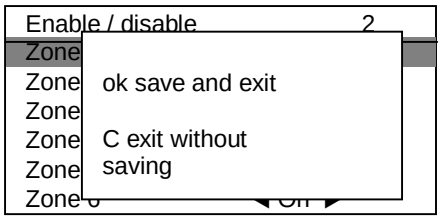


Select a zone and change its property with <▶>.

Change zone properties for other zones as needed.



Confirm all changes with <ok>.

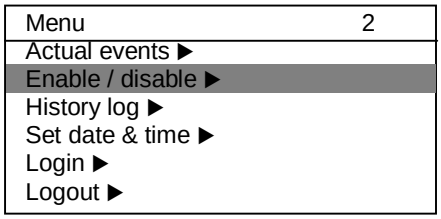


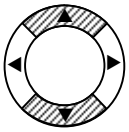
Exit menu without change by pressing the button <C> for the first time and then a second time while the information is displayed.

6.4.8 Enable test mode

Enable the test mode for each zone**.**

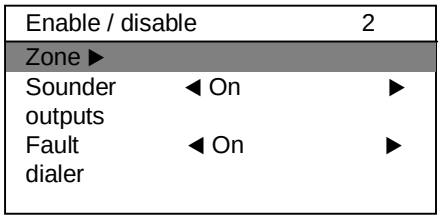
Push button <MENU>.





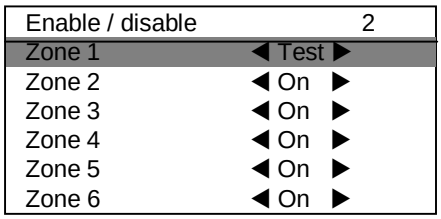
ok

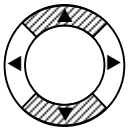
Select ‘Enable / disable’ and confirm with <ok>.

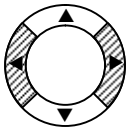


ok

Select ‘Zone’ and confirm with <ok>.

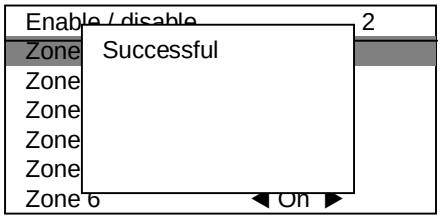






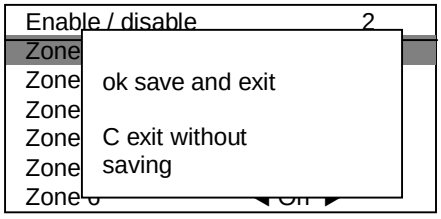
Select a zone and change its property with <▶>.

Change zone properties for other zones as needed.



ok

Confirm all changes with <ok>.



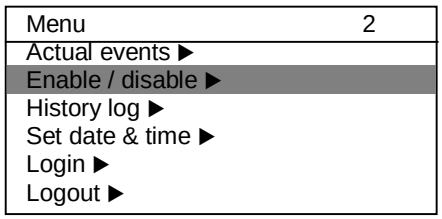
C

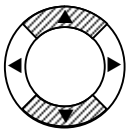
Exit menu without change by pressing the button <C> for the first time and then a second time while the information is displayed.

6.4.9 Enable / disable outputs

Disable outputs generally and / or individually.

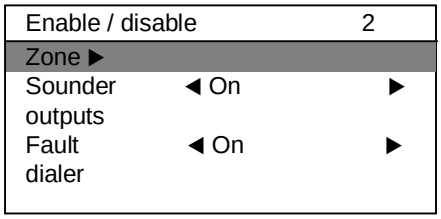
Push button <MENU>.

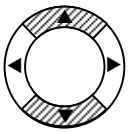




ok

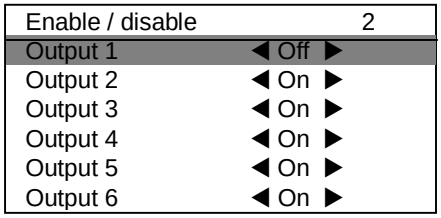
Select ‘Enable / disable’ and confirm with <ok>.

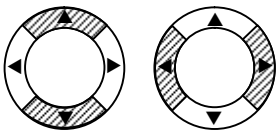




ok

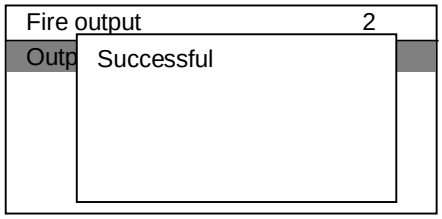
Select the respective Output (e.g. ‘Fire outputs‘) and confirm with <ok>.





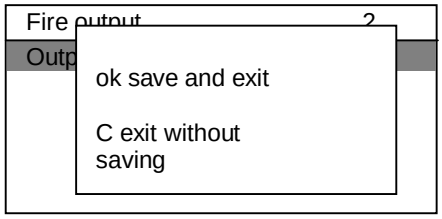
Select an output and change its property with <▶>.

Change output properties for other outputs as needed.



ok

Confirm all changes with <ok>.



C

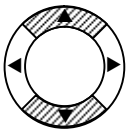
Exit menu without change by pressing the button <C> for the first time and then a second time while the information is displayed.

6.4.10 Panel information

Information about the software is displayed.

Push button <MENU>.

Menu	2
Panel information ▶	
Alarm counter	0001
Service information ▶	



ok

Select ‘Panel information’ and confirm with <ok>.

Panel information	2
Type: FC124-ZA	
App: 01.00.19	
Boot: 01.00.04	
Output card 1▶	
Output card 2 ▶	
Output card 3 ▶	

C

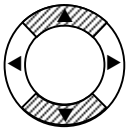
Exit with <C>.

6.4.11 Service information

The service information is shown in quiescent mode (e.g. contact address of the service provider and panel information).

Push button <MENU>.

Menu	2
Panel information ▶	
Alarm counter	1
Service information ▶	



ok

Select ‘Panel information’ and confirm with <ok>.

Service information	2
xxxxxx FC12X	
xxxxxx▶	

C

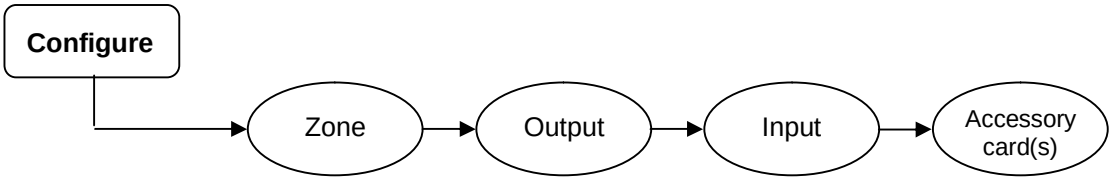
Exit with <C>.

7 Programming

For programming, access level 3 is required.

All outputs are automatically isolated during programming mode. All disabled outputs are automatically enabled if access level 2 is reached.

7.1 Configure



7.1.1 Zone

Zone

Configure parameter for each zone.

Zone 1..n

Select a zone for programming.

Mode

Standard	Automatic detectors and manual call points can be mixed within the same zone. Device could be either conventional or collective.	AVC option '1', '2'	
Mixed MCP & det.		AVC option '1', '2', '3'	If detectors are removed, the zone will work properly.
GB continuity			
Short = alarm			Any short is detected as 'Fire Alarm'.

AVC

Direct	'1'	No delay, immediate alarm.	
Via V1 / V2	'2'	Delayed alarm.	V1: reaction time, 3 min. V2: investigation time, 5 min. (Change value, see chapter 7.2.10).
Via AVC timer MCP direct	'3'	- Delayed alarm for automatic detectors. - No delay for MCPs.	

*Device coincidence

If selected, the 'Alarm' state is achieved, if the second device activation in the same zone occurs within 90 seconds. The first device activation is inhibited from the zone and automatically reset after a defined time, (default value: 15 second, see chapter 7.2.5).

Zone coincidence

If selected, the 'Alarm' state is achieved, if the second corresponding zone is in 'Alarm' as well. The zone pairs (1&2, 3&4, 5&6, etc) are predefined in the system,
e.g. if zone 6 is selected, zone 5 is automatically linked as well and vice versa.

Customer text

Name the zone, see chapter 7.5.

*Do NOT use this function in combination with FDOOT241-9 (ES<13). For detailed information refer to document A6V10393192.

7.1.2 Output

Output

Configure the output parameters.

Output 1..n

Select an output for programming.

Mode

Sounder control	Sounder control is used to activate sounder lines. (EVAC module replaces 'sounder control' with 'EVAC sounder NL'.)
Alarm dialer	Alarm dialer is used to transmit the fire alarm to the intervention force, e.g. fire brigade.
Fault dialer	Fault dialer is used to transmit the fault signal to the intervention force, e.g. service provider.
Fire output	Fire outputs are used to activate / deactivate controls, e.g. door holders, lifts, air-condition, etc.
EVAC Sounder NL	EVAC sounders are used to activate sounder lines. This option is available if the EVAC module is implemented.

Supervisior EN 54-13

Enables supervision, creeping open and short for the outputs: 4, 5, 8, 9, 12 and 13.

Calibrate line

The line calibration is needed to achieve supervision. As a result of the calibration the line resistance is indicated and can be proved using your own calculation.
This option is only availible on output cards and if supervision is set.

Activation condition*

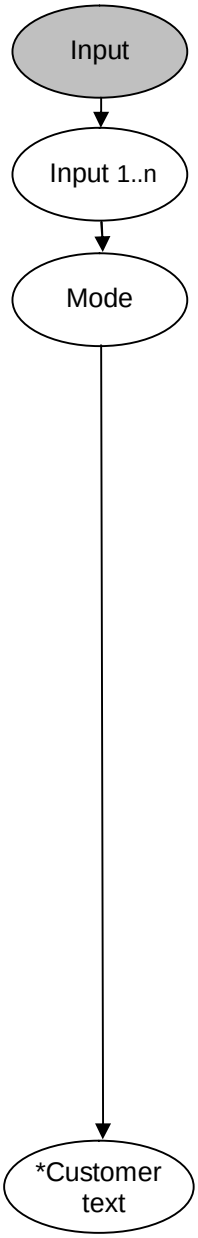
General Alarm	Output is activated if the alarm condition is fulfilled: Zone 'Direct' is activated, V1 / V2 is expired, cross zoning 2nd zone is activated.
Active by zone alarm	Output is activated if the selected zone(s) is in alarm.
General Alert	Output is activated if cross zoning 1st zone is in alarm or V1 / V2 time is running.
Active by zone alert	Output is activated if the selected zone(s) is in alarm by cross zoning 1st zone or V1 / V2 time is running.
Alert by ext. input	Output is activated if one input is activated and programmed as 'activate alert mode'.
Any isolation	Output is activated if any isolation is set.
Any fault	Output is activated if any fault condition occurs.
Manned mode activated	Output is activated if manned mode is activated.
Alarm dialer fault	Output is activated if the alarm dialer fault via input is in fault condition.
Dialer device confirmation signal	Output is activated if the programmed input is activated.
V1 / V2 is running (SE function)	Output flash during V1; Output on during V2.

* Options available depending on the selected mode.

Pulse time

This option is available in Alarm and Alert state.
Default on 0.5 sec. off 0.5 sec. Details see chapter 7.2.6.

7.1.3 Input



Configure the input parameters.

Select an input for programming.

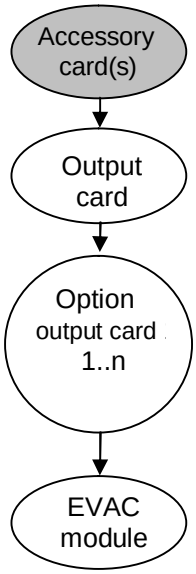
Class change signal	Activate all sounder controls as long as the input is closed.
Dependency reset	Reset function is suppressed if the Alarm dialer is activated or if ACK is not pressed before.
Level 2 access	Enables the access level 2 as long as the input is closed.
Disable dialer outputs	Disable fault and Alarm dialer as long as the input is closed.
Manned / unmanned	Switch to manned as long as the input is closed.
Toggle manned / unmanned	Toggle between manned / unmanned if the signal change on the input.
External PSU fault	Activate fault condition from the external PSU fault as long as the input is closed.
Alarm dialer fault	Activate general fault and LED 'Alarm dialer fault' until reset. Application remote transmission device is in fault state.
Dialer device confirmation signal	Generate an event of 'Fire brigade is called' and is used to activate outputs and the LED 'Fire brigade is called' as long as the input is closed.
Activate alert mode	This mode (alert) supports that the output(s) is activated as long as the input is closed. Menu: Configure→Outputs→Activation condition→Alert by ext. input
ACK	Acknowledge all events if the input is activated.
SE ACK function	Acknowledge function is suppressed if the Alarm dialer is activated.
Reset	Reset function is always available independently of the access level.

If the mode 'Class change signal' is selected, you can edit the customer text.
See chapter 7.5.

It is not allowed to configure two or more inputs as 'Class change signal'.

7.1.4 Accessories

The accessories (output cards / EVAC module) are automatically recognized by the system if connected before the initial start-up. An EVAC-Module NL, added after initial start-up, must be enabled manually.



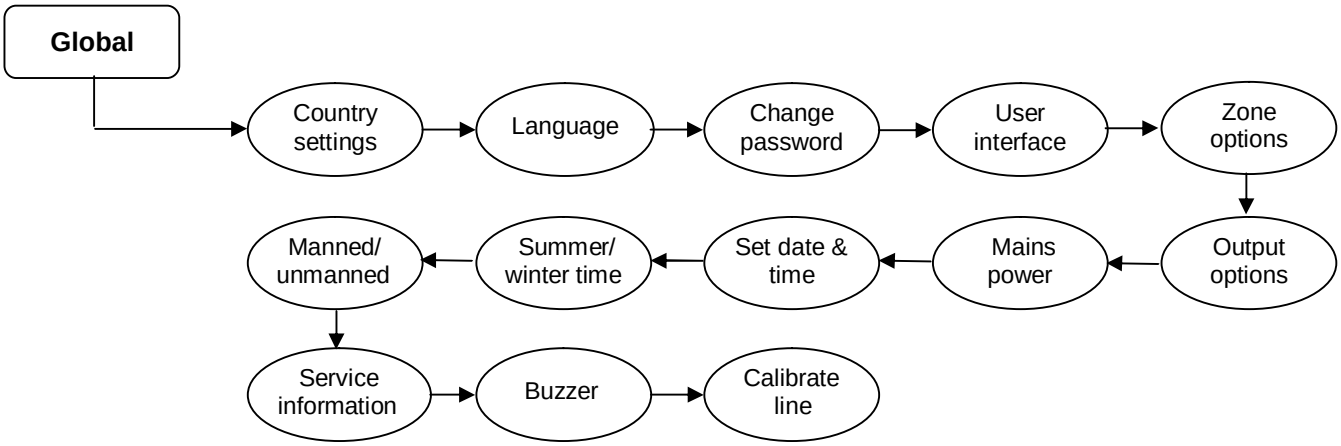
Configure accessories	
When an output card is removed, the quantity must be modified accordingly.	
External power input is used	Change the power concept from internal to external, if required. External power is automatically enabled if provided. Therefore check the calculation in chapter 11, max. external device power for FC121-ZA/FC122-ZA → 0.5 A and FC123-ZA/FC124-ZA →1.2 A.
Enable the EVAC module (must be connected first).	

Before installing an output card, power should be switched off.
If the quantity of configured output cards does not match the quantity of installed output cards, all outputs will report fault. After pressing <RESET> only outputs with fault are displayed.

The key switch set and the LED indication field do not need any configuration.

7.2 Global

The Global menu includes system wide parameters.



7.2.1 Country settings

Country settings

Factory setting	Factory default setting provides all possible programming.
n	Selection of the country specific setting.

7.2.2 Language

Language

English	All display texts are in English.
n	Selection of the language.

7.2.3 Change password

Change password

Change password for access level 2.

7.2.4 User interface

User interface

Lamp test available at access level 2	If selected, the lamp test function is only available at access level 2. Otherwise it is available at access levels 1 and 2.
Silence key with EVAC function	If selected, all sounder control lines can be activated by pressing the button <Silence / resound> if access level 2 is achieved.
Silence on ACK	If selected, all sounder lines can be silenced by <ACK>.
ACK available at access level 1	If selected, the button function <ACK> is available in access level 1 in addition to the access level 2.
LED fire brigade activated by alarm dialer output	If selected, the LED is activated when the output 'Alarm dialer' is active. Otherwise, the LED is activated by general alarm.
LED fire brigade activated via input	If selected, the LED is activated if the dialer device confirmation signal is given.
Display view	Standard: Fulfills EN 54-2
	UK only FC122: 4 zones without customer text are displayed.

7.2.5 Zone options

Zone options

Device coincidence inhibit time	The fire condition is achieved with the second detector activation in the same zone only. The inhibit time, between the first and the second activation can be set to from 15 to 60 seconds. The higher the value, the more reliable the application.

7.2.6 Output options

Output options

Pulse time	Fire alarm: Select the time for switch on / off for the respective outputs. Value range : On 0 - 3 sec. Off 0 - 5 sec.
	Alert: Select the time for switch on / off for the programmed outputs. Value range: On 0 - 3 sec. Off 0 - 5 sec.
Resound on new alarm	If selected, the sounder line will resound with a new alarm.

7.2.7 Mains power

Mains power

Fault delay time	Delay time for Mains power fault. Time delay up to 30 min. selectable in 5 min. steps.

7.2.8 Set date and time

Set date & time

Set date and time.

7.2.9 Summer / winter time

Summer/ winter time

Automatic switching	If selected, the panel will switch automatically to the summer / winter time each year.

7.2.10 Manned / unmanned

Manned/ unmanned

V1 time	Select the reaction time V1, value from 30 sec. - 4 min.
V2 time	Select the investigation time V2, value from 1 min. - 10 min. Allowed time with regards to EN 54-2 is V1+V2 = 10 min.
Automatic switch to unmanned	Enable the daily switching time.
Switching time	Set the switching time to unmanned.

7.2.11 Service information

Service information

The service information is shown in quiescent mode. Insert text as per chapter 7.5, e.g. FC12x 'address and telephone number'.

7.2.12 Buzzer

Buzzer

On: Enable the panel's internal buzzer. → **Comply with EN 54-2** Off: Disable the panel's internal buzzer**.** → **Not comply with EN 54-2**

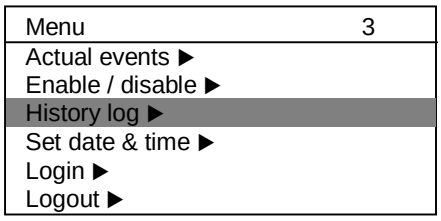
7.2.13 Calibrate line

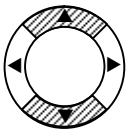
Calibrate line

Calibration for all programmed supervision outputs at once. Line calibration is needed to achieve supervision. As a result of the calibration, the line resistance is indicated and can be provided using your own calculation.

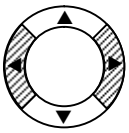
7.2.14 Delete history log

Access level 3 is required to delete the history log.

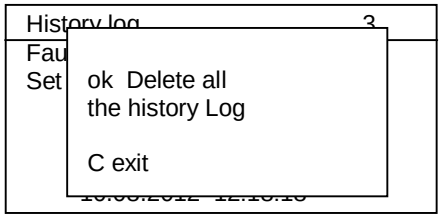




ok ◯ Select the ‘History log’.

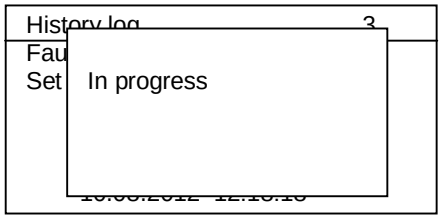


Enable the deletion by pressing <▶>.



ok ◯

Confirm the deletion by the button <ok>. This action is available as long as the information is displayed.



History log gets deleted.

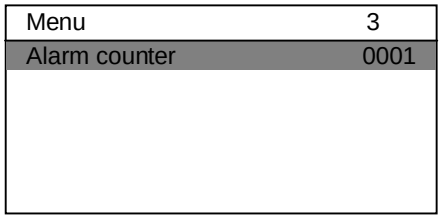
7.3 Logout

Exit the actual access level to the previous access level; Access level 3 → Access level 2; Access level 2 → Access level 1

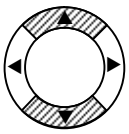
If no action has been taken within 10 minutes, the panel will automatically leave the access level 3 to access level 2.

7.4 Reset alarm counter

Reset the alarm counter by pressing <▶> and enter password '6669'.

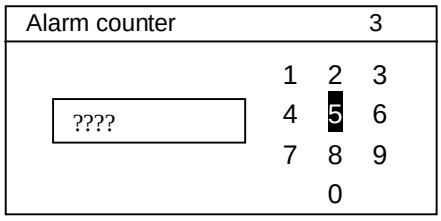


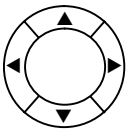
Display main menu with <MENU>.



ok

Select the ‘Alarm counter’ and press <▶>.





ok

Enter the password (6669).

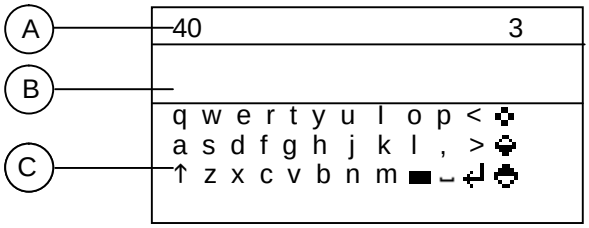
Alarm counter is reset if the password is correct.

7.5 Customer text

Input customer text for:

- Zones, see chapter 7.1.1.
- Input function 'class change signal', see chapter 7.1.3.
- Service information, see chapter 6.4.11.

The window is structured into the following sectors:



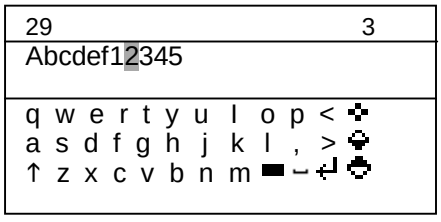
Sector	
A	Remaining space, out of 40 on two lines
B	Text area
C	Selection area of letters, numbers, characters and toggle function

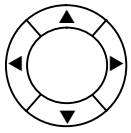
Legend:

↑	Toggle between capital and lower letters
■	Delete the character to the left of the cursor position
␣	Insert space
↵	Change entry to the second customer text line
✣	Switch to numeric
↩	Switch to letter
◓ ◒	Toggle between country specified character
← / →	Page up / down

7.5.1 Button function

The button function depends on the curser position.
Select the curser position by navigation key.

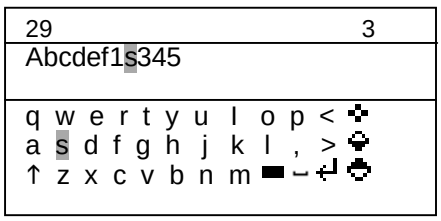


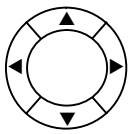


Curser position, area B

ok The <ok> button confirms the text entry and exits the menu.

C The <C> button deletes the letter to the left of the flashing curser.



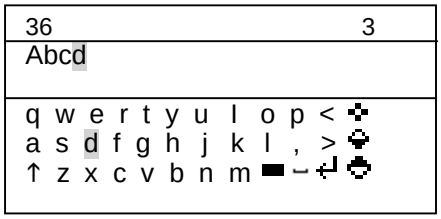


Curser position, area C

ok The <ok> button confirms the selected letter.

C The <C> button enables the exit and without save.

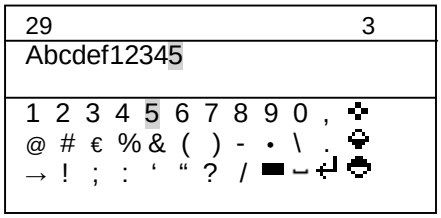
7.5.2 Text entry



Letter

Select the letter by the navigation button and confirm with <ok>. Repeat until the desired text is displayed in the text area.

Toggle between capital and lower case letters '↑ '.



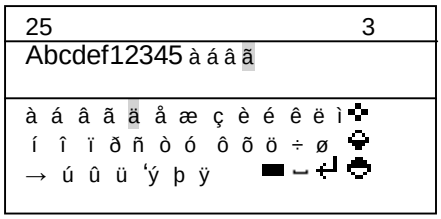
Numeric

Change to numeric entry by selecting this symbol '✣' and confirm with <ok>.

Select the desired number by the navigation key and confirm with <ok>.

Toggle between Numeric's '←' / '→'

Toggle back to letters ' '



Country specified character

Change to special character by selecting symbols ' ' or ' ' and confirm with <ok>.

Select the desired character and confirm with <ok>.

Toggle between country specified characters '←' / '→'

Toggle back to letters ' '

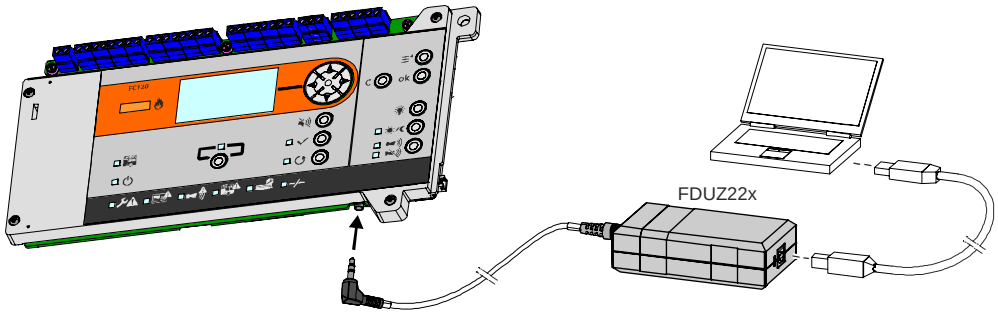
8 Tool function

The tool provides the following functions:

- Transfer history log data to the PC.
- Save panel configuration to the PC.
- Restore configuration to the panel.
- Firmware update.

8.1 Set up communication

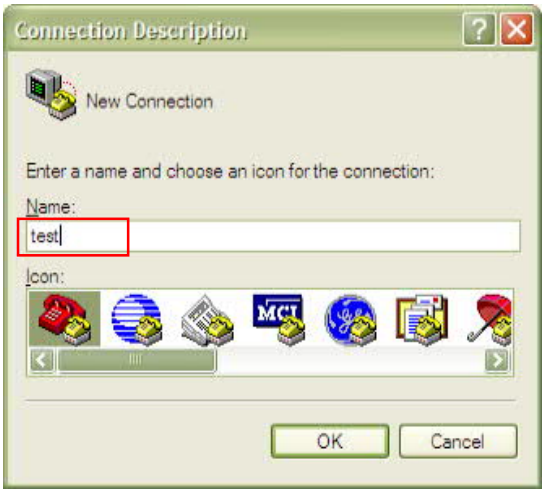
Connect the FDUZ22x MCL USB adapter with the FC12x control panel.

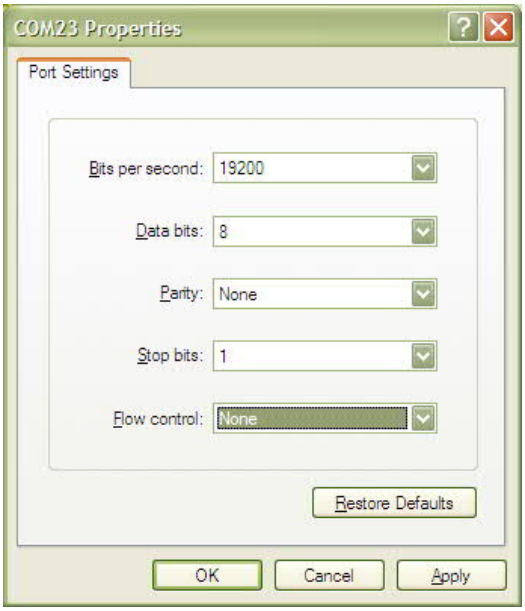


8.1.1 Tool installation

Install the communication tool 'Hyper Terminal'.
This tool is a Windows freeware and can be downloaded via internet.
General information of the tool:
https://docs.microsoft.com/en-us/previous-versions/windows/it-pro/windows-server-2003/cc737746(v=ws.10)
Download link:
https://drive.google.com/file/d/0BxSEu8_tErjCVDl0UUc0OXhBbE0/view

8.1.2 Tool settings

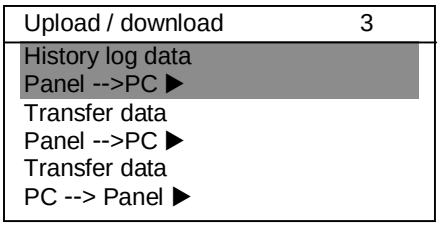
<table>
<tr><td>1. Start the Hyper Terminal and enter an appropriate name.</td><td>2. Select communication port.</td></tr>
<tr><td> 
</td><td> 

Make sure your PC is connected to the FDUZ22x box and the driver is installed.
Check the communication port on the device manager</td></tr>
<tr><td>3. Select the following properties.</td><td></td></tr>
<tr><td> 
</td><td></td></tr>
</table>

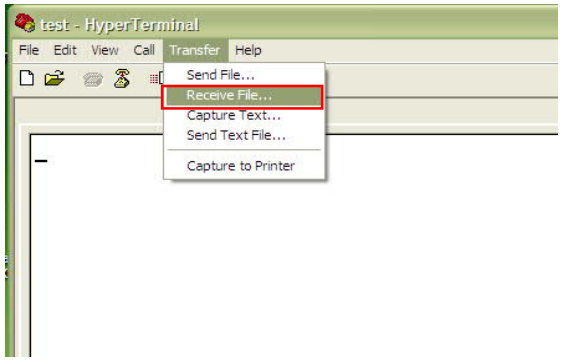
8.2 Transfer history log data to PC

Transfer the history log data from the FC12x control panel to the PC as a *.csv file. Edit this file in excel and print out as needed.

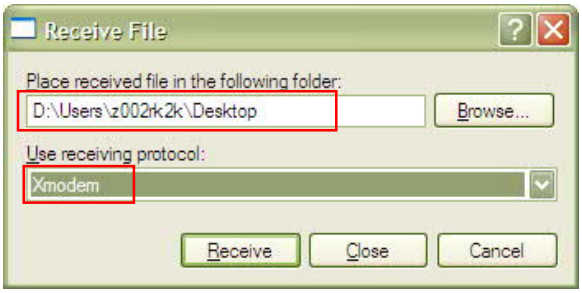
1. Select the following option on the panel.



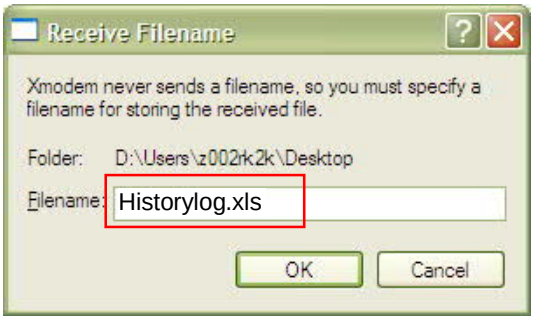
2. Enable the Hyper Terminal to receive data.



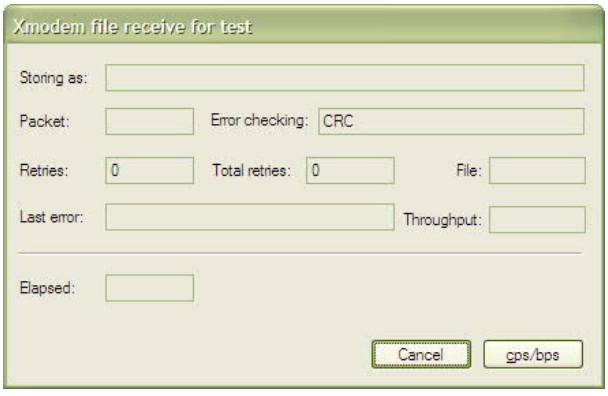
3. Select the folder to receive the file and select protocol 'Xmodem'.



4. Insert the filename 'Historylog.xls' and confirm the download with <OK>.

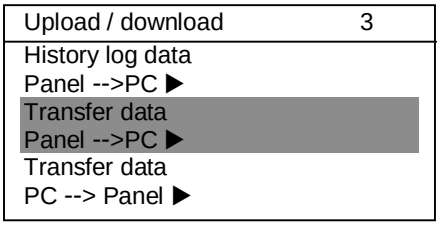


5. The progress is indicated.

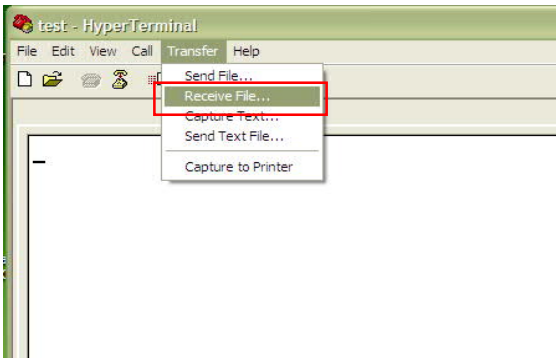


8.3 Save configuration file

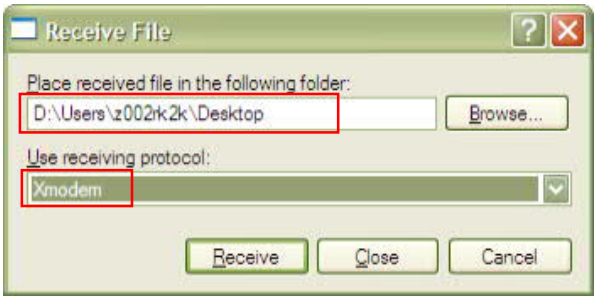
1. Select the following option on the panel.



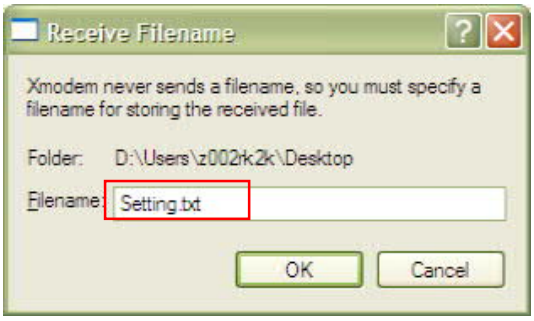
2. Enable the hyper terminal to receive data.



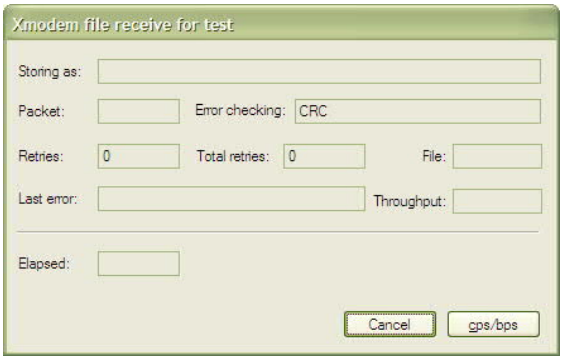
3. Select the folder to store the file and select the protocol 'Xmodem'.



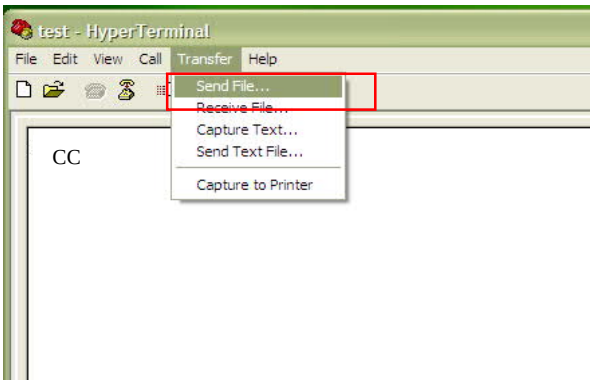
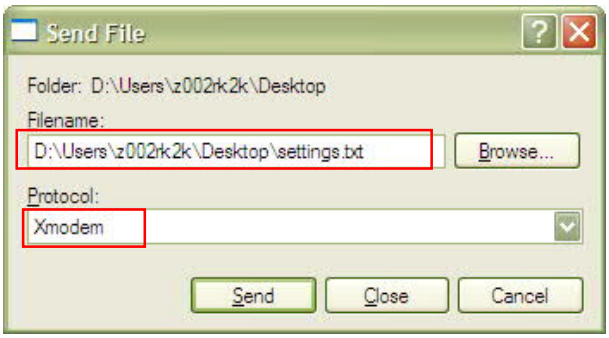
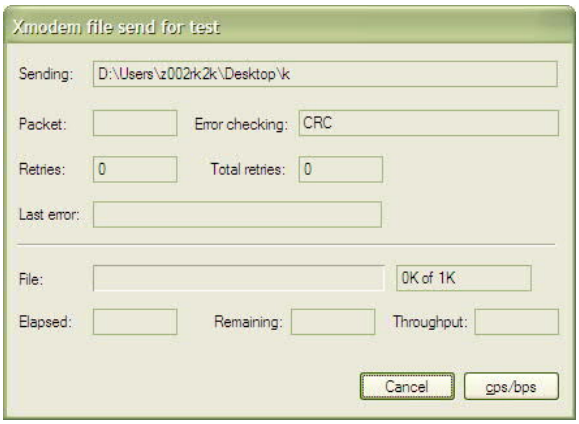
4. Insert the filename 'Setting.txt ' and confirm the download with <OK>.



5. The progress is indicated.



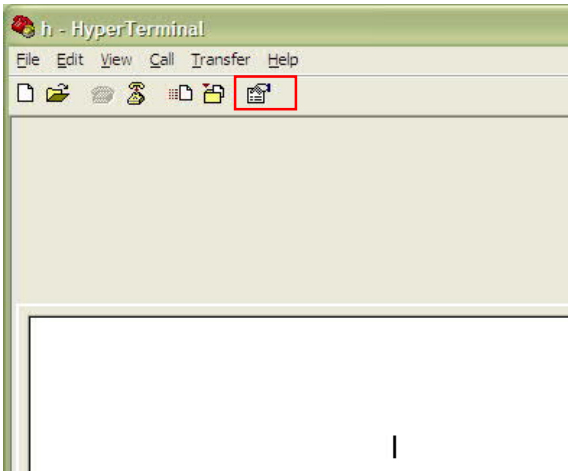
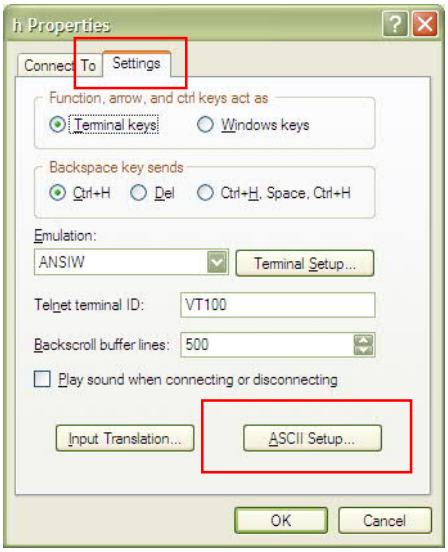
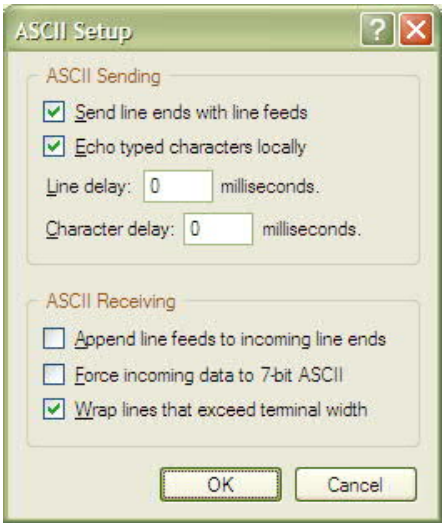
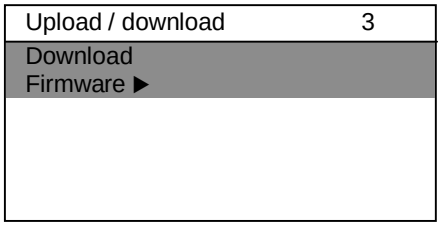
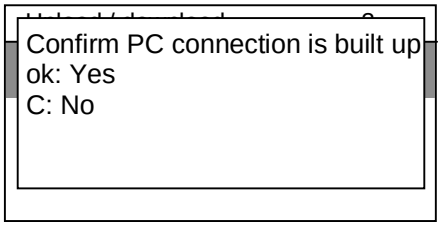
8.4 Restore configuration file

1. Select the following option on the panel..	2. Enable the hyper terminal to 'Send file'.
Upload / download 3 History log data Panel -->PC ▶ Transfer data Panel -->PC ▶ Transfer data PC --> Panel ▶	
3. Select the file to be sent out and select the protocol.	4. The progress is indicated.
	

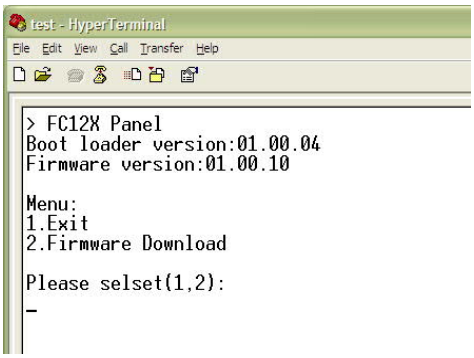
8.5 Download firmware

The FC12x is delivered with operable firmware.
In general, there is no need to update the firmware.
In case of any emergency, you update the panel on site.

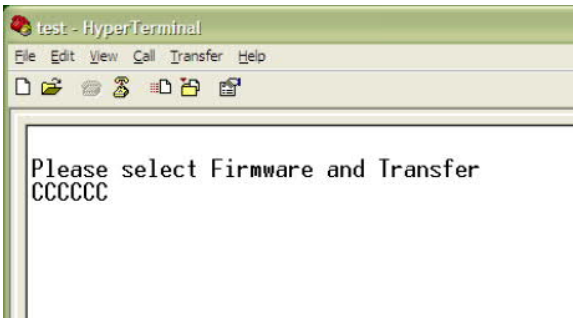
Save the configuration prior to updating, see chapter 8.2.
A firmware update deletes all configurations.

1. Click <PROPERTY>.	2. Select the folder 'Settings' and click 'ASCII Setup'.
	
3. Select the check boxes accordingly.	**4. Confirm the data transfer on the panel.**
	 Press <ok> to continue.  Press <ok> to continue.

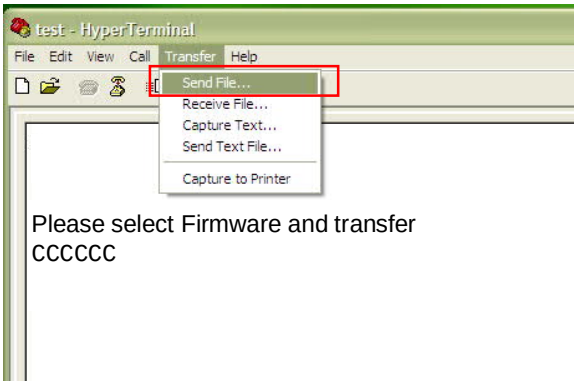
5. PC will display as below.
Press '2'.



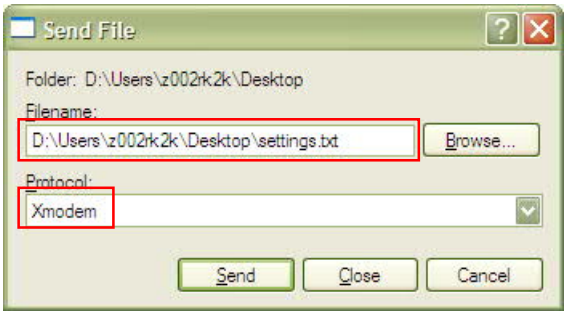
6. 'CC…' shows the connection is established and ready for transfer.



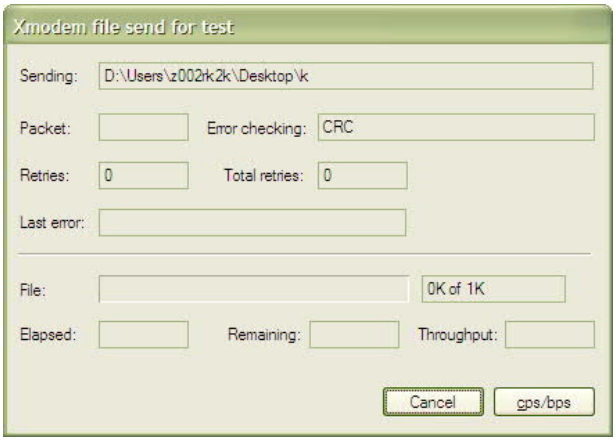
7. Click menu 'Transfer' and select 'Send File' to open send file dialog.



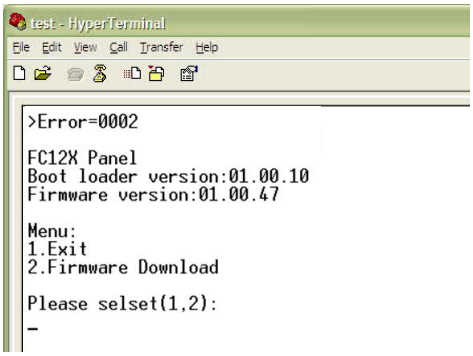
8. Select the file to be sent out and select the protocol.



9. The progress is indicated.



If downloading is successful, panel will start application. The window 'Xmodem file send for test' disappears automatically after download is complete.



If downloading has failed, panel will show error code:
0001: no firmware or firmware fault
0002: communication fault
0009: hardware fault

9 Commissioning

Planning

- Assign the field devices to the floor plan as per local regulations.
- Document the panel parameters (see Appendix A).
- Calculate battery standby time (see chapter 11).

Field installation

- Install detection lines (detectors and manual call points) and terminate with EOL element.
- Install control (sounder) lines and terminate with EOL element.

Warning Pay attention to external voltage (AC 230 V)!

Panel installation

- Fire control panel must be mounted.
- Connect all detection lines or terminate with EOL element.
- Connect all control lines or terminate with EOL element.
- Connect alarm and fault dialer.
- Inscription stripes must be inserted for zone ind. field (optional).
- Switch off the main supply fuse AC 230 V.
- Connect the power cable and check the earth connection.
- Switch on the main supply fuse AC 230 V.
- Place and connect battery.
- Fill in and place the provided label at the top, right-hand side of the housing.

Programming

- Initial start-up of the panel.
- Program the system and resolve the faults.

Function test

- Initiate lamp test and check all LED, internal buzzer.
- Test each device (Detector, MCP, etc.) individually and check the correctness of the system behavior in terms of outputs (e.g. Sounder, Fire output, etc.).
- Test fire and fault transmission.
- Make sure that the panel is in normal operation, the buzzer and all system parts are enabled.

The system can now be handed over to the customer.

10 Maintenance

It is assumed that the site was commissioned in accordance with the existing directives, i.e. all functions have been tested and the site data has been saved or logged to the table 'site configuration'.

10.1 Preparatory work

Inform the system owner of the scope and expected duration of work.
Disable the following system components as needed:

- Alarm transmission (log out on the receiving centre)
- Fire controls and sounder lines
- Extinguishing stations

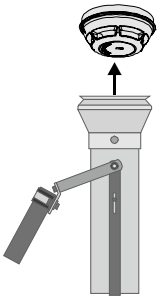
10.2 Function test

We recommend the following schedule. However, local regulations have priority.

Function	**Activity**	**Interval in years**		
		1	2	5
Zones	Activate all automatic detectors and all manual call points.		X	
	Activate a detector or manual call point per zone and verify zone assignment and if usage is in accordance with regulations.	X		
	Check all detectors and manual call points for soiling and verify if usage is in accordance with regulations.	X		
	Activate a fault, short circuit and open line, for each zone and verify zone assignment and if usage is in accordance with regulations.			X
Inputs	Activate each input and verify if usage is in accordance with regulations.	X		
Outputs	Check sounder controls and all acoustic alarm devices.	X		
	Activate fire outputs and check if usage is in accordance with regulations.	X		
	Activate alarm and fault dialer and check the transmission.	X		
Alarm organization	Mode Manned Activate a detector and manual call point and check the timer *V1* and *V2* and the transmission of the alarm dialer.	X		
	Mode Unmanned Activate a detector and check the transmission of the alarm dialer.	X		
Panel	Check date and time.	X		
	Check the display and LEDs.	X		
	Check earth connections.	X		
	Activate mains and battery fault condition and verify if usage is in accordance with regulations.	X		

10.3 Device Test

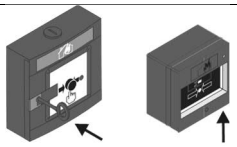
Smoke detector

1. Enable test mode for the zone. **2.** Place detector tester RE6 or RE8ST on detector head. **3.** Wait until LED is on – Sounder sounds 1 sec. **4.** Remove testing unit - Automatic reset of test alarm after 15 sec. **5.** Set zone to normal mode operation.	

Heat detector

1. Enable test mode for the zone. **2.** Place detector tester RE6T or RE7T on detector head and turn on heater. **3.** Wait until LED is on – Sounder sounds 1 sec. **4.** Remove testing unit - Automatic reset of test alarm after 15 sec. **5.** Set zone to normal mode operation.	

Manual call point

1. Enable test mode for the zone. **2.** Depending on type of call point, insert test key or open cover to activate. **3.** Wait until LED is on - Sounder sounds 1 sec. **4.** Remove test key or close door - Automatic reset of test alarm after 15 sec. **5.** Set zone to normal mode operation.	

Detector test for multiple protocol detectors FDOOT241-A9 and FDOOT241-9 in collective mode

In collective mode, the FDOOT241-A9 and FDOOT241-9 multiple protocol detectors can only be activated via the command '2.4 ALARM' using the FDUD292 detector exchanger and tester and the FDUD293 intelligent detector tester.

10.4 Completion work

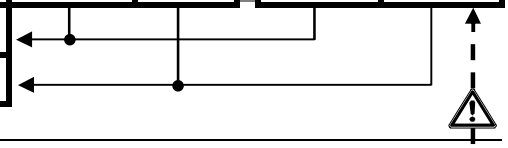
1. Activate a test alarm through the system operator with remote transmission.
2. Disable all 'OFF' status.
3. Have system owner confirm the revision.

11 Battery capacity

The battery capacity depends on panel type and standby time. The standby time is regulated by local code of praxis or the EN regulation.
The required battery size can be identified using the following calculation.
Moreover, the calculation indicates whether an external power supply is needed.

11.1 FC121-ZA calculation

Type	Description	Standby [mA]	Alarm [mA]	Panel (internally) Standby [mA]	Panel (internally) Alarm [mA]	Sounders, etc… Standby [mA]	Sounders, etc… Alarm [mA]
FC121-ZA	2 zone panel			38	107		
	Out 1 (e.g. Sounders)						
	Out 2 (e.g. Sounders)						
	Aux. output						
Accessory cards							
FCA1203-Z1 (1st)	Output card 2M 2R	12	25				
	Out A&B (e.g. Sounders)						
FTO1203-H1	EVAC Module	0.5	2.2				
Standby current [A]							
Alarm current [A]							



If the total current of the outputs (Sounders, etc.) is higher than **500mA**, then an external power supply is required.
In order to reduce the total current:

- Power the output A&B from the external power supply (possible per card).
- Move the Auxiliary output to the external power supply.

Choose the appropriate battery size depending on the calculated capacity.

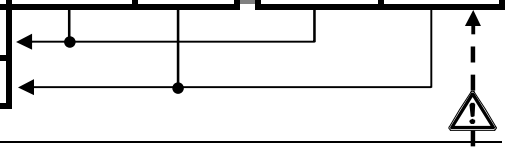
[(Standby time × Standby current) + (Alarm time × sum alarm current)] × Aging factor = Capacity (max.12 Ah)
_ _ h × 0._ _ _ A + 0.5 h × _._ _ _ A × 1.25 =

Standby time [h]:	24, 30 or 72
Alarm time [h]:	0.5 hour
Aging factor:	1.25
Standby current [A]:	Total current in standby mode
Alarm current [A]:	Total current in alarm mode
Capacity [Ah]:	4.5 Ah; 7 Ah

11.2 FC122-ZA calculation

Type	Description	Standby	Alarm	Panel (internally)	Sounders, etc…

		[mA]	[mA]	Standby [mA]	Alarm [mA]	Standby [mA]	Alarm [mA]
FC122-ZA	4 zone panel			54	123		
	Out 1 (e.g. Sounders)						
	Out 2 (e.g. Sounders)						
	Aux. output						
Accessory cards							
FCA1203-Z1 (1st)	Output card 2M 2R	12	25				
	Out A&B (e.g. Sounders)						
FTO1203-H1	EVAC Module	0.5	2.2				
Standby current [A]							
Alarm current [A]							



If the total current of the outputs (Sounders, etc.) is higher than **500mA**, then an external power supply is required.
In order to reduce the total current:

- Power the output A&B from the external power supply (possible per card).
- Move the Auxiliary output to the external power supply.

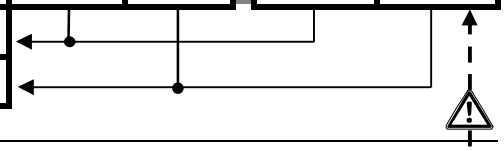
Choose the appropriate battery size depending on the calculated capacity.

[(Standby time × Standby current) + (Alarm time × sum alarm current)] × Aging factor = Capacity (max.12 Ah)
_ _ h × 0._ _ _ A + 0.5 h × _._ _ _ A × 1.25 =

Standby time [h]:	24, 30 or 72
Alarm time [h]:	0.5 hour
Aging factor:	1.25
Standby current [A]:	Total current in standby mode
Alarm current [A]:	Total current in alarm mode
Capacity [Ah]:	4.5 Ah; 7 Ah

11.3 FC123-ZA calculation

Type	Description	Standby [mA]	Alarm [mA]	Panel (internally) Standby [mA]	Panel (internally) Alarm [mA]	Sounders, etc… Standby [mA]	Sounders, etc… Alarm [mA]
FC123-ZA	8 zone panel			86	155		
	Out 1 (e.g. Sounders)						
	Out 2 (e.g. Sounders)						
	Aux. output						
Accessory cards							
FCA1203-Z1 (1st)	Output card 2M 2R	12	25				
	Out A&B (e.g. Sounders)						
FCA1203-Z1 (2nd)	Output card 2M 2R	12	25				
	Out A&B (e.g. Sounders)						
FTO1202-Z1	Zone indicator field 12*2	1	2.5				
FTO1203-H1	EVAC Module	0.5	2.2				
Standby current [A]							
Alarm current [A]							



If the total current of the outputs (Sounders, etc.) is higher than **1000 mA**, then an external power supply is required. In order to reduce the total current:

- Power the output A&B from the external power supply (possible per card).
- Move the Auxiliary output to the external power supply.

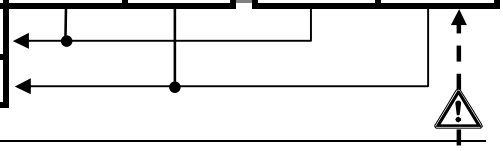
Choose the appropriate battery size depending on the calculated capacity.

[(Standby time × Standby current) + (Alarm time × sum alarm current)] × Aging factor = Capacity (max. 17 Ah)
_ _ h × 0._ _ _ A + 0.5 h × _._ _ _ A × 1.25 =

Standby time [h]:	24, 30 or 72
Alarm time [h]:	0.5 hour
Aging factor:	1.25
Standby current [A]:	Total current in standby mode
Alarm current [A]:	Total current in alarm mode
Capacity [Ah]:	7 Ah; 12 Ah; 17 Ah

11.4 FC124-ZA calculation

Type	Description	Standby [mA]	Alarm [mA]	Panel (internally) Standby [mA]	Panel (internally) Alarm [mA]	Sounders, etc… Standby [mA]	Sounders, etc… Alarm [mA]
FC124-ZA	12 zone panel			118	187		
	Out 1 (e.g. Sounders)						
	Out 2 (e.g. Sounders)						
	Aux. output						
Accessory cards							
FCA1203-Z1 (1st)	Output card 2M 2R	12	25				
	Out A&B (e.g. Sounders)						
FCA1203-Z1 (2nd)	Output card 2M 2R	12	25				
	Out A&B (e.g. Sounders)						
FCA1203-Z1 (3rd)	Output card 2M 2R	12	25				
	Out A&B (e.g. Sounders)						
FTO1202-Z1	Zone indicator field 12*2	1	2.5				
FTO1203-H1	EVAC Module	0.5	2.2				
Standby current [A]							
Alarm current [A]							



If the total current of the outputs (Sounders, etc.) is higher than **1000 mA**, then an external power supply is required. In order to reduce the total current:

- Power the output A&B from the external power supply (possible per card).
- Move the Auxiliary output to the external power supply.

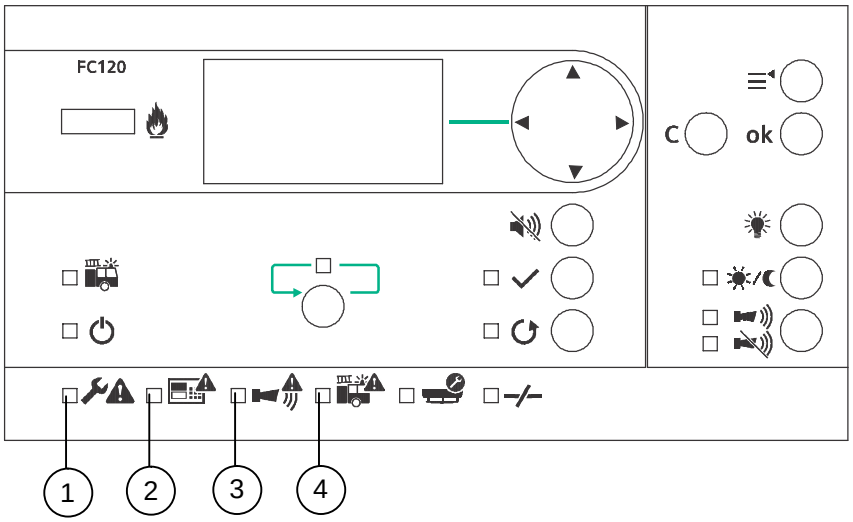
Choose the appropriate battery size depending on the calculated capacity.

[(Standby time × Standby current) + (Alarm time × sum alarm current)] × Aging factor = Capacity (max. 17 Ah)
_ _ h × 0._ _ _ A + 0.5 h × _._ _ _ A × 1.25 =

Standby time [h]:	24, 30 or 72
Alarm time [h]:	0.5 hour
Aging factor:	1.25
Standby current [A]:	Total current in standby mode
Alarm current [A]:	Total current in alarm mode
Capacity [Ah]:	7 Ah; 12 Ah; 17 Ah

12 Trouble shooting

12.1 LED indication



Fault description	LED Status		Cause / Action
General fault	1	ON	Any system fault is indicated: - Zone line fault - Sounder line fault (LED 3) - Alarm dialer line fault (LED 4) - Fault dialer if monitored - Fire output - Mains and battery fault See display for detailed information and check common issues: - Short / break in the line - Missing EOL element - Earth fault - Input condition e.g. dialer, external PSU - AUX 24V output - Output - 24VDC too low - EVAC module - Set date & time
System fault Additional indication: - General fault LED ON - Buzzer ON (interval tone) - Display show earth fault	2	ON	Earth fault indication in combination with the programming of the GB continuity zone.
System fault Additional indication: - General fault LED ON - Buzzer ON (interval tone) - Display frozen - Button functions are ignored	2	ON	CPU has failed (system not working). Switch the power off and restart, if fault continues replace mainboard.

Fault description	LED Status		Cause / Action
Sounder fault	3	Fast	Any fault on sounder lines is indicated. See display for detailed information and check common issues: - Short / break - Missing EOL element - If output is supervised → calibrate line
Alarm dialer fault	4	Fast	Fault of alarm dialer line See display for detailed information and check common issues: - Short / break - Missing EOL element - If output is supervised → calibrate line

12.2 System

Fault description	Cause / Action
Set date & time fault.	Power down, requires date & time, chapter 6.4.6.
Buzzer does not work.	Check the setting, chapter 7.2.12.

12.3 Accessories

Fault description	Cause / Action
DC 24 V is too low.	Check voltage input '24V In' on the output card(s) 2M2R.
All four outputs from one output card 2M2R indicate a fault.	Locate the faulty output card according to chapter 4.6.2. - Ribbon cable connected properly, chapter 4.6.2. - Output card programmed, chapter 7.1.4.
The EVAC module indicates a fault.	Check the following: - Ribbon cable connected properly, chapter 4.6.3. - EVAC module enabled, chapter 7.1.4.
Key switch set	No indication is given, change the device.
LED indication field	No indication is given, change the device.

Please contact your service provider if you cannot eliminate troubles.

12.4 Factory reset

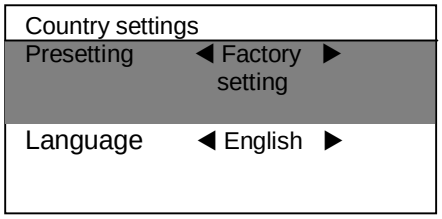
A factory reset will delete all configurations. Save configuration, see chapter 8.3.

Step 1: Disconnect mains and battery.

Step 2: Press and hold the buttons
<Silence Buzzer> + <ACK> + <ok> + <C> at the same time.

Step 3: Connect mains and battery.

Step 4: Release the buttons if the display is shown as below:



Step 5: Select the language independent of the country presetting. e.g. English.

13 Components and spare parts

Components

Type	Part no.	Designation
FC121-ZA	S54400-C131-A1	Fire panel conv. (2Z)
FC122-ZA	S54400-C130-A1	Fire panel conv. (4Z)
FC123-ZA	S54400-C129-A1	Fire panel conv. (8Z)
FC124-ZA	S54400-C128-A1	Fire panel conv. (12Z)

Accessory

Type	Part no.	Designation
FCA1203-Z1	S54400-B142-A1	Output card 2M 2R
FTO1202-Z1	S54400-B119-A1	Zone ind. field 12x2LED
FTO1201-H1	S54400-B120-A1	EVAC Module (NL 2&4 Z)
FTO1203-H1	S54400-B118-A1	EVAC Module (NL 8&12 Z)
FCA1209-Z1	S54400-B124-A1	Output module (230V)
FCA1206-Z1	S54400-S125-A1	Key switch set (Nordic SE)

Additional power supply

Type	Part no.	Designation
FP120-Z1	S54400-S122-A1	Power supply kit A 70W

Battery

Type	Part no.	Designation
AX1213	4392990001	Accumulator 12V 4.0Ah
FA2003-A1	A5Q00019353	Battery 12V, 7Ah, VDS
FA2004-A1	A5Q00019354	Battery 12V, 12Ah, VDS
FA2005-A1	A5Q00019677	Battery 12V, 17Ah, VDS

Spare part

Type	Part no.	Designation
FP2015-A1	S54400-B121-A1	Power supply (70W)

14 Disposal and environmental protection

This equipment is manufactured using materials and procedures which comply with current environmental protection standards as best as possible. More specifically, the following measures have been undertaken:

- Use of reusable materials
- Use of halogen-free plastics
- Electronic parts and synthetic materials can be separated

Larger plastic parts are labelled according to ISO 11469 and ISO 1043. The plastics can be separated and recycled on this basis.

Electronic parts and batteries must not be disposed of with domestic waste.

- Take electronic parts and batteries to local collection points or recycling centre.
- Contact local authorities for more information.
- Observe national requirements for disposing of electronic parts and batteries.

Appendix A: Site configuration, Factory Setting

Customer: _____ **Date of Installation:** _____

Control panel: □ FC121-ZA (2 zones) / □ FC122-ZA (4 zones) / □ FC123-ZA (8 zones) / □ FC124-ZA (12 zones)

Menu		Description	Default	On side programming														
Zone				1	2	3	4	5	6	7	8	9	10	11	12			
	Mode	Standard	Yes															
		Mixed MCP & det.	No															
		GB continuity	No															
		Short = alarm	No															
	AVC	Direct	No															
		Via V1 / V2	Yes															
		Via AVC timer MCP direct	No															
	Device coincidence		No															
	Zone coincidence (zone pairs; 1&2, 3&4, etc.)		No															
Output				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	Mode	Sounder control	Out 1															
		Alarm dialer	Out 2															
		Fault dialer	Out 3															
		Fire output	No															
		EVAC Sounder NL	No															
	EN 54-13 supervision																	
	Activation condition	General Alarm	Out 1,2															
		Active by zone alarm																
		General Alert																
		Active by zone alert																
		Alert by ext. input																
		Any isolation																
		Any fault	Out 3															
		Manned mode activated																
		Alarm dialer fault																
		Dialer device confirmation signal																
		V1 / V2 is running																
	Pulse time																	
Input				1	2	3												
	Mode	Class change signal	Input 1															
		Dependency reset																
		Level 2 access																
		Disable dialer outputs																
		Manned / unmanned																
		Toggle manned / unmanned																
		External PSU fault	Input 3															
		Alarm dialer fault																
		Dialer device confirmation signal																
		Activate alert mode																
		ACK																
		SE ACK function																
		Reset	Input 2															
Accessory				Y / N			Ext. powered											
	Output card	Card 1	No															
		Card 2	No															
		Card 3	No															
	EVAC module		No															
	Zone indication field		No															
	Key switch set		No															

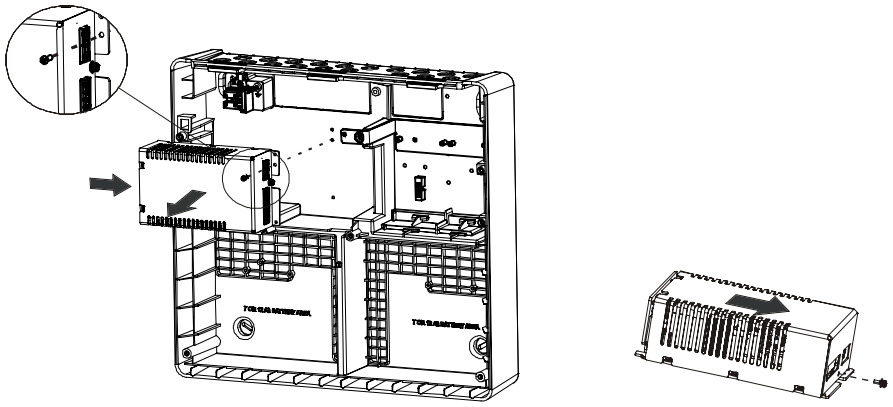
Global	Presetting		Factory setting			
	Language		English			
	Password (Level 2)		5555			
	User interface			Y / N	T1 (On)	T2 (Off)
		Lamp test available at access level 2	Yes			
		Silence key with EVAC function	No			
		Silence on ACK	No			
		ACK available at access level 1	No			
		LED fire brigade activated by alarm dialer output	Yes			
		LED fire brigade activated by input	No			
	Display view	Standard	Yes			
		UK only FC122	No			
	Zone options	Device coincidence inhibit time	10 Sec.			
	Output options	Fire alarm pulse time			0.5	0.5
		Alert pulse time			0.5	0.5
		Resound on new alarm	Yes			
	Mains power	Fault delay time	5 Min.			
	Summer / winter time	Automatic switching	Yes			
	Manned / unmanned	V1 time	3 Min.			
		V2 time	5 Min.			
		Automatic switch to unmanned	No			
		Switching time	18:00			

Description	**Customer text**	**Description**	**Customer text**
Zone 1		Zone 8	
Zone 2		Zone 9	
Zone 3		Zone 10	
Zone 4		Zone 11	
Zone 5		Zone 12	
Zone 6		Input class change	
Zone 7		Service information	

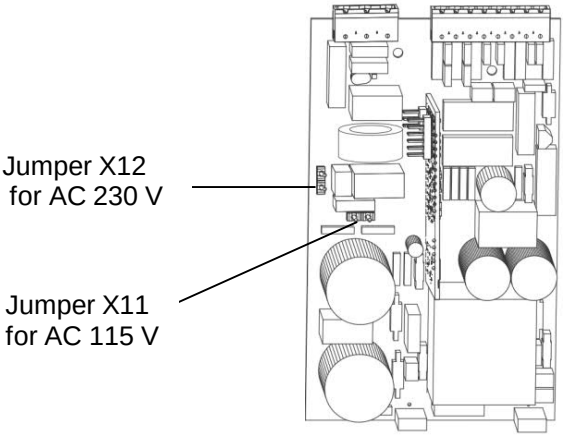
Appendix B: Switch mains to AC 115 V

Only available for the fire control panel FC123-ZA and FC124-ZA.

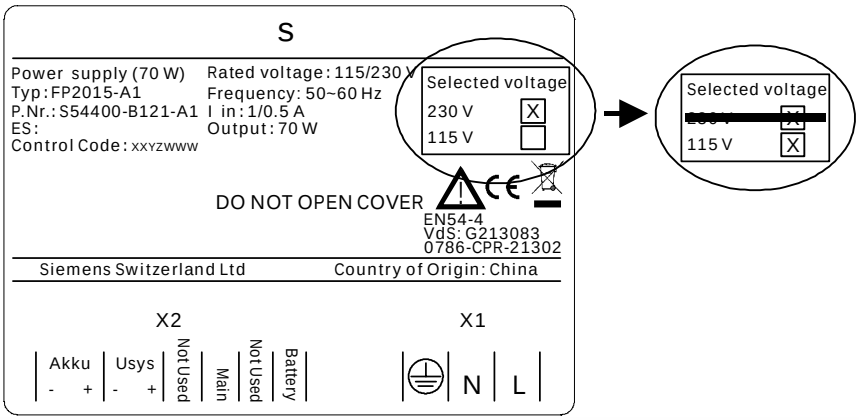
Step 1: Remove power supply FP2015-A1 and open it.



Step 2: Move the jumper on the PCB board from X12 to X11.



Step 3: Mark AC 115 V with 'x' and AC 230 V with '-----' on the label as indicated below.



Appendix C: History log

Message	Meaning
Fire alarm Zone #	Zone # has triggered an alarm.
Fault Zone #	Zone # is in fault state.
Isolation Zone #	Zone # was disabled.
Fault Output #	Output # is in fault state.
Fault AUX 24V output	Auxiliary 24 V output is in fault state.
Isolation Output #	Fire output # was disabled.
Active Output #	Output # is activated when V1 / V2 is running.
Isolation Fault dialer	'Fault dialer' outputs were disabled.
Isolation Alarm dialer	'Alarm dialer' outputs were disabled.
Isolation Sounder outputs	Sounder outputs were disabled.
Isolation EVAC sounder NL	'EVAC sounder NL' outputs were disabled.
Fault Mains power	Fault in 230 V (or 110 V) power supply.
Fault Battery	Fault in the battery power supply.
Fault External PSU	Fault in external power supply unit.
Fault Earth fault	Grounding fault.
Fault Set date & time	Date and time was not set.
Input Input # Reset	Panel has been reset when get signal from input.
Input Input # Level 2 access	Panel is into access level 2 when get signal from input.
Input Input # Alarm and fault dialer isolated	Isolation of the output 'Alarm dialer' and 'Fault dialer' when get signal from input.
Input Input # Manned operation	Panel is in 'Manned' mode when get signal from input.
Input Input # Alarm dialer fault	The output 'Alarm dialer' is in fault state when get signal from input.
Input Input # Alarm dialer confirmation received	Alarm dialer confirmation received when get signal from input.
Input Input # Alert active	Panel is in 'Alert' mode when get signal from input.

Message	Meaning
Input Input # ACK	Panel has been acknowledged from input.
Input Input # External PSU fault	External PSU fault information received when get signal from input.
ACK	Panel has been acknowledged from panel.
Reset	Panel has been reset from panel.
Active EVAC	All sounder outputs have been activated in quiescent mode, by pushing the button 'SILENCE / RESOUND'.
Active EVAC sounder NL	Programmed EVAC sounder NL outputs have been activated by pushing the button 'Start' on EVAC module.
Fault EVAC Module	With or without EVAC module status is not match with panel's configure
Input Input # Dependency reset	Panel has been reset when get signal from input.
Test Zone #	Zone # is in Test state.
Fault Input # Alarm dialer fault	The output 'Alarm dialer' is in fault state when get signal from input.
Input Input # SE ACK function	Panel has been acknowledged from input.
Fault Output # 24VDC too low	For output # which is powered by external power, external power voltage is too low.

Issued by
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Document ID: A6V10393190_h_en_--
Edition: 2019-09-01