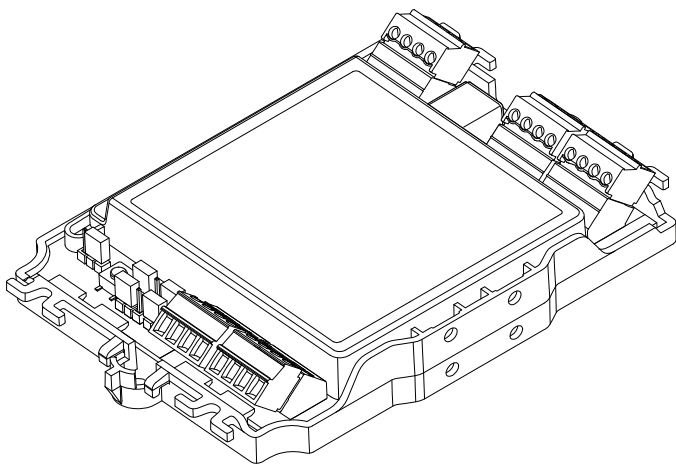


SIEMENS



FDCIO223

Input/output module
(transponder)

Technical manual

Technical specifications and availability subject to change without notice.

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1 About this document

Goal and purpose

This document contains information on the input/output module (transponder) FDCIO223. Consistent compliance with the instructions guarantees correct and safe use.

Target groups

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

Target group	Activity	Qualification
Product Manager	<ul style="list-style-type: none"> Is responsible for information passing between the manufacturer and regional company. Coordinates the flow of information between the individual groups of people involved in a project. 	<ul style="list-style-type: none"> Has obtained suitable specialist training for the function and for the products. Has attended the training courses for Product Managers.
Project Manager	<ul style="list-style-type: none"> Coordinates the deployment of all persons and resources involved in the project according to the schedule. Provides the information required to run the project. 	<ul style="list-style-type: none"> Has obtained suitable specialist training for the function and for the products. Has attended the training courses for Project Managers.
Installation personnel	<ul style="list-style-type: none"> Assembles and installs the product components at the place of installation. Carries out a performance check following installation. 	<ul style="list-style-type: none"> Has received specialist training in the area of building installation technology or electrical installations.
Commissioning personnel	<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> Has obtained suitable specialist training for the function and for the products. Has attended the training courses for commissioning personnel.
Maintenance personnel	<ul style="list-style-type: none"> Carries out all maintenance work. Checks that the products are in perfect working order. Searches for and corrects malfunctions. 	<ul style="list-style-type: none"> Has obtained suitable specialist training for the function and for the products.

Document identification

Position	Information
Title page	<ul style="list-style-type: none"> ● Product type ● Product designation ● Document type
Footers	<ul style="list-style-type: none"> ● Document ID <ul style="list-style-type: none"> – ID_ModificationIndex_Language_COUNTRY ● Edition date
Last page	<ul style="list-style-type: none"> ● Document ID ● Edition date ● Manual (product line) ● Register (table of contents for whole documentation, folder register)

Conventions for text marking

Markups

Special markups are shown in this document as follows:

>	Requirement for a behavior instruction
⇒	Intermediate result of a behavior instruction
⇨	End result of a behavior instruction
'Text'	Quotation, reproduced identically
<Key>	Identification of keys

Supplementary information and tips



The 'i' symbol identifies supplementary information and tips for an easier way of working, for example.

Technical terms

Term	Explanation
ABS	Acrylonitrile-butadiene-styrene (plastic)
ASA	Acrylic ester-styrene-acrylnitrile (plastic)
EOL	Line termination element (end of line)
ES	Product version
FDnet/C-NET	Addressed detector line
GMT	Limit value detection technology (collective)
KMK	Load connection factor for collective devices (collective detector connection factor)
Collective detector line	Non-addressed detector line
LED	Light-emitting diode
MC link	Maintenance and Commissioning Link; interface to the detector exchanger and tester
PC	Polycarbonate (plastic)

Reference documents

Document ID	Title
009124	Installation of Input/output module FDCIO223, Installation of housing FDCH291/FDCH292
001204	Fire alarm signal in areas at risk of explosion
008331	List of compatibility (for 'Sinteso' product line)
A6V10229261	List of compatibility (for 'Cerberus PRO' product line)
007227	Operation of detector exchanger and tester FDUD292
009718	Operation of intelligent detector tester FDUD293

History of changes

Document ID	Edition date	Brief description
009122_e_en_--	11.2009	Housing FDCH29x replaced with FDCH221 Editorial adjustments made.
009122_d_de_--	07.2009	Editorial changes made. New 'Index' chapter.
009122_c_de_--	09.2007	Descriptions of 'Control with confirmation' removed. 'Alarm verification' chap. corrected; new 'Diagnosis levels' and 'Degraded mode in FDnet' chap. Corrections in 'Technical data': <ul style="list-style-type: none">● Line separator added● Humidity changed● Protection category IP changed (short name for housing)
009122_b_de_--	10.2006	Naming: "Synova 820" and "SynoNet" omitted New: Chapter 9, annex (collective compatibility)
009122_a_de_--	05.2006	First edition

2 Safety

2.1 Safety notices

The safety notices must be observed in order to protect people and property.

The safety notices in this document contain the following elements:

- Symbol for danger
- Signal word
- Nature and origin of the danger
- Consequences if the danger occurs
- Measures or prohibitions for danger avoidance

Symbol for danger



This is the symbol for danger. It warns of **risks of injury**.
Follow all measures identified by this symbol to avoid injury or death.

Additional danger symbols

These symbols indicate general dangers, the type of danger or possible consequences, measures and prohibitions, examples of which are shown in the following table:



General danger



Explosive atmosphere



Voltage/electric shock



Laser light



Battery



Heat


Signal word

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.
<i>NOTICE</i>	<i>NOTICE</i> identifies possible damage to property that may result from non-observance.


How risk of injury of presented

Information about the risk of injury is shown as follows:

	⚠ WARNING
	Nature and origin of the danger Consequences if the danger occurs <ul style="list-style-type: none"> ● Measures / prohibitions for danger avoidance

How possible damage to property is presented

Information about possible damage to property is shown as follows:


	<i>NOTICE</i>
	Nature and origin of the danger Consequences if the danger occurs <ul style="list-style-type: none"> ● Measures / prohibitions for danger avoidance

2.2 Safety regulations for the method of operation

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

	<p>⚠ WARNING</p> <p>Electrical voltage</p> <p>Electric shock</p> <ul style="list-style-type: none"> ● 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 electrotechnical regulations.
---	--

- Wherever possible disconnect products from the power supply when carrying out commissioning, maintenance or repair work on them.
- Lock volt-free areas to prevent them being switched back on again by mistake.
- Label the connection terminals with external 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

- 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 collaborate with the people appointed.
- 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.
 - Only check controls up to the interface (relay with blocking option).
 - Make sure that only the controls to be tested are activated.
- Inform people before testing the alarming control devices and allow for possible panic responses.
- Inform people about any noise or mist which may be produced.
- Before testing the remote transmission, inform the corresponding alarm and fault signal receiving stations.

Modifications to the system layout and products

Modifications to the system and to individual products may lead to 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.
- Batteries must be disposed of in an environmentally friendly manner. Observe national guidelines and regulations.

Disregard of the 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:

- 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 cannot therefore assume 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.


2.3 Standards and directives complied with

A list of the standards and directives complied with is available from your Siemens contact.

2.4 Release Notes

Limitations to the configuration or use of devices in a fire detection installation with a particular firmware version are possible.

	⚠ WARNING
	<p>Limited or non-existent fire detection</p> <p>Personal injury and damage to property in the event of a fire.</p> <ul style="list-style-type: none"> ● Read the 'Release Notes' before you plan and/or configure a fire detection installation. ● Read the 'Release Notes' before you carry out a firmware update to a fire detection installation.

	NOTICE
	<p>Incorrect planning and/or configuration</p> <p>Important standards and specifications are not satisfied.</p> <p>Fire detection installation is not accepted for commissioning.</p> <p>Additional expense resulting from necessary new planning and/or configuration.</p> <ul style="list-style-type: none"> ● Read the 'Release Notes' before you plan and/or configure a fire detection installation. ● Read the 'Release Notes' before you carry out a firmware update to a fire detection installation.

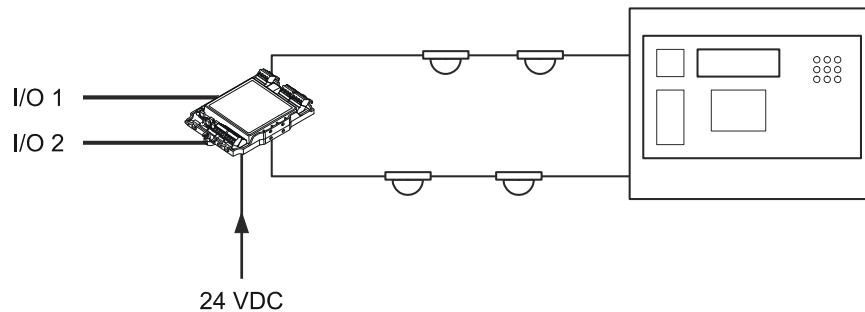
3 Setup and function

3.1 Overview

The FDCIO223 input/output module is operated on the FDnet/C-NET and features two inputs/outputs. These can be configured as follows:

- Collective detector line
- Control line
- Contact input

The figure below shows the integration of the module in the fire detection system.



Input/output module in the fire detection system

Properties

- Connection of two collective detector lines to the FDnet/C-NET
- Connection of monitored or non-monitored contacts
- Monitored control of equipment
- Built-in line separator
- Compatible with AlgoRex, SIGMASYS and FS20/FS720 fire detection systems
- With the safety barrier, it is also possible to connect intrinsically safe detectors (ex-zones 1 and 2)



If the FDCIO223 input/output module is operated on a FS20/FS720 fire detection system, only collective detector lines and monitored equipment control are supported. It is not possible for contacts to be connected.

3.1.1 Details for ordering

Type	Order no.	Designation
FDCIO223	S24218-B102-A1	Input / output module (transponder)

See also

☰ Enclosed accessories [→ 35]

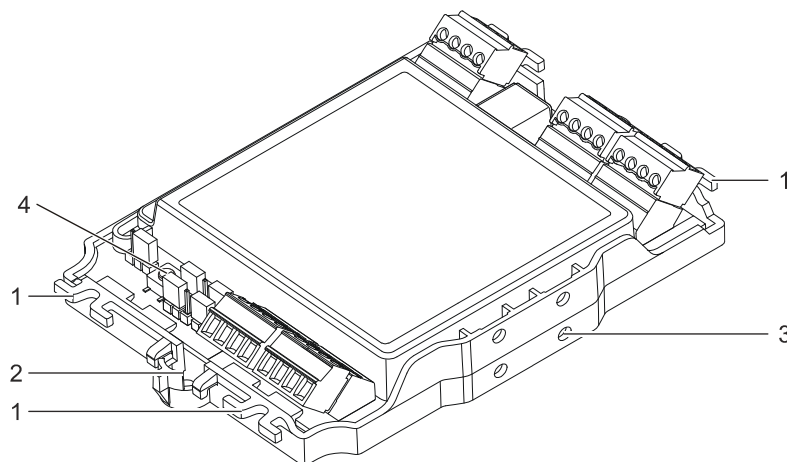
3.2 Setup

The modules consist of the module carrier, the printed circuit board and the cover. The printed circuit board includes LEDs. These indicate the status of the inputs and outputs and the operating condition.

The cover of the printed circuit board is transparent, so that the state of the LEDs is visible even when the housing is closed.

To protect the modules from environmental influences, the FDCH221 housing (accessories) is available.

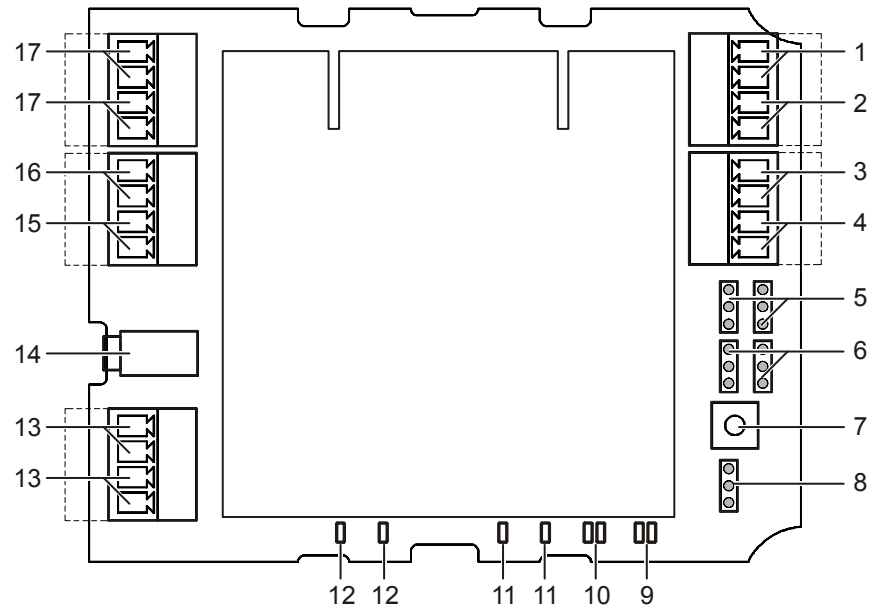
3.2.1 Overall view



Overview

- | | |
|---------------------------|---|
| 1 Cable tie holder | 3 Holes for mounting feet FDCM291 |
| 2 Bores for wall mounting | 4 Push button for calibrating control lines |

3.2.2 P.c.b. view



Circuit board view

- 1 Ground connection
- 2 Shielding connection for inputs/outputs 'I/O 1' and 'I/O 2'
- 3 Connection for input/output 'I/O 2'
- 4 Connection for input/output 'I/O 1'
- 5 Jumper for polarization of monitoring for input/output 'I/O 2'
- 6 Jumper for polarization of monitoring for input/output 'I/O 1'
- 7 Push button for calibrating control lines
- 8 Jumper for ground fault monitoring of inputs/outputs 'I/O 1' and 'I/O 2'
- 9 LEDs for indicating the status of input/output 'I/O 2'
- 10 LEDs for indicating the status of input/output 'I/O 1'
- 11 LEDs for indicating the status of the input/output module's secondary side
- 12 LEDs for indicating the status of the input/output module's primary side
- 13 Connection for the FDnet/C-NET detector line
- 14 Connection for the detector exchanger and tester (MC link)
- 15 Connection for the FDnet/C-NET detector line shielding
- 16 Connection for the 24 V supply shielding
- 17 Connection for 24 V secondary side supply

3.2.3 Indication elements

3.2.3.1 Input/output module status display

Primary side LEDs

Green 'PWR PRIM' (Ref 12)	Yellow 'FAULT PRIM' (Ref 12)	Meaning
Flashes every 4 s	Off	Normal condition
Flashes every 4 s	Flashes every 4 s	Test mode
Flashes every 4 s	Flashes once a second	Localization mode
Off	Off	Fault: <ul style="list-style-type: none"> ● No FDnet/C-NET supply voltage ● Input/output module defective
Off	Flashes every 4 s	Fault: <ul style="list-style-type: none"> ● No supply voltage (24 V) ● Fault on input/output line, e.g., short-circuit or open line
Off	Single pulse every second and double pulse every 4 seconds	Input/output module is in localization mode and there is a fault pending.

What the LEDs mean: Input/output module status (primary side)

Secondary side LEDs

Green 'PWR SEC' (Ref 11)	Yellow 'FAULT SEC' (Ref 11)	Meaning
Off	Off	Fault: <ul style="list-style-type: none"> ● No supply voltage (24 V) ● Input/output module defective
Flashes once a second	Off	Normal operation
Flashes once a second	ON	Fault: <ul style="list-style-type: none"> ● Input/output module defective ● Ground fault ● Error on FDnet/C-NET detector line

What the LEDs mean: Input/output module status (secondary side)

3.2.3.2 Status indication of the lines

There are both red and green LEDs for each input/output and these are used to indicate the status (LED 'I/O 1' and 'I/O 2'). Their meaning depends on how the input/output is configured.

Input/output is configured as an input (detector line or contact input)

Green 'I/O 1' / 'I/O 2' (Ref 10 / 9)	Red 'I/O 1' / 'I/O 2' (Ref 10 / 9)	Condition
Off	Off	<ul style="list-style-type: none"> • Not active • No supply • Incorrectly configured
ON	Off	Standby
Off	ON	Alarm
ON	ON	Fault: <ul style="list-style-type: none"> • Open line • Short-circuit • Deviation in terms of monitoring resistances (only in the case of a contact input)
Off	Flashes	Triggered in inspection mode/test mode
Flashes every 0.5 s	Off	Calibration of load resistances
Off	ON for 2 seconds	Calibration of load resistances not permitted

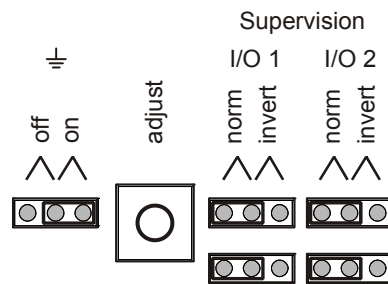
What the LEDs mean (detector line or contact input)

Input/output is configured as an output (control line)

Green 'I/O 1' / 'I/O 2' (Ref 10 / 9)	Red 'I/O 1' / 'I/O 2' (Ref 10 / 9)	Condition
Off	Off	<ul style="list-style-type: none"> • Not active • No supply • Incorrectly configured
ON	Off	Standby
Off	ON	Output activated
ON	ON	Fault: <ul style="list-style-type: none"> • Open line • Short-circuit • Control line not calibrated
Off	Flashes	Inspection mode/test mode
Flashes every 0.5 s	Off	Calibration of load resistances
Off	ON for 2 seconds	Calibration of load resistances not permitted

What the LEDs mean (control line)

3.2.4 Adjustment elements



Adjustment elements

Legend

Jumper	Function	Position	Meaning
\perp (Ref 8)	Ground fault monitoring	on ¹	Activated
		off	Deactivated
Supervision I/O 1 (Ref 6)	Input/output 1: Polarity during monitoring	norm ¹	Setting for: <ul style="list-style-type: none"> ● Control line featuring identical-polarity monitoring ● Detector line ● Contact input
		invert	Setting for: <ul style="list-style-type: none"> ● Control line featuring reverse-polarity monitoring
Supervision I/O 2 (Ref 5)	Input/output 2: Polarity during monitoring	norm ¹	Setting for: <ul style="list-style-type: none"> ● Control line featuring identical-polarity monitoring ● Detector line ● Contact input
		invert	Setting for: <ul style="list-style-type: none"> ● Control line featuring reverse-polarity monitoring

Adjustment elements

¹ Jumper setting shown in the figure (corresponds to factory setting)

Notes

- Only the settings detailed above are permitted.
- The jumpers must always be connected.
- For monitoring, both of an input/output's jumpers must be in the same position at all times.
- The jumpers only need to be in the 'invert' (reverse polarity) position in the case of control involving reverse-polarity monitoring. For all other applications, the jumpers must be in the 'norm' (identical polarity) position.



All other settings are made using the engineering tool.



The control line is not monitored in the connected state.

3.3 Function

3.3.1 Overview

A distinction is made in terms of the function between the primary and secondary sides of the FDCIO223 input/output module. The primary side represents the connection to the FDnet/C-NET. Both inputs/outputs are triggered on the secondary side.

The inputs/outputs can be used as follows:

- GMT Siemens/Cerberus collective detector lines
- GMT SynoLINE300 collective detector lines
- Control lines
- Contact inputs

3.3.2 Input/output module primary side

Communication

The communication with the control panel is performed via the FDnet/C-NET detector line. Configuration is performed on the control panel.

Line separator

All FDnet/C-NET devices are equipped with a line separator.

The FDnet/C-NET device is equipped with electronic switches which isolate the defective part in case of a short-circuit on the detector line. The rest of the detector line remains serviceable. On a loop line all FDnet/C-NET devices remain fully functional after a simple error.

3.3.3 Power supply

The primary side (FDnet/C-NET) is always supplied with power via the FDnet/C-NET detector line. The secondary side must always be supplied with power via an external 24 V DC supply. The primary and secondary sides are electrically isolated. In addition, any inputs/outputs that are configured as contact inputs are electrically isolated from the 24 V supply.

!	NOTICE
	<p>No fusing of control lines on the input/output module</p> <p>Damage to the device due to nominal currents > 2 A</p> <ul style="list-style-type: none"> ● To safeguard the device, either the 24 V supply or each control line must be protected with a fuse (2 AT max.).

3.3.4 Operating modes

The FDCIO223 input/output module features the following modes:

- Normal operation
- Test/inspection
- Localization

Normal operation

The input/output module FDCIO223 is in intended operation. The inputs are monitored and evaluated. The outputs can be triggered.

Test/inspection

With test mode/inspection mode, the input/output module functions according to how the input/output is configured.

If the FDCIO223 input/output module is operated with an FS20/FS720 control panel, no control outputs will be triggered in the event of activation in test mode/inspection mode. Instead, activation will merely be signaled by means of LEDs on the input/output module.

The input/output module is meant to respond quickly in test mode/inspection mode. Consequently, the lines are operated as follows in test mode:

- With detector lines, the alarm buffer is deactivated
- With contact inputs, the filter time is deactivated

Localization

To enable clear identification, the FDCIO223 input/output module can be set to localization mode from the control panel. Localization mode is signaled by the LEDs.

See also

- 📖 Input/output module status display [→ 17]

3.3.5 Earth fault monitoring

The secondary side is monitored for ground faults regardless of mode. Ground fault monitoring can be deactivated with a jumper. The setting for ground fault monitoring always applies to both inputs/outputs.

If intrinsically safe detectors are connected, ground fault monitoring must be deactivated.

See also

- 📖 Adjustment elements [→ 19]
- 📖 Connection of intrinsically safe detectors in ex-zone 1 [→ 25]

3.4 Input/output configuration options (secondary side)

Both inputs/outputs can be configured independently of one another. The table below shows which configurations are possible for input/output 1 and input/output 2.

Configuration	Input/output 1	Input/output 2
Siemens/Cerberus detector line	X	X
SynoLINE300 detector line	X	X
Contact input	X	X
Control line (monitored/non-monitored)	X	X

Comment

The device is configured on the control panel with the aid of the configuration tool. For more detailed information, please refer to the control panel documentation.

3.4.1 Configuration as collective detector line (GMT)

3.4.1.1 Detectors which can be connected

Different generations of detector can be connected to the input/output module, e.g.:


- Collective detector line configured as Siemens/Cerberus:
 - MS6; only detectors with LED alarm indicator (not incandescent lamps)
 - MS7
 - MS9
 - SIGMACON (SIGMASYS GMT)
 - AlgoRex DS110x
- Special detectors on the collective detector line, configured as Siemens/Cerberus:
 - Flame detector S2406, DF119x, FDF2x1-9
 - Linear detector A2400, DLO1191, FDL2x1-9
 - Neural fire detector FDOOT2419-9
 - Intrinsically safe ex detector DS110x-Ex, DF1101-Ex, F911
 - Titanus ProSens smoke extraction system (only with new resetting board type E548/c)

- Collective detector line configured as SynoLINE300:
 - Synova300
 - Third-party products in accordance with 'Industrial conventional' (Synova300C)



It is not possible to operate Siemens/Cerberus detectors and SynoLINE300 detectors simultaneously on the same detector line. The compatible detector types are listed in the 'Collective compatibility' chapter and in the 'List of compatibility'.

See also

 Collective compatibility [→ 53]

3.4.1.2 Detector line execution

Permissible cable types

The detector line is compatible with the following cables:

- Shielded cables
- Unshielded cables

The table below shows the permissible cable values:

Cable values	Detector line without safety barrier	Detector line with safety barrier
Inductance	Max. 5 mH	Max. 5 mH
Capacitance	Max. 4 µF	Max. 4 µF
Resistance	Max. 150 Ω	Max. 50 Ω

End-of-line (EOL)

One of the following must be used to terminate the detector line:

- Bidirectional 20 V transorb (tolerance max. ±5 %); 1.5 kW pulse power
- EOL22(Ex); absolutely essential with intrinsically safe ex detectors on ex lines above safety barrier SB3!

Non-assigned inputs/outputs do not require an end-of-line (EOL).

Monitoring of detector lines

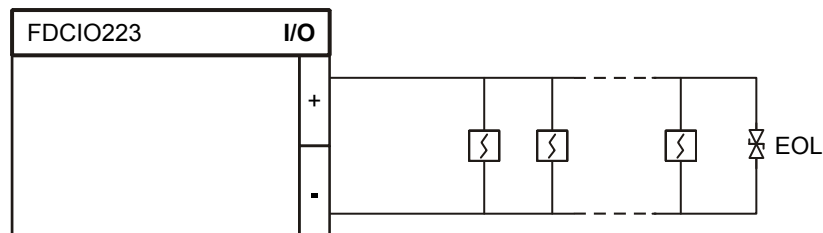
The input/output module monitors the line resistance of the detector line during operation.

The line resistance is adjusted precisely in each of the following cases:

- On initial start-up
- When an alarm has been reset
- Whenever the detector line is switched on

Circuit

A maximum of 32 detectors can be connected (KMK = 32).



Detector line circuit



The quiescent current of 3.2 mA must not be exceeded.

De-energization of the detector line

With ES60 and higher, the collective detector lines are de-energized as soon as FDnet/C-NET has been de-energized.


With all ES versions, the collective detector lines can also be de-energized individually (control panel-specific).

For more detailed information, please refer to the control panel documentation.

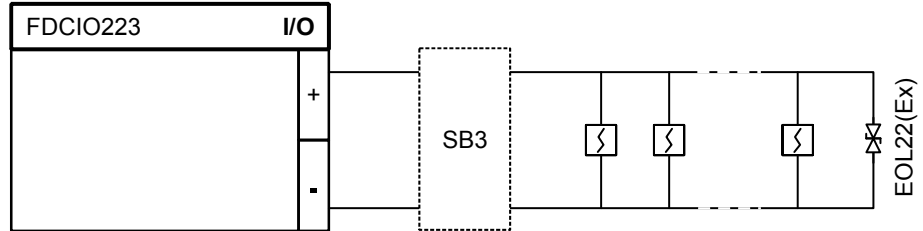
3.4.1.3 Connection of intrinsically safe detectors in ex-zone 1

Safety barrier SB3 can also be connected to the FDCIO223 input/output module. This allows intrinsically safe detectors to be operated in ex-zone 1+2. If you operate the module in conjunction with an SB3 safety barrier, the following points must be observed in particular:

- The line resistance must not exceed 50 Ω (excluding the safety barrier resistance).
- If a safety barrier is connected to both inputs/outputs, both barriers must be connected to the same grounding point.
- An EOL22(Ex) must always be used as the end-of-line.
- Specific national requirements always apply when creating installations in areas at risk of explosion.

	<p>NOTICE</p>
	<p>Activated ground fault monitoring Input/output module malfunction</p> <ul style="list-style-type: none"> ● If you are using safety barrier SB3, deactivate ground fault monitoring on the input/output module.

Circuit



Detector line circuit with intrinsically safe detectors in ex-zone 1+2

Notes

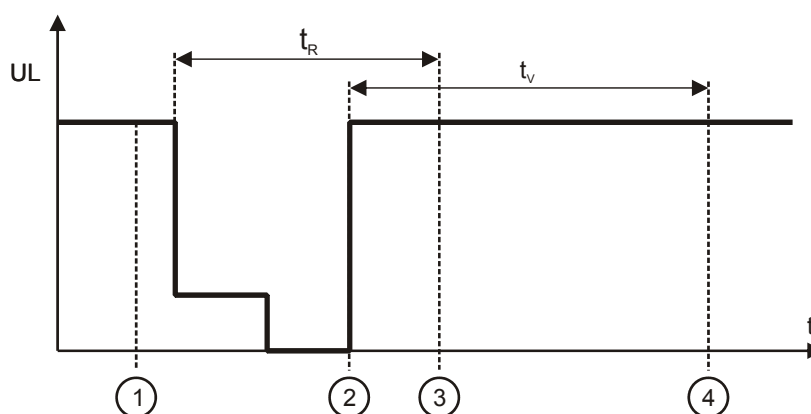
- Safety barrier SB3 is always required when connecting intrinsically safe ex detectors for ex-zone 1+2.
- An EOL22(Ex) end-of-line must always be used to terminate detector lines in ex-zone 1+2.

You will find more information in document 001204.

3.4.1.4 Alarm verification

To help prevent false alarms, the FDCIO223 input/output module features a form of alarm verification that can be activated as required.

When alarm verification is activated, any alarm (1) that occurs will first be stored by the input/output module. Then the detector line will be reset and powered up again. Once the detector line has finished powering up, the input/output module will continue monitoring the detector line as normal (2). If the alarm recurs within t_v (70 s), it will be forwarded to the control panel. Once the monitoring window of t_v (4) has elapsed, any new instance of the alarm will be treated as if it were occurring for the first time.



Alarm verification

UL	Detector line voltage	1	First alarm occurs
t_R	Alarm response time	2	Time when the input/output module starts monitoring the detector line again
t_v	Alarm verification time	3	If the alarm remains active, it is sent to the control panel
		4	End of monitoring window

The input/output module supports alarm response times (t_R) of between 0 and 255 seconds.

To avoid false alarms, transfer to the control panel can be delayed by means of a setting. In theory, a delay time of between 10 and 250 seconds can be set. However, in practice the actual setting range will depend on the control panel and the alarm response time. The permissible combinations should be selected when configuring the system.

Comment

The permissible alarm response time may be limited by local regulations.

3.4.1.5 Supervision

The input/output module monitors the detector line for the following criteria:

- Alarm
- Open line (creeping)
- Short circuit (creeping)
- Ground fault (joint)

3.4.2 Configuration as contact input

The inputs/outputs of the input/output module can be configured as contact inputs. The following configurations are possible:

Status inputs

Status inputs trigger a status change as soon as they are activated.

Danger inputs

Danger inputs trigger an alarm as soon as the input is activated.

Filter time

The statuses of the inputs are polled several times a second. The following conditions apply to detecting a change in status:

- The activation signal must be present for at least as long as the filter time (can be set between 0.5 and 240 seconds).
- The deactivation signal must be present for at least as long as the filter time but for no more than 2 seconds.

The filter time is used to suppress interfering pulses.

Line monitoring

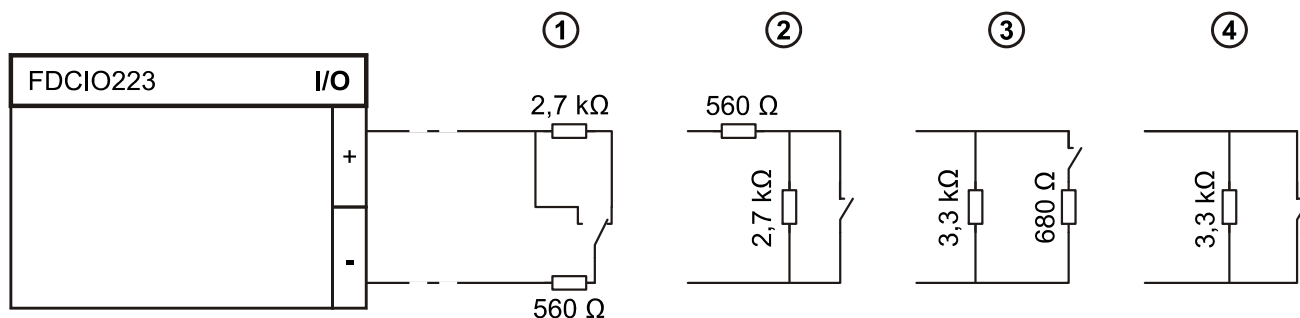
The input lines can be monitored for the following criteria:

- Open line
- Open line and short circuit
- No monitoring

To facilitate this, resistors must be connected to the lines of the inputs. When a short-circuit or open line occurs on one of the input lines, a fault message is transmitted to the control panel.

Circuit

The figure below shows the various circuit options available for contact inputs.



Circuit for contact inputs

1 ... 3 Monitoring for open line and short circuit

4 Monitoring for open line only



The contact inputs must be potential-free.

3.4.3 Configuration as control line

3.4.3.1 Overview

Current limiting

!	NOTICE
	<p>Short circuit on control line</p> <p>Damage to input/output module due to increase in current</p> <ul style="list-style-type: none"> ● The external 24 V supply voltage must be monitored. ● If a short-circuit occurs on the control line, the 24 V supply voltage must be disconnected.

Within the context of control, the secondary side supply voltage (24 V DC) is applied to the relevant output via a relay. During control, there is no limiting of the output current. The FDCIO223 input/output module does not contain any fuses. Contact protection measures should therefore be undertaken on-site.

Monitoring

You have the option of monitoring the control line. Monitored control lines are monitored for the following criteria:

- Open line (creeping)
- Short circuit (creeping)
- Ground fault (only both inputs/outputs jointly, no line-specific fault message)

Notes:

- The control line is not monitored in the triggered state.
- To avoid false alarms, transfer to the control panel can be delayed by means of a setting. In theory, a delay time of between 0.5 and 240 seconds can be set. However, in practice the actual setting range will depend on the control panel.

Monitoring can be configured in accordance with the following types:

- Identical-polarity monitoring
- Reverse-polarity monitoring

The monitoring voltage is set by means of jumpers.

Identical-polarity monitoring

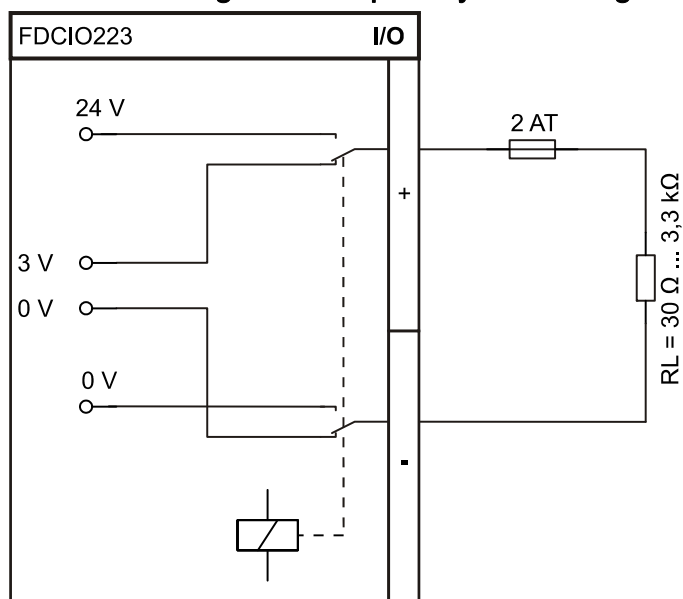
With this type of monitoring, the connected load's internal resistance is monitored. As a result, no monitoring resistors need to be installed. Calibration is only possible with the push button.

Reverse-polarity monitoring

With this type of monitoring, the control voltage polarity is reversed in relation to that of the monitoring voltage. The monitoring resistor is parallel with the load. The load must be isolated from the monitoring voltage by means of a diode. Two different monitoring resistances can be selected: 3.3 k Ω and 560 Ω

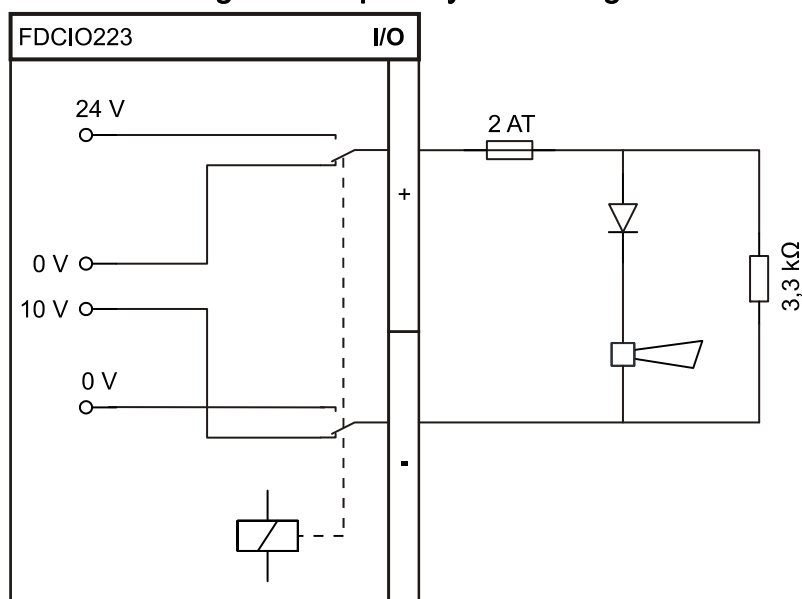
Reverse-polarity monitoring should always be used in the case of electronic loads.

Circuit featuring identical-polarity monitoring



Circuit for control lines with identical-polarity monitoring

Circuit featuring reverse-polarity monitoring



Circuit for control lines with reverse-polarity monitoring

The figure shows the relay in the dropped-out state, i.e., the triggered state.

Calibration of load resistances

To ensure that any load resistances (particularly those associated with coils) can be monitored without any problems, the connected line must be calibrated during commissioning. During calibration, the load resistance and the line resistance are measured and stored as reference values.

The calibration process is initiated by pressing the push button on the input/output module. Once calibration has been successfully completed, the input/output module adopts the operating mode. This is indicated by the input/output LEDs. The LEDs also indicate if the calibration process has failed.

With identical-polarity inverse control, the calibration process can only be performed if the relays have dropped out. Therefore, control must be activated following configuration so that the relay will drop out.

Control

Control is possible with or without confirmation. The various configuration options are described in the next two sections.

See also

- ☰ [Calibrating the control line \[→ 46\]](#)
- ☰ [Control without confirmation \[→ 32\]](#)
- ☰ [Control with confirmation \[→ 33\]](#)

3.4.3.2 Control without confirmation

Configuration

The following configurations are supported in the case of control without confirmation:

- Once activated, the control remains permanently active
- Once activated, the control only remains active for a certain time. How long the contact remains active can be configured (pulse duration).
- Once activated, the control remains astable (symmetrical pulse pattern of 1 s)
- With line monitoring
- Without line monitoring
- Behavior in the event of an error

If used as a monitored output:

- Failsafe behavior when the FDnet/C-NET detector line is current-free or in degraded mode (e.g. in case of a failure of the processor in the control panel).

The error behavior defines the position of the contact in the event of an error.

- The contact remains in the same position as before the error
- The contact is activated in case of an error
- The contact is deactivated in case of an error
- The contact responds to signal 'Degraded mode horn' like other sounders on the FDnet/C-NET.

If used as a sounder line:

- Failsafe behavior when the FDnet/C-NET detector line is current-free or in degraded mode (e.g. in case of a failure of the processor in the control panel).

The error behavior defines the position of the contact in the event of an error.

- The contact responds to signal 'Degraded mode horn' like other sounders on the FDnet/C-NET.

The statuses of the outputs (active/not active) cannot be polled on the control panel, only switched.

Control methods involving pulse patterns

Control methods involving pulse patterns reduce the service life of the relay contacts on the input/output module. Contact wear is also dependent on the load. Up to 300,000 switching cycles are permitted.

Behavior in the event of an error (control panel-specific)

Error	Configuration option
Failure of 24 V power supply	Open (configuration not possible)
Error involving control panel (e.g., communication with control panel interrupted)	<ul style="list-style-type: none"> ● Relay remains unchanged ● Relay deactivated ● Relay activated ● 'Degraded mode horn' function (only possible with FS20/FS720 control panels)

Notes

- In the case of the 'Degraded mode horn' function, the input/output module accepts the 'Sounder ON' command. This function is only supported on FS20/FS720 control panels.
- The monitoring of monitored control systems will only be resumed 30 seconds after deactivation.

3.4.3.3 Control with confirmation

Control with confirmation is not supported in the case of the FS20/FS720, AlgoRex, and SIGMASYS control panels/the confirmation is configured and processed on the control panel.

3.5 Diagnosis levels

The FDCIO223 input/output module monitors its operation largely autonomously.

The following diagnosis levels are derived from the different control measurements:

- Normal
- Observe information
- Replacement recommended
- Replacement necessary
- Fault

For details, see table below.

When a fatal error (one which impairs the module's function) occurs, a fault message is signaled. The module contains additional information for addressing the cause. This can be displayed by the FDUD292 detector exchanger and tester or FDUD293 intelligent detector exchanger and tester for example.

For details, see Documents 007227 and 009718.

Information displayed on the detector exchanger and tester	Meaning	Measures
'no deviation'	Normal, no fault is present Input/output module is fully functional	None
'maybe excha.' ¹	Observe information -	-
'advice excha.' ¹	Replacement recommended -	-
'needed excha.' ¹	Replacement necessary -	-
Any fault message ²	Fault present Input monitoring error (open line, short circuit, deviation)	Check input circuit (parameter settings, resistances, short circuit, open line)
	Invalid parameter settings	Make valid parameter settings or use push button to calibrate output/control line
	Supply error on secondary side	<ul style="list-style-type: none"> ● Check voltage ● Replace the module
	Software error (Watchdog error)	Replace the module
	Memory error	Replace the module
	Communication error between module and control panel	Remedy cause

¹ The information displayed on the detector exchanger and tester is always in English; no translation into the corresponding language.

² This status can be displayed together with another status, e.g. 'needed excha.' (replacement necessary).



Status queries with detector exchanger and tester FDUD292 or intelligent detector tester FDUD293 are only possible with devices of the 'Sinteso' product line on the FDnet.

3.6 Behavior in degraded mode

Applicable for the FDnet/C-NET:

If the main processor of the fire control panel fails, the control panel enters degraded mode operation. Depending on the control panel, the fire control panel may continue to provide the main alarming functions and signaling functions in degraded mode operation.

Degraded mode operation behavior on control panels that support degraded mode operation:

Alarming is still ensured in degraded mode operation. However, in degraded mode operation, only collective alarming is possible. This means that in the event of an alarm, it is possible to identify the detector line but not the exact location of the detector triggering the alarm.

When the outputs are used for control systems (e.g. fire controls), the outputs adopt the configured default position in the event of a communication failure or de-energized FDnet/C-NET.

Degraded mode operation on the FDnet/C-NET is not supported in the same way by all control panels. The information in the 'List of compatibility' and in the corresponding control panel documentation must be taken into account during project planning.

3.7 Accessories


3.7.1 Enclosed accessories

The FDCIO223 input/output module is supplied with the following accessories:

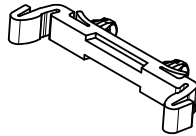
- 2 resistors 560 Ω , 0.25 W
- 2 resistors 680 Ω , 0.25 W
- 2 resistors 2.7 k Ω , 0.25 W
- 2 resistors 3.3 k Ω , 0.25 W
- 2 bidirectional transorbs for terminating the collective detector lines
- 2 mounting feet FDCM291 for installation on a TS35 top-hat rail

3.7.2 Optional accessories



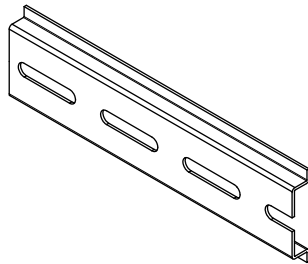
The symbol  is used if there are no graphics for an accessory.

3.7.2.1 Mounting foot FDCM291



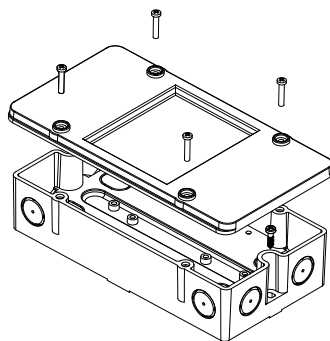
- For device installation on a top hat rail TS35
- Two mounting feet must always be used
- Compatible with:
 - FDCI22x(-CN) input module
 - FDCIO22x(-CN) input/output module
 - Multi line separator module FDCL221-M
- Order no.: A5Q00003855

3.7.2.2 Top hat rail TS35



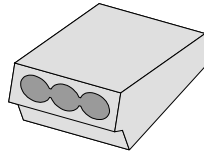
- Standard top hat rail for installing devices
- Width: 35 mm
- Length: 122 mm or 288 mm
- Compatible with:
 - FDCL221 line separator
 - Mounting foot FDCM291
- Order no. (length 122 mm): BPZ:5644780001
- Order no. (length 288 mm): BPZ:5644230001

3.7.2.3 Housing FDCH221



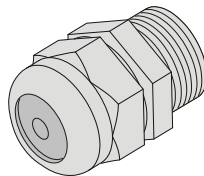
- To protect against dust and wetness
- Compatible with:
 - Multi line separator module FDCL221-M
 - Input module FDCI22x(-CN)
 - Input/output module FDCIO22x(-CN)
- Order no.: S54312-F3-A1

3.7.2.4 Connection terminal DBZ1190-AB



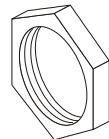
- Auxiliary terminal for connecting cables
- For T-branches of additional cabling for cable shielding, detector heating units, sounder base, external alarm indicators, etc.
- For wire diameters of 1 ... 2.5 mm²
- 3-pin
- Order no.: BPZ:4942340001

3.7.2.5 M20 x 1.5 metal cable gland



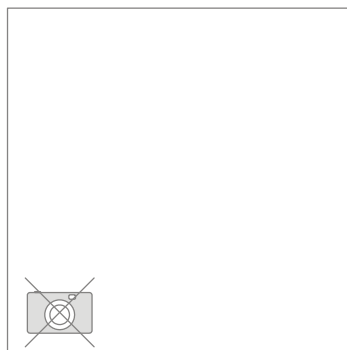
- For introducing a cable into a housing
- Compatible with:
 - M20 x 1.5 metal counter nut
- Order no.: A5Q00004478

3.7.2.6 M20 x 1.5 metal counter nut



- For use with metal cable gland M20 x 1.5
- Order no.: A5Q00004479

3.7.2.7 Cable ties 2.4 x 137



- For strain relief on the connection wires or generally for attachment
- Made from polyamide
- Compatible with:
 - Input module FDCI22x(-CN)
 - Input/output module FDCIO22x(-CN)
 - FDCL221 line separator
 - Multi line separator module FDCL221-M
 - Radio gateway FDCW221
- Order no.: BPZ:1825330001

4 Project planning

When planning a project, proceed as follows:

1. Define the installation site and configuration of the lines
2. Plan the various line types
 - Collective detector line GMT
 - Control lines
 - Contact inputs

4.1 Compatibility

The input/output module FDCIO223 is compatible with the AlgoRex, SIGMASYS and FS20/FS720 fire detection systems.

For details see 'List of compatibility'.

4.2 Define the place of installation and line configuration

Guideline

- In humid, wet or dirty environments, use housing FDCH221.
- Use housing FDCH221 to protect the input/output module against unauthorized access.

In clean and dry environments, you are free to install the input/output module without any housing.

Define the type of application for the input/output module (see table).

Installation site	_____
Mode of installation	<input type="checkbox"/> Without housing <input type="checkbox"/> With housing FDCH221
Configuration of input/output 'I/O 1'	<input type="checkbox"/> Siemens/Cerberus detector line, SynoLINE600 <input type="checkbox"/> SynoLINE300 detector line <input type="checkbox"/> Contact input <input type="checkbox"/> Control line without confirmation <input type="checkbox"/> Inverted control <input type="checkbox"/> Reverse-polarity monitoring of control
Configuration of input/output 'I/O 2'	<input type="checkbox"/> Siemens/Cerberus detector line, SynoLINE600 <input type="checkbox"/> SynoLINE300 detector line <input type="checkbox"/> Contact input <input type="checkbox"/> Control line without confirmation <input type="checkbox"/> Inverted control <input type="checkbox"/> Reverse-polarity monitoring of control
Ground fault monitoring for both inputs/outputs (jointly)	<input type="checkbox"/> Yes <input type="checkbox"/> No

4.3 Planning the detector line

Define the values of the individual parameters for the relevant inputs/outputs (see table).

Parameter	Input/output 'I/O 1'	Input/output 'I/O 2'
Detector line type	<input type="checkbox"/> SynoLine300 <input type="checkbox"/> Siemens/Cerberus, SynoLINE600 <input type="checkbox"/> Siemens/Cerberus ex line	<input type="checkbox"/> SynoLine300 <input type="checkbox"/> Siemens/Cerberus, SynoLINE600 <input type="checkbox"/> Siemens/Cerberus ex line
Alarm verification	<input type="checkbox"/> No <input type="checkbox"/> Yes => alarm verification time = ____s	<input type="checkbox"/> No <input type="checkbox"/> Yes => alarm verification time = ____s
End-of-line	<input type="checkbox"/> EOL22(Ex); obligatory in ex-zone 20-V tranzorb diode	<input type="checkbox"/> EOL22(Ex); obligatory in ex-zone 20-V tranzorb diode

4.4 Planning the control line

Define the values of the individual parameters for the relevant inputs/outputs (see table).

Parameter	Input/output 'I/O 1'	Input/output 'I/O 2'
Polarity of control and monitoring systems in relation to one another	<input type="checkbox"/> Identical polarity <input type="checkbox"/> Reverse polarity	<input type="checkbox"/> Identical polarity <input type="checkbox"/> Reverse polarity
Activation period/behavior	<input type="checkbox"/> Permanent <input type="checkbox"/> Only for the period of: ____ s (1 ... 20 s) <input type="checkbox"/> Symmetrical pulse pattern	<input type="checkbox"/> Permanent <input type="checkbox"/> Only for the period of: ____ s (1 ... 20 s) <input type="checkbox"/> Symmetrical pulse pattern
Behavior in the event of a communication problem involving the control panel	<input type="checkbox"/> Control remains the same as before the error <input type="checkbox"/> Control is activated <input type="checkbox"/> Control is deactivated <input type="checkbox"/> 'Degraded mode horn' function (only possible with FS20/FS720)	<input type="checkbox"/> Control remains the same as before the error <input type="checkbox"/> Control is activated <input type="checkbox"/> Control is deactivated <input type="checkbox"/> 'Degraded mode horn' function (only possible with FS20/FS720)

4.5 Planning contact input

Define the values of the individual parameters for the relevant inputs/outputs (see table).

Parameter	Input/output 'I/O 1'	Input/output 'I/O 2'
Type of input	<input type="checkbox"/> Danger input <input type="checkbox"/> Status input	<input type="checkbox"/> Danger input <input type="checkbox"/> Status input
Monitored for	<input type="checkbox"/> Open line <input type="checkbox"/> Short circuit and open line <input type="checkbox"/> No monitoring	<input type="checkbox"/> Open line <input type="checkbox"/> Short circuit and open line <input type="checkbox"/> No monitoring
Input active, when contact is:	<input type="checkbox"/> Open <input type="checkbox"/> Closed	<input type="checkbox"/> Open <input type="checkbox"/> Closed
Filter time	Duration: ____ s (0.5 ... 240 s)	Duration: ____ s (0.5 ... 240 s)

Notes

- The resistors must be connected at the end of the lines.
- If the inputs/outputs are configured as contact inputs, no automatic detectors or manual call points can be connected to them.

4.6 Environmental influences

If the devices are used in industrial applications, consultation with the project manager is required, since plastics do not withstand certain environmental conditions.

The following factors must be taken into consideration:

- Chemicals
- Temperature
- Humidity

4.7 Filling out the configuration sheet


1. Copy out the configuration sheet. You will find it in the appendix.
2. Fill out the configuration sheet.
3. Hand over copies of the completed configuration sheet to the installer and the service technician.


See also

 Configuration sheet [→ 55]

5 Mounting / Installation

The procedure followed during installation depends on whether the input/output module is installed with or without a housing.

	⚠ WARNING
	Electrical voltage on output cables! Mortal danger due to electric shock! <ul style="list-style-type: none"> ● Ensure that the cables are not supplied with voltage during installation.

	NOTICE
	High temperatures in the module's environment Module overheating and damage <ul style="list-style-type: none"> ● A minimum clearance of 1 cm must be observed between two modules or between the module and any other boundary.

5.1 Installation with housing



Note the positive and negative connections.

Only connect one wire per terminal. This is the only way of ensuring a problem-free connection over the device's entire service life.

The module can be installed at any location, along with the separate FDCH221 housing.

When installing the module in the housing FDCH221, proceed as follows:

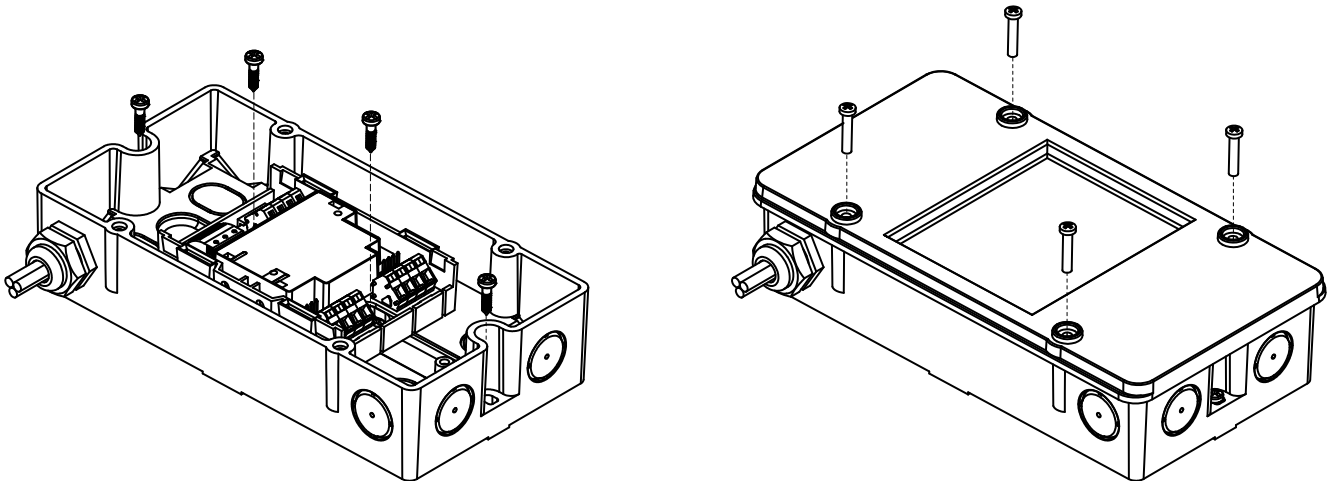
1. Break out the required cable entries.
2. Install housing on a flat surface.
3. Insert cables. If necessary, fix the cables using the M20 x 1.5 cable glands or use a different cable entry.
4. If you are using shielded cable, join the shielding to the DBZ1190-AB connection terminal. The shielding must not touch any extrinsic earthing potentials or metal parts in the housing.
5. Install the module in the housing using the fixing screws supplied.
6. Connect cables to corresponding terminals (see connection diagram).
7. Close housing using supplied screws.

Cable with diameter $> 1.5 \text{ mm}^2$

If the cable diameters on the inputs/outputs are greater than 1.5 mm^2 , auxiliary terminals must be used:

- In the case of cables with a diameter of $1.5 \dots 2.5 \text{ mm}^2$, connection terminal DBZ1190-AB can be used.
- In the case of cables with a diameter of $> 2.5 \text{ mm}^2$, an appropriate terminal must be provided by the customer.

The terminal can be positioned inside the housing.



Installing the module in the FDCH221 housing

See also

- 📄 Connection terminal DBZ1190-AB [→ 37]

5.2 Installation without housing

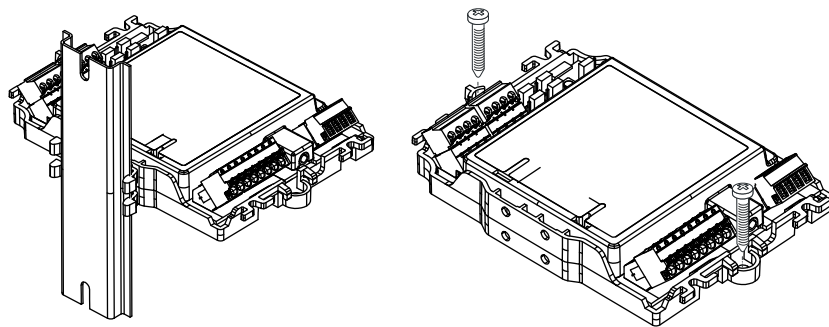


Note the positive and negative connections.

Only connect one wire per terminal. This is the only way of ensuring a problem-free connection over the device's entire service life.

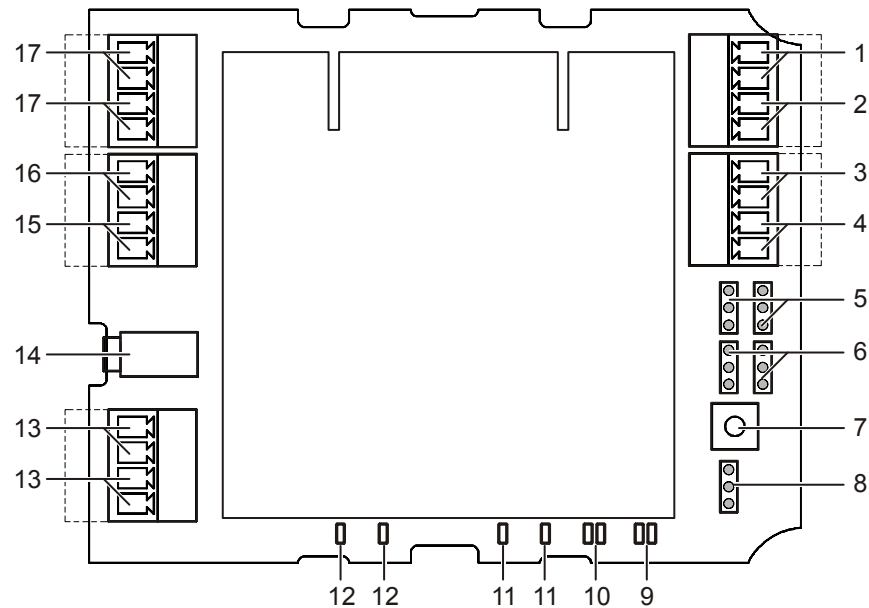
If you are installing the module without the housing, proceed as follows:

1. Mount the module on an even surface or on a TS35 top hat rail, using the two FDCM291 mounting feet supplied (see figure). To make sure that the LEDs remain visible at all times, the housing cap is transparent. Pick a suitable installation position, ensuring that the LEDs will remain visible at all times during operation.
2. Connect cables to corresponding terminals (see connection diagram).
3. Secure cables on module with cable ties.



Installation of module without housing

5.3 Connecting input/output module



Circuit board view

Connect the module in accordance with the corresponding connection diagrams.



Note the positive and negative connections.

Only connect one wire per terminal. This is the only way of ensuring a problem-free connection over the device's entire service life.

When connecting the device, consider the following:

- The shielding of the FDnet/C-NET detector line must be connected to terminal 15.
- The shielding of the 24 V secondary side supply must be connected to terminal 16.
- The grounding for the shielding on the secondary side must be connected to terminal 1, as must the secondary side ground fault monitoring.
- The shielding for the lines on the secondary side should be connected to terminal 2.
- In the case of shielding on the secondary side, the secondary-side grounding must be connected. If there is no local station ground available, the shielding for the secondary-side supply can be used as a ground instead.



The shielding of the FDnet/C-NET detector line must never be used as a secondary-side ground potential or connected to other shields. If shields are connected, this can result in faults on the FDnet/C-NET detector line. Terminals 15 and 16 are used exclusively for looping through the shields.

See also

- Configuration as collective detector line (GMT) [→ 23]
- Configuration as contact input [→ 28]
- Configuration as control line [→ 29]

6 Commissioning

The device is commissioned via the control panel. The exact procedure is described in the control panel documentation.

Conduct a performance check once commissioning is complete.

If the input/output module is to be used for control purposes, the control lines will need to be calibrated during commissioning.

6.1 Calibrating the control line

- ▷ The input/output module must be connected correctly (inputs/outputs and power supply).
 - ▷ The detector line must have been commissioned.
 - ▷ The input/output module must be correctly configured.
 - ▷ The relay must not be triggered during calibration. This is especially important in the case of inverse controls (normal position = triggered)! Consequently, control must be activated for calibration in the case of inverse controls!
1. Press the push button on the input/output module.
 - ⇒ The control lines will then be calibrated. This process will take approximately 2 s.
 2. Check that calibration has been performed successfully.
 - ⇒ Following successful calibration, the input/output module will assume normal operation.

Notes

- The control line will be recalibrated whenever the push button is pressed.
- The line must be recalibrated with each new configuration.

7 Maintenance / Repair

7.1 Status retrieval

The FDCIO223 input/output module is equipped with the MC link (Maintenance and Commissioning Link).

Using this interface, it is possible to read out data from the device the detector exchanger and tester FDUD292 or the intelligent detector tester FDUD293.

For details, see Documents 007227 and 009718.

You can use the MC link to query the following data:

- Status of inputs
- Status of outputs
- Impermissible configuration
- Error list
- Status register



Status queries with detector exchanger and tester FDUD292 or intelligent detector tester FDUD293 are only possible with devices of the 'Sinteso' product line on the FDnet.

7.2 Function check

The devices are automatically subjected to a performance check during the self-test. Nevertheless, it is necessary to check the devices on site at regular intervals.

Recommendation:

- Check the devices every year.
- Replace heavily soiled or damaged devices.

No other special maintenance work is necessary.

For more detailed information, please refer to the control panel documentation.

8 Specifications

8.1 Technical data

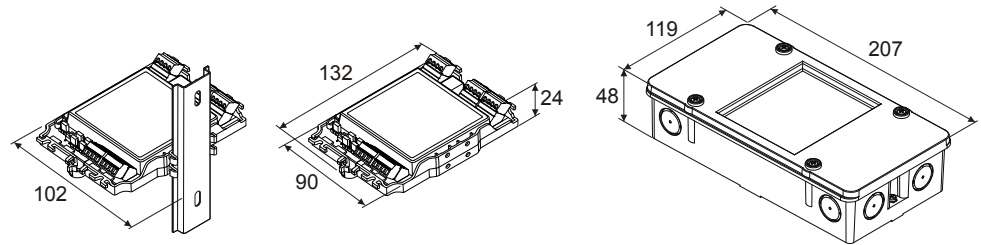
Secondary-side supply	Operating voltage	18 ... 32 VDC
	Operating current without secondary load at 24 V	<ul style="list-style-type: none"> ● 26 mA (typ.) ● 30 mA (max.)
	Operating current with secondary load	Max. 4 A
FDnet/C-NET detector line	Operating voltage	12 ... 33 VDC
	Operating current	0.6 ... 0.75 mA
	Maximum current connection factor	3
	Quiescent current connection factor	3
	Address connection factor	1
	Separator connector factor	1
	Protocol	FDnet/C-NET
	Design	<ul style="list-style-type: none"> ● Inherently short-circuit-proof ● Protected against polarity reversal ● Protected against overvoltage
	Compatibility	See 'List of compatibility'
Line separator	Line voltage:	
	<ul style="list-style-type: none"> ● Nominal 	32 VDC (= V_{nom})
	<ul style="list-style-type: none"> ● Minimum 	12 VDC (= V_{min})
	<ul style="list-style-type: none"> ● Maximum 	33 VDC (= V_{max})
	Voltage at which the separator opens:	
	<ul style="list-style-type: none"> ● Minimum 	7.5 VDC (= $V_{SO min}$)
	<ul style="list-style-type: none"> ● Maximum 	10.5 V DC (= $V_{SO max}$)
	Permanent current when switches are closed:	Max. 0.5 A (= $I_{C max}$)
	Switching current (e.g. in the event of a short-circuit):	Max. 1 A (= $I_{S max}$)
	Leakage current when switches are open:	Max. 1 mA (= $I_{L max}$)
Serial impedance when switches are closed:	Max. 0.5 Ω (= $Z_{C max}$)	
Detector line	Can be configured as:	<ul style="list-style-type: none"> ● Siemens/Cerberus type ● SynoLINE300 type
	Number of detectors per detector line	Max. 32
	Collective detector connection factor with Siemens/Cerberus type	32

	Current consumption of all detectors on a SynoLINE300 line	Max. 3,2 mA
	Operating voltage/quiescent current:	
	● Siemens/Cerberus type	20 V / max. 4.5 mA
	● SynoLINE300 type	20 V / max. 17 mA
	Line resistance/line capacitance:	
	● Without safety barrier SB3	$\leq 150 \Omega / \leq 1 \mu\text{F}$
	● With safety barrier SB3	$\leq 50 \Omega / 4 \mu\text{F}$
	Alarm activation:	
	● Siemens/Cerberus type	680 Ω resistor or 5.6 V Zener diode
	● SynoLINE300 type	410 ... 600 Ω resistor
	Alarm voltage	4 ... 14 V
	Alarm current:	
	● Siemens/Cerberus type	< 10 mA
	● SynoLINE300 type	< 17 mA
	Reset voltage	< 1 V
	Reset time	< 3 s
	Settling time following a reset	10 s
	Flashing current	Approx. 80 mA
	End-of-line (EOL)	<ul style="list-style-type: none"> ● Transzorb diode (20 V \pm5%; 1.5 kW pulse power) ● EOL22(Ex) end-of-line; obligatory for ex lines
	Monitored for:	<ul style="list-style-type: none"> ● Open line ● Short-circuit ● Ground fault monitoring (both inputs/outputs jointly)
	Suppression of erroneous information	Continuous analysis
	Message evaluation for:	
	● Alarms	1 s (can be increased by the alarm response time)
	● Faults	1 s (can be increased by the filter time)
	● Ground fault	60 s
	Compatibility	<ul style="list-style-type: none"> ● Collective Siemens/Cerberus ● Collective SynoLINE300 For details, see 'List of compatibility' and 'Annex' chapter
Contact input	Measurement voltage	Approx. 2 V
	Measurement current	Max. 32 mA
	Effective terminating resistances	<ul style="list-style-type: none"> ● 3.3 kΩ; +/-1 %; 0.25 W ● 560 Ω; +/-1 %; 0.25 W
	Line resistance	Max. 150 Ω
	Line capacitance	Max. 1 μF

	Monitored for:	<ul style="list-style-type: none"> ● Short circuit (if configured) ● Closed ● Deviation in terms of monitoring resistances ● Open ● Open line ● Ground fault monitoring (both inputs/outputs jointly)
	Suppression of erroneous information	Continuous analysis
	Message evaluation for:	
	<ul style="list-style-type: none"> ● Faults ● Ground fault 	1 s (can be increased by the filter time) 60 s
	Message types	<ul style="list-style-type: none"> ● Danger input ● Status input
Control line	Output voltage in active state	24 V nominal (= secondary-side supply voltage)
	Output current per control line in active state	<ul style="list-style-type: none"> ● Max. 2 A ● Max. 1.5 A in housing FDCH29x and an ambient temperature of over 50 °C
	Monitored for:	<ul style="list-style-type: none"> ● Open line (creeping) ● Short circuit (creeping) ● Ground fault monitoring (both inputs/outputs jointly)
	Monitoring voltage	4 V no-load
	Monitoring functions	<ul style="list-style-type: none"> ● 3.3 k Ω; +/-1 %; 0.25 W (reverse polarity) ● 560 Ω; +/-1 %; 0.25 W (reverse polarity) ● Manual calibration (identical polarity)
	Monitoring polarity	<ul style="list-style-type: none"> ● Identical polarity ● Reverse polarity
	Suppression of erroneous information	Continuous analysis
	Message evaluation for:	
	<ul style="list-style-type: none"> ● Faults ● Ground fault 	1 s (can be increased by the filter time) 60 s
	Control line resistance	10% of load resistance; but only up to max. 150 Ω
	Fusing of control line	Max. 2 AT (to be provided by customer)
Connections	FDnet/C-NET detector line, inputs and outputs, shielding, external 24 V DC:	
	<ul style="list-style-type: none"> ● Design ● Cable cross section 	Screw terminals on plug 0.2 ... 1.5 mm ²
	MC link	Plug connection

Ambient conditions	Operating temperature/permissible ambient temperature	-25 ... +60 °C
	Storage temperature	-30 ... +65 °C
	Air humidity	≤ 95 % rel.
	Protection categories according to EN 60529/IEC 60529:	
	● Without housing	IP30
	● With housing FDCH221	IP65
	Electromagnetic compatibility	EN 50131-4
Mechanical data	Dimensions (W x H x D):	
	● Input/output module	132 x 90 x 24 mm
	● Housing	207 x 119 x 48 mm
	Weight:	
	● Input/output module	0,116 kg
	● Housing FDCH221	0,444 kg
	Material:	
	● Input/output module rack	ABS
	● Cover cap, housing cover	PC
	● Housing bottom	ASA
	Color:	
	● Input/output module rack, housing bottom	~RAL 9010 pure white
	● Cover cap, housing cover	Transparent
Standards	Standards	<ul style="list-style-type: none"> ● CEA GEI I084 ● EN 54-17 ● EN 54-18
	VdS approvals	G206054
	LPCB approvals	126aq/01
	Certificates	0786-CPD-20430
	CE conformity mark	Yes
	Protection categories	IEC 60529
	Application class	IEC 60721-3 3K8H
	Test class	IEC 60068-1 25/070/42
	QA Standards	<ul style="list-style-type: none"> ● Siemens Standard SN 36350 ● ISO 9001 ● ISO 9004

8.2 Dimensions



Dimensions

8.3 Environmental compatibility

- Reusable materials
- Electronic parts and synthetic materials can be easily separated
- Halogen-free synthetic materials, marked by embossed code
- The synthetic materials used do not generate any toxic substances during combustion.

The larger plastic parts are labeled according to ISO 11469. The basic polymer abbreviations comply with ISO 1043. The materials can be separated and recycled on this basis.

9 Appendix

9.1 Collective compatibility

The tables below show which devices can be connected to the collective detector line of input/output module FDCIO223. Any devices that are neither listed below nor detailed in 'List of compatibility' are to be regarded as incompatible.

Compatible with Siemens/Cerberus collective detector line

Type	Designation
A2400	Linear smoke detector
BM957	Maximum temperature detector
BM980	Maximum temperature detector
BD957	Heat detector
BR12	Optical smoke detector
BR910	Ionization smoke detector
D600	Rate of rise heat detector
DF1101Ex	Infrared flame detector (3 sensors)
DF1191	Infrared flame detector (1 sensor)
DF1192	Infrared flame detector (3 sensors)
DLA1191	Detector unit for linear smoke detector
DLA1191A	Detector unit for linear smoke detector
DM1103	Manual call point
DM1104	Manual call point
DMA1103	Manual call point
DMA1103A	Manual call point
DMA1103B	Manual call point
DMA1104A	Manual call point
DMA1104B	Manual call point
DO1101	Wide-spectrum smoke detector
DO1101A	Automatic fire detectors
DO1101A-Ex	Automatic fire detectors
DT1101	Heat detector
DT1101A	Automatic fire detectors
DT1101A-Ex	Automatic fire detectors
DT1102	Heat detector
DT1102A	Automatic fire detector, collective
DT1102A-Ex	Automatic fire detectors
F600	Ionization smoke detector
F910	Ionization smoke detector

Type	Designation
HI620C	Differential heat detector
HI622C	Differential heat detector
OP620C	Optical smoke detector
R610	Scattered light smoke detector
S2406	Infrared flame detector
S620	Flame detector
SDF200	Optical smoke detector
SDT210	Heat detector
SMF120	Manual call point
FDOOT241-9 ¹	Neural fire detector
FDL241-9 ¹	Linear smoke detector
FDF221-9 ¹	Infrared flame detector
FDF241-9 ¹	Infrared flame detector
Titanus ProSens ²	Smoke extraction system

¹ For details see 'List of compatibility'

Compatible with SynoLINE300 (Synova) collective detector line

Type	Designation
HI320C	Differential heat detector
HI322C	Heat detector
MT320C	Manual call point
OH320C	Multi-sensor smoke detector
OP320C	Optical smoke detector
Apollo Series65	Rival detector series

² Titanus ProSens smoke extraction system

The Titanus ProSens smoke extraction system (produced by the German company Wagner) is compatible if the new resetting board is used.

Details for ordering:

Resetting board type E548/c

Art. No. 09-20-5481

9.2 Configuration sheet

Planning the type of application

Installation site	_____
Mode of installation	<input type="checkbox"/> Without housing <input type="checkbox"/> With housing FDCH221
Configuration of input/output 'I/O 1'	<input type="checkbox"/> Siemens/Cerberus detector line, SynoLINE600 <input type="checkbox"/> SynoLINE300 detector line <input type="checkbox"/> Contact input <input type="checkbox"/> Control line without confirmation <input type="checkbox"/> Inverted control <input type="checkbox"/> Reverse-polarity monitoring of control
Configuration of input/output 'I/O 2'	<input type="checkbox"/> Siemens/Cerberus detector line, SynoLINE600 <input type="checkbox"/> SynoLINE300 detector line <input type="checkbox"/> Contact input <input type="checkbox"/> Control line without confirmation <input type="checkbox"/> Inverted control <input type="checkbox"/> Reverse-polarity monitoring of control
Ground fault monitoring for both inputs/outputs (jointly)	<input type="checkbox"/> Yes <input type="checkbox"/> No

Planning the detector line

Parameter	Input/output 'I/O 1'	Input/output 'I/O 2'
Detector line type	<input type="checkbox"/> SynoLine300 <input type="checkbox"/> Siemens/Cerberus, SynoLINE600 <input type="checkbox"/> Siemens/Cerberus ex line	<input type="checkbox"/> SynoLine300 <input type="checkbox"/> Siemens/Cerberus, SynoLINE600 <input type="checkbox"/> Siemens/Cerberus ex line
Alarm verification	<input type="checkbox"/> No <input type="checkbox"/> Yes => alarm verification time = _____s	<input type="checkbox"/> No <input type="checkbox"/> Yes => alarm verification time = _____s
End-of-line	<input type="checkbox"/> EOL22(Ex); obligatory in ex-zone 20-V tranzorb diode	<input type="checkbox"/> EOL22(Ex); obligatory in ex-zone 20-V tranzorb diode

Planning the control line

Parameter	Input/output 'I/O 1'	Input/output 'I/O 2'
Polarity of control and monitoring systems in relation to one another	<input type="checkbox"/> Identical polarity <input type="checkbox"/> Reverse polarity	<input type="checkbox"/> Identical polarity <input type="checkbox"/> Reverse polarity
Activation period/behavior	<input type="checkbox"/> Permanent <input type="checkbox"/> Only for the period of: ___ s (1 ... 20 s) <input type="checkbox"/> Symmetrical pulse pattern	<input type="checkbox"/> Permanent <input type="checkbox"/> Only for the period of: ___ s (1 ... 20 s) <input type="checkbox"/> Symmetrical pulse pattern
Behavior in the event of a communication problem involving the control panel	<input type="checkbox"/> Control remains the same as before the error <input type="checkbox"/> Control is activated <input type="checkbox"/> Control is deactivated <input type="checkbox"/> 'Degraded mode horn' function (only possible with FS20/FS720)	<input type="checkbox"/> Control remains the same as before the error <input type="checkbox"/> Control is activated <input type="checkbox"/> Control is deactivated <input type="checkbox"/> 'Degraded mode horn' function (only possible with FS20/FS720)

Planning contact input

Parameter	Input/output 'I/O 1'	Input/output 'I/O 2'
Type of input	<input type="checkbox"/> Danger input <input type="checkbox"/> Status input	<input type="checkbox"/> Danger input <input type="checkbox"/> Status input
Monitored for	<input type="checkbox"/> Open line <input type="checkbox"/> Short circuit and open line <input type="checkbox"/> No monitoring	<input type="checkbox"/> Open line <input type="checkbox"/> Short circuit and open line <input type="checkbox"/> No monitoring
Input active, when contact is:	<input type="checkbox"/> Open <input type="checkbox"/> Closed	<input type="checkbox"/> Open <input type="checkbox"/> Closed
Filter time	Duration: ___ s (0.5 ... 240 s)	Duration: ___ s (0.5 ... 240 s)

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