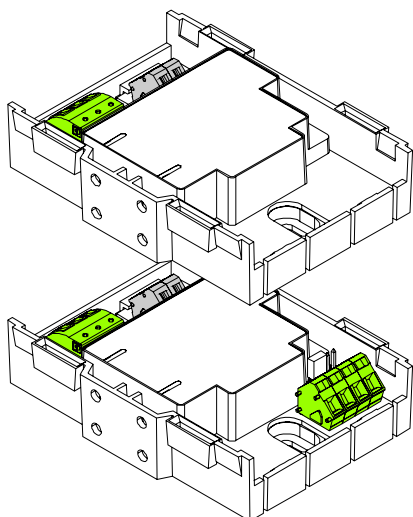


SIEMENS



FDCI221, FDCIO221

Input module, input/output module

Technical Manual

Imprint

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1 About this document



- Specialist electrical engineering knowledge is required for installation.
 - Only an expert is permitted to carry out installation work.
- Incorrect installation can take safety devices out of operation unbeknown to a layperson.

Goal and purpose

This document contains all the information about the input module FDCI221 and the input/output module FDCIO221. Following the instructions consistently will ensure that the product can be used safely and without any problems.

Scope

The document is valid for the following modules:

- Input module FDCI221
- Input/output module FDCIO221

Intended use

- The input module FDCI221 and the input/output module FDCIO221 may only be used in one of the following fire detection systems:
- FS20
- FS720
- FC360

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 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.
Project engineer	<ul style="list-style-type: none"> Sets parameters for product depending on specific national and/or customer requirements. Checks operability and approves the product for commissioning at the place of installation. Is responsible for troubleshooting. 	<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 Engineer.
Installation personnel	<ul style="list-style-type: none"> Assembles and installs the product components at the place of installation. Carries out a function check following installation. 	<ul style="list-style-type: none"> Has received specialist training in the area of building installation technology or electrical installations.
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.

Source language and reference document

- The source/original language of this document is German (de).
- The reference version of this document is the international version in English. The international version is not localized.

Document identification

The document ID is structured as follows:

ID code	Examples
ID_ModificationIndex_Language_COUNTRY -- = multilingual or international	A6V10215123_a_de_DE A6V10215123_a_en_-- A6V10315123_a_--_--

Date format

The date format in the document corresponds to the recommendation of international standard ISO 8601 (format YYYY-MM-DD).

Conventions for text marking

Markups

Special markups are shown in this document as follows:

▷	Requirement for a behavior instruction
1. 2.	Behavior instruction with at least two operation sequences
–	Version, option, or detailed information for a behavior instruction
⇒	Intermediate result of a behavior instruction
⇨	End result of a behavior instruction
•	Numbered lists and behavior instructions with an operation sequence
[→ X]	Reference to a page number
'Text'	Quotation, reproduced identically
<Key>	Identification of keys
>	Relation sign and for identification between steps in a sequence, e.g., 'Menu bar' > 'Help' > 'Help topics'
↑ Text	Identification of a glossary entry

Supplementary information and tips



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

1.1 Applicable documents

Document ID	Name
008331	List of compatibility (for 'Sinteso™' product line)
A6V10212086	Input module FDCI221, input/output module FDCIO221, housing FDCH221
A6V10202196	Data sheet Input module FDCI221, Input/output module FDCIO221
A6V10229261	List of compatibility (for 'Cerberus™ PRO' product line)
A6V10393192	List of compatibility (for 'Cerberus™ FIT' product line)

1.2 Download center

You can download various types of documents, such as data sheets, installation instructions, and license texts via the following Internet address:

<https://siemens.com/bt/download>

- Enter the document ID in the search field.



You will also find information about search variants and links to mobile applications (apps) for various systems on the home page.

1.3 Technical terms

Term	Explanation
ES	Product version
FET	Field Effect Transistor
LED	Light-emitting diode
FDnet/C-NET	Addressed detector line
NC	Contact: Opener (normally closed)
NO	Contact: NO (normally open)

1.4 History of changes

The reference document's version applies to all languages into which the reference document is translated.



The first edition of a language version or a country variant may, for example, be version 'd' instead of 'a' if the reference document is already this version.

The table below shows this document's revision history:

Version	Edition date	Brief description
m	2018-09-18	'Normal operation', 'Inverted operation', 'Output not monitored' chapter: Jumper position Infobox amended
l	2018-01-12	<ul style="list-style-type: none"> • 'Structure and function' chapter: Graphics updated • 'Accessory' chapter: DBZ1190-AB: Conductor cross-section adapted (0.5...2.5 mm²) • Changes in the 'Technical data' chapter
k	2016-04-20	<ul style="list-style-type: none"> • Data sheet updated in 'Applicable documents' chapter • 'Download center' chapter updated • Intended use added • Standard EN 54-14 changed to EN 54-17 • Portfolio 'FC360' added • Changes in the following chapters: <ul style="list-style-type: none"> – 'Normal operation (output lines monitorable)' – 'Inverted operation (output lines not monitored)' – 'Output not monitored' – 'Details for ordering' – 'Defining the output configuration' – 'Technical data' • Editorial changes
j	2012-09-30	AC voltage specification corrected to 'Max. AC 22 V'
i	2012-09-07	Change to date format in line with ISO 8601 specifications (yyyy-mm-dd format); 'Max. voltage 30 V, DC or AC' added to several graphics
h	10.2011	Marine approvals added, 'Product version' chapter added
g	09.2010	FM approvals added
f	04.2010	Document revised for 'Dual channeling'; minor editorial changes
e	09.2009	LPCB approvals added
d	04.2009	VdS approvals and CPD no. added Minor editorial changes
c	10.2008	New note in chapter 3.3.3 indicating that the output has to be potential-free.
b	06.2008	Term 'SynoNET' removed. Additional output configuration added. New 'Localization mode' chapter added. FDCH221 module and housing dimensions corrected.
a	05.2008	First edition

2 Safety

2.1 Safety instructions

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>	'NOTICE' identifies a possibly harmful situation or possible damage to property that may result from non-observance. 'NOTICE' does not relate to possible bodily injury.


How risk of injury is presented

Information about the risk of injury is shown as follows:

	<p>⚠ WARNING</p>
	<p>Nature and origin of the danger Consequences if the danger occurs</p> <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:




	<p><i>NOTICE</i></p>
	<p>Nature and origin of the danger Consequences if the danger occurs</p> <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, mounting, 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 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.
<ul style="list-style-type: none"> • 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 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. 	
	<p>⚠ CAUTION</p>
	<p>Noncompliance with the following safety regulations Risk of injury to persons and damage to property</p> <ul style="list-style-type: none"> • Compliance with the following regulations is required.
	<ul style="list-style-type: none"> • Specialist electrical engineering knowledge is required for installation. • Only an expert is permitted to carry out installation work. <p>Incorrect installation can take safety devices out of operation unbeknown to a layperson.</p>

Mounting, 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 alarm 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 design and the 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


2.3 Standards and directives complied with

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

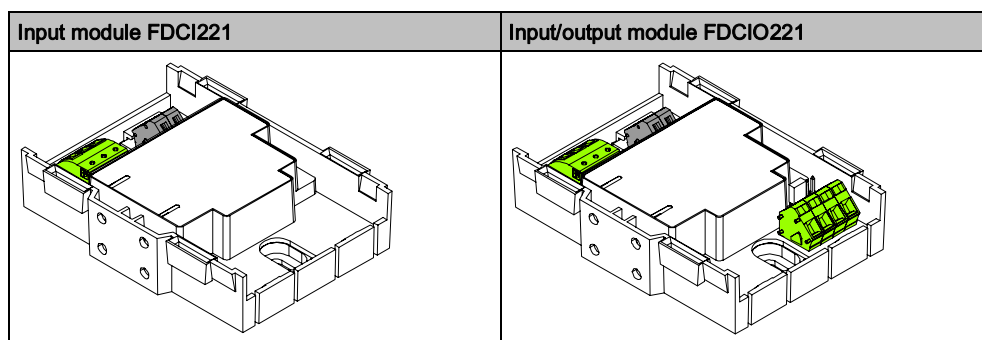
2.4 Release Notes

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. Fire detection installation is not accepted for commissioning. 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 Structure and function



Input module FDCI221

The FDCI221 input module has 1 input. It allows you to monitor statuses (e.g. whether a door is closed).

Input/output module FDCIO221

The FDCIO221 input/output module has 1 output and 1 input. With the output, control functions can be performed. With the input, statuses can be monitored. The input and output can be operated independently.

Properties

- Communication via the detector line
- Configuration options
- Built-in line separator
- Status indicators (LED)
- Different mounting options
- Monitored input
- FDCIO221: The following configurations are possible with jumpers:
 - Bistabile, switched voltage, monitored or non-monitored (external DC 24 V supply required)
 - Potential-free output

The housing FDCH221 is available for fitting the module outside an electric cabinet. The housing protects the module from dust and dampness and increases protection.

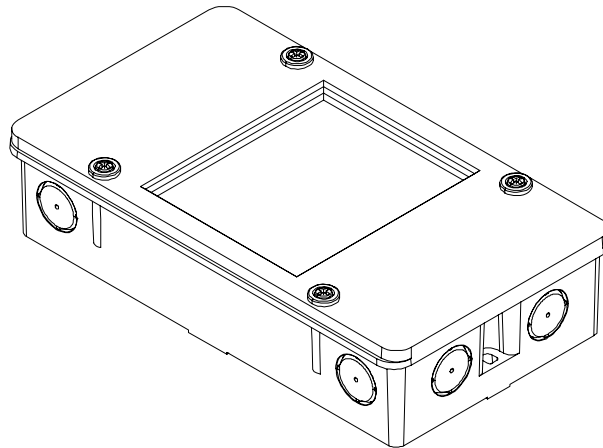


Figure 1: Housing FDCH221

3.1 Details for ordering

Type	Order number	Designation
FDCI221	S54312-F1-A1	Input module
FDCIO221	S54312-F2-A1	Input/output module

Scope of delivery

Type	Scope of delivery
FDCI221	Input module FDCI221, 2x mounting foot FDCM291, 1x 3.3 k Ω resistor, 1x 680 Ω resistor
FDCIO221	Input/output module FDCIO221, 2x mounting foot FDCM291, 2x 3.3 k Ω resistor, 1x 680 Ω resistor, 1x diode

3.2 Product version ES

The product version ES provides the technical status of a device in terms of software and hardware. The product version is provided as a two-digit number.

You will find the details of your device's product version:

- On the packaging label
- On the product label or the type plate

Product version on the packaging label

Details of the product version can be found directly on the packaging label in the barcode:

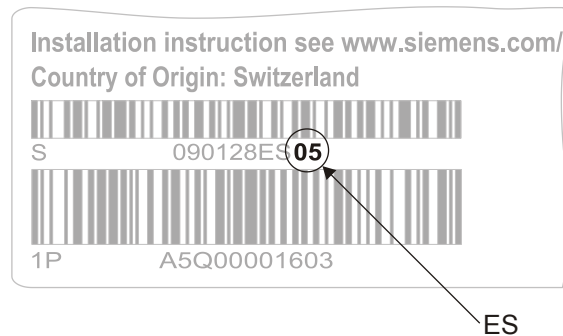


Figure 2: Example of a packaging label with details of the product version

Product version on the product label and the type plate

Details of the product version can be found after the device order number:

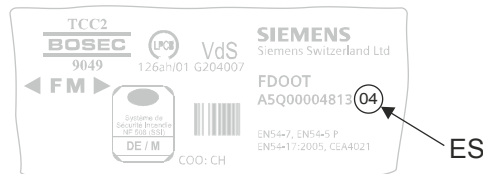


Figure 3: Example of a product label with details of the product version



Depending on the product and various approvals, the product labels may differ in terms of the information type and layout.

Look for your device's order number on the product label.

You will find the product version after the order number.

3.3 Setup

The modules consist of the module carrier, the printed circuit board and the cover cap. The printed circuit board includes the LEDs. The LEDs indicate the status of the input, output and localization mode. The cover cap of the printed circuit board is transparent such that the statuses of the LEDs are visible even when the cover cap is fitted.

To protect the modules from environmental influences, the FDCH221 housing types is available.

3.3.1 Input module

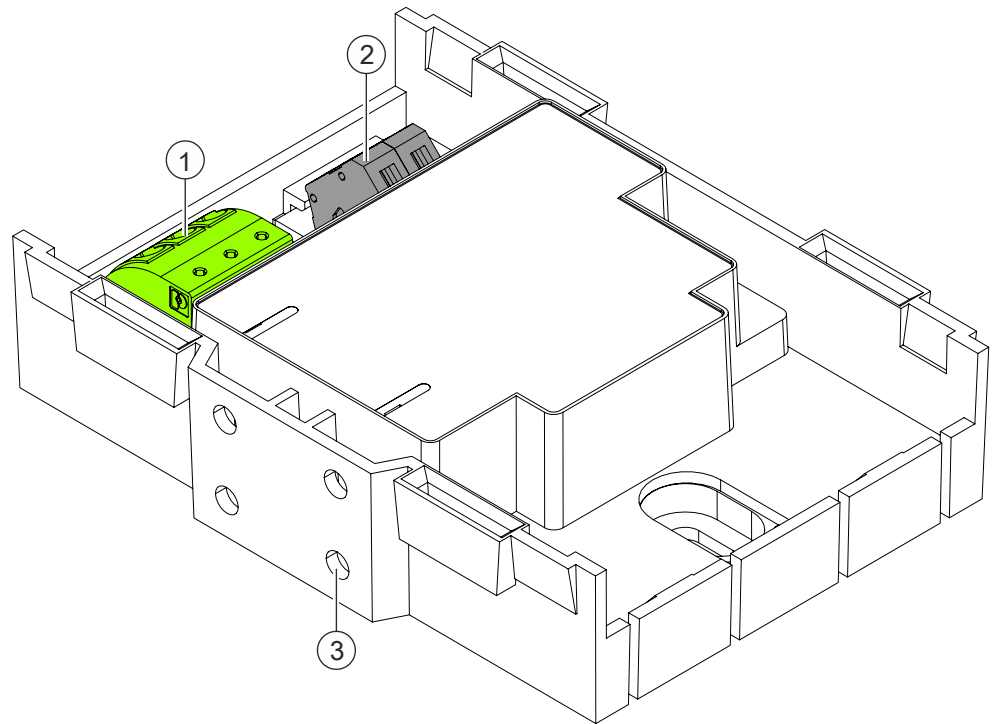


Figure 4: Overview of input module

1 Connections for the detector line

3 Holes for mounting feet

2 Connections for the input

3.3.2 Input/output module

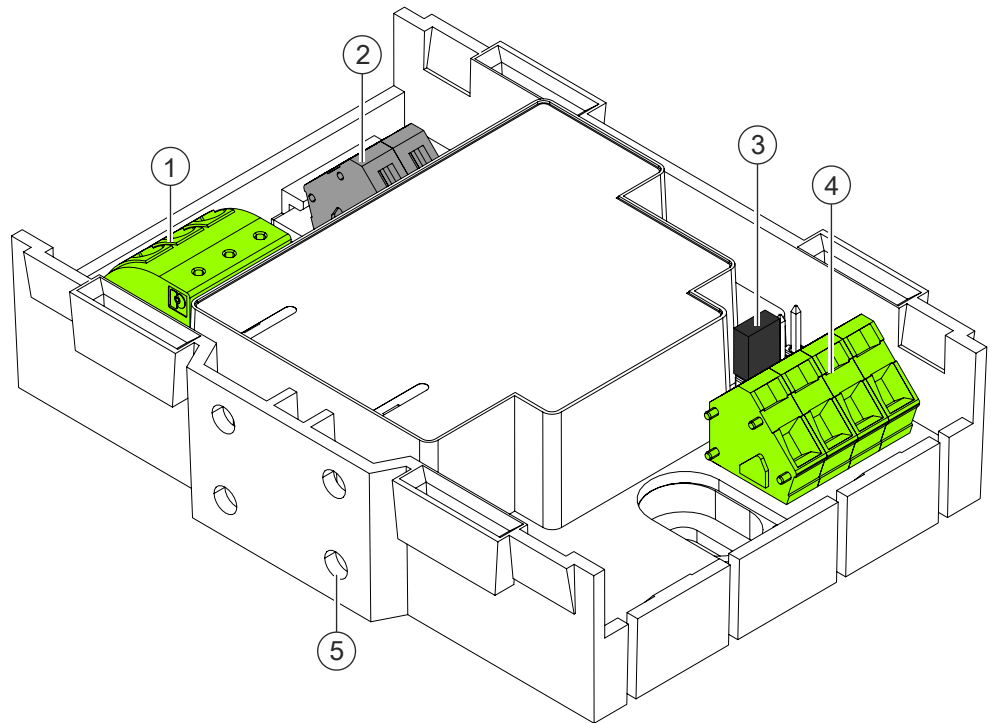


Figure 5: Overview of input/output module

- | | |
|-------------------------------------|------------------------------|
| 1 Connections for the detector line | 4 Connections for the output |
| 2 Connections for the input | 5 Holes for mounting feet |
| 3 Jumper for output configuration | |

3.3.3 Printed circuit board view of the input module

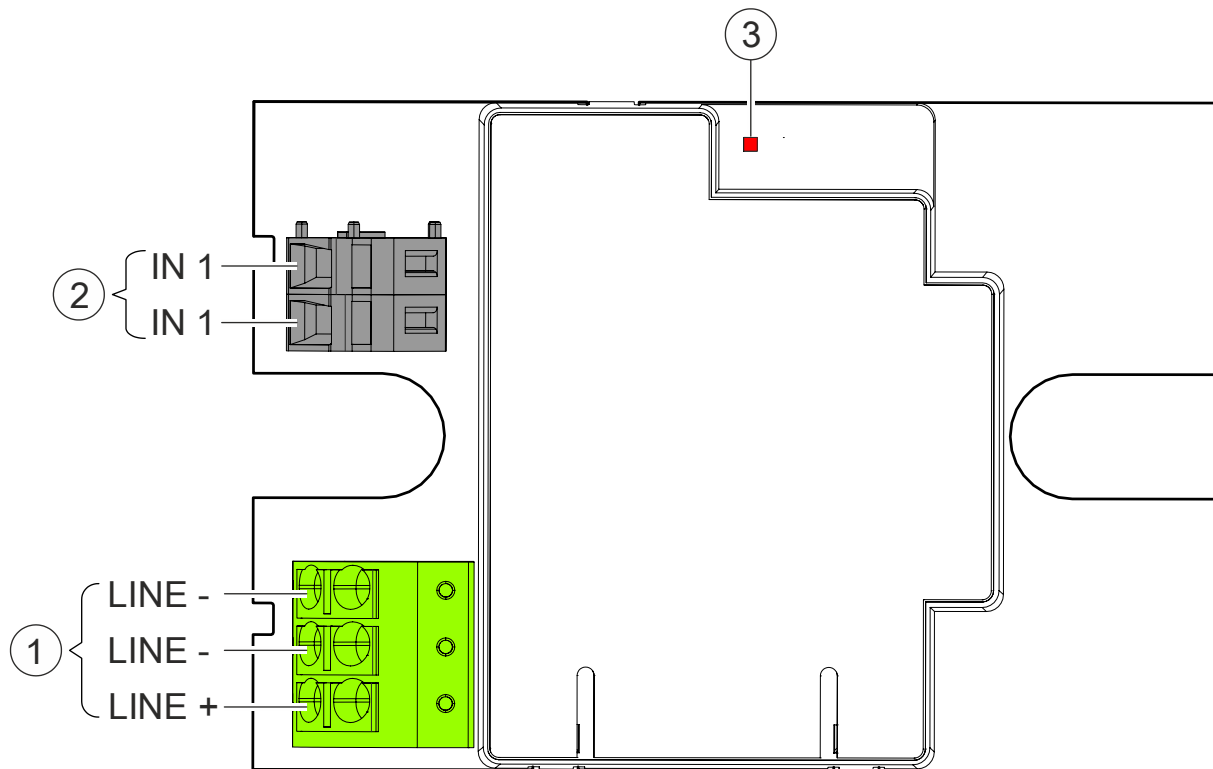


Figure 6: Printed circuit board view of the input module

1 Detector line connections

3 Red LED for input status and
localization mode

2 Connections for input IN1

3.3.4 Printed circuit board view of the input/output module

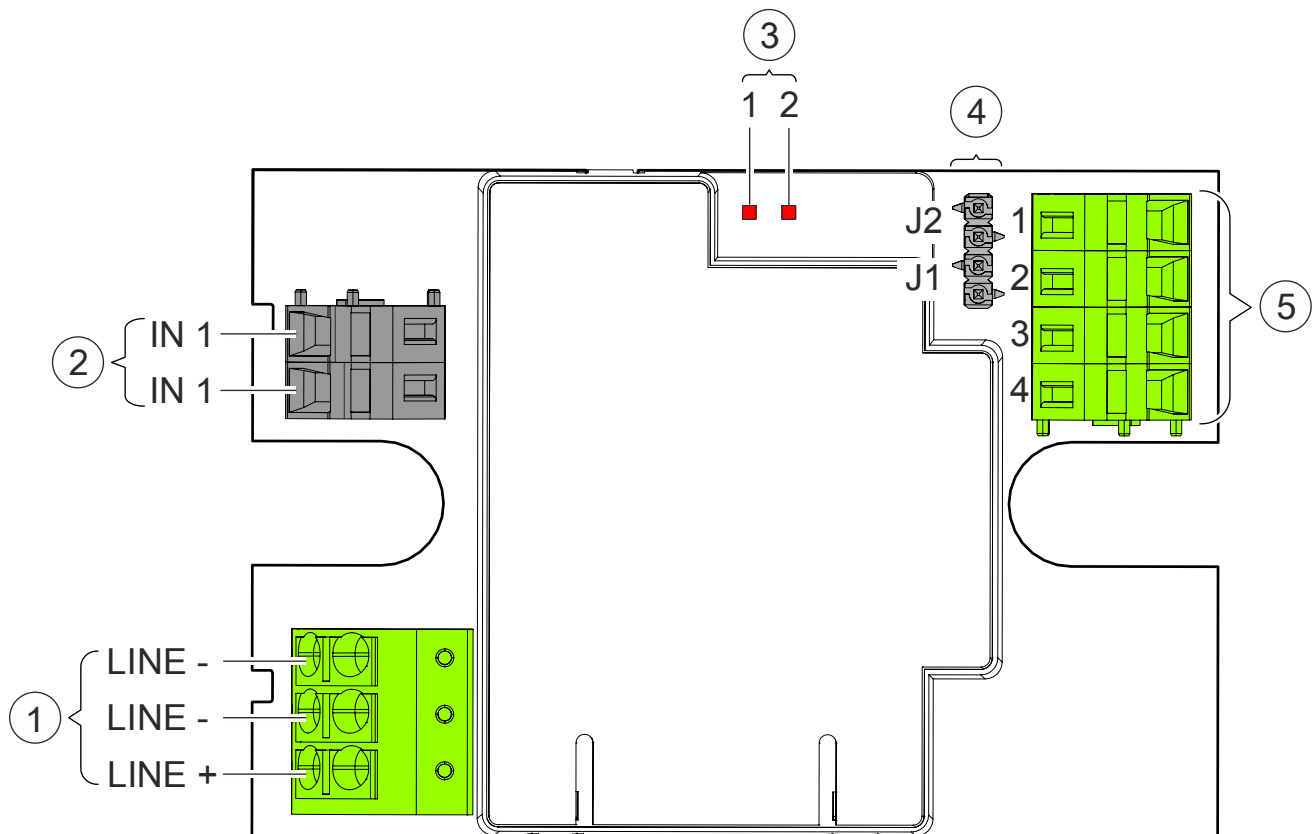


Figure 7: Printed circuit board view of the input/output module

- | | | | |
|---|---|---|---------------------------------------|
| 1 | Detector line connections | 4 | Jumper J1/J2 for output configuration |
| 2 | Connections for input IN1 | 5 | Terminals for output OUT A |
| 3 | <ul style="list-style-type: none"> • Red LED for input status and localization mode • Red LED for output status | | |

Assignment of terminals for output OUT A, depending on jumper position

Jumper position	Configuration of the output
J2	<ul style="list-style-type: none"> • Bistable, switched voltage, normal operation (option of monitoring output lines) • Bistable, switched voltage, inverted operation (output lines not monitored)
J1	Bistable, potential-free contact (output not monitored)

3.3.5 LEDs

The tables below show the meaning of the LED states.

Red LED for the input status and for localization mode

Status LED	Meaning
LED off	Normal operation
LED flashing every 2 s	Input activated
LED flashing every 1 s	Localization mode

Red LED for the output status (for input/output module only)

Status LED	Meaning
LED off	Output not active
LED flashing every 2 s	Output active

The LED displays can be deactivated if necessary (e.g. in a cinema).



Not all control panels support the functions named above. Please observe the documentation for your fire control panel.

3.4 Function

3.4.1 Block diagram

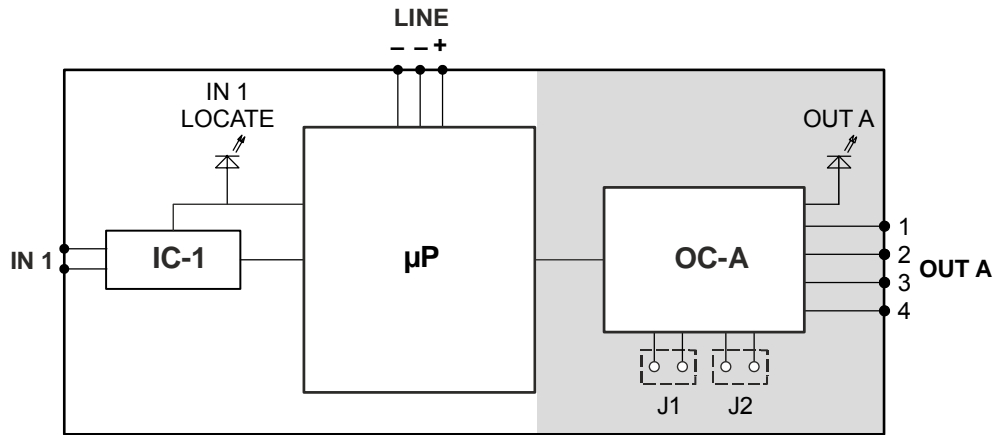


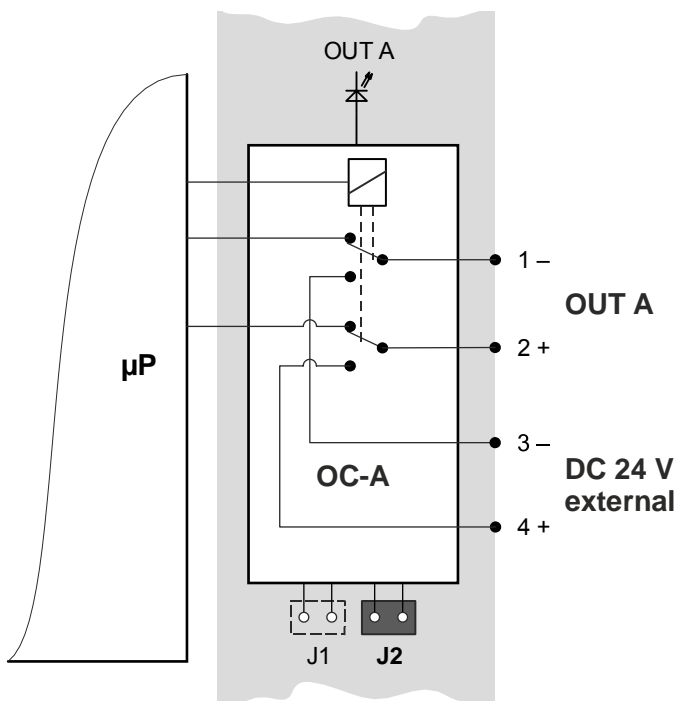
Figure 8: Block diagram of input module and input/output module

LINE Detector line

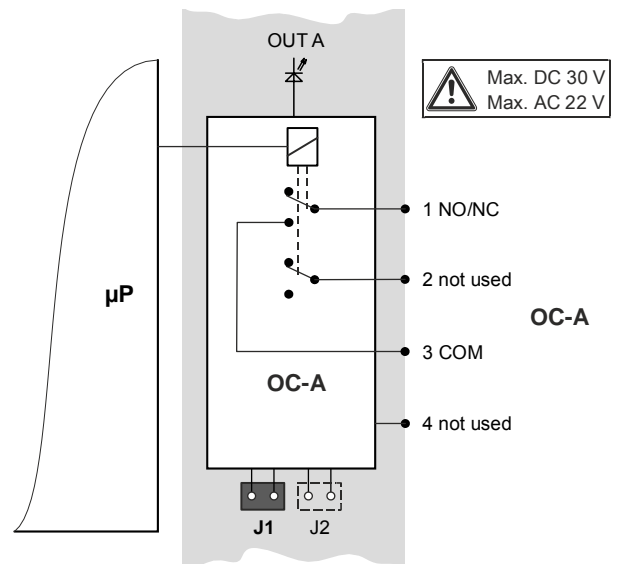
OUT A Output
(for FDCIO221 only)

IN 1 Input

J1, J2 Jumper plug positions
(for FDCIO221 only)



FDCIO221 with plugged jumper on 'J2'



FDCIO221 with plugged jumper on 'J1'

The communication with the control panel is performed via the detector line. Configuration is performed on the control panel. The output must also be configured with a jumper on the input/output module. The modules are normally in operating mode.

The modules can be set to test mode or localization mode for service work.

An external DC 24 V supply is only needed for the input/output module FDCIO221 when the jumper is plugged into position 'J2'.

3.4.2 Input

With the input a status can be monitored e.g. whether a door is closed. The input can be configured as follows:

- Status input or danger input
- Lead monitoring for open line or open line and short circuit
- Active when contact is:
 - Open (normally closed NC)
 - Closed (normally open NO)

Status inputs and danger inputs

Danger inputs trigger an alarm as soon as the input is activated. Status inputs trigger a status change as soon as they are activated.

Line monitoring and circuitry

The input lines are monitored for open line or open line and short circuit. To make this possible, resistors must be connected to the lines of the input. When an open line or a short circuit occurs on one of the input lines, a fault message is transmitted to the control panel.

The input must be potential-free.

Circuit

- The input line must be provided with resistors.
- The resistors must be connected at the end of the line.
- Only monitoring resistors with a tolerance of 1 % must be used.
- The configuration of the module must correspond to the actual circuitry.

Input module FDCI221 and input/output module FDCIO221

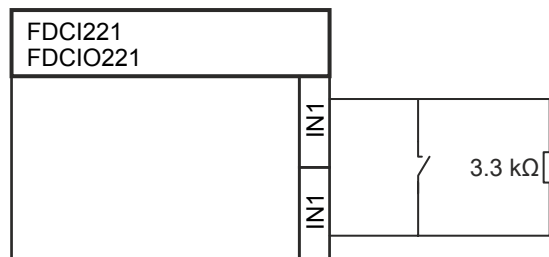


Figure 9: Connection diagram of input with monitoring for open line

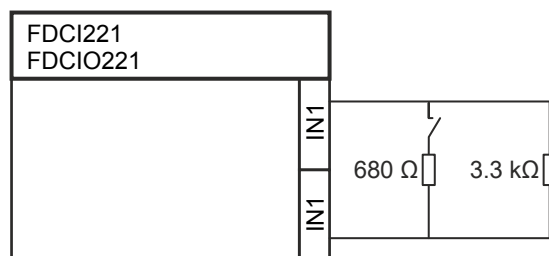


Figure 10: Connection diagram of input with monitoring for open line and short circuit

3.4.3 Output (for input/output module only)

With the exception of the jumper, the output must be configured from the control panel. To ensure the desired function, the jumper must be plugged locally into the relevant position on the module.

If the configurations on the control panel and jumper don't match, this is recognized and an error message is triggered.

The output must be potential-free.

3.4.3.1 Normal operation (output lines monitorable)

The input/output module output FDCIO221 can be used for control.

In this mode the module switches the externally supplied DC 24 V voltage to the output when active. The externally supplied 24 V voltage is monitored. In the event of failure, an error message is generated.

In inactive status the output line is monitored for open line and short circuit. This can be configured and can also be switched off by the control panel.

The jumper on the input/output module must be plugged into 'J2'.



Figure 11: Input/output module jumper position 'J2'



Take care to ensure that the position of the jumper agrees with the configuration. Otherwise, a configuration fault will be displayed.

Check the following points if an error message occurs:

- Is the jumper positioned correctly?
- Is the EOL module connected?
- Does the configuration agree with the jumper position?

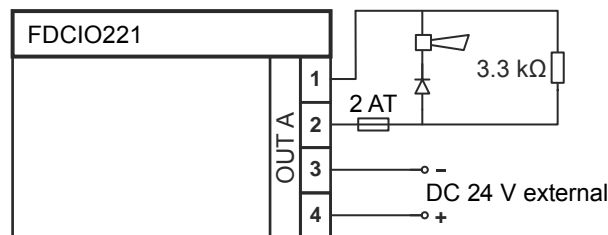


Figure 12: Connection diagram for normal operation with output line monitored for short circuit and open line

- The output line must be provided with the resistor.
- The resistor must be connected at the end of the line.
- Only one monitoring resistor with a tolerance of 1 % must be used.
- The diode is included in the scope of delivery and must be installed in accordance with the connection diagram.



NOTICE

Large currents in the line circuit

Module overload during a short-circuit

- Provide a 2 AT fuse in the line circuit.

Configuration



Depending on the control panel, not all configurations may be supported. Observe the information in the 'List of compatibility' as well as in the documentation for your fire control panel.

The following configurations are possible:

- After activation, the output remains in the following status:
 - Permanently active
 - Active only for a certain period of time. How long the contact remains active can also be configured (pulse duration).
- Failsafe behavior when the 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 output in the event of an error:
 - Output remains in the same position as before the error
 - Output is activated in case of an error
 - Output is deactivated in case of an error
 - Output remains in the same position as before the error, responds to the 'Degraded mode horn' signal like other sounders on the detector line.
- Monitoring of the 'on' or 'off' output.
- Jumper is set to 'J2' in the hardware and in the software.

See also

Applicable documents [→ 7]

3.4.3.2 Inverted operation (output lines not monitorable)

The output of the input/output module FDCIO221 can be used for controlling (e.g., closing a door).

In this mode the module switches off the externally supplied DC 24 V voltage on the output when active. The externally supplied 24 V voltage is monitored. In the event of failure, an error message is generated.

There is no monitoring of the output lines for open line and short circuit.

The jumper on the input/output module must be plugged into 'J2'.



Figure 13: Input/output module jumper position 'J2'



Take care to ensure that the position of the jumper agrees with the configuration. Otherwise, a configuration fault will be displayed.

Check the following points if an error message occurs:

- Is the jumper positioned correctly?
- Does the configuration agree with the jumper position?

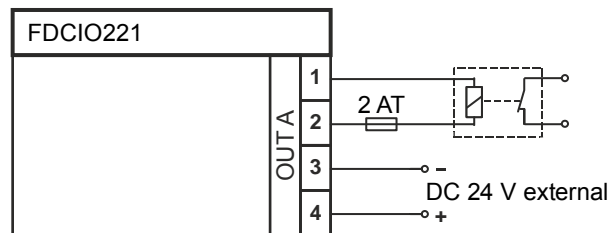


Figure 14: Connection diagram for inverted operation, e.g., when used as door retainer

- The configuration of the module must correspond to the actual circuitry.



NOTICE

Large currents in the line circuit

Module overload during a short-circuit

- Provide a 2 AT fuse in the line circuit.

In inactive status the 24 V are permanently applied to the output and may keep a door open, for example. When the output is switched to active, the output goes into "open" status (= no longer 24 V voltage) and the door closes.



In this example, the door would also close if the 24 V supply were to fail, e.g., due to a line problem (short-circuit, open line).

Configuration



Depending on the control panel, not all configurations may be supported. Observe the information in the 'List of compatibility' as well as in the documentation for your fire control panel.

The following configurations are possible:

- After activation, the output remains in the following status:
 - Permanently active
 - Active only for a certain period of time. How long the contact remains active can also be configured (pulse duration).
- Failsafe behavior when the 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 output in the event of an error:
 - Output remains in the same position as before the error
 - Output is activated in case of an error
 - Output is deactivated in case of an error
 - Output remains in the same position as before the error, responds to the 'Degraded mode horn' signal like other sounders on the detector line.
- Jumper is set to 'J2' in the hardware and in the software.

See also

Applicable documents [→ 7]

3.4.3.3 Output not monitored

This section describes the function mode when control is not monitored. An externally supplied 24 V voltage is not needed.

Control functions can be performed with the output (e.g. close door). The output is designed as a potential-free relay contact.

The jumper on the input/output module must be plugged into 'J1'.

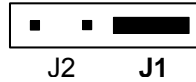


Figure 15: Input/output module jumper position 'J1'



Take care to ensure that the position of the jumper agrees with the configuration. Otherwise, a configuration fault will be displayed.

Check the following points if an error message occurs:

- Is the jumper positioned correctly?
- Does the configuration agree with the jumper position?

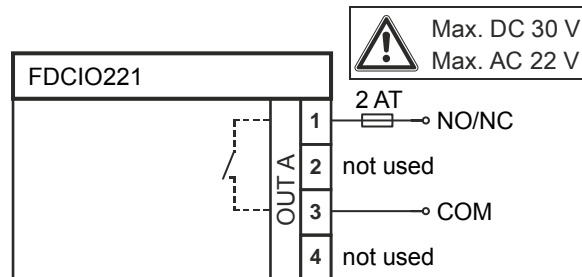


Figure 16: Connection diagram for output which is not monitored



NOTICE

Large currents in the line circuit

Module overload during a short-circuit

- Provide a 2 AT fuse in the line circuit.

Configuration



Depending on the control panel, not all configurations may be supported. Observe the information in the 'List of compatibility' as well as in the documentation for your fire control panel.


The following configurations are possible:

- The contact is active when it is in the following status:
 - It is closed (normally open NO)
 - It is open (normally closed NC)
- After activation, the contact remains in the following status:
 - Permanently active
 - Active only for a certain period of time. How long the contact remains active can also be configured (pulse duration).
- Failsafe behavior when the 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 case of an error.

 - Contact remains in the same position as before the error
 - Contact is activated in case of an error
 - Contact is deactivated in case of an error
 - Output remains in the same position as before the error, responds to the 'Degraded mode horn' signal like other sounders on the detector line.
- Jumper is set to 'J1' in the hardware and in the software.

See also

 Applicable documents [→ 7]

3.4.4 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 FDnet/C-NET detector line. The rest of the detector line remains serviceable. On a loop line, all FDnet/C-NET devices remain fully functional after a single short-circuit.

3.4.5 Diagnosis levels

The FDCI221 input module and the FDCIO221 input/output module largely monitor their function autonomously. The following diagnosis levels are taken from the different control measuring processes:

- Normal
- Fault

When a fatal error occurs, which makes the proper function of the module impossible, a fault message is reported to the control panel.

3.4.6 Behavior in degraded mode

Applicable for the FDnet/C-NET:

When the main processor of the fire control panel fails, the control panel works in degraded mode operation. Depending on the control panel type, the fire control panel can continue to perform the most important alarming and signaling functions in degraded mode operation.

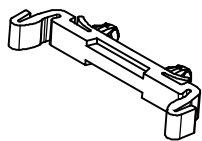
Behavior in degraded mode on control panels supporting degraded operation

- Alarming is still ensured in degraded mode operation. However, in degraded mode 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 module triggering the alarm.
- If the output is being used for control (e.g., fire controls), it will take on the configured fail-safe position in the event of a communication failure or current-free detector line.
- If the output is being used for controlling sounders or other evacuation devices and degraded mode has been configured correctly, the output will respond to the "Degraded mode horn" signal in the same way as other sounders on the detector line.

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.

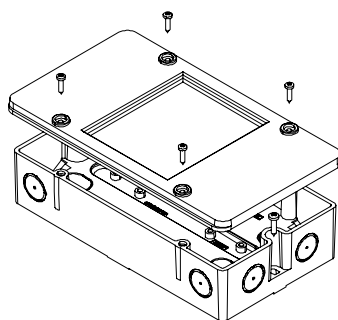
3.5 Accessories

3.5.1 Mounting foot FDCM291



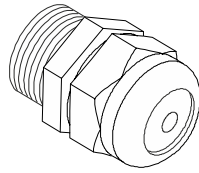
- For device mounting on a DIN rail TS35
- Two mounting feet must always be used
- Compatible with:
 - Input module FDCI22x(-CN)
 - Input/output module FDCIO22x(-CN)
 - Output module FCA1209-Z1
 - Multi line separator module FDCL221-M
 - Zone module, external powered FDCI223, FDCI723
 - Sounder module FCA2005-A1
- Order number: A5Q00003855

3.5.2 Housing FDCH221



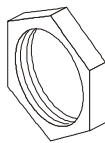
- To protect against dust and wetness
- Compatible with:
 - Multi line separator module FDCL221-M
 - Input module FDCI22x(-CN)
 - Input/output module FDCIO22x(-CN)
 - Output module FCA1209-Z1
 - Radio gateway FDCW241
 - Zone module, external powered FDCI223, FDCI723
 - Sounder module FCA2005-A1
- Order number: S54312-F3-A1

3.5.3 M20 x 1.5 metal cable gland



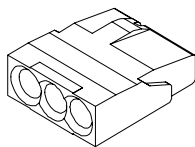
- For introducing a cable into a housing
- For cable diameters of 3.5...5.5 mm
- Temperature range: -40...+100 °C
- Allows for increased IP protection
- Compatible with:
 - M20 x 1.5 metal counter nut
 - Housing FDMH231-S-R
 - Housing FDMH292-x
 - Housing FDMH293-x
 - Housing FDMH297-R
 - Housing FDCH221
 - Manual call point FDM243H
 - Air sampling smoke detection kit FDBZ290
 - Base deep (wall mounting) FDB227-x
- Order number: A5Q00004478

3.5.4 M20 x 1.5 metal counter nut



- For use with metal cable gland M20 x 1.5
- Order number: A5Q00004479

3.5.5 Connection terminal DBZ1190-AB



- Auxiliary terminal for connecting cables
- For T-branches of additional cabling, e.g., for cable shielding, detector heating units, sounder base, external alarm indicators, etc.
- For conductor cross-sections of 0.5...2.5 mm²
- 3 poles
- Order number: BPZ:4942340001

4 Planning

When planning a project, proceed as follows:

1. Take into account the compatibility.
2. Define the place of installation.
3. Define the type of monitoring and configuration of the input.
4. Only for FDCIO221: Determine the output configuration
5. Fill out the configuration sheet.

4.1 Compatibility

Compatible with control panels that support the FDnet/C-NET detector line.

Detector line					
	FC20xx	FC72x	SIGMASYS	AlgoRex	FC360
FDnet	X	–	X ¹	X ¹	–
C-NET	–	X	–	–	X

¹ With suitable line card

X = compatible

– = not compatible

You will find detailed information in the 'List of compatibility'.

4.2 Defining the place of installation

Installation specification for controlling fire protection installations

For the purpose of controlling fire protection installations in accordance with EN 54-2, the input/output module FDCIO221 must be integrated into the fire control housing.

Installation specification for controlling the VdS extinguishing interface

If the input/output module FDCIO221 is used to control the VdS extinguishing interface, it must be installed in the control panel housing. Details are described in the control panel documentation.

Defining the place of installation

- Install the module as close as possible to the fire control. This simplifies the cabling.
- Use the housing FDCH221 for the following installation situations:
 - Outside a switch cabinet
 - Outside a control panel
 - In a wet or dirty environment

4.3 Defining the type of monitoring and input configuration



There must be no automatic fire detector and no manual call point connected to the inputs.

Proceed as follows:

1. Define the type of input (danger input or status input).
2. Define the type of monitoring and the monitoring resistors.
The inputs cannot be monitored for ground fault.
3. Define whether the input is active with open or closed contact. The configuration of the input must correspond to the actual circuitry.



Connect resistors to the end of the lines.

4.4 Defining the output configuration

When configuring the outputs, please proceed as follows:

1. Define the type of output:
 - Bistable, switched voltage, normal operation (option of monitoring output lines)
 - Bistable, switched voltage, inverted operation (output lines not monitored)
 - Bistable, potential-free contact (output not monitored)
2. Mount the jumper onto 'J2' or 'J1' depending on your selection.
3. Determine in which position the contact is active. The contact may be active when it is:
 - Closed (NO)
 - Open (NC)
4. Define how long the output shall remain active after activation. The output can be:
 - Permanently active.
 - Active only for a certain period of time. How long the output remains active can also be configured (pulse duration).
5. Determine the behavior of the output in case of error (e.g., open line to the control panel).

The following configurations are possible for the behavior in case of a failure:

- Output remains the same as before the error
- Output is activated in case of an error
- Output is deactivated in case of an error
- Output remains the same as before the error, but responds to the 'Degraded mode horn' signal like other sounders on the detector line

Pulse duration

The following settings are possible for pulse duration:

1 s	2 s	3 s	5 s
10 s	15 s	20 s	–

See also

-  Output (for input/output module only) [→ 25]

4.5 Filling out the configuration sheet

Proceed as follows when 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 [→ 46]

5 Mounting / Installation

5.1 Mounting on a U-rail

!	NOTICE
	Impairment of module function due to dust or humidity <ul style="list-style-type: none"> The only situation in which the housing FDCH221 should not be used is if the module is installed in a closed electrical cabinet or in a control panel

In case of an installation without FDCH221 housing, please proceed as follows:

1. Mount the two mounting feet into the module.
2. Press the module's two mounting feet against the U-rail until the mounting feet engage (see figure). To make sure that the LEDs remain visible at all times, the cover cap is transparent. Pick a suitable mounting position, ensuring that the LEDs will remain visible at all times during operation.
3. If you are using shielded cable, join the shielding to the DBZ1190-AB connection terminal. The shielding must not touch any external ground potentials or metal parts.
4. Connect the cables to the corresponding terminals.

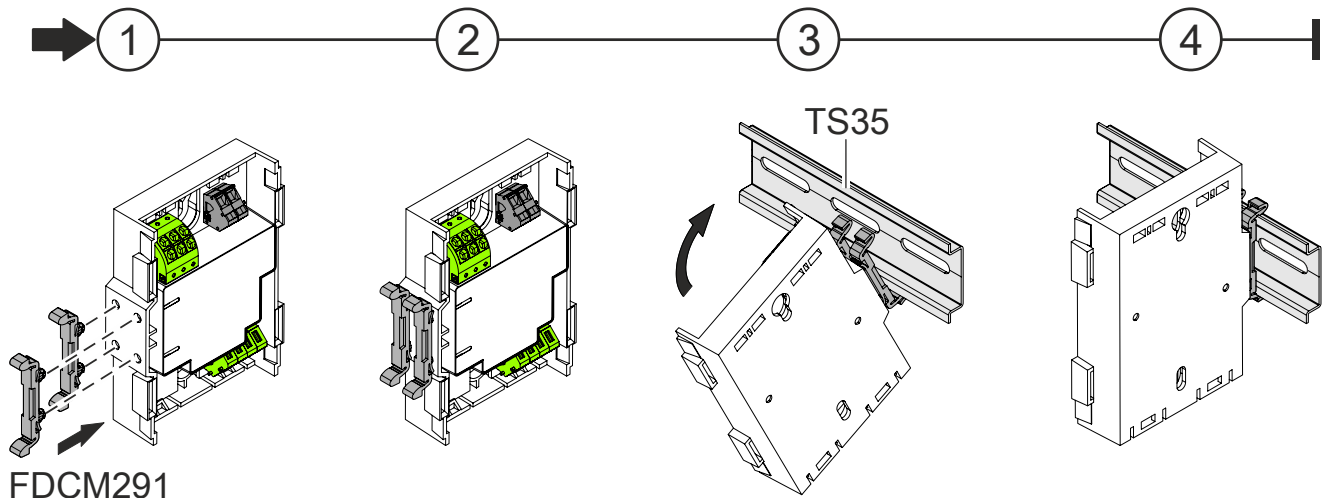


Figure 17: Module mounting variants

See also

- Connecting the module [→ 40]
- Printed circuit board view of the input module [→ 20]
- Printed circuit board view of the input/output module [→ 21]

5.2 Mounting in housing FDCH221

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. Open the housing.
2. Break out the required cable entries.
3. Install the housing on a flat surface.
4. Insert cables. If necessary, fix the cables using M20 x 1.5 metal cable glands (accessories) or use a different cable entry.
5. If you are using shielded cable, join the shielding to the DBZ1190-AB connection terminal. The shielding must not touch any extrinsic ground potentials or metal parts in the housing.
6. Install the module in the housing using the M3 x 12 fixing screws supplied.
7. Connect the cables to the corresponding terminals.
8. Close housing using supplied screws.

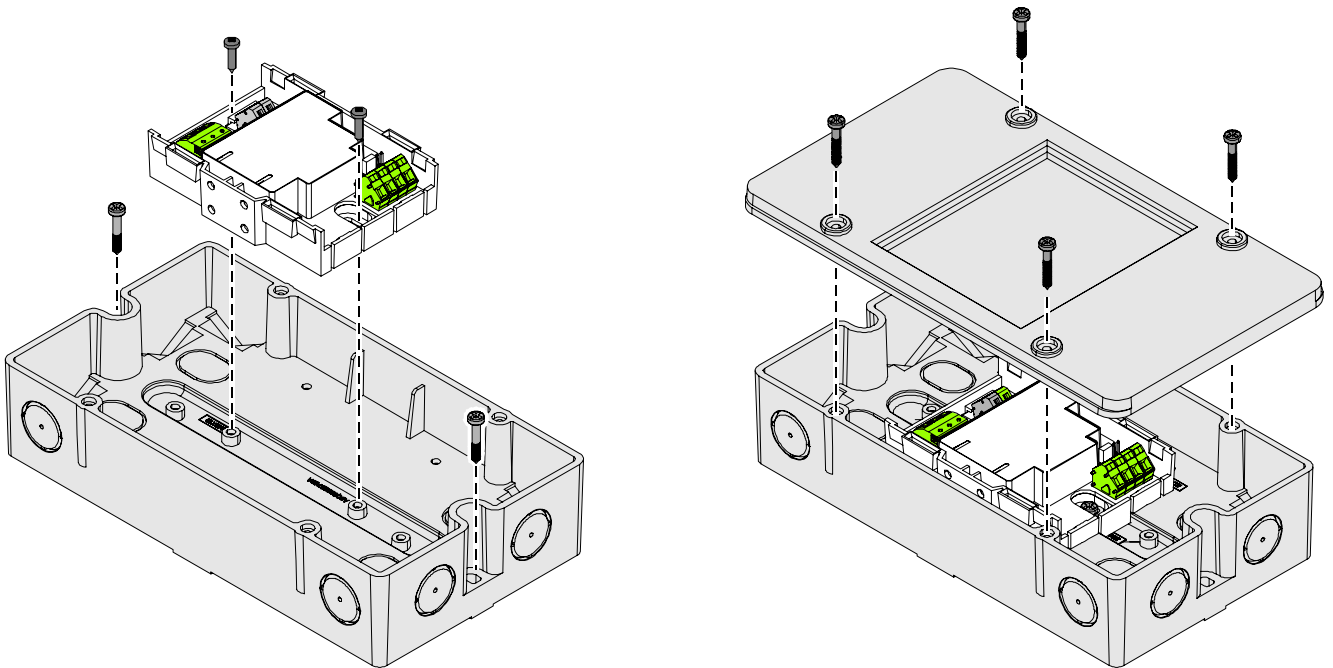


Figure 18: Installing the module in the FDCH221 housing

See also

- 📄 Dimensions [→ 45]
- 📄 Connecting the module [→ 40]

5.3 Connecting the module



⚠ CAUTION

Electrical voltage on lines

Risk of injury due to electric shock

- During mounting and installation work, electrical voltage must not be applied to the lines.



Note the positive and negative poles.

Only connect one wire per terminal. This is the only way to ensure the connection is failure-free for the entire service life of the device.



- Specialist electrical engineering knowledge is required for installation.
- Only an expert is permitted to carry out installation work.

Incorrect installation can take safety devices out of operation unbeknown to a layperson.

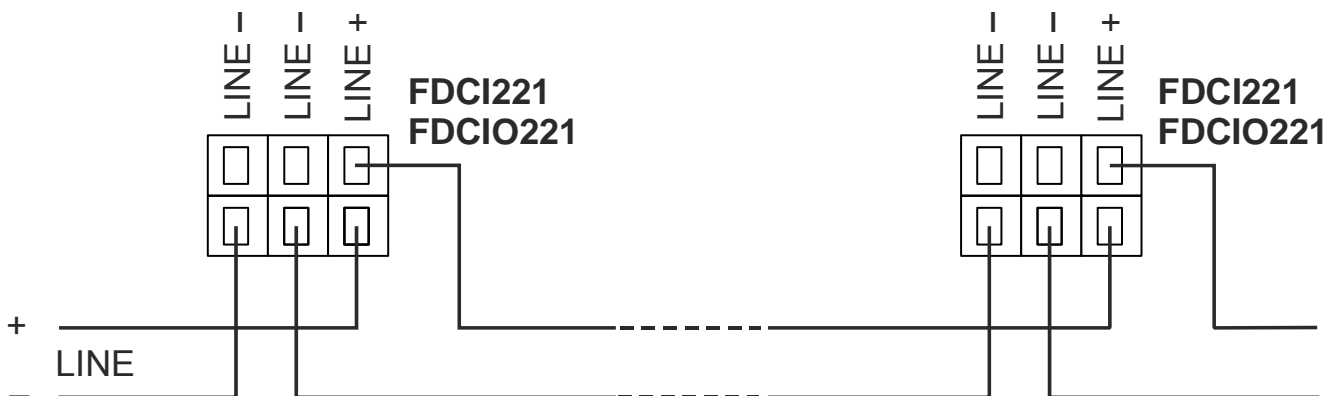


Figure 19: Detector line connection diagram

The connection diagram for the input and output depends on the type of use (monitoring) and configuration. You will find details in the corresponding section.

- Connect the module in accordance with the corresponding connection diagrams.

See also

- Normal operation (output lines monitorable) [→ 26]
- Inverted operation (output lines not monitorable) [→ 28]
- Output not monitored [→ 30]
- Input [→ 24]

6 Commissioning

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

Conduct a performance check once commissioning is complete.

7 Maintenance / troubleshooting

7.1 Performance 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.
- Check cables connected to the terminals and correct connections.

No other special maintenance work is necessary.

7.2 Test mode

When the FDCIO221 is operated on a fire control panel FC20xx/FC72x the modules themselves are not switched to test mode. The control does not activate an output and therefore the LED for indicating the output status does not light up.

7.3 Localization mode

For service purposes, the modules can be switched to localization mode. In this mode the input LED flashes continuously once per second.



The localization mode does not work with FC20xx/FC72x fire control panels!

7.4 Remediating faults

With the FDCIO221 input/output module, the output can be operated using an external supply. This external supply must be protected by a fuse.

- Check the external fuse of the external supply.

8 Specifications

8.1 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 A6V10202196

Detector line	Operating voltage	DC 12...33 V
	Operating current (quiescent):	
	• FDCI221	Max. 0.3 mA
	• FDCIO221	Max. 0.4 mA
	Connection factor:	
	• FDCI221	1
	• FDCIO221	1
	Address connection factor	1
	Separator connector factor	1
	Protocol	FDnet/C-NET
Compatibility	See 'List of compatibility'	
Line separator	Line voltage:	
	• Nominal	DC 32 V (= V_{nom})
	• Minimum	DC 12 V (= V_{min})
	• Maximum	DC 33 V (= V_{max})
	Voltage at which the line separator opens:	
	• Minimum	DC 7.5 V (= $V_{SO min}$)
	• Maximum	DC 10.5 V (= $V_{SO max}$)
	Permanent current when switches are closed	Max. 1.5 A (= $I_{C max}$)
	Switching current (e.g., in the event of a short-circuit)	Max. 2 A (= $I_S max$)
	Leakage current when switches are open	Max. 1 mA (= $I_L max$)
	Serial impedance when switches are closed	Max. 0.4 Ω (= $Z_C max$)
	The line separator is closed via an actuation signal from the control panel. Required line voltage: DC 12...33 V (normal range)	
	External alarm indicator	Number of external alarm indicators that can be connected
Input	Monitoring voltage	3 V, unloaded
	Monitoring resistors, input:	
	• FDCI221/FDCIO221	3.3 k Ω / 680 Ω ; each ± 1 %; 0.25 W
	Line resistance	Max. 20 Ω

Output	Max. switching performance at ohmic load at:	
	• AC voltage	Max. AC 22 V; 2 A; 44 VA
	Only permitted in potential-free contact.	
	• DC voltage	Max. 30 V DC; 2 A; 60 W
	These values do not apply for inductive or capacitive loads.	
	Monitoring voltage	3 V, unloaded
	Monitoring resistor, output:	
	• FDCIO221	3.3 kΩ ±1 %; 0.25 W
Connections	Design	Spring clips
	Conductor cross section	0.2...2.5 mm ²
Ambient conditions	Operating temperature	-25...+70 °C
	Storage temperature	-30...+75 °C
	Air humidity, non-condensing	≤95 % rel.
	Protection category (IEC 60529):	
	• Without housing	IP30
	• With housing FDCH221, screwed	IP65
	Electromagnetic compatibility:	
	• 1 MHz...1 GHz	50 V/m
Mechanical data	Dimensions (L x W x H):	
	• Module (without housing)	95 x 71 x 24 mm
	• Housing FDCH221	207 x 119 x 50 mm
	Housing material	ABS
	Colors:	
	• Module carrier	~RAL 9010, pure white
	• Housing	~RAL 9010, pure white
	• Housing cover	Transparent matt
	Weight [kg]	
	• FDCI221	0,060 kg
	• FDCIO221	0,066 kg
Standards	European standards	<ul style="list-style-type: none"> • EN 54-17 • EN 54-18
	International standards	<ul style="list-style-type: none"> • IEC 60092-504 • IEC 60533

8.2 Dimensions

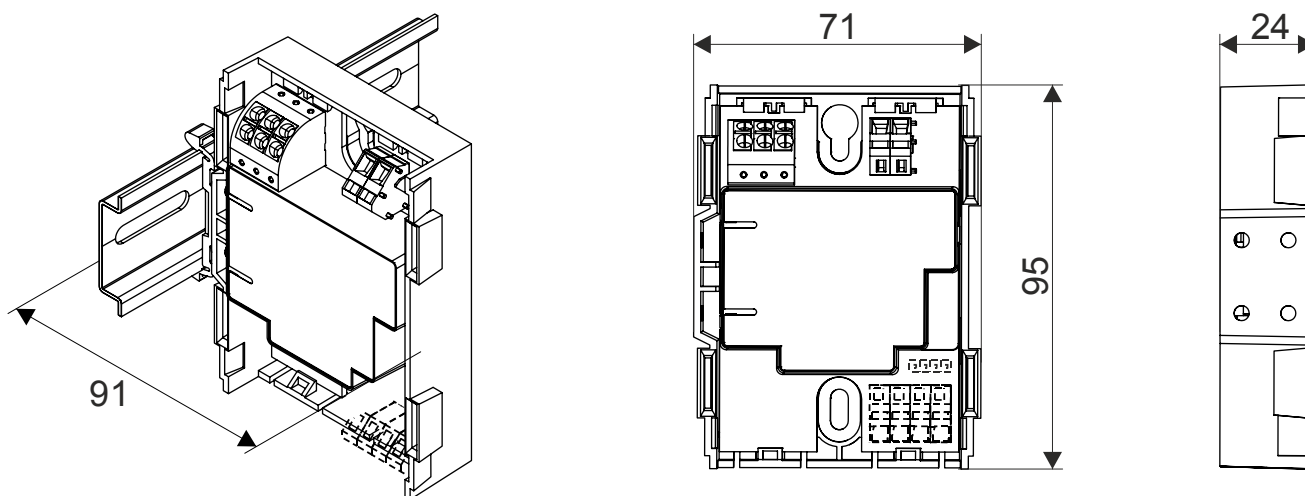
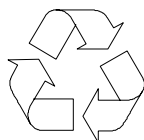


Figure 20: Dimensions of installation variants

The dimensions for FDCI221 and FDCIO221 are identical.

8.3 Environmental compatibility and disposal



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 labeled according to ISO 11469 and ISO 1043. The plastics can be separated and recycled on this basis.



The device is considered an electronic device for disposal in accordance with the European Guidelines and may not be disposed of as domestic garbage.

- Dispose of the device through channels provided for this purpose.
- Comply with all local and currently applicable laws and regulations.

9 Annex

9.1 Configuration sheet

Mounting site	
Module	<input type="checkbox"/> Input module FDCI221 <input type="checkbox"/> Input/output module FDCIO221
Mode of mounting	<input type="checkbox"/> Without housing <input type="checkbox"/> With housing FDCH221
Input IN1 monitors ...	
Output OUT A controls ...	

Configuration for the input		
Parameters	Value	IN1
Type of input	Danger input	<input type="checkbox"/>
	Status input	<input type="checkbox"/>
Input monitoring	Open line monitoring	<input type="checkbox"/>
	Open line and short circuit monitoring	<input type="checkbox"/>
Input active, when contact is	Open	<input type="checkbox"/>
	Closed	<input type="checkbox"/>

Configuration for the output		
Parameters	Value	OUT A
Output active, when contact is:	Open (NC)	<input type="checkbox"/>
	Closed (NO)	<input type="checkbox"/>
Duration of activation (without monitoring control)	Permanent	<input type="checkbox"/>
	Only for the period of:	<input type="checkbox"/> ___ s
Behavior in case of fault	Control remains the same as in normal operation	<input type="checkbox"/>
	Control is activated	<input type="checkbox"/>
	Control is deactivated	<input type="checkbox"/>
	'Degraded mode horn'	<input type="checkbox"/>
Output configuration	Bistable, switched voltage: Normal operation, output line monitored ('J2' jumper)	<input type="checkbox"/>
	Bistable, switched voltage: Normal operation, output line not monitored ('J2' jumper)	<input type="checkbox"/>
	Bistable, switched voltage: Inverted operation, output line not monitored ('J2' jumper)	<input type="checkbox"/>
	Bistable, potential-free contact: Output line not monitored ('J1' jumper)	<input type="checkbox"/>



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