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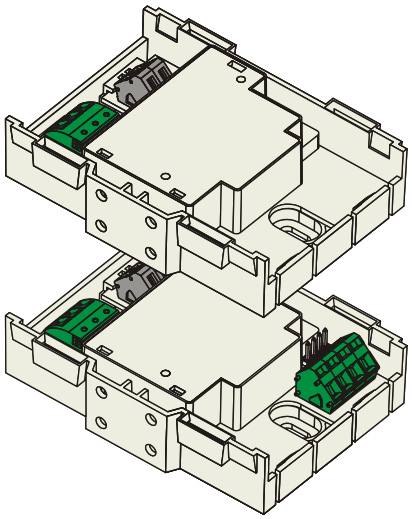

FDCI221, FDCIO221

Input module, input/output module

Technical Manual

A6V10211122_j_en_--
2012-09-30

Building Technologies
Control Products and Systems

Legal notice

Technical specifications and availability subject to change without notice.

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Table of contents

1 About this document

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

Target groups

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

Target group	Activity	Qualification
Product Manager	● 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.	● Has obtained suitable specialist training for the function and for the products. ● Has attended the training courses for Product Managers.
Project Manager	● Coordinates the deployment of all persons and resources involved in the project according to schedule. ● Provides the information required to run the project.	● Has obtained suitable specialist training for the function and for the products. ● Has attended the training courses for Project Managers.
Project engineer	● 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.	● Has obtained suitable specialist training for the function and for the products. ● Has attended the training courses for Product Engineer.
Installation personnel	● Assembles and installs the product components at the place of installation. ● Carries out a performance check following installation.	● Has received specialist training in the area of building installation technology or electrical installations.
Maintenance personnel	● Carries out all maintenance work. ● Checks that the products are in perfect working order. ● Searches for and corrects malfunctions.	● Has obtained suitable specialist training for the function and for the products.

Reference document and source language

- The source 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.

The reference document has the following designation:

ID_x_en_--

x = modification index, en = English, -- = international

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_--_--

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
[→ X]	Reference to a page number
'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.

1.1 Applicable documents

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

1.2 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)

1.3 History of changes

The reference document's modification index 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 have the modification index 'd' instead of 'a' if the reference document already has this modification index.

The table below shows this document's history of changes:

Modification index	Edition date	Brief description
j	2012-09-30	Voltage information for alternating current corrected to 'max. AC 22 V'
i	2012-09-07	Date format changed to meet ISO 8601 specifications (format yyyy-mm-dd); in several graphics, note 'Max. voltage 30 V DC or AC' added
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. Extra output configuration added. New 'Localization mode' chapter added. Dimensions of module and housing FDCH221 corrected.
a	05.2008	First edition

The table below shows the published language versions with the corresponding modification index:

Modification index	en_--	de_--	fr_--	it_--	es_--
j	X	X	X	X	X
i	X	X	X	X	X
h	X	X	X	X	X
g	X	X	X	X	X
f	X	X	X	X	X
e	X	X	–	–	–
d	X	X	–	–	–
c	X	X	X	X	X
b	X	X	X	X	X
a	X	X	X	X	X

X = published

– = no publication with this modification index

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.
NOTICE	*NOTICE* identifies possible damage to property that may result from non-observance.

How risk of injury is presented

Information about the risk of injury is shown as follows:

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

How possible damage to property is presented

Information about possible damage to property is shown as follows:

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

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

⚠ WARNING

Electrical voltage

Electric shock

- Work on electrical installations may only be carried out by qualified electricians or by instructed persons working under the guidance and supervision of a qualified electrician, in accordance with the 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 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

Limited or non-existent fire detection

Personal injury and damage to property in the event of a fire.

- 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

Incorrect planning and/or configuration

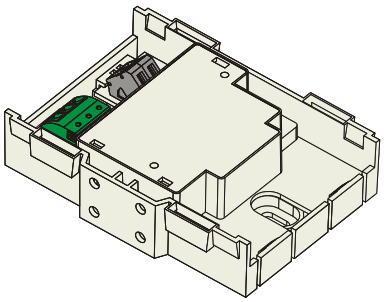
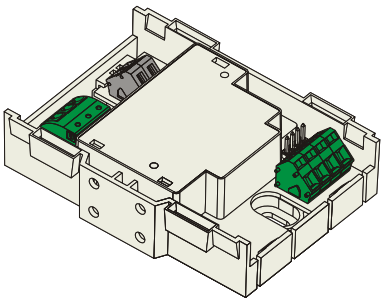
Important standards and specifications are not satisfied.

Fire detection installation is not accepted for commissioning.

Additional expense resulting from necessary new planning and/or configuration.

- 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	Input/output module FDCIO221
	

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

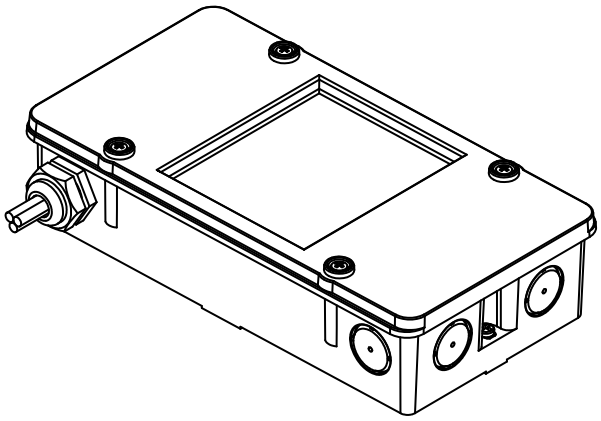
The FDCIO221 input/output module has 1 output and 1 input. With the output, control functions can be performed. With the input, statuses can be monitored.

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.



Housing FDCH221

3.1 Details for ordering

Type	Order no.	Designation
FDCI221	S54312-F1-A1	Input module
FDCIO221	S54312-F2-A1	Input/output module

3.2 Product version ES

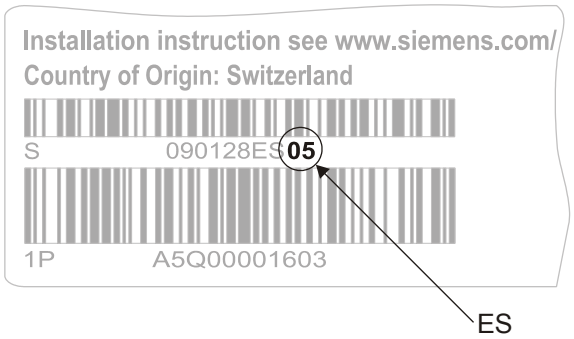
The product version ES provides the technical status of a device in terms of software and hardware. The product version is provided as a two-digit number.

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

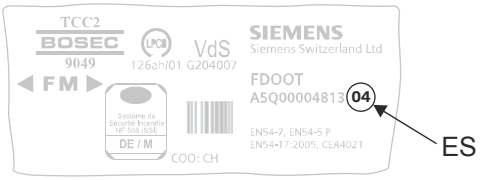
Details of the product version can be found directly on the packaging label in the barcode:



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:



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.

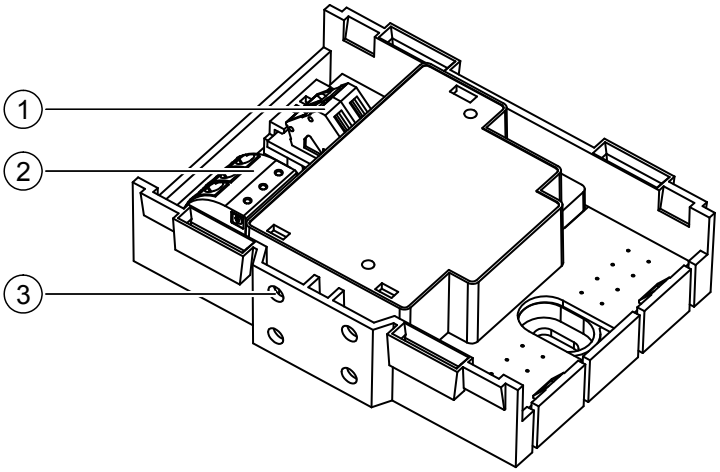
You will find the product version after the order number.

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. These 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



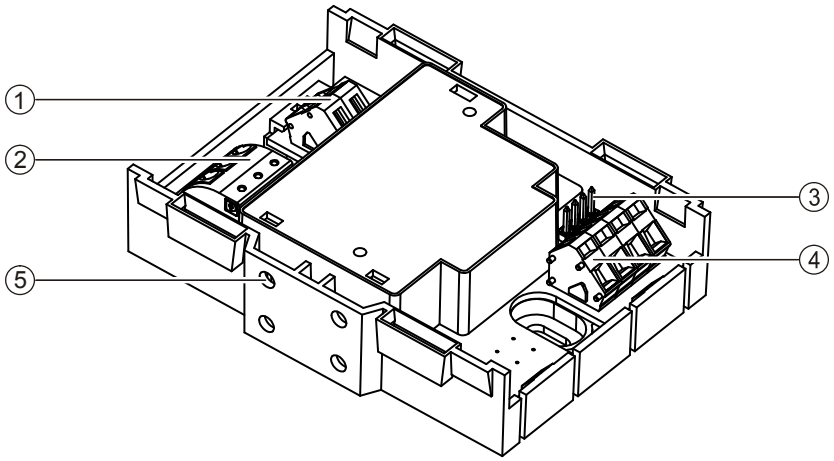
Overview of input module

1 Terminals for input

2 Terminals for the detector line

3 Holes for mounting feet

3.3.2 Input/output module



Overview of input/output module

1 Terminals for input

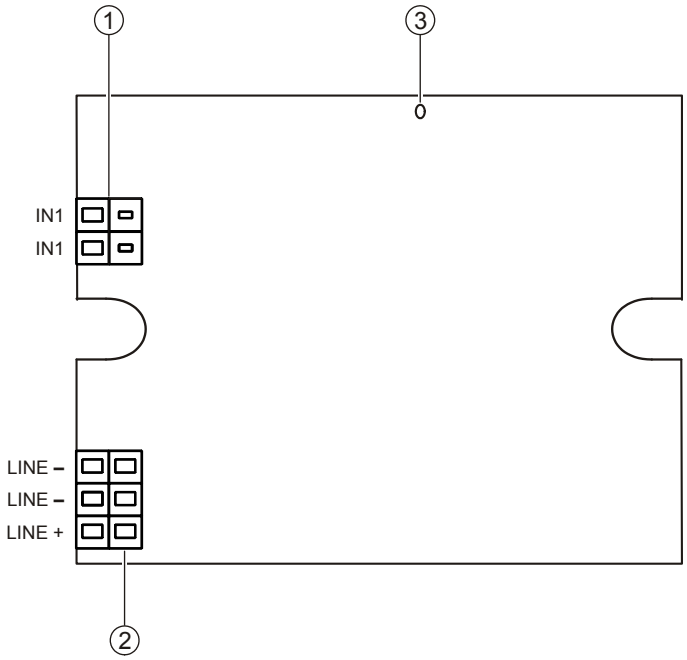
2 Terminals for the detector line

3 Jumper for output configuration

4 Terminals for output

5 Holes for mounting feet

3.3.3 Printed circuit board view of the input module



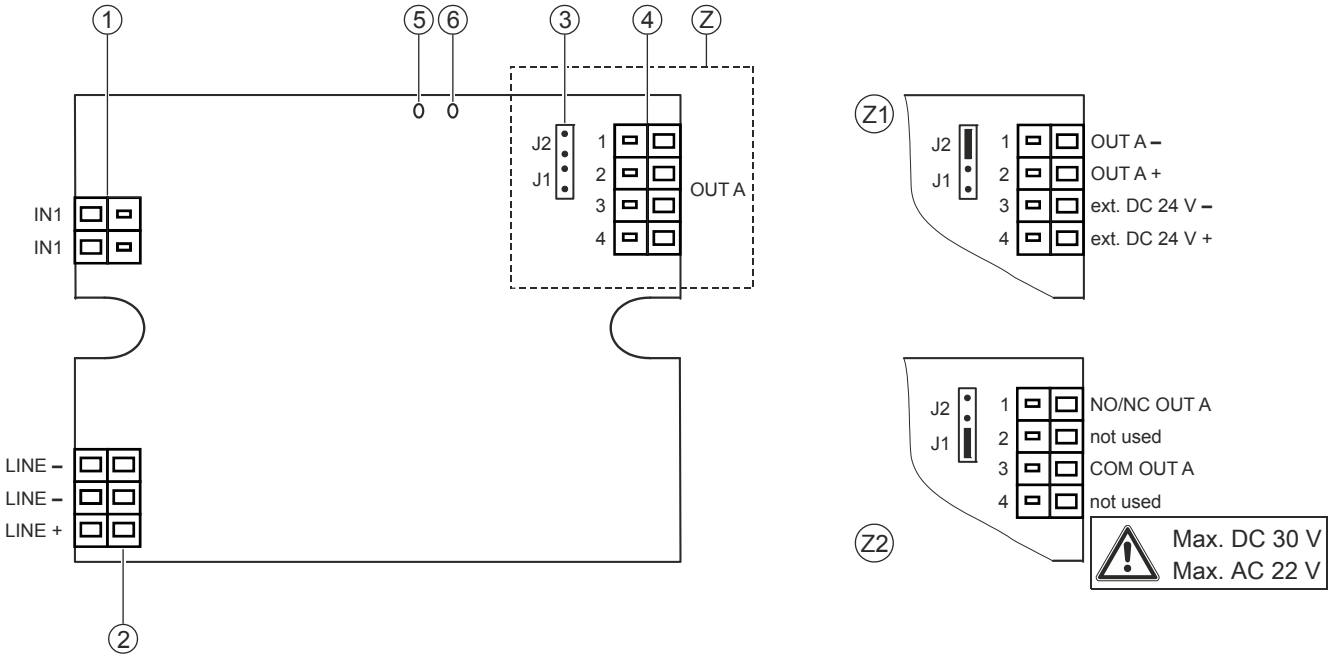
Printed circuit board view of the input module

1 Terminals for input IN1

2 Terminals for detector line

3 Red LED for input status and localization mode

3.3.4 Printed circuit board view of the input/output module



Printed circuit board view of the input/output module

1 Terminals for input IN1

2 Terminals for detector line

3 Jumper J1/J2 for output configuration

4 Terminals for output OUT A

5 Red LED for input status and localization mode

6 Red LED for output status

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

Cut-out Z	Jumper position	Configuration of the output
Z1	J2	● Bistable, switched voltage, normal operation (option of monitoring output lines) ● Bistable, switched voltage, inverted operation (output lines not monitored)
Z2	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

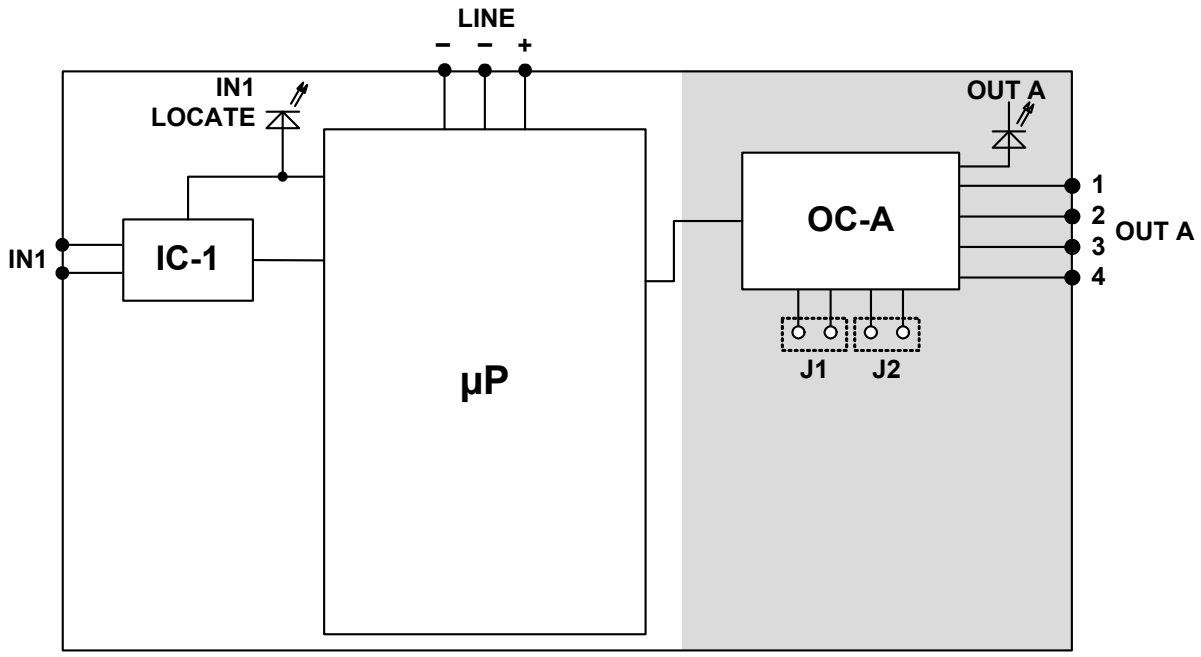
Red LED for the output status (for input/output module only)

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).

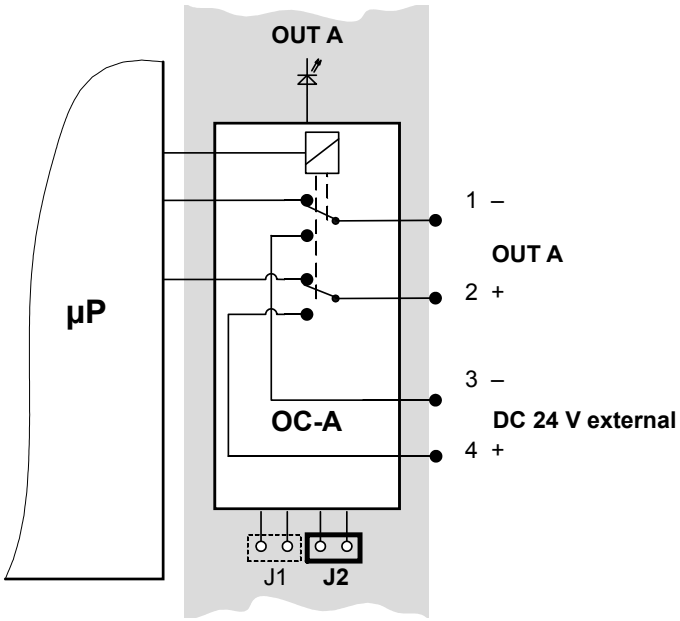
3.4 Function

3.4.1 Block diagram

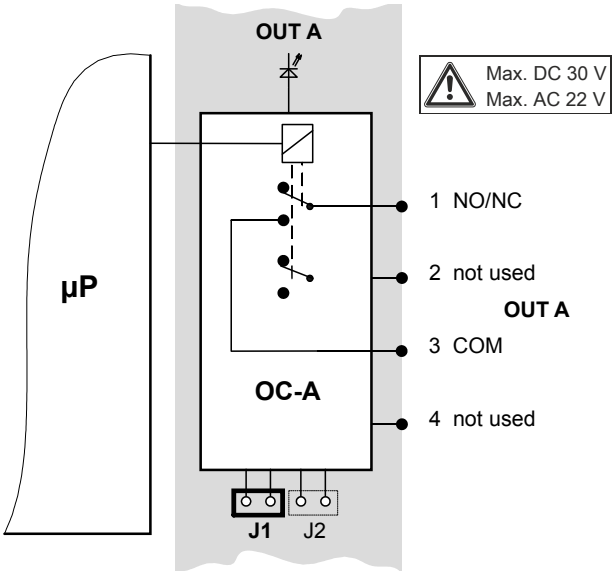


Block diagram of input module and input/output module

LINE	Detector line	OUT A	Output (for FDCIO221 only)
IN1	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

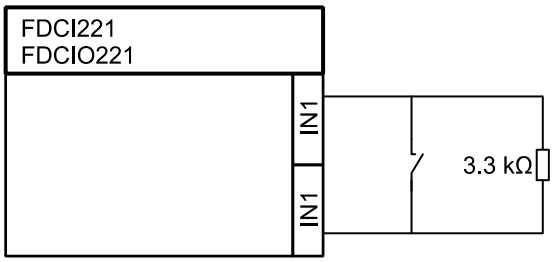
The input lines are monitored for open line or open line and short circuit. To make this possible, resistors must be connected to the lines of the input. When an open line or a short circuit occurs on one of the input lines, a fault message is transmitted to the control panel.

The input must be potential-free.

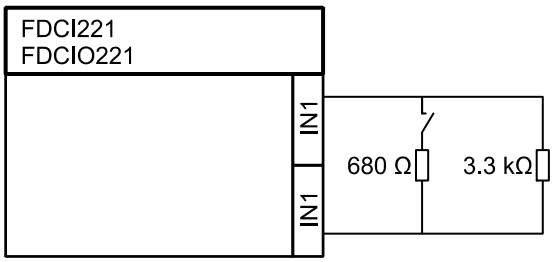
Circuit

- 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



Connection diagram of input with monitoring for open line



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.

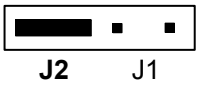
3.4.3.1 Normal operation (output lines monitored)

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

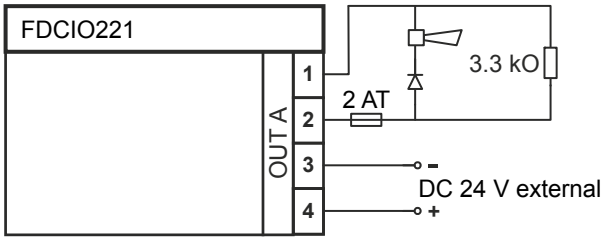
In this mode the module switches the externally supplied 24 V voltage to active status on the output. The externally supplied 24 V voltage is monitored. In the event of failure, an error message is generated.

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.



Input/output module jumper position J2



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 must be installed in accordance with the connection diagram.

!	*NOTICE*
	Strong currents in the line circuit Module overload during a short-circuit • Provide a 2 AT fuse in the line circuit.

Configuration

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 case 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
  - Responds to signal 'Degraded mode horn' like other sounders on the detector line
- Monitoring of the 'on' or 'off' output.

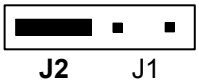
3.4.3.2 Inverted operation (output lines not monitored)

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

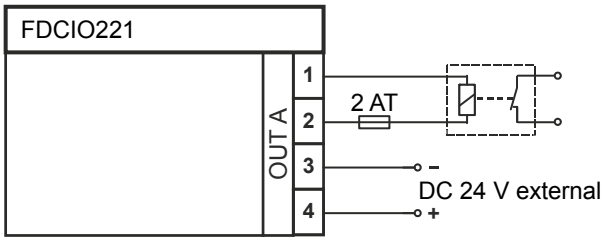
In this mode the module switches the externally supplied 24 V DC voltage to active status on the output. The externally supplied 24 V voltage is monitored. In the event of failure, an error message is generated.

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.



Input/output module jumper position J2



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

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

!	*NOTICE*
	Strong 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

The following configurations are possible:

- Output monitoring must be 'off'
- 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 case 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
  - Responds to signal 'Degraded mode horn' like other sounders on the detector line

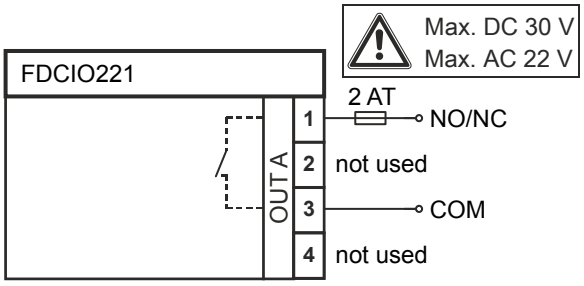
3.4.3.3 Output not monitored

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.

Input/output module jumper position J1



Connection diagram for output which is not monitored

!	*NOTICE*
	Strong currents in the line circuit Module overload during a short-circuit • Provide a 2 AT fuse in the line circuit.

Configuration

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
  - Responds to signal 'Degraded mode horn' like other sounders on the detector line

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 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.

3.4.5 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 is 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.

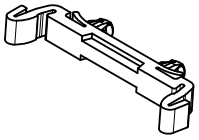
Behavior in degraded mode on control panels supporting degraded operation

- 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 default 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.

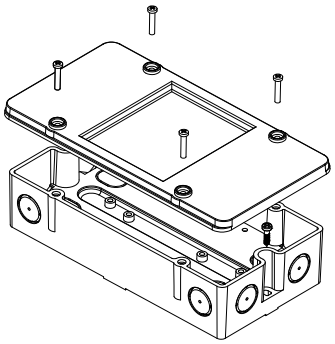
3.5 Accessories

3.5.1 Mounting foot FDCM291



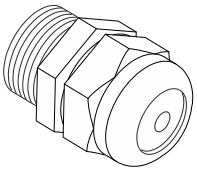
- For device installation on a DIN rail TS35
- Two mounting feet must always be used
- Compatible with:
  - Input module FDCI22x(-CN)
  - Input/output module FDCIO22x(-CN)
  - Multi line separator module FDCL221-M
- Order no.: A5Q00003855

3.5.2 Housing FDCH221



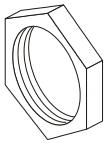
- To protect against dust and wetness
- Compatible with:
  - Multi line separator module FDCL221-M
  - Input module FDCI22x(-CN)
  - Input/output module FDCIO22x(-CN)
  - Radio gateway FDCW221
- Order no.: S54312-F3-A1

3.5.3 M20 x 1.5 metal cable gland



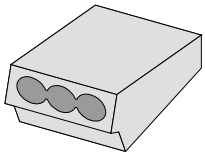
- For introducing a cable into a housing
- Allows for increased IP protection
- Compatible with:
  - M20 x 1.5 metal counter nut
  - Manual call point FDM223
  - Manual call point FDM224
  - Manual call point FDM223H
  - Manual call point FDM224H
- Order no.: A5Q00004478

3.5.4 M20 x 1.5 metal counter nut



- For use with metal cable gland M20 x 1.5
- Order no.: 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 wire diameters of 1…2.5 mm²
- 3 poles
- Order no.: 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	Control panel			
	FC20xx	FC72x	SIGMASYS	AlgoRex
FDnet	X	-	–	–
C-NET	–	X	–	–

X = compatible

– = not compatible

You will find details 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

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 short to ground.
3. Define whether the input is active with open or closed contact. The configuration of the input must correspond to the actual circuitry.

The resistors must be connected at the end of the lines.

No automatic detectors or manual call points can be connected to the inputs.

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. Plug 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 control shall remain active after activation. The control can be:
   - Permanently active.
   - Active only for a certain period of time. How long the contact remains active can be configured as well (pulse duration).
5. Determine the behavior of the control 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 (default positions):
   - Control remains the same as before the error
   - Control is activated
   - Control is deactivated
   - Responds to signal 'Degraded mode horn' 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) [→ 24]

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 [→ 44]

5 Mounting / Installation

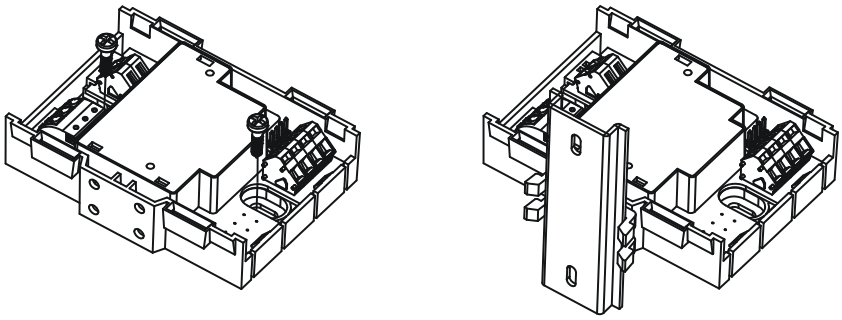
The procedure followed during mounting and installation depends on whether the module is used with or without housing.

5.1 Installation without housing

!	*NOTICE*
	Impairment of module function due to dust or humidity • 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 module on an even surface or on a DIN rail with two mounting feet (see figure). To make sure that the LEDs remain visible at all times, the cover cap is transparent. Pick a suitable installation position, ensuring that the LEDs will remain visible at all times during operation.
2. 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.
3. Connect cables to corresponding terminals (see connection diagram).



Module installation variants

See also

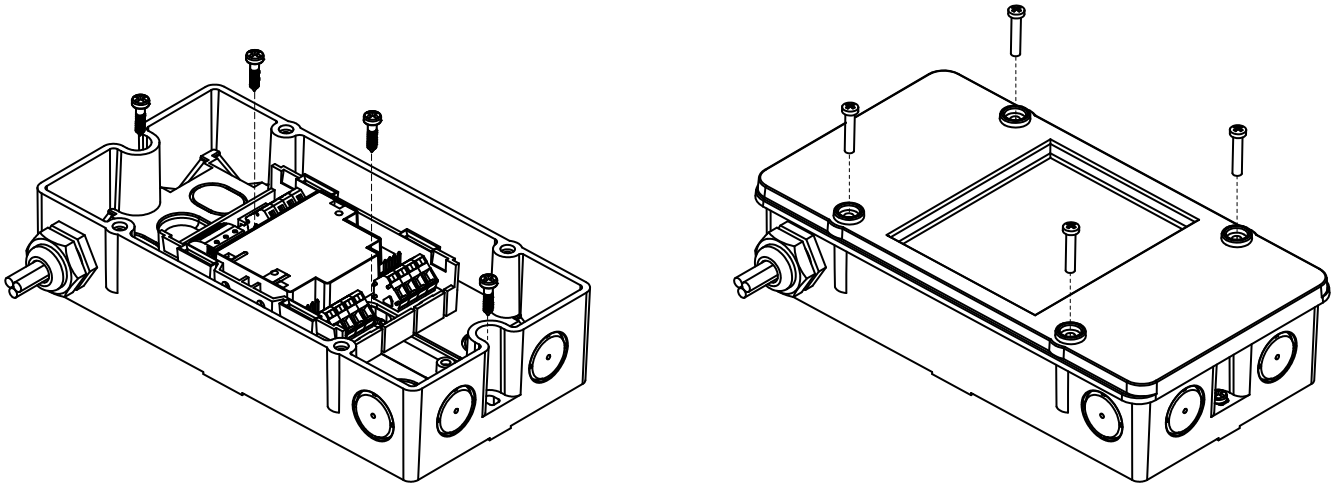
Connecting the module [→ 37]

5.2 Installation with housing

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 ground potentials or metal parts in the housing.
5. Install the module in the housing using the fixing screws supplied.
6. Connect the cables to the corresponding terminals.
7. Close housing using supplied screws.



Installing the module in the FDCH221 housing

See also

- Dimensions [→ 42]
- Connecting the module [→ 37]

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 of ensuring a problem-free connection over the device's entire service life.

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 monitored) [→ 25]
- Inverted operation (output lines not monitored) [→ 26]
- Output not monitored [→ 27]
- Input [→ 23]

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

For service purposes, the modules can be switched to test mode. In this mode, the relay is not activated when activating the outputs. Only the LED is activated. You will find more detailed information in the control panel documentation.

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.

7.4 Remedying 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

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. 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 (= $Z_{C\ max}$)
External alarm indicator	Number of external alarm indicators that can be connected	None
Input	Monitoring voltage	3 V, unloaded
	Monitoring resistors, input:	
	● FDCI221/FDCIO221	3.3 kΩ/680 Ω; each ±1%; 0.25 W
	Line resistance	Max. 20 Ω

Output	Max. switching performance at ohmic load at:	
	• AC voltage	Max. 22 V AC; 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
	Cross-section	0.2…2.5 mm^2
Ambient conditions	Operating temperature	-25…+70 °C
	Storage temperature	-30…+75 °C
	Air humidity	≤95 % rel.
	IP protection:	
	• 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 48 mm
	Housing material	ABS
	Colors:	
	• Module carrier	~RAL 9010 pure white
	• Housing	~RAL 9010 pure white
	• Housing cover	Transparent
Standards	European standards	EN 54-14 EN 54-18
	International standards	IEC 60092-504 IEC 60533 IEC 60529 ISO 9001 ISO 9004
	Siemens standards	SN 36350

Approvals

EC Certificate of Conformity (construction products):

- FDCI221 0786-CPD-20709
- FDCIO221 0786-CPD-20710

EC-type examination certificate (marine equipment):

- FDCI221 19 485 - 11 HH
- FDCIO221 19 485 - 11 HH

VdS approvals:

- FDCI221 G209066
- FDCIO221 G209067

LPCB approvals:

- FDCI221 531h/01
- FDCIO221 531h/02

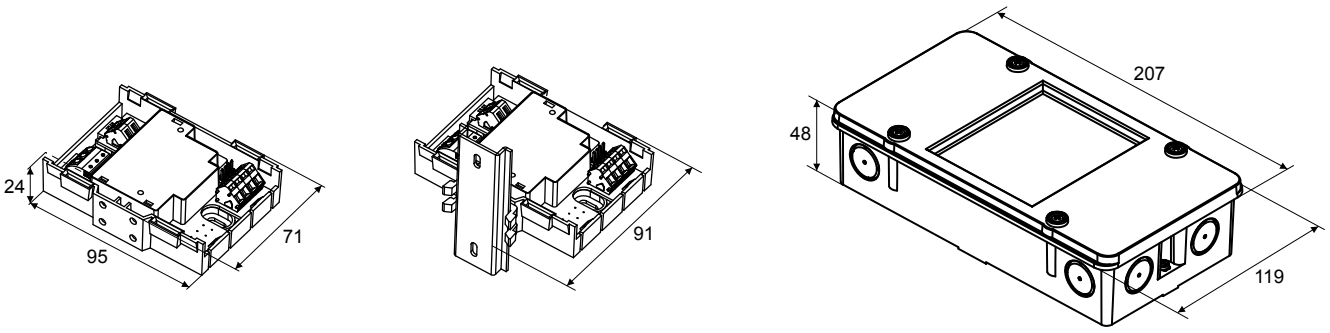
FM approvals:

- FDCI221 3038448
- FDCIO221 3038448

Approvals from Germanischer Lloyd:

- FDCI221 19 563 - 11 HH
- FDCIO221 19 563 - 11 HH

8.2 Dimensions



Dimensions of installation variants

The dimensions for FDCI221 and FDCIO221 are identical.

8.3 Environmental compatibility and disposal

This device 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.

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

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

9 Annex

9.1 Configuration sheet

Installation site	
Module	□ Input module FDCI221 □ Input/output module FDCIO221
Mode of installation	□ Without housing □ with housing FDCH221
Input IN1 monitors ...	
Output OUT A controls ...	

Configuration for the input		
Parameter	**Value**	**IN1**
Type of input	Danger input	□
	Status input	□
Input monitoring	Open line monitoring	□
	Open line and short circuit monitoring	□
Input active, when contact is:	Open	□
	Closed	□

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

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