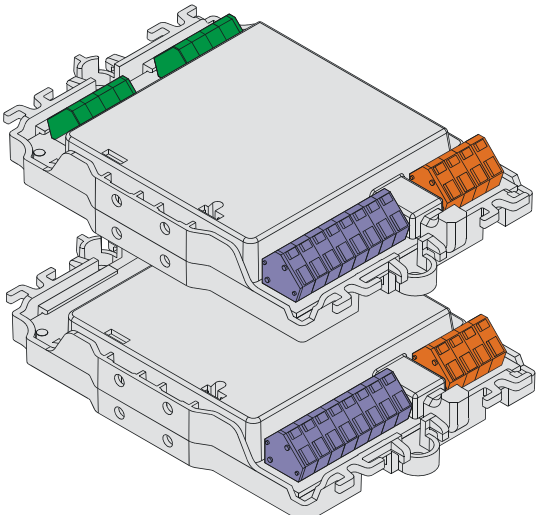


SIEMENS



FDCI222, FDCIO222, FDCIO224

**Input module,
input/output module**

Technical manual

Technical specifications and availability subject to change without notice.

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Table of contents

1	About this document	5
2	Safety.....	8
2.1	Safety notices.....	8
2.2	Safety regulations for the method of operation.....	10
2.3	Standards and directives complied with.....	12
2.4	Release Notes.....	13
3	Setup and function.....	14
3.1	Overview	14
3.1.1	Details for ordering	15
3.2	Setup	15
3.2.1	Input module FDCI222.....	15
3.2.2	In-/Output module FDCIO222/FDCIO224	16
3.2.3	P.c.b. view.....	17
3.2.4	LED	18
3.3	Function.....	19
3.3.1	Block diagram	19
3.3.2	Inputs	20
3.3.2.1	Function.....	20
3.3.2.2	Circuit	21
3.3.3	Outputs (only with FDCIO222/FDCIO224)	23
3.3.4	Monitoring the control function with the inputs (only with FDCIO222/FDCIO224)	24
3.3.5	Diagnosis levels.....	25
3.3.6	Behavior in degraded mode.....	26
3.4	Accessories.....	27
3.4.1	Mounting foot FDCM291.....	27
3.4.2	Housing FDCH221.....	27
3.4.3	Connection terminal DBZ1190-AB.....	27
3.4.4	M20 x 1.5 metal cable gland.....	28
3.4.5	M20 x 1.5 metal counter nut	28
3.4.6	Cable ties 2.4 x 137	28
4	Project planning	29
4.1	Compatibility.....	29
4.2	Defining the place of installation	29
4.3	Defining the type of monitoring and input configuration.....	30
4.4	Defining the output configuration	31
4.5	Filling out the configuration sheet	32
4.6	Environmental influences	32
5	Mounting / Installation	33
5.1	Installation with housing	33
5.2	Installation without housing	35
5.3	Connecting the module	36

6	Commissioning	37
7	Maintenance / Troubleshooting	38
7.1	Status retrieval	38
7.2	Function check	38
7.3	Test mode.....	38
8	Specifications	39
8.1	Technical data	39
8.2	Dimensions.....	41
8.3	Environmental compatibility.....	41
9	Appendix	42
9.1	Configuration sheet	42
10	Index	44

1 About this document

Goal and purpose

This document contains all information on the input module FDCI222 and the input/output modules FDCIO222 and FDCIO224. Consistent compliance with the instructions guarantees correct and safe use.

Target groups

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

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

Document identification

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

Conventions for text marking

Markups

Special markups are shown in this document as follows:

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

Supplementary information and tips



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

Technical terms

Term	Explanation
ABS	Acrylonitrile-butadiene-styrene (plastic)
ASA	Acrylic ester-styrene-acrylonitrile (plastic)
ES	Product version
FS20/FS720	Addressed detector line
LED	Light-emitting diode
MC link	Maintenance and commissioning link
PC	Polycarbonate (plastic)

Reference documents

Document ID	Title
008175	Installation of input module FDCI222
008176	Installation of input/output module FDCIO222/FDCIO224
008331	List of compatibility (for 'Sinteso' product line)
A6V10229261	List of compatibility (for 'Cerberus PRO' product line)
007227	Operation of detector exchanger and tester FDUD292
009718	Operation of intelligent detector tester FDUD293

History of changes

Document ID	Edition date	Brief description
007023_i_en--	12.2009	<ul style="list-style-type: none"> Maximum current/quiescent current connection factor changed Housing FDCH29x replaced with FDCH221 Editorial changes made
007023_h_en--	09.2007	<ul style="list-style-type: none"> Diagnosis levels changed Output configuration changed Images with language texts replaced by language-neutral images
007023_g_en--	07.2007	<p>Localization mode added to 'LED' chapter.</p> <p>Corrections in 'Technical data':</p> <ul style="list-style-type: none"> Line separator added Humidity changed IP protection category changed EN54-17 standard added LPCB approvals added
007023_f_en--	01.2007	<ul style="list-style-type: none"> Fail-safe behavior added VdS no. added for FDCIO224
007023_e_en--	09.2006	<ul style="list-style-type: none"> ES ≥ 30 complemented FDCIO224 supplemented Technical data revised Diagnosis levels added Degraded mode function included
007023_d_en--	08.2005	Line resistance and address
007023_c_en--	01.2005	Name of division
007023_b_en--	09.2004	Safety-relevant adaptations

2 Safety

2.1 Safety notices

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

The safety notices in this document contain the following elements:

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

Symbol for danger



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

Additional danger symbols

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



General danger



Explosive atmosphere



Voltage/electric shock



Laser light



Battery



Heat


Signal word

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

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


How risk of injury of presented

Information about the risk of injury is shown as follows:

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

How possible damage to property is presented

Information about possible damage to property is shown as follows:


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

2.2 Safety regulations for the method of operation

National standards, regulations and legislation

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

Electrical installations

	⚠ WARNING
	<p>Electrical voltage</p> <p>Electric shock</p> <ul style="list-style-type: none"> ● Work on electrical installations may only be carried out by qualified electricians or by instructed persons working under the guidance and supervision of a qualified electrician, in accordance with the electrotechnical regulations.

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

Assembly, installation, commissioning and maintenance

- If you require tools such as a ladder, these must be safe and must be intended for the work in hand.
- When starting the fire control panel ensure that unstable conditions cannot arise.
- Ensure that all points listed in the 'Testing the product operability' section below are observed.
- You may only set controls to normal function when the product operability has been completely tested and the system has been handed over to the customer.

Testing the product operability

- Prevent the remote transmission from triggering erroneously.
- If testing building installations or activating devices from third-party companies, you must collaborate with the people appointed.
- The activation of fire control installations for test purposes must not cause injury to anyone or damage to the building installations. The following instructions must be observed:
 - Use the correct potential for activation; this is generally the potential of the building installation.
 - Only check controls up to the interface (relay with blocking option).
 - Make sure that only the controls to be tested are activated.
- Inform people before testing the alarming control devices and allow for possible panic responses.
- Inform people about any noise or mist which may be produced.
- Before testing the remote transmission, inform the corresponding alarm and fault signal receiving stations.

Modifications to the system layout and products

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

Modules and spare parts

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

Disregard of the safety regulations

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

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

Disclaimer

We have checked that the content of this document matches the hardware and software described. Despite this, we cannot rule out deviations and cannot therefore assume liability for them matching completely. The details in this document are checked regularly and any corrections needed included in subsequent editions.




We are grateful for any suggestions for improvement.


2.3 Standards and directives complied with

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

2.4 Release Notes

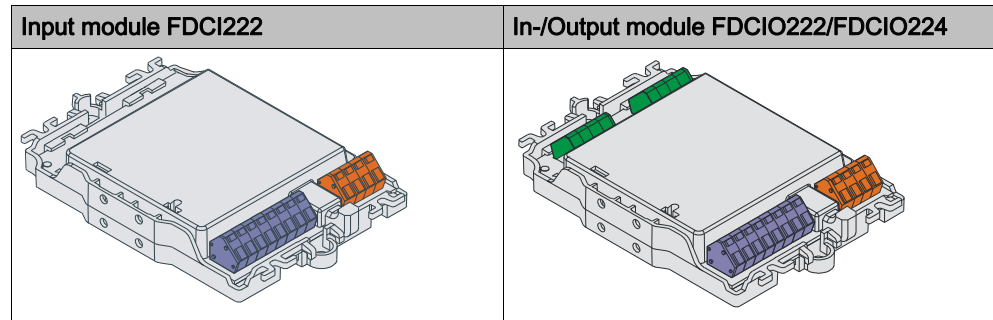
Limitations to the configuration or use of devices in a fire detection installation with a particular firmware version are possible.

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

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

3 Setup and function

3.1 Overview



Input module FDCI222

The input module FDCI222 has four inputs. The inputs can be used to monitor the status (e.g. whether a door is closed).

In-/Output module FDCIO222/FDCIO224

The input/output module FDCIO222 has four outputs and four inputs. With the outputs, control functions can be performed. With the inputs, statuses can be monitored.

The inputs and outputs can be operated independently. However, it is also possible to monitor the control of the outputs by means of the input. In this case, an input is assigned to the output. A control function can be performed on the output (e.g. 'Close door'). The correct execution of the control can be monitored on the input (e.g. 'door is closed').

The difference between FDCIO222 and FDCIO224 is in the circuitry for the monitoring of the inputs. FDCIO224 meets the requirements on the VdS extinguishing interface.

Properties

The modules have the following properties:

- Communication via FDnet/C-NET (detector line)
- Potential-free outputs
- Configuration options
- Built-in line separator
- No auxiliary supply required
- Status indicators (LED)
- Different mounting options

3.1.1 Details for ordering

Type	Order no.	Designation
FDCI222	A5Q00001984	Input module
FDCIO222	A5Q00002369	Input/output module
FDCIO224	A5Q00018689	Input/output module

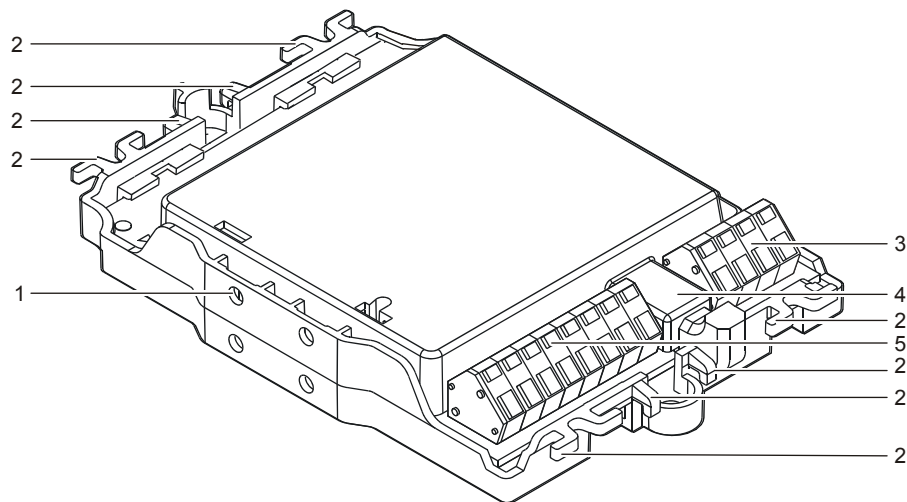
3.2 Setup

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

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

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

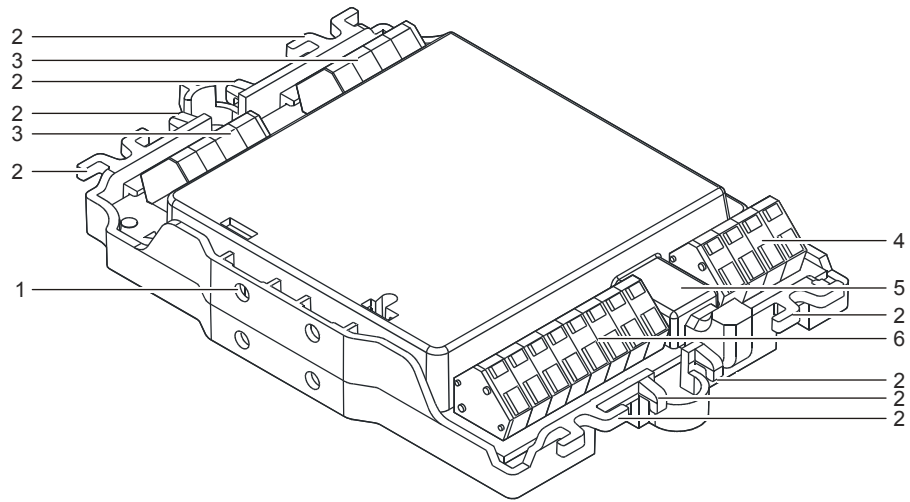
3.2.1 Input module FDCI222



Overview FDCI222

1	Holes for mounting feet FDCM291	4	Connection for MC-Link
2	Cable tie holder	5	Terminals (inputs)
3	Terminals (FDnet/C-NET)		

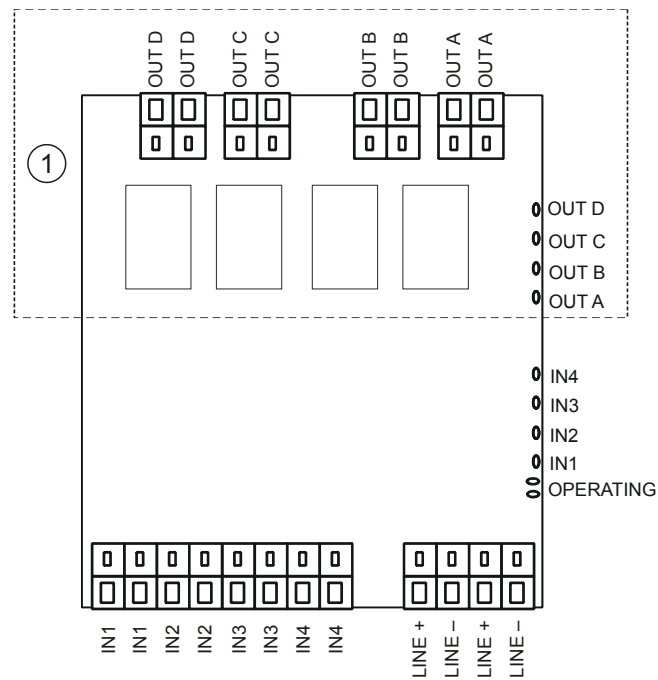
3.2.2 In-/Output module FDCIO222/FDCIO224



Overview

1	Holes for mounting feet FDCM291	4	Terminals (FDnet/C-NET)
2	Cable tie holder	5	Connection for MC-Link
3	Terminals (outputs)	6	Terminals (inputs)


3.2.3 P.c.b. view



Circuit board view

1 Only with FDCIO222 and FDCIO224

See also

 [Connecting the module \[→ 36\]](#)

3.2.4 LED

The table below shows the meaning of the LED states.

Operating LED

Status LED	Meaning
Green LED flashes every 4 sec.	Normal operation
Green LED flashes every 1 sec.	Localization mode
Yellow LED is flashing	Fault
Yellow and green LEDs are flashing	Test mode

LEDs for inputs and outputs

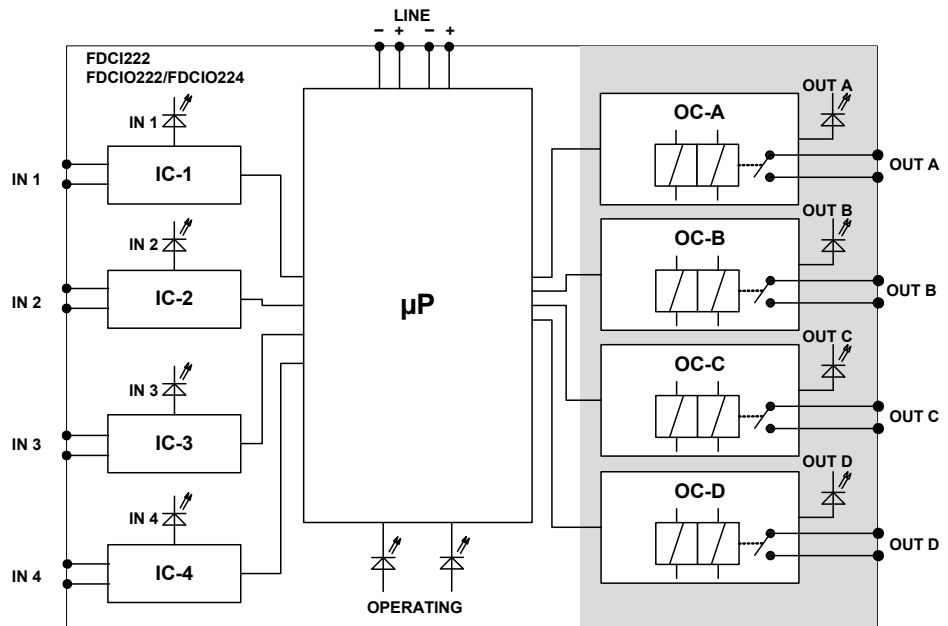
For each input and each output there is an LED

Status LED	Meaning
Red LED is flashing	Input activated
Orange LED is flashing	Command for the activation of the output received by the control unit

The displays can be deactivated on option (e.g. in a cinema).

3.3 Function

3.3.1 Block diagram



Block diagram for modules

Designation	Legend	Comment
IN 1 ... IN 4	Inputs	
OUT A ... OUT D	Outputs	Only with FDCIO222 and FDCIO224
OPERATING	LED operation	

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

The modules are normally in operating mode. For service purposes, the modules can be switched to test mode.

The modules require no auxiliary power supply.

3.3.2 Inputs

3.3.2.1 Function

The inputs can be used to monitor the status, e.g. whether a 'door is closed'. Each input can be configured as follows:

- Status input or danger input
- Lead monitoring for 'Open line' or 'Open line and short circuit'
- The input is active when the contact is open (normally closed, NC)
- The input is active when the contact is closed (normally open, NO)
- Filter time (0 ... 240 s)

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

The inputs must be potential-free.

Filter time

The statuses of the inputs are polled several times a second.

The following conditions must be satisfied to detect a change in status:

- The status change must be present during activation for at least as long as the filter time
- The status change must be present during deactivation for at least as long as the filter time but for no more than 5 seconds

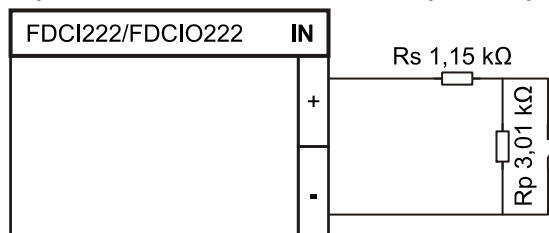
The filter time can be used for the suppression of disturbing pulses. Status changes and faults are indicated by the LEDs on the module and are transmitted to the control unit.

3.3.2.2 Circuit

Notes:

- The input lines 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 admissible circuitry depends on the module that is used.
- The configuration of the module must correspond to the actual circuitry.

Input module FDCI222 and input/output module FDCIO222



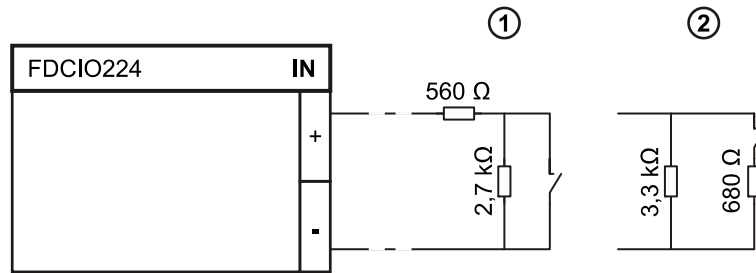
FDCI222 and FDCIO222 circuitry

Notes:

- The above connection diagram applies to monitoring for 'short-circuit' and 'open line'.
- When the line shall only be monitored for 'open line', the resistor R_s 1.15 k Ω must not be provided.

Input/output module FDCIO224

With FDCIO224 two different kinds of circuitry are possible.



FDCIO224 circuitry

Notes:

- Connection diagram (1):
 - The monitoring resistance 560 Ω is only required when monitoring for 'short-circuit and open line'.
 - When the line shall only be monitored for 'open line', the 560 Ω resistor must not be provided.
- Connection diagram (2) for the VdS extinguishing interface: only monitoring for 'short-circuit and open line' is possible.

See also

📄 Connecting the module [→ 36]

3.3.3 Outputs (only with FDCIO222/FDCIO224)

This section describes the function mode when controls are not monitored. The following section describes how the controls are monitored by the inputs.

Control functions can be performed with the outputs (e.g. 'Close door'). The outputs are potential-free relay contacts.

Configuration

The following configurations are possible:

- The contact is active when it is closed (normally open, NO)
- The contact is active when it is open (normally closed, NC)
- Once activated, the control remains permanently active
- Once activated, the contact only remains active for a certain time. How long the contact remains active can be configured (pulse duration).
- Failsafe behavior when the FDnet/C-NET detector line is current-free or in degraded mode (e.g. in case of a failure of the processor in the control panel).

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

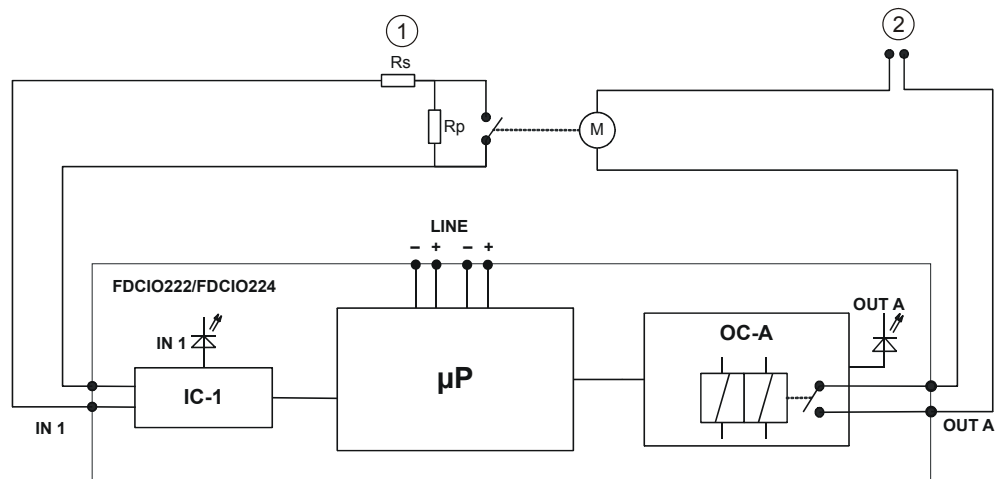
- The contact remains in the same position as before the error
- The contact is activated in case of an error
- The contact is deactivated in case of an error
- The contact responds to the 'Degraded mode horn' signal in the same way as other sounders on the FDnet/C-NET (only possible with devices with ES ≥ 30 in FS20/FS720)

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

3.3.4 Monitoring the control function with the inputs (only with FDCIO222/FDCIO224)

General

With the input/output modules the effected control functions (e.g. 'close door') can be monitored for correct execution (e.g. 'door closed') (see graphics).



Monitoring controls with input/output modules

1 Optional

2 Supply

Configuration

When the control functions are monitored by the inputs, the following configurations are possible:

- The contact is active when it is closed (normally open, NO)
- The contact is active when it is open (normally closed, NC)
- Once activated, the control remains permanently active
- Once activated, the contact remains active only until the allocated input is activated or the delay period has expired. The delay period can be adjusted.
- Failsafe behavior when the FDnet/C-NET detector line is current-free or in degraded mode (e.g. in case of a failure of the processor in the control panel).

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

- The contact remains in the same position as before the error
- The contact is activated in case of an error
- The contact is deactivated in case of an error
- The contact responds to the 'Degraded mode horn' signal in the same way as other sounders on the FDnet/C-NET (only possible with devices with ES ≥ 30 in FS20/FS720)

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

If the control function has not been executed after the expiry of a certain period (delay period), a fault message is transmitted to the control unit. Only the activation of the control is monitored. The deactivation is not monitored.

Allocation of inputs and outputs

The assignment of outputs to inputs is fixed.

Input	Output
IN 1	OUT A
IN 2	OUT B
IN 3	OUT C
IN 4	OUT D

3.3.5 Diagnosis levels

The devices largely monitor their function autonomously. The following diagnosis levels are taken from the different control measuring processes:

- Normal
- Fault

For details, see table below.

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

For details, see Documents 007227 and 009718.

Information displayed on the detector exchanger and tester	Meaning	Measures
'no deviation'	Normal, no fault is present Input/output module is fully functional	none
Any fault message ¹	Fault present Error with the input circuitry (open line, short-circuit, deviation)	Checking the input circuitry (parameter setting, resistors, short-circuit, open line)
	Invalid parameter settings	Check the parameter setting
	Supply error	<ul style="list-style-type: none"> • Check detector line voltage • Exchange device
	Software error (Watchdog error)	Exchange device
	Memory error	Exchange device
	Communication error between detector and control panel	Remedy cause

¹ This status can be displayed together with another status, e.g. 'needed excha.' (replacement necessary).

3.3.6 Behavior in degraded mode

Applicable for the FDnet/C-NET:

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

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


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

When the outputs are used for controls (e.g. fire controls), the outputs take on the configured default position in case of a communication failure or current-free FDnet/C-NET (only devices with ES ≥ 30).

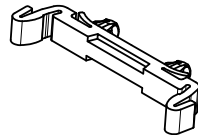
Degraded mode operation on the FDnet/C-NET is not supported in the same way by all control panels. The information in the 'List of compatibility' and in the corresponding control panel documentation must be taken into account during project planning.

3.4 Accessories



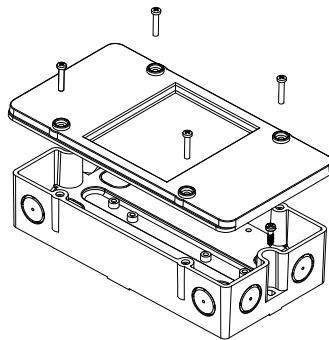
The symbol  is used if there are no graphics for an accessory.

3.4.1 Mounting foot FDCM291



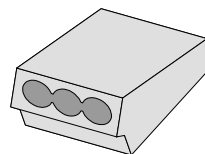
- For device installation on a top hat rail TS35
- Two mounting feet must always be used
- Compatible with:
 - FDCI22x(-CN) input module
 - FDCIO22x(-CN) input/output module
 - Multi line separator module FDCL221-M
- Order no.: A5Q00003855

3.4.2 Housing FDCH221



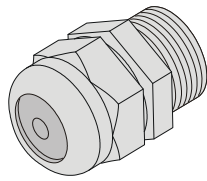
- To protect against dust and wetness
- Compatible with:
 - Multi line separator module FDCL221-M
 - Input module FDCI22x(-CN)
 - Input/output module FDCIO22x(-CN)
- Order no.: S54312-F3-A1

3.4.3 Connection terminal DBZ1190-AB



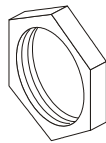
- Auxiliary terminal for connecting cables
- For T-branches of additional cabling for cable shielding, detector heating units, sounder base, external alarm indicators, etc.
- For wire diameters of 1 ... 2.5 mm²
- 3-pin
- Order no.: BPZ:4942340001

3.4.4 M20 x 1.5 metal cable gland



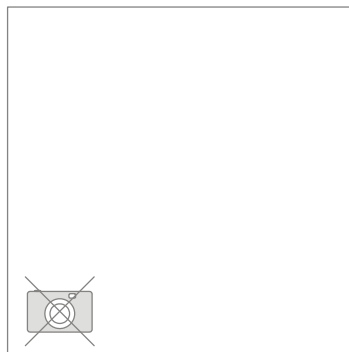
- For introducing a cable into a housing
- Compatible with:
 - M20 x 1.5 metal counter nut
- Order no.: A5Q00004478

3.4.5 M20 x 1.5 metal counter nut



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

3.4.6 Cable ties 2.4 x 137



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

4 Project planning

When planning a project, proceed as follows:

1. Take into account the compatibility.
2. Define the place of installation.
3. Define the type of monitoring and configuration of the inputs.
4. Define the configuration of the outputs.
5. Fill out the configuration sheet.

4.1 Compatibility

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

For details see 'List of compatibility'.

Detector line	Control panel			
	FS20	AlgoRex	SIGMASYS	FS720
FDnet	✓	✓	✓	
C-NET				✓



4.2 Defining the place of installation

Guideline

- For the purpose of controlling fire protection installations in accordance with EN 54-2, the input/output module FDCIO224 must be integrated into the fire control housing.
- When the in-/output module FDCIO224 is used to control the VdS extinguishing interface, it must be built in the control panel housing.

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

Procedure

	 DANGER
	<p>Voltage levels of up to 250 V AC may occur on the module's terminals!</p> <p>Danger to life through contact with live components!</p> <ul style="list-style-type: none"> ● Use the housing FDCH221 if switching outputs of voltages >60 VDC (ripple <10 % of average value) or >30 VAC (peak value max. 42.4 V). ● Ensure that the cables are not supplied with voltage during installation.

1. Define the place of installation. To simplify the cabling the module should be installed as close as possible to the fire control installations.
2. Use a housing FDCH221 (accessories) when more than 60 VDC or 30 VAC are applied to the outputs and when the module is not used in a closed switch cabinet.

4.3 Defining the type of monitoring and input configuration

1. Define the type of input (danger input or status input).
2. Determine the type of monitoring and the monitoring resistors.



Monitoring the inputs for earth fault is not possible.

3. Define the filter time. The following filter times can be set:

0,5 s	20 s	150 s
1 s	45 s	180 s
2,5 s	60 s	210 s
5 s	90 s	240 s
10 s	120 s	

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


Notes

- The resistors must be connected at the end of the lines
- No automatic detectors or manual call points can be connected to the inputs

See also

 Circuit [→ 21]

4.4 Defining the output configuration

	⚠ DANGER
	<p>Voltage levels of up to 250 V AC may occur on the module's terminals!</p> <p>Danger to life through contact with live components!</p> <ul style="list-style-type: none"> ● Use the housing FDCH221 if switching outputs of voltages >60 VDC (ripple <10 % of average value) or >30 VAC (peak value max. 42.4 V). ● Ensure that the cables are not supplied with voltage during installation.

When configuring the outputs, please proceed as follows:

1. Determine in which position the contact is active:
 - The contact is active when it is closed (normally open, NO)
 - The contact is active when it is open (normally closed, NC)
2. Define how long the control shall remain active after activation:
 - Once activated, the control is permanently active
 - Once activated, the control is only active for a certain time. The period for which the control remains active can be configured (pulse duration). The following settings are possible:

1 s	5 s	20 s
2 s	10 s	
3 s	15 s	
3. Determine the type of monitoring (equal or reversed polarity).
4. 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):

- The control continues to behave as it did before the error
- The control is activated in case of an error
- The control is deactivated in case of an error
- The control responds to the 'Degraded mode horn' signal in the same way as other sounders on the FDnet/C-NET (only possible with devices with ES \geq 30 in FS20/FS720)

See also

- 📖 Outputs (only with FDCIO222/FDCIO224) [→ 23]
- 📖 Monitoring the control function with the inputs (only with FDCIO222/FDCIO224) [→ 24]

4.5 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 [→ 42]


4.6 Environmental influences

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

The following factors must be taken into consideration:

- Chemicals
- Temperature
- Humidity

5 Mounting / Installation

	⚠ DANGER
	<p>Voltage levels of up to 250 V AC may occur on the module's terminals!</p> <p>Danger to life through contact with live components!</p> <ul style="list-style-type: none"> ● Use the housing FDCH221 if switching outputs of voltages >60 VDC (ripple <10 % of average value) or >30 VAC (peak value max. 42.4 V). ● Ensure that the cables are not supplied with voltage during installation.

The installation procedure depends on whether the module is installed with or without housing FDCH221.

5.1 Installation with housing



Note the positive and negative connections.

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

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

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

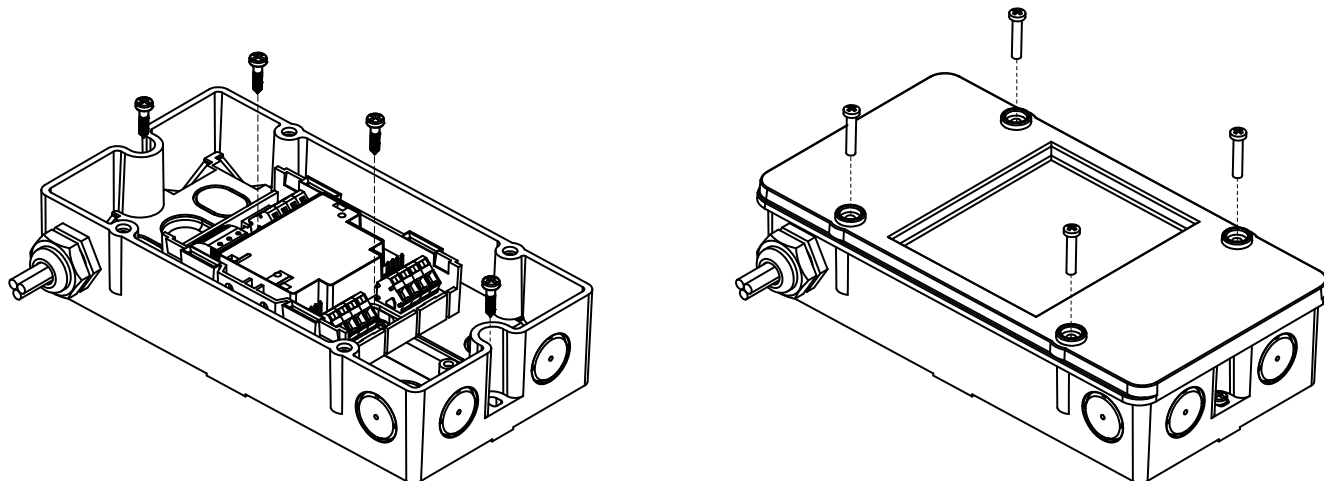
1. Break out the required cable entries.
2. Install housing on a flat surface.
3. Insert cables. If necessary, fix the cables using the M20 x 1.5 cable glands or use a different cable entry.
4. If you are using shielded cable, join the shielding to the DBZ1190-AB connection terminal. The shielding must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

Cable with diameter > 1.5 mm²

If the cable diameters on the inputs/outputs are greater than 1.5 mm², auxiliary terminals must be used:

- In the case of cables with a diameter of 1.5 ... 2.5 mm², connection terminal DBZ1190-AB can be used.
- In the case of cables with a diameter of > 2.5 mm², an appropriate terminal must be provided by the customer.

The terminal can be positioned inside the housing.



Installing the module in the FDCH221 housing

5.2 Installation without housing

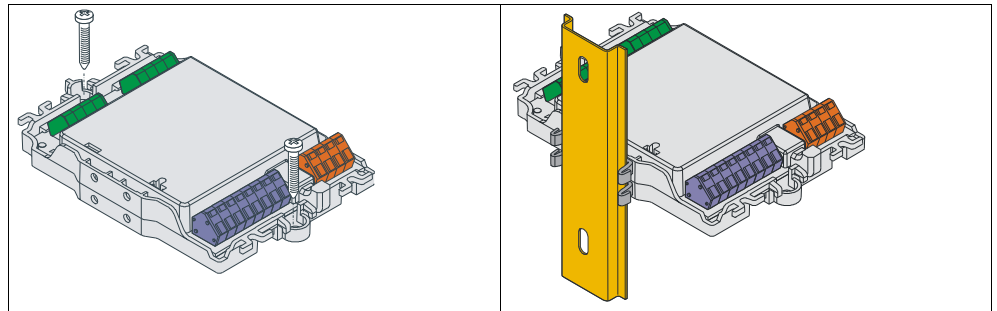


Note the positive and negative connections.

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

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

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



Installation of module without housing

5.3 Connecting the module



⚠ DANGER

Voltage levels of up to 250 V AC may occur on the module's terminals!

Danger to life through contact with live components!

- Use the housing FDCH221 if switching outputs of voltages >60 VDC (ripple <10 % of average value) or >30 VAC (peak value max. 42.4 V).
- Ensure that the cables are not supplied with voltage during installation.



Note the positive and negative connections.

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

- Connect module according to diagram in 'Circuit board view' chapter.

See also

- 📄 P.c.b. view [→ 17]
- 📄 Circuit [→ 21]

6 Commissioning

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

Conduct a performance check once commissioning is complete.

7 Maintenance / Troubleshooting

7.1 Status retrieval

The modules are equipped with the MC-Link (Maintenance and Commissioning Link).

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

For details, see Documents 007227 and 009718.

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

- Status of inputs
- Status of outputs
- Impermissible configuration
- Deviation of the line or termination resistor from the initial values
- Error list
- Status register

7.2 Function check

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

Recommendation:

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

No other special maintenance work is necessary.

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

7.3 Test mode

For service purposes, the modules can be switched to test mode. In this mode, the relays are not activated when activating the outputs. Only the LEDs are activated.

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

8 Specifications

8.1 Technical data

Detector line	Operating voltage	12 ... 33 VDC
	Operating current (quiescent):	
	● FDCI222	0.6 ... 0.75 mA
	● FDCIO222/FDCIO224	0.25 ... 0.35 mA
	Maximum current/quiescent current connection factor :	
	FDCI222	2
	FDCIO222/FDCIO224	3
	Address connection factor	1
	Separator connector factor	1
	Protocol	FDnet/C-NET
Compatibility	See 'List of compatibility'	
Line separator	Line voltage:	
	● Nominal	32 VDC (= V_{nom})
	● Minimum	12 VDC (= V_{min})
	● Maximum	33 VDC (= V_{max})
	Voltage at which the separator opens:	
	● Minimum	7.5 VDC (= $V_{SO min}$)
	● Maximum	10.5 V DC (= $V_{SO max}$)
	Permanent current when switches are closed:	Max. 0.5 A (= $I_{c max}$)
	Switching current (e.g. in the event of a short-circuit):	Max. 1 A (= $I_{s max}$)
	Leakage current when switches are open:	Max. 1 mA (= $I_{L max}$)
Serial impedance when switches are closed:	Max. 0.5 Ω (= $Z_{C max}$)	
External alarm indicators	Number of external alarm indicators that can be connected	None
Inputs	Monitoring voltage	3 V no-load
	Monitoring resistors parallel R_p / serial R_s :	●
	● FDCI222/FDCIO222	● 3.01 k Ω / 1.15 k Ω ; each +/-1 %; 0.25 W
	● FDCIO224	● 2,7 k Ω / 560 Ω ; each +/-1 %; 0.25 W
		● 3.3 k Ω / 680 Ω ; each +/-1 %; 0.25 W
Line resistance	Max. 20 Ω	

Specifications

Outputs	Max. switching performance at ohmic load at:	
	<ul style="list-style-type: none">● AC voltage● DC voltage	250 VAC; 4 A; 1000 VA 30 VDC; 4 A; 120 W
	These values do not apply for inductive or capacitive loads.	
Connections	Detector line:	
	<ul style="list-style-type: none">● Design● Cross-section	Spring clips 0.2 ... 1.5 mm ²
	Inputs and outputs:	
	<ul style="list-style-type: none">● Design● Cross-section	Spring clips 0.2 ... 1.5 mm ²
	MC link	Plug connection
Ambient conditions	Operating temperature	-25 ... +70 °C
	Storage temperature	-30 ... +75 °C
	Air humidity	≤ 95 % rel.
	Protection categories according to EN 60529/IEC 60529:	
	<ul style="list-style-type: none">● Without housing● With housing FDCH221t	IP30 IP65
	Electromagnetic compatibility:	
	<ul style="list-style-type: none">● 1 MHz ... 1 GHz● 1 GHz ... 2 GHz	50 V/m 30 V/m
Mechanical data	Dimensions (L x W x H):	
	<ul style="list-style-type: none">● Module● Housing	153 x 93 x 27 mm 207 x 119 x 48 mm
	Housing material	ABS
	Color:	
	<ul style="list-style-type: none">● Module carrier● Housing● Housing cover	~RAL 9010 pure white ~RAL 9010 pure white Transparent
	Standards	Standards
VdS approvals:		
<ul style="list-style-type: none">● FDCI222● FDCIO222● FDCIO224		G204028 G204029 G207001
LPCB approvals:		
<ul style="list-style-type: none">● FDCI222● FDCIO222		126ad/01 126ad/02

Certificates:

- FDCI222 0786-CPD-20446
- FDCIO222 0786-CPD-20447
- FDCIO224 0786-CPD-20448

CE conformity mark

Yes

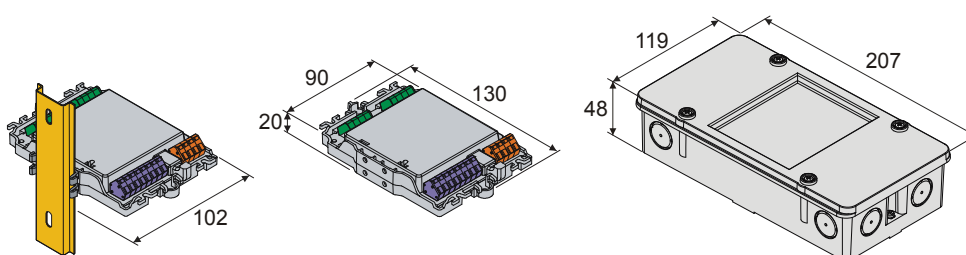
Protection categories

IEC 60529

QA Standards

- Siemens Standard SN 36350
- ISO9001
- ISO9004

8.2 Dimensions



Dimensions

8.3 Environmental compatibility

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

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

9 Appendix

9.1 Configuration sheet

Installation site	
Module	<input type="checkbox"/> Input module FDCI222 <input type="checkbox"/> Input/output module FDCIO222 <input type="checkbox"/> Input/output module FDCIO224
Mode of installation	<input type="checkbox"/> Without housing <input type="checkbox"/> With housing FDCH221
Input IN 1 monitored ...	
Input IN 2 monitored ...	
Input IN 3 monitored ...	
Input IN 4 monitored ...	
Output OUT A controls...	
Output OUT B controls...	
Output OUT C controls...	
Output OUT D controls...	

Configuration for the inputs

Parameter	Value	IN1	IN2	IN3	IN4
Type of input	Danger input	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Status input	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Input monitoring	Open line monitoring	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	short circuit and open line	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Input active, when contact is:	Open	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	closed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Filter time	Duration:	___ s	___ s	___ s	___ s

Configuration for the outputs

Parameter	Value	OUT1	OUT2	OUT3	OUT4
Output active, when contact is:	open (normally closed NC)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	closed (normally open NO)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Control monitoring	Yes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	No	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Duration of activation (without monitoring control)	Permanent	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Only for the period of:	<input type="checkbox"/> ___ s	<input type="checkbox"/> ___ s	<input type="checkbox"/> ___ s	<input type="checkbox"/> ___ s
Behavior in case of fault	Control remains the same as in normal operation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Control is activated	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Control is deactivated	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Function 'Degraded mode horn'	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

10 Index

- C**
- Circuit board view
 - Connection diagram, 30*
 - Collective behavior
 - Degraded mode operation, 22*
 - Compatibility, 24
 - Compatibility with control panels, 24
 - Configuration sheet, 26, 36
 - Connection diagram
 - Circuit board view, 30*
 - Control panel, 31
- D**
- Degraded mode operation
 - Collective behavior, 22*
 - Failure of fire control panel, 21*
 - Detector exchanger and tester
 - Diagnosis levels, 21*
 - Detector exchanger and tester FDUD292
 - MC link, 32*
 - Diagnosis levels
 - Detector exchanger and tester, 21*
 - Intelligent detector tester, 21*
- F**
- Failure of fire control panel
 - Degraded mode operation, 21*
 - Fault messages, 21
 - Field of application
 - Ambient conditions, 27*
- I**
- Influence
 - Chemicals, 27*
 - Humidity, 27*
 - Temperature, 27*
 - Intelligent detector tester
 - Diagnosis levels, 21*
 - Intelligent detector tester FDUD293
 - MC link, 32*
 - Interface
 - MC link, 32*
- L**
- List of compatibility, 7, 22, 24
- M**
- Maintenance intervals, 32
 - MC link, 32
 - Detector exchanger and tester FDUD292, 32*
 - Intelligent detector tester FDUD293, 32*

Issued by
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