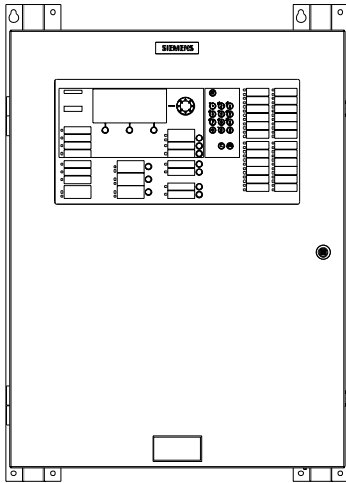


SIEMENS



FC2025 / FC2050 / FC922 / FC924

Fire Alarm Control Panel

Marine Application

US COAST GUARD Approved

Certificate No. 161.002/60/0

Reference ULI File No. S522



U. S. Department of Homeland Security United States Coast Guard Certificate of Approval

Coast Guard Approval Number: 161.002/60/0

Expires: 19 February 2021

FIRE PROTECTIVE SYSTEM

SIEMENS INDUSTRY, INC.
8 FERNWOOD DRIVE
FLORHAM PARK NJ 07932

Desigo Fire Safety and Cerberus PRO

Consisting of control panels, initiating devices, notification devices, and accessories identified in Approved Component List which is identified below.

IDENTIFYING DATA:

Siemens manual: FC2025/FC2050/FC922/FC924 Fire Alarm Control Panel Marine Application, Document A6V10519176_enUS_a.

Approved Component List: Section 28, Equipment Lists for Marine Application, on pages 128 through 131 of the manual identified above.

TEST REPORTS: Retlif Testing Laboratories reports: ? R-14750-1 dated September 13, 2013, ? R-14750-2 dated September 13, 2013, ? R-14954-1 dated November 21, 2014, ? 14954-2 dated November 21, 2014, and ? R-15769 dated December 17, 2015.

May not be installed in locations requiring an exceptional degree of protection, such as location exposed to weather, seas, splashing, pressure-directed liquids, or similar moisture conditions. These locations include locations within a galley or pantry area, laundry, or water closet which contains a shower or bath; on deck; machinery spaces; cargo spaces; and other spaces with similar environmental conditions.

The system must be installed and configured in accordance with Subpart 161.002 and Subchapter J of Title 46 of the U.S. Code of Federal Regulations, and with the 1993 or later version of NFPA 72. This is in addition to any other requirements specific to the vessel and its route. Only those components listed on the approved component list may be used.

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THIS IS TO CERTIFY THAT the above named manufacturer has submitted to the undersigned satisfactory evidence that the item specified herein complies with the applicable laws and regulations as outlined on the reverse side of this Certificate, and approval is hereby given. This approval shall be in effect until the expiration date hereon unless sooner canceled or suspended by proper authority.



GIVEN UNDER MY HAND THIS 19TH DAY OF
FEBRUARY 2016, AT WASHINGTON D.C.

B. A. BALDWIN
Chief, Lifesaving and Fire Safety Division
BY DIRECTION OF THE COMMANDANT

DEPT. OF HOMELAND SECURITY, USCG, CGHQ -10030
(REV. 3-03)

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The approval holder is responsible for making sure that the required inspections or tests of materials or devices covered by this approval are carried out during production as prescribed in the applicable regulations.

The approval of the item covered by this certificate is valid only so long as the item is manufactured in conformance with the details of the approved drawings, specifications, or other data referred to. No modification in the approved design, construction, or materials is to be adopted until the modification has been presented for consideration by the Commandant and confirmation received that the proposed alteration is acceptable.

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For additional information on building technology security and our offerings, contact your Siemens sales or project department. We strongly recommend customers to follow our security advisories, which provide information on the latest security threats, patches and other mitigation measures.

<http://www.siemens.com/cert/en/cert-security-advisories.htm>

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1 About this document

Goal and purpose

This document describes how to install the FS20 Marine panels and the components of the fire detection system. This document contains lists and descriptions of the hardware components that are necessary for the FS20 Fire Alarm Control Panel for Marine Application and list of reference documentations to configure and commission the system for this application.

Minimum Requirement to Access the FS20 documents

- Computer with high speed internet connection
- Microsoft Explorer 7.0 or higher (or equivalent browser)
- Adobe Reader (<http://www.adobe.com>)

If you cannot meet these requirements, please contact Siemens Technical Support at 1-800-xxx-xxxx to request hard copies of the installation guidelines.

1.1 Desigo Fire Safety User Documentation

To access the Desigo Fire system user documentations, go to Siemens website:

<http://iknow.us009.siemens.net/infolink/InfoLink.aspx?page=/infolink/Default.htm>.

Enter the appropriate document number in the “Search” dialog box (see below) to access then press “Find”.



Select the appropriate document by double-clicking it. It is recommended to save these documents in your computer for future access. Select the “Save” button to store the document in your computer.

Table 1: Desigo Fire Safety - User Documentation Description *

Document Description	Doc Number	Description
FS20 System Description	A6V10315009	Overview of the FS20 System structures and function
FS20 Planning	A6V10315013	Provide information on project planning for the system and individual devices
FS20 Mounting, Installation, Product Data	A6V10315015	Provide HW reference document. This contains the wiring connection, electrical rating, module setting and compatible accessories for each individual module. Provides detailed description on how each module is installed in the enclosure and how internal and external wiring are routed. *
FS20 Commissioning, Maintenance, Troubleshooting	A6V10315021	Provides instructions for commissioning, maintenance and troubleshooting of the whole fire detection system.
FS20 Configuration	A6V10315023	Provides instructions how to use the Desigo Works Configuration Tool to configure and program the system.
FC20xx Operation Manual	A6V10315017	Provides the detailed operating instruction of the system after it has been configured.
FC2025 / FC2050 Installation Instructions	A6V10337045	Provides a summary and overview of the FS20 Fire Alarm Control Panel.

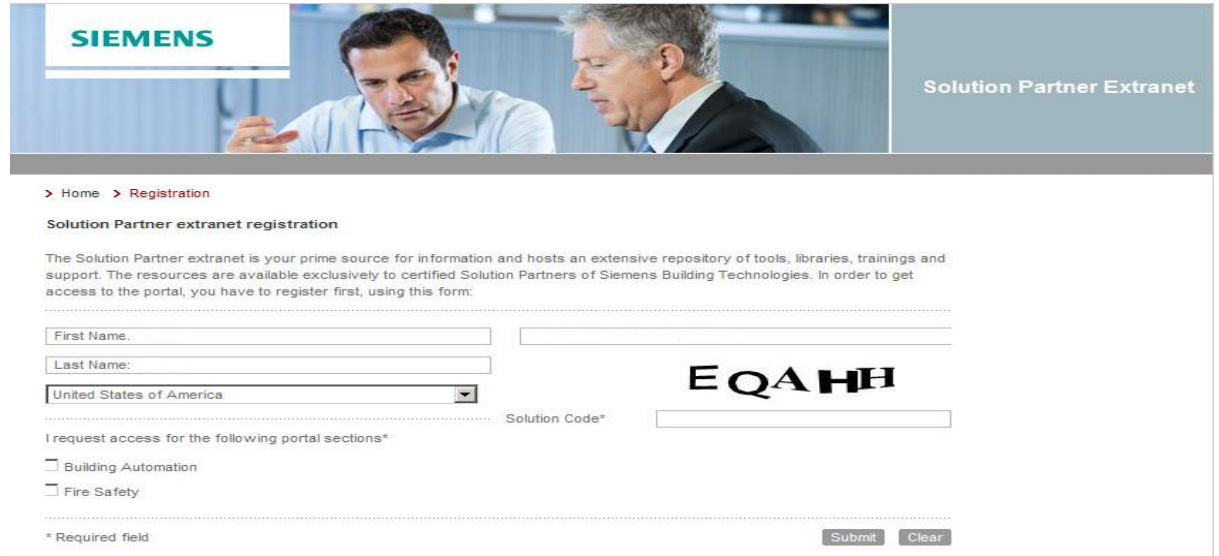
(*) – Note that only the modules / devices / appliances listed in this manual can be used for Marine Application

1.2 Cerberus-PRO User Documentation

To access the Desigo Fire system user documentations, go to Siemens website:

<https://www.buildingtechnologies.siemens.com/extranet/ba-sp/>

Enter the appropriate document number in the “Search” dialog box (see below) to access then press “Find”.



The screenshot shows the Siemens Solution Partner Extranet registration page. The header includes the Siemens logo and the text 'Solution Partner Extranet'. The main content area is titled 'Solution Partner extranet registration' and contains a registration form. The form includes fields for 'First Name', 'Last Name', and a dropdown menu for 'Country' (currently set to 'United States of America'). There is also a 'Solution Code*' field. Below these fields, there are checkboxes for 'Building Automation' and 'Fire Safety'. At the bottom of the form, there is a 'Submit' button and a 'Clear' button. A note at the bottom left states '* Required field'.

Select the appropriate document by double-clicking it. It is recommended to save these documents in your computer for future access. Select the “Save” button to store the document in your computer.

Table 2: Cerberus Pro User Documentation Description*

Document Description	Doc Number	Description
FS20 System Description	A6V10333401	Overview of the FS20 System structures and function
FS20 Planning	A6V10333396	Provide information on project planning for the system and individual devices
FS20 Mounting, Installation, Product Data	A6V10333409	Provide HW reference document. This contains the wiring connection, electrical rating, module setting and compatible accessories for each individual module. Provides detailed description on how each module is installed in the enclosure and how internal and external wiring are routed. *
FS20 Commissioning, Maintenance, Troubleshooting	A6V10333434	Provides instructions for commissioning, maintenance and troubleshooting of the whole fire detection system.
FS20 Configuration	A6V10333423	Provides instructions how to use the Desigo Works Configuration Tool to configure and program the system.
FC922/FC924 Operation Manual	A6V10333380	Provides the detailed operating instruction of the system after it has been configured.
FC922/FC924 Installation Instructions	A6V10356958	Provides a summary and overview of the FS20 Fire Alarm Control Panel.


2 Safety

2.1 Safety instructions

Observe the safety notices 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

The following symbols indicate general dangers, the type of danger or possible consequences, measures and prohibitions, an examples of each symbol is displayed:

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


Risk of Injury Is Presented

Information about the risk of injury is displayed:

	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 displayed:


	NOTICE
	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 United States Coast Guard 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 <ul style="list-style-type: none"> Work on electrical installations must be carried out by certified electricians or by instructed persons working under the guidance and supervision of a certified electrician, in accordance with the electrotechnical regulations.

Disconnect products from the power supply when carrying out commissioning, maintenance or repair work on them.

Lock volt-free areas to prevent them being switch on again by mistake.

Label the connection terminals with external voltage using a 'DANGER External voltage' sign.

Route mains connections to products separately and fuse them with their own, clearly marked fuse.

Fit an easily accessible disconnecting device in accordance with IEC 60950-1 outside the installation.

Produce earthing as stated in local safety regulations.

Assembly, Installation, Commissioning and Maintenance

If additional tools are required, such as a ladder, they must be safe and used as intended.

When starting the fire control panel ensure that unstable conditions cannot arise.

Ensure that all points listed in the 'Testing the Product Operability' section are observed.

Only set controls to normal function when the product operability is completely tested and the system is handed to the customer.

Testing the Product Operability

Prevent the remote transmission from triggering inappropriately.

If testing building installations or activating devices from third-party companies, you must collaborate with the appointed people.

The activation of fire control installations for test purposes must not cause injury to anyone or damage to the building installations. The following instructions must be observed:

- Use the correct potential for activation; this is generally the potential of the building installation.
- 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 being produced.

Before testing the remote transmission, inform the people that will receive the corresponding alarms.

Modifications to the System Layout and Products

Modifications to the system and to individual products may lead to troubles, malfunctioning and safety risks. Written confirmation must be obtained from Siemens and the corresponding safety people 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

Siemens products are tested before delivery 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 this 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

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

2.4 FCC Statement

	WARNING
	<p>Installation and usage of equipment is not in accordance with instructions manual</p> <p>Radiation of radio frequency energy Interference to radio communications</p> <ul style="list-style-type: none"> • Install and use equipment in accordance with instructions manual. • Read the following information.



The equipment generates, uses, and can radiate radio frequency energy, if not installed and used in accordance with the instructions manual, may cause interference to radio communications.

It has been tested and found to comply with the limits for a Class A computing device pursuant to Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment.

Operation of this equipment in a residential area is likely to cause interference in which case the user at their expense will be required to take whatever measures may be required to correct the interference.

2.5 Release Notes

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

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

3 Description of FS20 Fire Alarm Control Panel

3.1 Introduction

The FS20 system is a life safety system that is modular, networkable fire detection systems that can consist of FC2025/FC922 and/or FC2050/FC924 Fire Alarm Control Panel (FACP). It comprises of all the components required for the detection, evaluation and annunciation of life safety event such as fire and smoke condition. By using optional modules, copper wiring cables can be used to network the panels together.

The FC2025 / FC922 FACP is capable of supporting up to 252 devices and FC2050/FC924 FACP is capable of supporting up to 504 devices. Both panels have a PMI with optional LED module, 2 Class B or 1 Class A NAC, 4 control relays, battery charger capability and auxiliary power connection. Both panels support a DACT capability, connection to Remote Annunciator and Releasing Application as optional features. All panels use 170W power supply and EMI filter with terminal block that comes with the FH2071-UM enclosure.

For Marine Application, FH2071-UM enclosure was designed specifically for marine application with built-in shock mounting is used to be able to absorb vibration and comes with seismic battery bracket.

3.2 Minimum panel requirement for Marine Application

The HW list below is minimum required for FS20 panel for Marine Application:

- FH20710UM Marine Enclosure: this comes with pre-installed shock mounting plate, EMI filter, battery bracket, Terminal block and outer door with built-in water-tight plexiglass.
- FP2011-U1 170W Power Supply
- FHD2004-U1 Inner Door (for operating unit)
- FCM2018 –U2/U3 (or FC2019-U2/U3) Operating unit
- FCI2016-U1 (or FCI2017-U1) Periboard
- BP-62 16AHr Battery Set for Marine Application

3.3 Equipment Location

The FC2025 / FC2050 system must not be installed in location that requires an exceptional degree of protection such as those that are exposed to weather, sea, splashing, pressure-directed liquids or similar moisture conditions, such as:

- On deck
- machinery spaces
- cargo spaces
- location within a gallery or pantry area, laundry or water closet which contains a shower or bath
- spaces with similar environment conditions

3.4 Software and Configuration

The FS20 system utilizes a complex software system that incorporates multitasking operation that allows its microprocessors to handle many tasks in an efficient manner. This allows the panel to supervise the overall system integrity during its normal operation to detect wiring faults, communication errors, bad initiating devices in addition to detecting and annunciating life safety events.

Prior to its normal operation, the panels must be configured according to perform its intended tasks and must be tested/commissioned accordingly to verify proper operation. For detailed configuration steps, please refer to FS20 Configuration manual, Document ID A6V10315023 for Desigo and Document ID A6V10333423 for Cerberus Pro.

For detailed testing and commission methods , please refer to FS20 Commissioning, Maintenance, Troubleshooting manual, Document ID A6V10315021 for Desigo and Document ID A6V10333434 for Cerberus Pro.

4 Planning a Fire Detection System

When planning a fire detection system, select a detector based on the type of fires expected. Consider the type and quantity of fuel, possible ignition sources, ranges of ambient conditions, and the value of the property to be protected.

In general, heat detectors have the lowest cost and false alarm rate, but are the slowest to respond. Since the heat generated by small fires tends to dissipate rapidly, heat detectors are best used to protect confined spaces, or directly over hazards where flaming fires can be expected. Usually they are installed on a grid pattern at their recommended spacing distances or at reduced spacing for faster response. The operating temperature of a heat detector should be at least 25°F above the maximum expected ambient temperature in the area protected.

Smoke detectors cost more than heat detectors, but respond faster to fires. They are better suited to protect large open spaces than heat detectors because smoke does not dissipate as rapidly as heat does in the same size space. Smoke detectors are either installed according to prevailing air current conditions or on a grid layout.

Photoelectric smoke detectors are best used in places where wire insulation or other smoldering fires can be expected.

NFPA Standard 72 Chapter 5 has more specific information on the installation of the various types of detectors.

4.1 Detector Application

In view of the problems that can be expected with the misapplication and location of detection devices aboard a ship, the following guidelines are recommended when designing a system.

The table below list situation where smoke detectors should be avoided.

Moisture:

Salt water spray	Steam tables	Heat treating	Sawing, drilling and grinding
Corrosive atmospheres	Humid outside air	Dust or lint	Water spray
Excessive tobacco smoke	Humidifiers	Pneumatic transport	
	Live Steam	Slop sinks, Showers	

Combusting Products and Fumes:

Cooking equipment	Metal cutting	Chemical Fumes	Engines not vented outside
Ovens	Machining	Cleaning fluids	Heating element
Dryers	Paint spray	Gasoline forklifts	Improper exhaust systems
Exhaust hoods	Curing	Welding and brazing	Incomplete combustion
Diesel trucks	Engine exhaust	Dust accumulation	Locomotives

4.2 Intelligent/Analog Detectors

NOTE: Do not install FS20 Detectors in cargo holds and Roll On / Roll Off (RO/RO) spaces.

Areas to Protect:

- **ACCOMMODATION SPACES (PHOTO)**
Halls, dining rooms, lounges, and areas of this type with permanent walls, corridors, sanitation facilities, cabins, offices, infirmaries, and leisure rooms not containing cooking appliances
- **SERVICE AREA (PHOTO, HEAT)**
Service cabinets, radio rooms, strong rooms, stores, workshops other than machinery spaces, and similar area, including and not limited to shafts going to them, as well as life-vest storage area
- **SPECIAL AREAS (PHOTO, HEAT)** Closed areas for transport of special materials
- **SAFETY STATIONS (PHOTO, HEAT)**
Area housing the radio equipment, major navigation equipment, standby generator and central installation
- **MACHINERY SPACES (PHOTO, HEAT)**
Areas housing the propulsion unit, boilers, liquid-fuel handling units, stabilization equipment, ventilation and air conditioning equipment, and similar areas, including the shafts running to them

Due to the irregular shape of most machinery spaces and the strong air currents present, the number and type of detectors used cannot be based on the area protected, as is in the common practice on land-based installations and ship accommodation spaces.

The best design approach is to pick out all potential fire outbreak areas and place a fire detector above each of them at deck level. Areas of potential fire risk include the following:

Auxiliary boiler front	Fuel oil purifiers
Main boiler front	Lubricating oil purifiers
Fuel oil pressure pumps	Fuel oil transfer pumps
Auxiliary generator sets	Workshops
Main diesel engine fuel oil pumps and injectors	Electrical switchboards
	Storerooms

Locate additional detectors with wide spacing to give general cover to areas not containing special risk.

4.3 Detector Installation

Once the detector is selected, the next step is to consider the space that requires protection.

Spot-Type Detectors are usually located on the ceiling or sidewall with the edge of the detector located no closer than four inches from the wall or ceiling. When **Heat Detectors** are installed at their listed spacing, detection times are approximately equivalent to the operating time of standard 165°F link-and-lever sprinklers. If faster response is desired, reduce detector spacing. Also, where ceiling heights exceed 16 feet, or where ceiling construction is not smooth, reduce detector spacing accordingly. Specific information on the treatment of joisted, beamed, and sloped ceilings can be located in Chapter 5 of NFPA (2002 Edition).

When installing any type of heat detector, consideration should be given to sources of heat within the protected space that can cause false alarms. For example, locate heat detectors away from unit heaters and ovens where surges of hot air might be expected.

The installation of **Smoke Detectors** is more critical than for heat detectors because smoke transport is strongly influenced by the convective airflow patterns within the protected area. For this reason, smoke detectors are not assigned a listed spacing by the testing laboratories other than maximum area coverage of 900 square feet per detector. Although a grid pattern can be used as a starting point, care must be taken to locate the heating supply registers and return air registers.

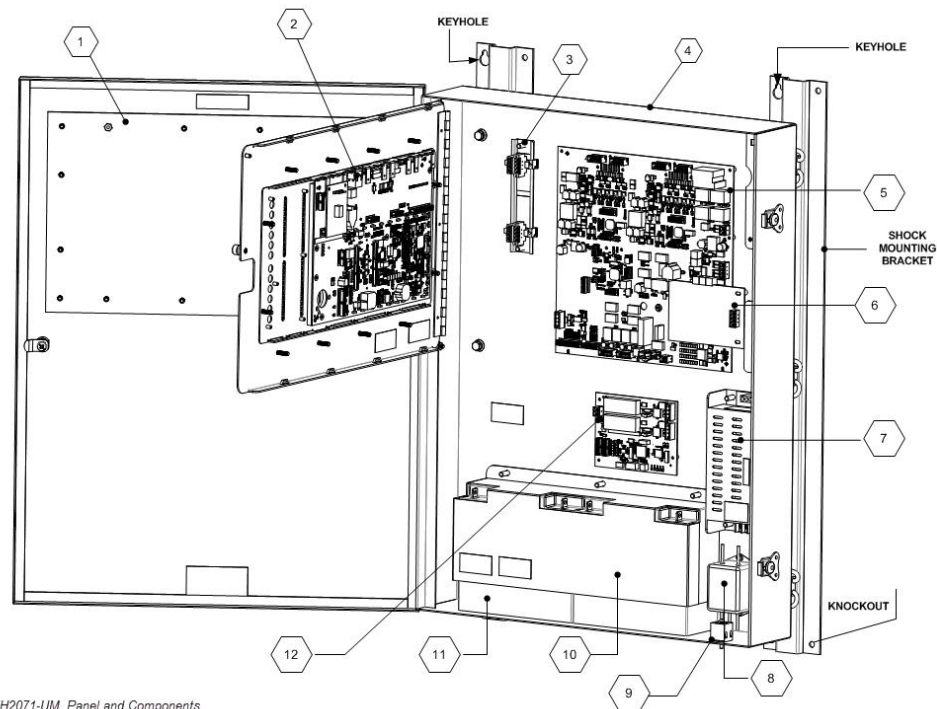
Smoke detectors should be located away from turbulence caused by hot air outlets. The location of the smoke detectors should favor return air because the return air draws smoke toward the detector and because air velocity at the return tends to be lower.

Smoke stratification also should be considered when smoke detectors are installed. Smoke may stratify below a ceiling due to temperature gradients or air flow along the ceiling. When stratification is a possibility, smoke detectors can be installed with alternate detectors at different levels.

5 Standard Structure of FS20 Panel

This section describes a typical view of the FS20 FACP for Marine Application.

The model FH2071-UM enclosure is used to house all system modules that are approved by the U.S. Coast Guard. The enclosure is shipped with shock mounting brackets already in place. A US Coast Guard approval nameplate is positioned on the front door of the enclosure for authentication at the time of installation.

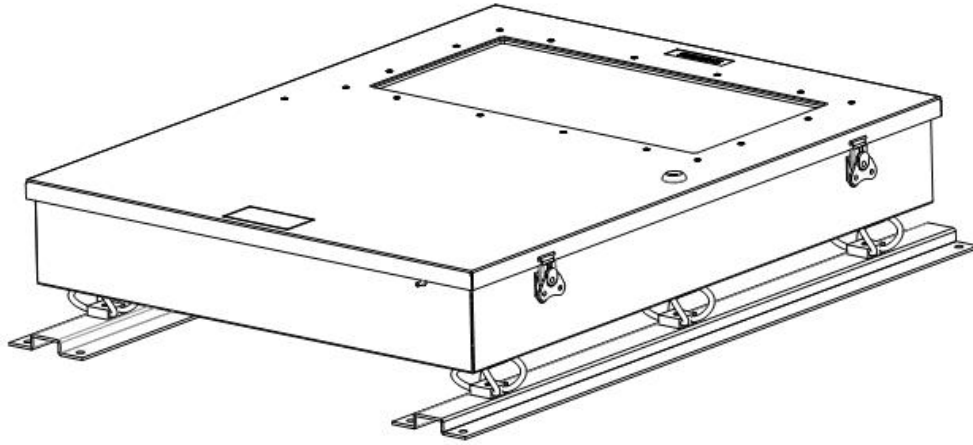


FH2071-UM Panel and Components

- | | | | |
|---|---|----|-----------------------------|
| 1 | FH2071-UM Outer Door | 7 | FP2011-U1 Power Supply 170W |
| 2 | FCM2018-U2 Standard Operating Unit (Desigo) | 8 | EMI Filter |
| | FCM2018-U3 Standard Operating Unit (Cerberus Pro) | | |
| 3 | FHA2031-U1 DIN Rail | 9 | AC Power Terminal Block |
| 4 | FH2071-UM Backbox enclosure | 10 | Battery Bracket |
| 5 | FCI2016-U1 / FCI2017-U1 Periboard | 11 | BP62 Battery* |
| 6 | XCI-2001-U1 Releasing Module | 12 | FCA2015-U1 DACT module |

* Marine panels must use the BP62 battery to withstand high temperatures of 195°F.

5.1 FH2071-UM Marine Enclosure



FS20 Fire Control Panel for Marine Application

The FH2071-UM Marine Enclosure is specifically designed for Marine Application. It comes built and installed in shock-mounting plate and has a tight-locking seal to close the unit. This allows the electronics therein to protect from exposure to harsh marine environment. In addition, this enclosure has the following equipment installed:

- EMI Filter
- AC Power terminal block
- Seismic Battery bracket

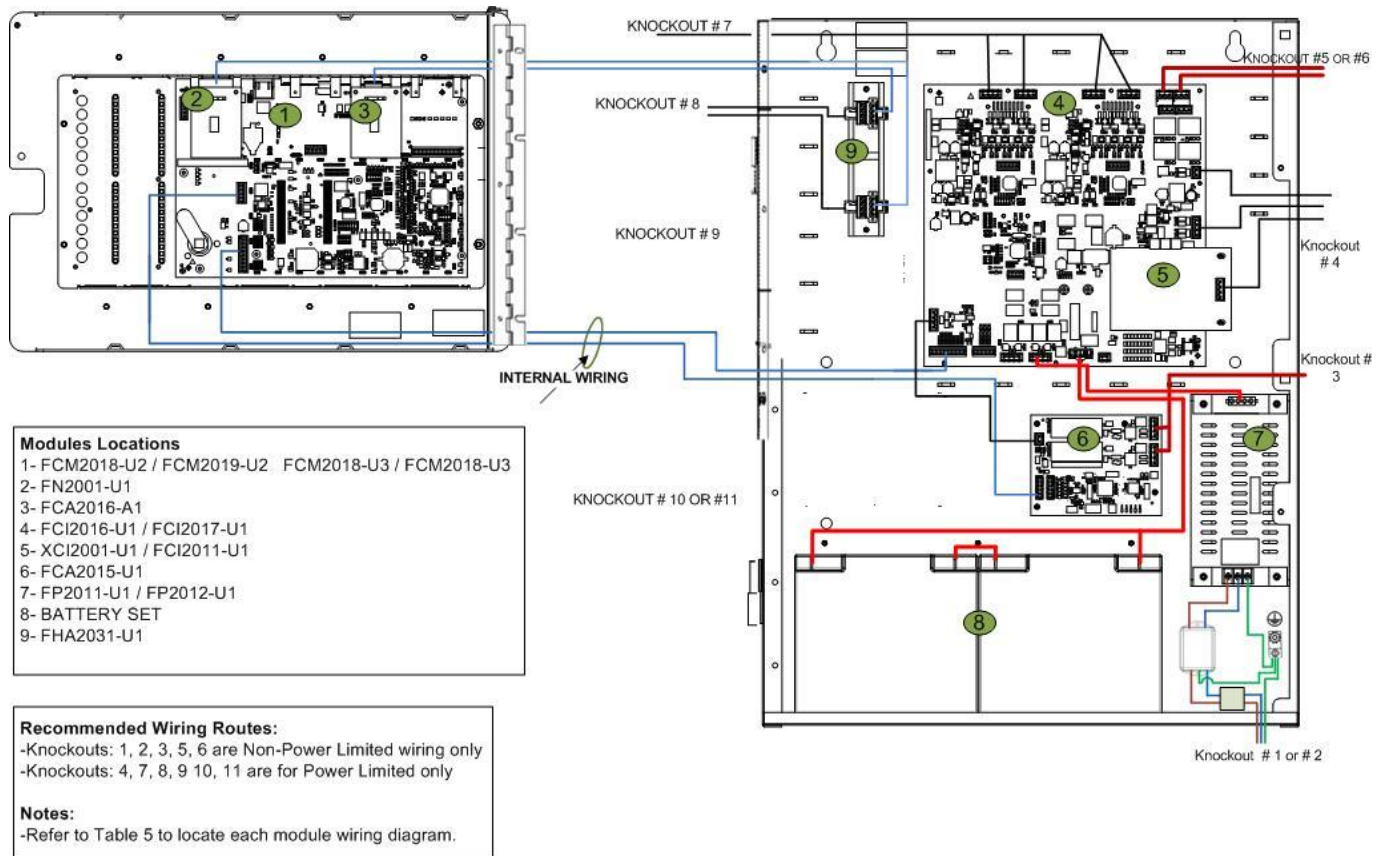
The enclosure will house the control panels, extensions, additional extensions and/or option components. The enclosure has the following features:

- Opening for cable supplies
- Protected room for installed components
- Access to the components through closable door
- Variable use through various doors
- Four-point wall fastening

Table 3: FH2071-U1 Technical Data

Outer door	Enclosure material	Sheet metal 0.062"
	Surface treatment	Galvanized, annealed
Inner door	Enclosure material	Sheet metal 0.062"
	Surface treatment	Galvanized, outside annealed
Back box	Enclosure material	Sheet metal 0.062"
	Surface treatment	Galvanized, sprayed
Windows	Material	Lexan, clear
Dimensions (W- H- D)	Outer door (1HU)	15.5" x 21.45" x 0.97"
	Inner door	20.62" x 13.25" x 0.68"
	Window	16.50" x 8.30" x 0.125"

Power Limited and Non-Power Limited Wire Routing



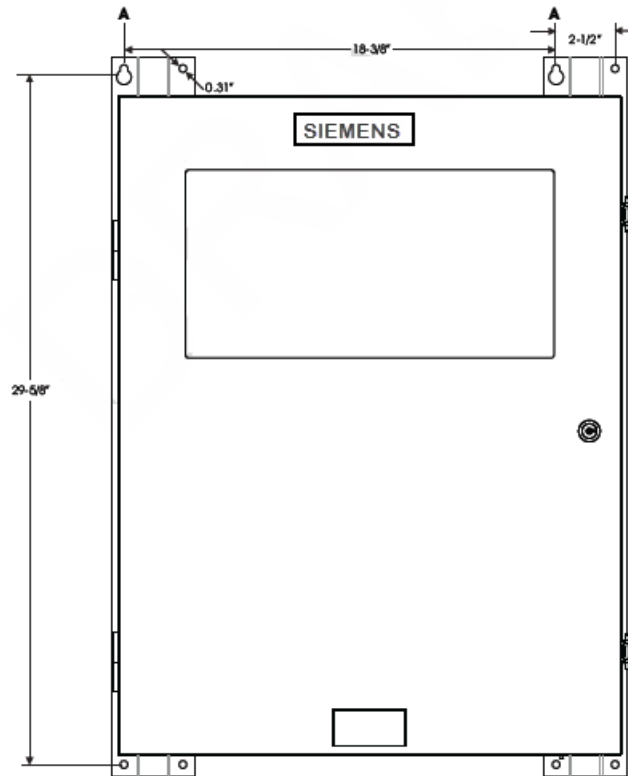
5.2 Installation

The Enclosure kit model FH2071-UM for use in 'Coast Guard' installation is shipped as a complete package. When mounting the enclosure, consider the following:

Mounting height for visual and manual access to the keyboard/annunciator

Weight and size of enclosure (10 lbs, 22" W x 6 ⁵/₁₆ D x 30 ⁵/₈ H)

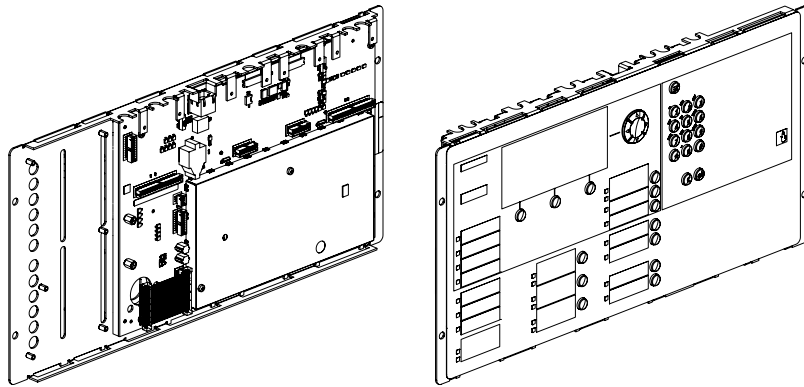
Local mounting access



FH2071-UM Enclosure

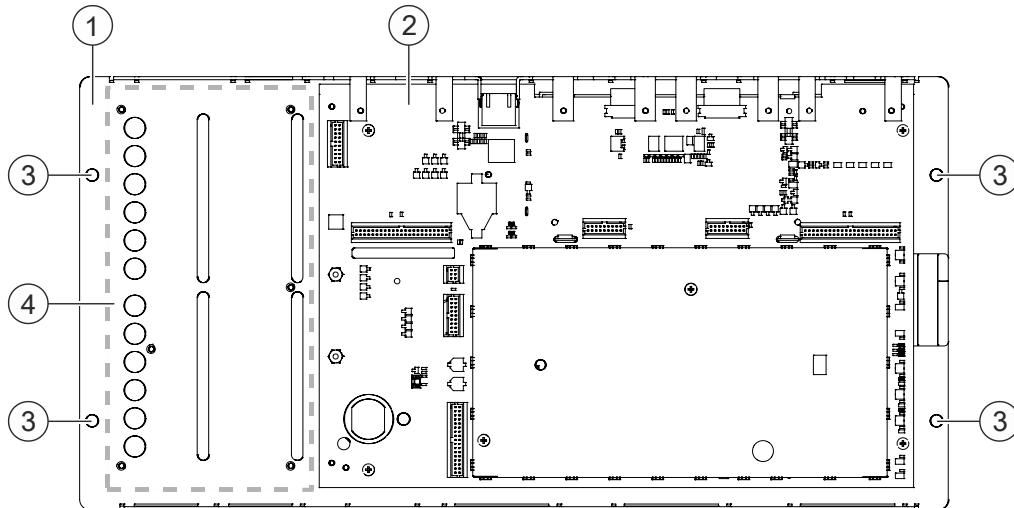
1. Hold the empty enclosure against the wall at a height that provides easy access.
2. Mark drill points on the wall in the center of the two keyholes slots (mark A in FH2071-UM Enclosure image) on the upper rail that are attached to the enclosure.
3. Drill the two holes. Screw in the top bolts (user supplied), leaving a small gap between the wall and each top bolt.
4. Mount the enclosure/rail assembled on the two bolts.
5. Mark drill points on the wall for remaining six holes in the rails. Drill the holes.
6. Install bolts in the remaining two holes in the top rail and four holes in the bottom rails. Tighten all bolts securely.
7. Install the BP62 battery set in the enclosure; first remove the 33AH battery bracket (FHA2032-U1) from the bottom left hand corner of the enclosure by removing the three nuts and washers. Place the nuts and washers on the side. Install the battery. Replace the battery bracket and secure it in place with the three nuts and washers. For further details on installing the batteries, refer to page 44, 'Batteries FHA2042'.

6 FCM2018-U2 / FCM2019-U2 / FCM2018-U3 / FCM2019-U3, Operating Units



View of FCM2018 operating unit

The operating unit is Person Machine Interface (PMI) of the FS20 Panel. It is installed on upper portion of the cabinet. An optional cover plate (FHD2005-U1) can be installed in the lower portion of the cabinet.



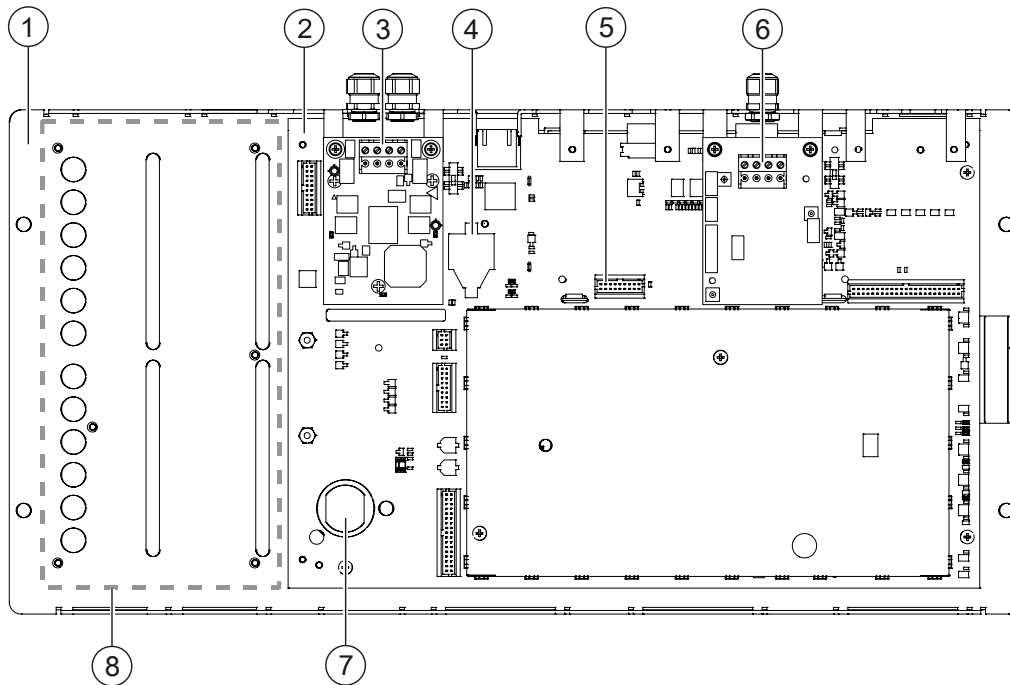
Rear view of operating unit FCM2018 with Operating Unit & its Mainboard FCM2027

- 1 Operating unit carrier plate
- 2 System Operating Units & Mainboard FCM2027
- 3 Mounting holes for installing on the inner door
- 4 Space for LED module for operating unit (+LED) FCM2019-U2

Supplied Installation Material

- 4x Screws for securing the operating unit
- 1x Ribbon cable for the connection of the Operating Unit & Mainboard to the periphery board
- 1x Inscription set or inscription sheet for operating unit.

6.1 Components on the Standard Operating Unit (FCM2018-U1)



- 1 Carrier plate for Operating Unit & Mainboard
- 2 Standard Operating Unit & Mainboard FCM2027-U1
- 3 FN2001-U1 Network module (SAFEDLINK) on X13
- 4 Retainer for license key (NOT USED)
- 5 X14, additional space for RS-485 class A module FCA2016-U1
- 6 RS-485 class A module FCA2016-U1 on X19
- 7 Opening for key switch [NOT USED]
- 8 Area for options or LED module for operating unit (LED)

6.2 Description

The operating unit is installed in the FCM2018-U2/U3 operating unit with control and display elements.

Properties

- Ground fault supervision for system supply
- Integrate real time clock: Maintains the time function up to two days in the event of power failure
- Shield plate
- Interface to the periphery board
- Slot for a network module (SAFEDLINK) with full functionality
- Ethernet connection for maintenance PC
- Slots for serial options:
 - RS-485 class 'A' module for connecting additional devices, external printer or FT2015
- Peripheral data bus connection for LED module
- Retainer for the license key

The Standard Operating Unit has the following features:

- Graphic-compatible display, 8 lines
- Buzzer
- Configurable LED indicators
- Operating buttons
- Inscription strips for sliding in
- Operation can be released with a password or key switch (optional)

Additional Functions of the Operating Unit:

- 24-zone indicator with LEDs
- bi-colored LED per zone (red/green)
- yellow LED per zone
- indication of any events

Document References

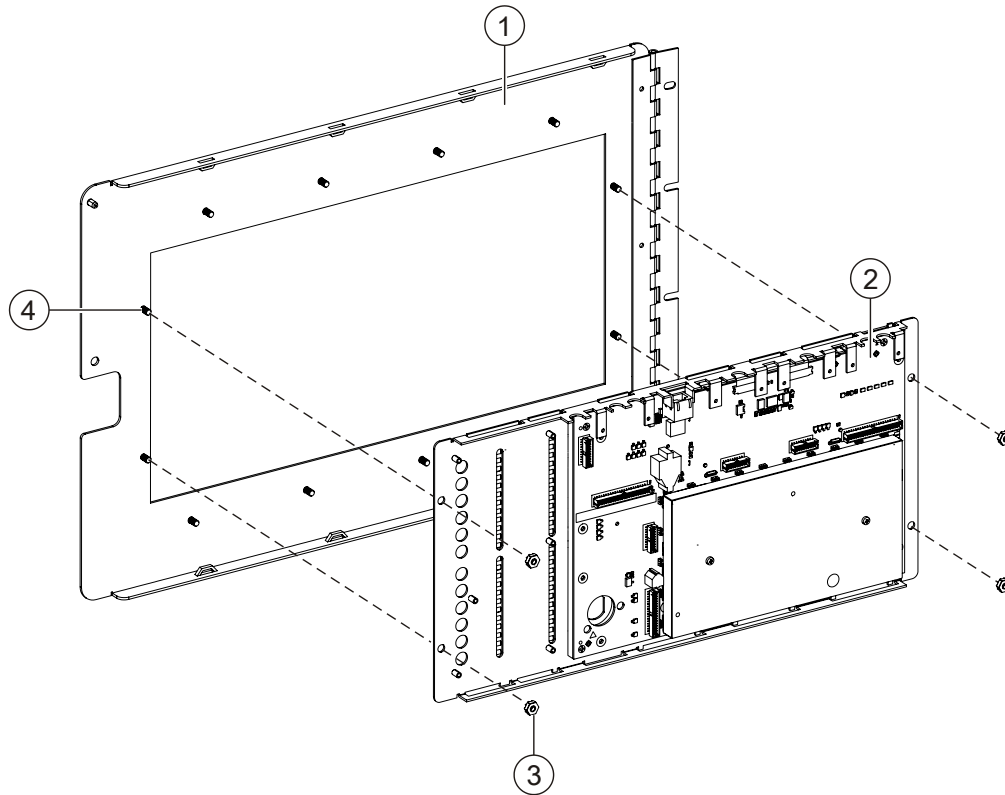
The templates for the inscription strips and the operating instructions with button and LED designations are located in the Appendix on page 134.

For further information about the LED Module, refer to the chapter 'LED Module [→76]'.

6.3 Mounting the Operating Unit

The operating unit has an option to be installed on the outer door in place of the clear glass window.

INSTALLING THE OPERATING UNIT



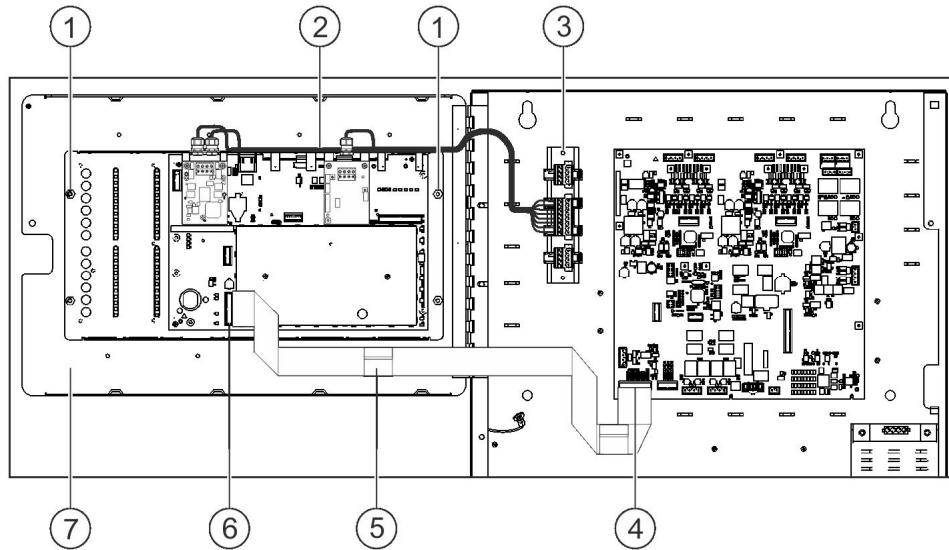
Installing the operating unit on the inner door (rear view)

- 1 Inner door with window FHD2004-U1
- 2 Operating unit FCM2018/FCM2019-U2/U3
- 3 4x fixing nut for operating unit
- 4 4x set screw for operating unit (welded)

Installation Steps

1. Plug the operating unit (2) onto the set screws (4) of the inner door (1) from behind, as shown above.
2. Use the four nuts (3) to screw the operating unit tight.

6.4 Wiring the Operating Unit



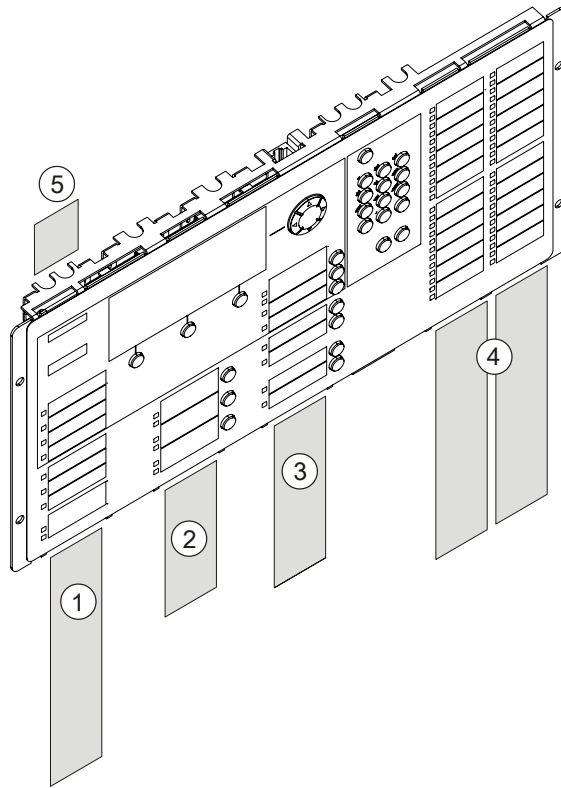
Wiring the FCM2018 operating unit (inside view)

- 1 Screw fastenings of operating unit
- 2 Wiring to modules of operating unit
- 3 DIN Rail kit FHA2031-U1
- 4 Periphery bus connection on periphery board (X201)
- 5 Ribbon cable fixing with cable support
- 6 Peripheral data bus connection on Operating Units & Mainboard (X3)
- 7 Inner door with FCM2018 operating unit

Wiring

1. Insert the connection cable to the periphery board into the intended slots (4 and 6).
2. Stick the supplied cable supports (5) into the panel as shown and fix the flat cable.
3. Guide the cables for the operating unit modules (2) to the DIN Rail set (3) as shown and fix these cables with cable ties.
4. Insert the supplied inscription strips underneath the operating unit film as shown in the following figure.
5. Swivel the inner door towards the panel and secure it using the locking screw.

6.5 Inserting the Inscription Strips



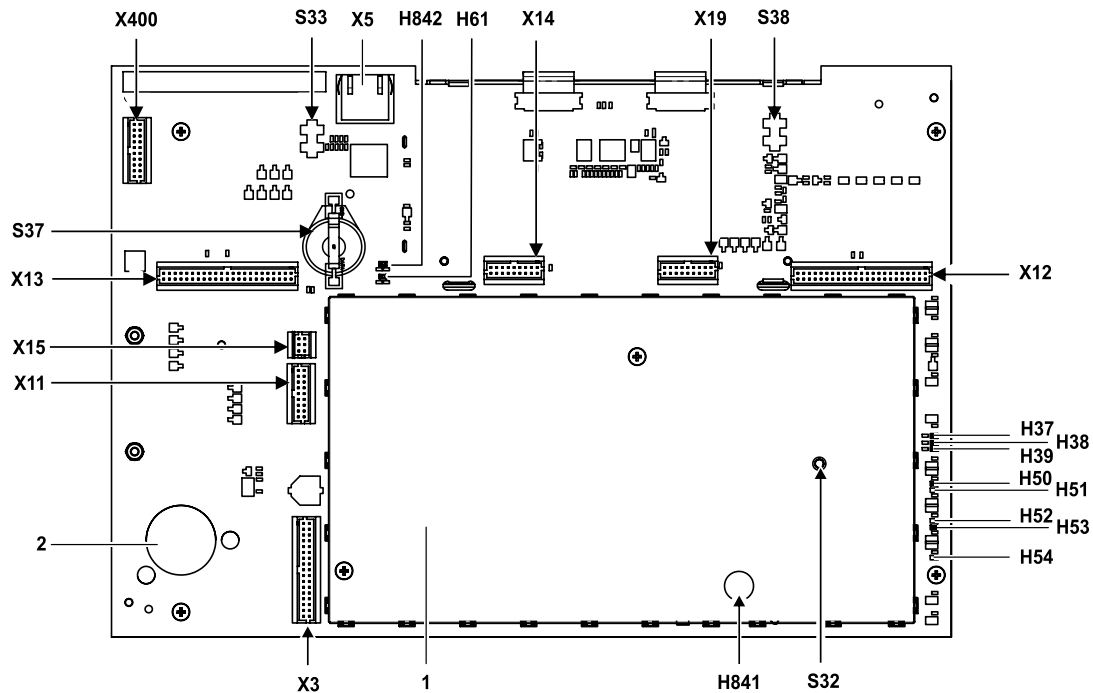
Inserting the inscription strips into the operating unit

- 1 Inscription LEDs
- 2 Inscription for the standard keys in the center
- 3 Inscription for standard keys on the right
- 4 Inscription for LED module (depending on whether operating unit is present or not)
- 5 Inscription for panel and alarm



The template for the inscription strips is located in the Appendix on page 134.

6.6 View of Operating Unit & Main Board



Equipment for Operating Unit & Mainboard FCM2027

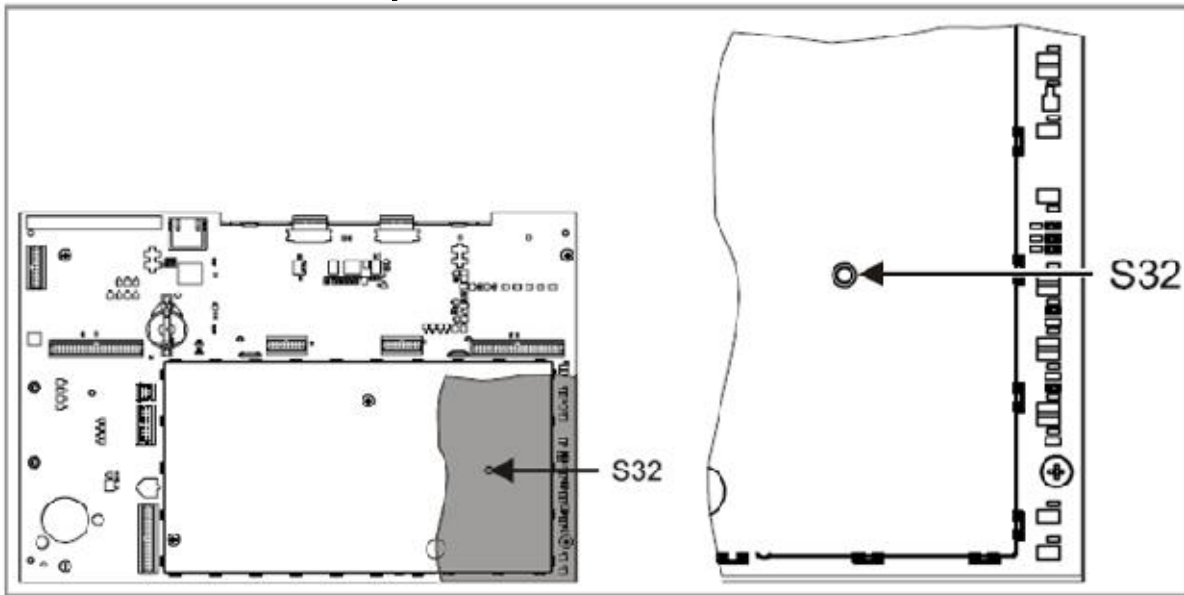
Element	Des.	Function
Position	1	Shield plate
	2	Space for key switch (T45)
Plug connections	X3	Connection for periphery board or fire terminal board (supply and data signals)
	X5	Ethernet connection
	X11	Not used
	X12	Not Used
	X13	Slot for network module (SAFEDLINK) FN2001-U1
	X14	Slot for RS-485 class A module (isolated) FCA2016-U1
	X15	Not used
	X19	Slot for RS-485 class A module (isolated) FCA2016-U1
	X400	Connection for peripheral data bus
Indicators	H37-H39, H50-H54, H61 & H842	LED indicators
	H841	Buzzer
Switch, keys	S32	Reset key
	S33	Switch for ground fault supervision of the Ethernet connection
	S37	Support for license key
	S38	Switch for ground fault supervision of the system supply

6.7 Indicators

LED	Color	Function	Condition	Definition
H37	Yellow	Diagnosis 1	Off	Normal operation
			On	Ground fault present
H38	Yellow	Diagnosis 2		Not used
H39	Yellow	Diagnosis 3		Not used
H50	Yellow	'MSP fail' (processor periphery)	Off	Normal operation
			On	Processor in degraded mode; replace component or contact hotline
H51	Red	'PD ready', installation ready to switch off	Off	Installation in operation
			On	Installation may be disconnected from the mains
H52	Yellow	'PPC fail' (CPU module)	Off	Normal operation
			On	Processor in degraded mode; replace component or contact hotline
H53	Yellow	'CPLD fail' (reset and watchdog logic)	Off	Normal operation
			On	Logic unit failed; replace component or contact hotline
H54	Red	'TEMP', CPU module excess temperature indicator	Off	Normal operation
			On	CPU >45 °C
H61	Yellow	'SPEED', Ethernet transmission indicator	Off	Data transfer at 10 Mbit/s
			On	Data transfer at 100 Mbit/s
H842	Green	'LINK' control indicator	Off	No Ethernet connection
			On	Ethernet connection established

6.8 Adjustment Elements

S32: Reset key



The 'S32' button has multiple functions depending on how long it is pressed and whether it is pressed with combinations of other buttons.

Operation	Function
Press for <2 s	Panel is shut down and restarted in a controlled manner. This procedure takes up to five minutes.
Press for >2 s	Panel is shut down and restarted immediately. This may lead to data loss. This procedure takes up to two minutes.
Press S32 + 'Reset' or 'Acknowledge' (front operating buttons) at the same time	Restore factory settings or update firmware.

Restore factory settings





Restoring factory setting will remove all configurations, it is recommended to save the configuration data before restoring the factory setting.

Operation	Function
Press S32 + 'Reset' (front operating button) for > 2 s at the same time	Panel is started in Restore factory settings mode. A short beeping sound confirms the function is being executed.

Updating the firmware



Operation	Function
Press S32 + 'Acknowledge' (front operating button) for > 2 s at the same time	Panel's firmware is updated. A short beeping sound confirms the function is being executed.

S33: Switch for ground fault supervision of the Ethernet Connection

S33	Position	Function
OFF		Default settings Setting for networking via FCnet/C-Web
On		Setting for networking via Ethernet

S38: Switch for Ground Fault

- S38 deactivates the panel's internal ground fault supervisor including the Ethernet interface, which can also be deactivated with S33
- Electrically isolated components, such as network module (SAFEDLINK) or RS-485 module, have their own supervision and are not included in the deactivation of ground fault supervision.

S39	Position	Function
On		Ground fault supervision activated
Off		Ground fault supervision deactivated

6.9 Technical Data

Supply input	Voltage	24 VDC
	Standby current (display illumination off)	130 mA
	Alarm current (display illumination on)	170 mA + 1 mA per LED
Display	Number of lines	8 lines
	Resolution	256 x 112 pixels
Interfaces	Serial modules	For class A RS-485 module for connecting an external printer or FT2015
	Networking	Network module (SAFEDLINK) functionality (incl. degraded mode function) Ethernet connection RJ45, 10/100 Mbit/s
	Peripheral data bus	X3, X400

7 Laying and Connecting the Power Supply




7.1 Overview of the Installation Procedure

Prerequisites

All parts have been checked to ensure they are complete and intact.

The mains cable is disconnected from the power supply and secured against inadvertently being switched on.

Installation procedure

	<p>WARNING</p> <p>Electrical Voltage Mortal danger due to electric shock</p> <ul style="list-style-type: none"> • The mains cable must be fused separately. Wiring must be undertaken according to NEC 760 and local regulations. • Before working on the panel check that the mains cable is disconnected from the power supply. • Check to make sure that the mains cable is secured against inadvertently being switched on. • The components must be installed by a certified electrician or a trained person.
	<p>NOTICE</p> <p>System Functions Impaired By Incorrect Wiring</p> <ul style="list-style-type: none"> • All 'power limited' fire detection cables must be laid separately and be minimal of a quarter inch away from the following cables: <ul style="list-style-type: none"> - electrical lighting - mains cable - class 1 or 'non power limited' fire detection cables • All 'non power limited' cables must be guided into the enclosure from the bottom right and wired using the shortest route. • All 'non power limited' cables must be guided into the enclosure from the left and wired using the shortest route. There must be <u>no</u> crossover with other lines.
	<p>NOTICE</p> <p>Damage to Hardware Caused By an Incorrect Installation Sequence</p> <ul style="list-style-type: none"> • Please note the sequence of the installation steps. • Do not connect the batteries after inserting them; only connect immediately before commissioning.

1. Mount the back box.
2. Feed all laid mains cables into the enclosure.
3. Mount the components in the back box.
4. Install the optional components on the operating unit.
5. Install and wire the operating unit and the option module (optional) to the inner door.
6. Insert the batteries, and connect the battery wiring.

Do not connect the batteries to the periphery board; at this point.

7. Connect the mains cable to the power supply.
8. Insert the inscription strips into the operating unit or the option module.
9. Close the inner doors and install the outer door.
10. Affix the installation plate to the outside of the fire control panel enclosure such that it is clearly legible.


The panel is ready for commissioning.

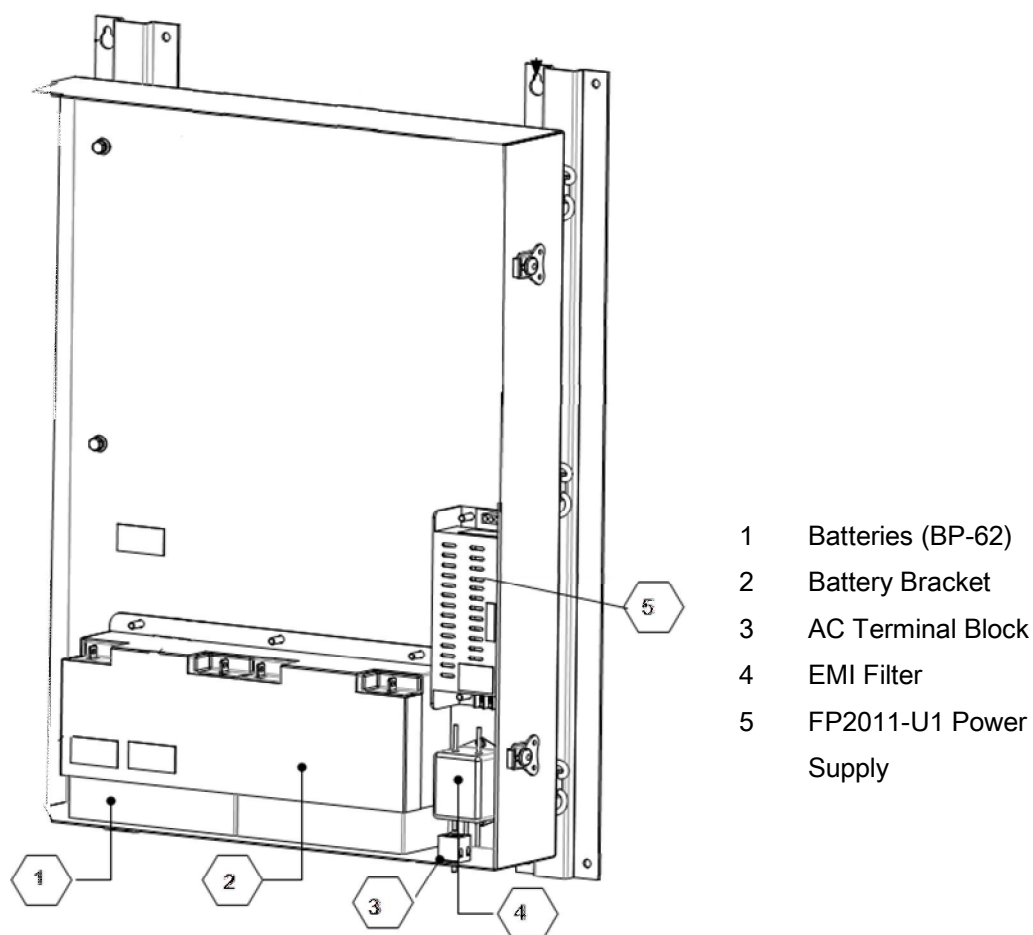
12. Add the installation number (no. :), and the date of commissioning (Date:) during commissioning.

See also

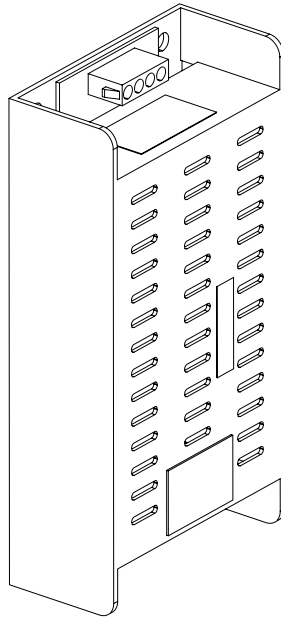
Laying and connecting the mains cable [→ 40]

7.2 Power Supply Location

	WARNING
	Electrical Voltage Electric Shock <ul style="list-style-type: none">• Before feeding in and laying the mains cable, disconnect it from the power supply.• Secure the mains connection against inadvertently being switched on.• The mains cable must be fed in at the side from below.• The mains connection must be placed along the right side of the enclosure (no EMC zone).• Signal and control circuits must only be fed into the enclosure on the left or from above.• Batteries must be installed so that they cannot leak.• No cable openings should be made in the base of the enclosure, unless an additional enclosure is mounted below the panel to accommodate the batteries.



8 Power Supply (170W) FP2011-U1

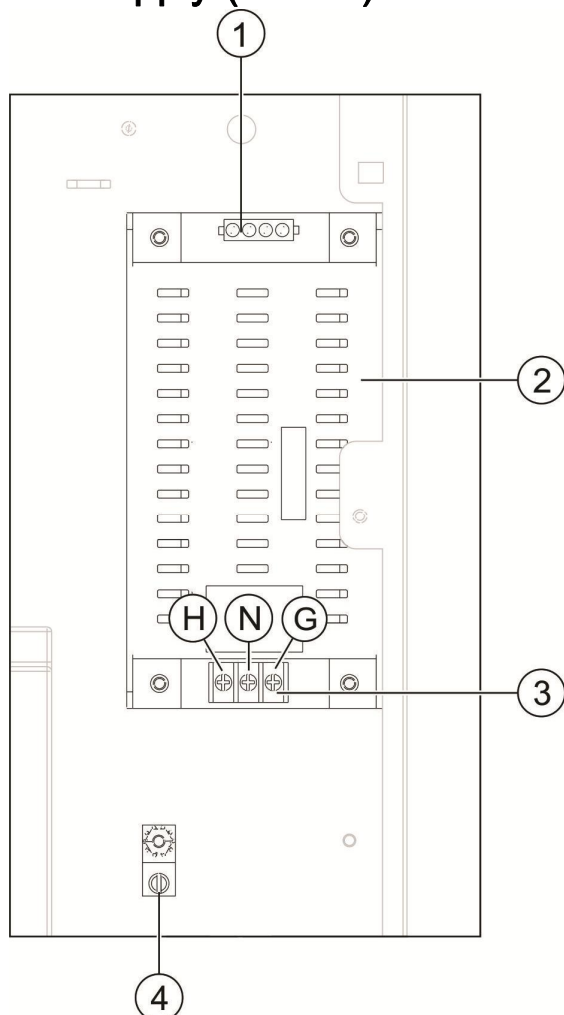


The power supply (170W) FP2011-U1 is a primary-switched 24VDC for 6.5 A output current. It is connected to the periphery board (500p) or (250p). It is not possible to cascade the power supply in the enclosure, due to lack of space.

The power supply has the following features:

- Output power 170W
- Protection from Short-circuit
- Current limited
- Mains voltage supervision
- Built-in AC filter

8.1 Laying and Connecting the Mains Cable for the Power Supply (170 W)



1	Secondary output slot or connection cable for periphery board
2	Power supply (170W) FP2011-U1
3	Primary input screw terminal
4	Back box ground connection
H	'Hot' connection (black)
N	'Neutral' connection (white)
G	'Ground' connection (green)
* See following section for installation of the EMI Filter	

Mains cable wiring for the power supply (170W)



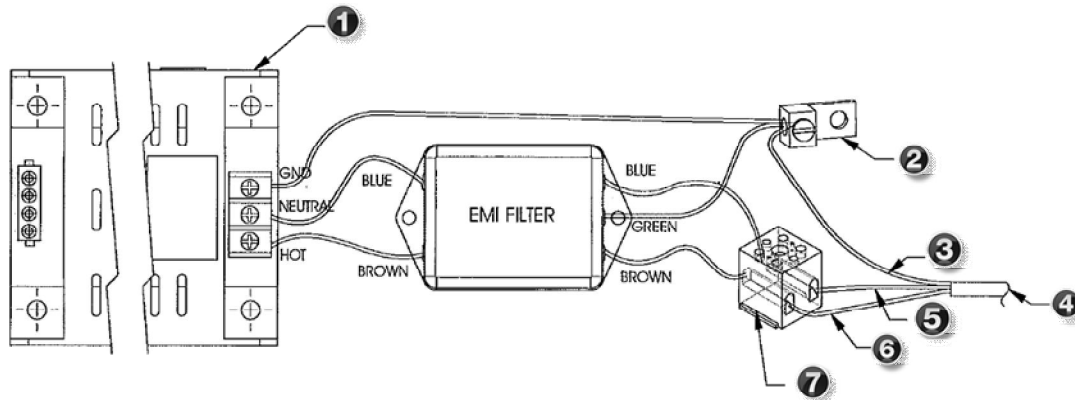
WARNING

Danger of Electric Shock

Before feeding in and laying the mains cable, disconnect it from the power supply. Secure the mains connection against inadvertently being switched on.

8.2 Installing the Electromagnetic Interference (EMI) Filter to Power Supply

The Electromagnetic Interface (EMI) Filter is used to filter out noise that is created by the power supply.



- | | |
|--------------------------------------|-----------------------------|
| 1 Power Supply 170 Watts (FP2011-U1) | 5 Neutral Wire |
| 2 Ground Lug | 6 Hot Wire |
| 3 Ground Wire | 7 2-Position Terminal Block |
| 4 AC Line | |

The EMI Filter reduces the noise that is generated from the FS20 panel. Refer to the Standard Structure Panel image in section 5 for location of the filter.

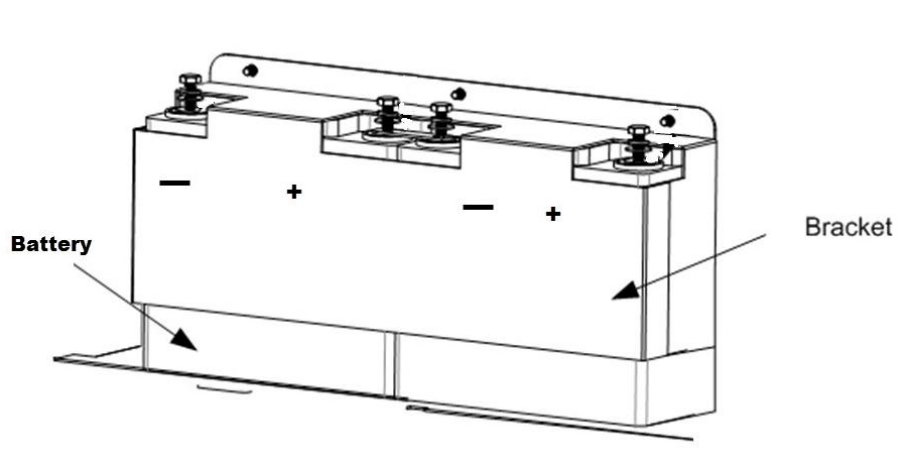
INSTALLATION


1. The Neutral and Hot wire is connected to the two position terminal block that is fed to the EMI filter. (Blue and Brown wire).
2. The Ground wire is plugged into the Ground Lug, which is then connected to the Power Supply (170W) FP2011-U1.

9 BP-62 Batteries

The battery bracket is preinstalled in the unit prior to being delivered.

9.1 Install Batteries – BP-62



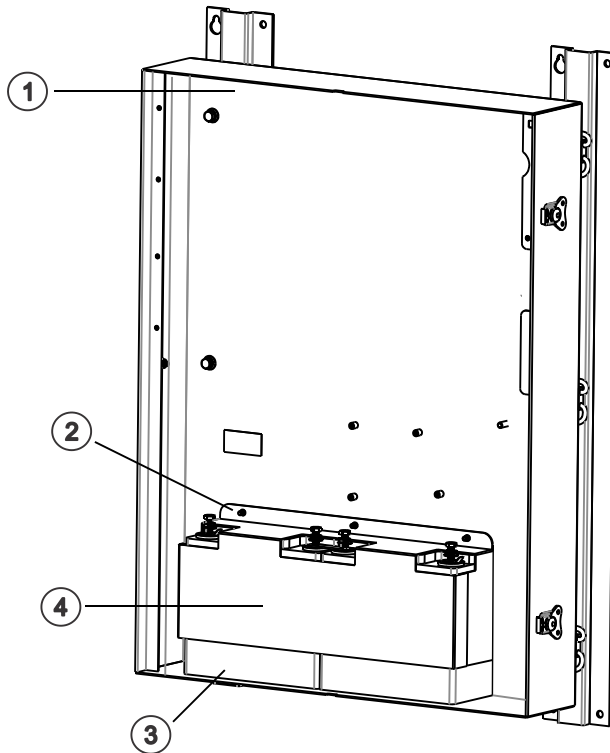
	NOTICE
	Danger of short circuit Potential damage to hardware The supplied jumper wire must not be connected until the time of commissioning. Ensure the polarity of the supply is correct; red cable = positive pole, blue cable = negative pole.

The batteries must meet the predefined specifications. For specifications, refer to the section, '**Determine Battery**' on page 47.

INSTALLATION



The batteries must be installed such that they cannot leak. The bottom can be broken out for this reason. The batteries must meet the predefined specifications.



1	FH-2071-UM Enclosure
2	#10-32 Nut (Qty: 3)
3	12V 16 AH Batteries (Qty: 2)
4	Battery Bracket

The battery bracket is designed to support two 24V 33 AH batteries that can with stand temperature up to 195°F (87°C).



WARNING

Danger of Electric Shock

Ensure that all power connections are removed from the backbox before installing the FHA2042-U1 battery bracket. If the batteries have been installed, disconnect the batteries before the AC power supply.

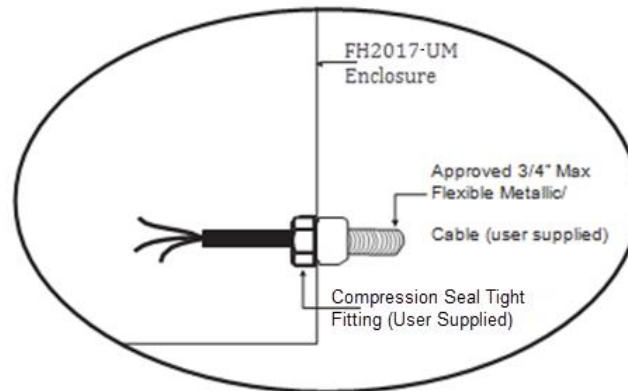
1. Remove the pre-installed bracket from the cabinet set aside.
2. Place the batteries on the base of the back box.
3. Connect the cable running from the charging connection to the periphery board to the battery poles:
 - a. Red cable to positive pole of the battery
 - b. Blue cable to negative pole of the battery
4. Re-install the battery bracket in the enclosure by aligning the three holes in the bracket with the three studs above the batteries and place the buss plate on the inner stubs of battery.
5. Thread the three #10-32 nuts onto the mounting studs and tighten.
6. Fasten the battery bracket to the bottom of the backbox using the three sets of #10-32 nuts and bolts.

9.2 Install Wiring

Remove all system power before installation. First, disconnect the battery and then AC.

(To start the power, connect the AC first and then the battery)

1. Wire in accordance with local codes, NEC 760, and Subchapter J of Title 46 of the Code of Federal Regulations.
2. Determine in the location of knockouts in the sides of the backbox where field wiring is required.
 - Drill a hole of appropriate size at each knockout location.
 - Install a compression seal tight fitting (user supplied) at each knockout location. Refer to the following figure:



Installing Compression Seal Tight Fitting

3. Pull all field wiring into the backbox. Do not dress the wiring until the location of all the equipment is known.
4. Install the wiring from the external AC power source to the approximate location of the power supply. Refer to '*Installing Power Supply*', chapter. Add one ferrite each to the hot, neutral and ground wires.

9.3 Determining the Battery

CALCULATING BATTERY CAPACITY

$$K_{\text{Batt}} = (I_{\text{R total}} * t_{\text{R}} + I_{\text{A total}} * t_{\text{A}}) * K_{\text{dis}} * K_{\text{age}}$$

K_{Batt}	Battery capacity in [Ah]
$I_{\text{R total}}$	Total operating current of all consumers in quiescent condition [A]
$I_{\text{A total}}$	Total operating current of all consumers in alarm status [A]
t_{R}	Emergency power time desired in quiescent condition [h]
t_{A}	Emergency power time desired in alarm status [h] (standard 0.5 h)
K_{dis}	Correction coefficient for discharge $K_{\text{dis}} = 1.1$ with emergency power time ≤ 12 hours. The coefficient can be ignored for longer emergency power times.
K_{age}	Correction co-efficient for aging $K_{\text{age}} = 1.25$ if the emergency power time desired is ≤ 24 h. In all other cases, the co-efficient can be ignored.

EXAMPLE

$$K_{\text{Batt}} = (I_{\text{R total}} * t_{\text{R}} + I_{\text{A total}} * t_{\text{A}}) * K_{\text{dis}} * K_{\text{age}}$$

For 12 h emergency power time:

$$= ((0.9 \text{ A} * 12\text{h}) * 1.1 * 1.25) + ((3.5 \text{ A} * 0.5 \text{ H}) * 1.1 * 1.25) = 17.2 \text{ Ah}$$

For 24 h emergency power time:

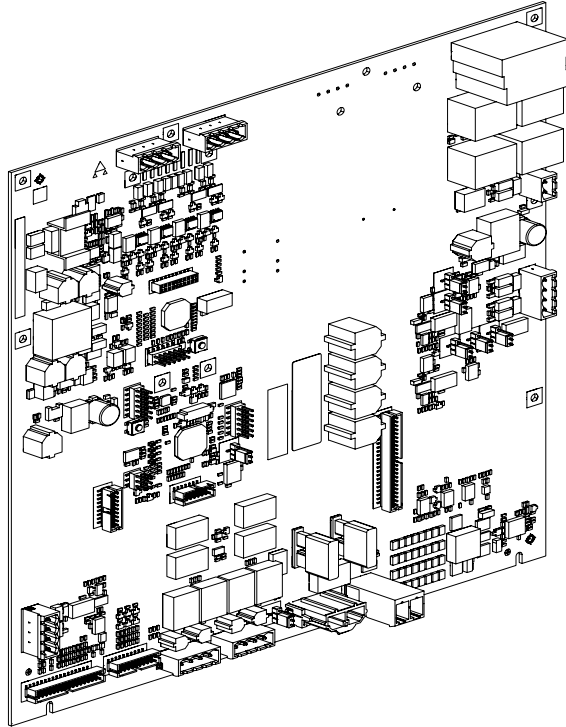
$$= ((0.9 \text{ A} * 24\text{h}) * 1.25) + ((3.5 \text{ A} * 0.5 \text{ H}) * 1.25) = 29.2 \text{ Ah}$$

For 72 h emergency power time:

$$= (0.9 \text{ A} * 72\text{h}) + (3.5 \text{ A} * 0.5\text{H}) = 66.5 \text{ Ah}$$

NOTE: Refer to the Section 10 and 11 (Periboard) for Power Supply and Battery parameter settings and connections.

10 FCI2016-U1 Periphery Board (250p)



10.1 Description

The periphery board (250p) FCI2016-U1 is used for fire control panels with maximum 252 initiating device addresses. The periphery board is used to provide a method for supervising and controlling various peripheral devices, such as detectors, notification devices, and providing power for the entire panel.

There is a detector core on the periphery board that is isolated from the rest of the periphery board. An auxiliary output circuit (1.5 A, 24 V) provides power to remote devices or internal modules. The integrated NAC circuit (NAC 1) provides up to three A of power for one class A circuit or for each of two class B circuits. The periphery board has expansion capabilities for releasing circuit with two zones, and an additional NAC circuit (NAC 2).

The periphery board has a battery charger and battery switchover circuit for AC outage or brownout. The battery charger is capable of charging up to 100 Ah batteries.

Properties

The power supply is connected to (170W) FP2011-U1 with a maximum load of 6.5 A.

Battery charger capable of charging up to 100 Ah batteries at a maximum of 6 A.

Power supply (170W) FP2011-U1 must be used for batteries of 33 Ah or less.

Ground faults detected at $<1 \text{ k}\Omega$ to ground.

Ground fault detection for all circuits except the two detector circuits handled by Operating Units. Each detector core has its own ground fault and supervision circuit.

One integrated network circuit card for circuits 1 & 2 and EMC surge protection for four style 4 or two style 6 circuits.

Maximum of 252 device addresses can be controlled per integrated network circuit card.

Three relay outputs and one user programmable relay output for common alarm, common trouble, common supervision, and user programmable.

The auxiliary output is a regulated 24VDC output with a maximum of 1.5 A.

Degraded alarm and trouble mode functions when either or both CPUs for the periphery board or Operating Unit are compromised.

Integrated NAC circuit, specified for DC 24 V, configured for either one class A (style Z) or two class B (style Y) circuits with a maximum of three A for one class A or one of the two class B circuits. NACs have integrated synchronization protocol for audible or visual notification appliances.

- All NAC circuits are supervised and protected for over current and direct short-circuited output.

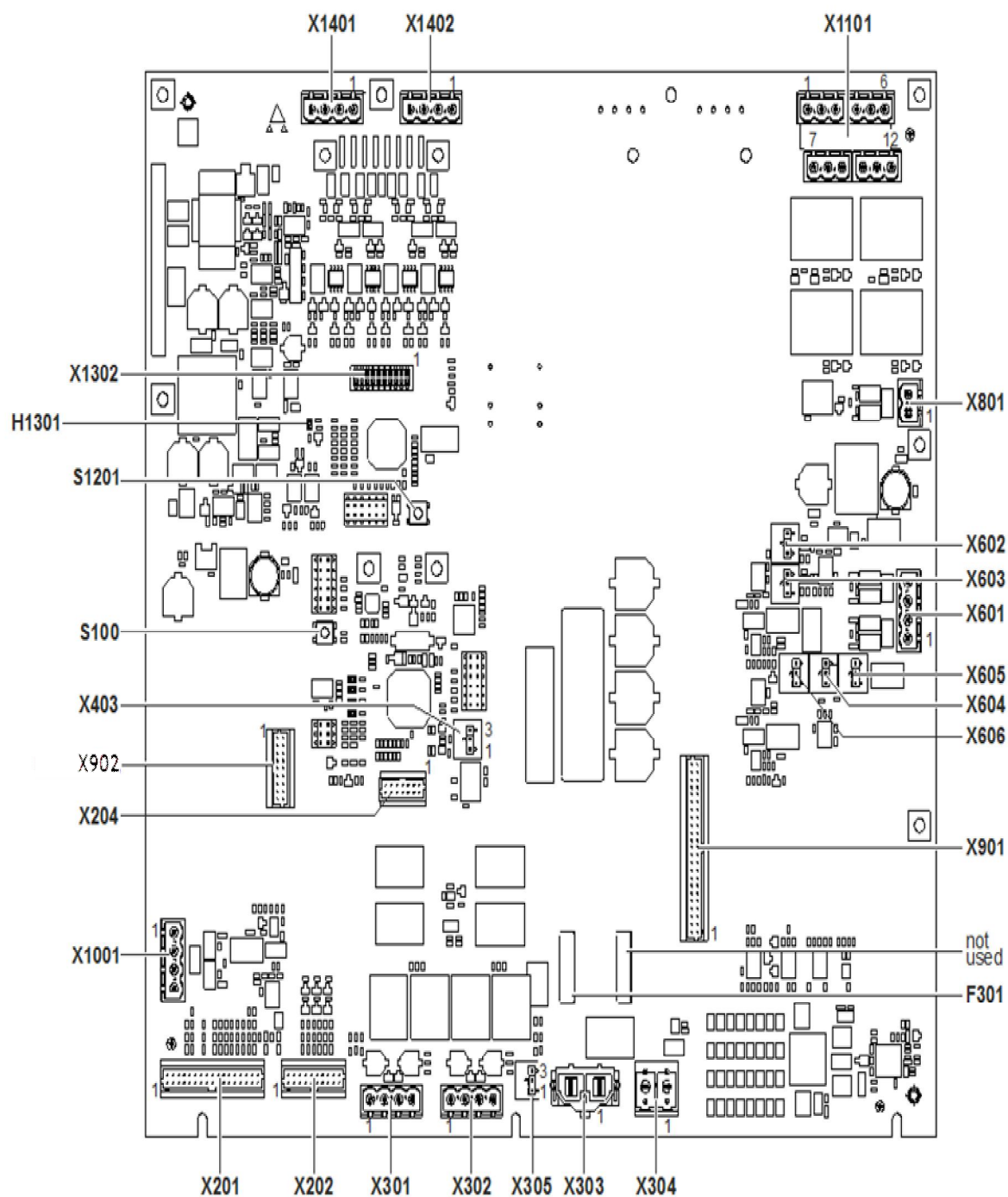
Two slots for optional extensions, one of which is for NAC module (1A/2B) or releasing module (XCI2001-U1):

- NAC module (1A/2B) FCI2001-U1 for one additional class A circuit or two class B circuits (same data as integrated NAC circuit) (P/N S54400-A54-A1). The module connects to X901.
- Releasing module (XCI2001-U1) (P/N S54400-A69-A1) The module connects to X901.

Additional peripheral data bus connection (X202) for LED or DACT modules.

Main CPU and detector core CPUs capable of being updated in the field through the Operating Unit.

10.2 Views



Printed circuit board view for FCI2016

Element	Destination	Function
Fuses	F301	30 A fuse for battery
Indicators	H1301	Status display for circuit card 1 (circuits 1 and 2)
Adjustment elements	S100	Reset key for periphery processor (without circuits)
	S1201	Reset key for circuit card 1 (circuits 1 and 2)
Jumper	X403	Degraded mode ALARM SILENCEABLE/NON SILENCEABLE
	X602	Degraded mode ENABLE/DISABLE NAC 1 class A or NAC 1-1 class B
	X603	Degraded mode ENABLE/DISABLE NAC 1-2 class B
	X604	NAC 1 class A/B selection
	X605	NAC 1 class A/B selection
	X606	NAC 1 class A/B selection
	X305	Power supply 2 ON/OFF
Connector	X201	Peripheral data bus to the Operating Unit & Mainboard
	X202	Peripheral data bus output
	X204	Future extension (not used)
	X301	Connector for power supply 1 (PS1)
	X302	Not connected
	X303	Battery connection
	X304	Not connected
	X601	NAC1 output
	X801	BELL follower input
	X901	NAC 2 extension or releasing module
	X902	For future application
	X1001	Output 24VDC AUX
	X1101	Plug block for relay connections
	X1302	For future application
	X1401	Detector circuit card 1, circuit 1
	X1402	Detector circuit card 1, circuit 2

10.3 Configuration Input Power and Battery

The periphery board has jumpers that are used to configure the system functions. The jumper settings are described in the following sections.

10.3.1 Wiring Specs

X301		
BROO	+	1
PSSI		2
GND		3
+26V		4

X303		
BAT-	-	2
BAT+	+	1

10.3.2 X301 Terminal Block – Power Supply 1

Verify that the AC is disconnected. Link power supply (170W) connection to X301. X301 must always have a power supply connected.

Do not connect AC or batteries until all jumpers and modules are configured and connected in the system. Once everything is installed and configured, first connect the AC and then the batteries.



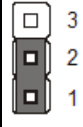
Once the system is powered down, disconnect the batteries first and then the AC.

Pin	Designation	Description
1	BROO	(White) AC Brown Out. Signals when the mains connection drops below 102 VAC
2	PSSI	(Green) Power supply status indication. Used by the periphery board to know the type and health of the power supply.
3	GND	(Black) Return (ground)
4	+24V	(Red) DV +24 V system supply

Admissible cable cross-section: 1 x 12...18 AWG or 2 x 16...18 AWG

10.3.3 X305 Jumper – Power Supply On/Off

X305 jumper is used to configure the periphery board for one or two power supplies. The factory setting must not be changed because only operation with one power supply is supported.

X305	Jumper position	Function	Definition
	1-2	Disable power supply #2	Default setting, DO NOT change

10.3.4 X303 Battery Terminal

A cable harness is required to connect batteries to the periphery board. The battery connector end that goes on the periphery board at X303 can only connect one way because it is keyed.



The battery connection is made once the system has been configured through jumpers and modules, and after AC has been applied.

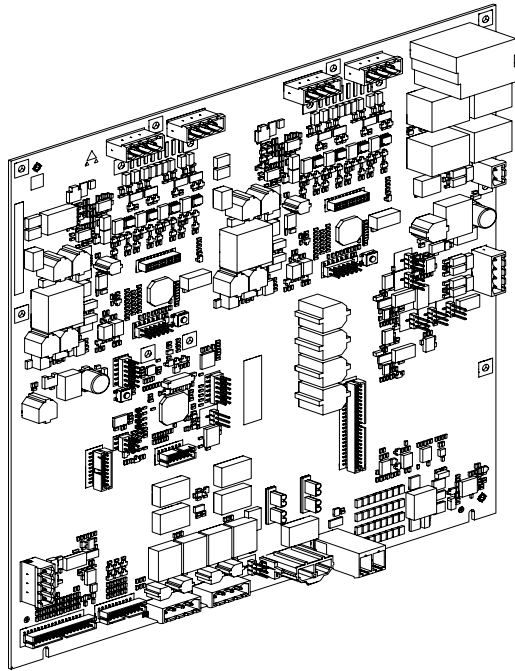
Pin	Designation	Description
1	BAT (+)	DC 24 V feed for battery (RED WIRE)
2	BAT (-)	Return (Ground) feed for battery (BLUE WIRE)

Admissible cable cross-section: 1 x 12...18 AWG or 2 x 16...18 AWG



The hardware required to connect the batteries to the periphery board is in the battery kit.

11 FCI2017-U1 Peripheral Board (500p)



11.1 Description

The peripheral board (500p) FCI2017-U1 is used for fire control panels with maximum 504 device addresses. The peripheral board is used to provide a method for supervising and controlling various peripheral devices, such as detectors, notification devices, and providing power for the entire panel.

There are two detector cores on the peripheral board, each isolated from the rest of the peripheral board, and from each other. An auxiliary output circuit (1.5 A, 24V) provides power to remote devices or internal modules. The integrated NAC circuit (NAC 1) provides up to three A of power for one class A circuit or for each of two class B circuits. The peripheral board has expansion capabilities for leased line / city tie operation, a releasing circuit with two zones, and an additional NAC circuit (NAC 2).

The peripheral board has a battery charger and battery switchover circuit for AC fail or brownout. The battery charger is capable of charging up to 100 Ah batteries.

Properties

The power supply connects to (170W) FP2011-U1 with a maximum load of 6.5 A.

The battery charger capable of charging up to 100 Ah batteries at a maximum of 6A.

Power supply (170W) FP2011 must be used for batteries of 33 Ah or less.

Ground faults detected at $<1\text{ k}\Omega$ to ground.

Ground fault detection for all circuits except the two detector circuits handled by Operating Unit. Each detector core has its own ground fault and supervision circuit.

Two integrated network circuit cards, one for circuits 1 and 2, one for circuits 3 and 4, and EMC surge protection for eight style 4 or four style 6 circuits.

Maximum of 252 device addresses can be controlled per integrated network circuit card.

Three relay outputs and one user programmable relay output for common alarm, common trouble, common supervision and user programmable.

The auxiliary output is a regulated 24VDC output with a maximum of 1.5 A.

Degraded alarm and trouble mode functions when either or both CPUs for the periphery board or Operating Unit are compromised.

Integrated NAC circuits, specified for 24VDC, configured for either one class A (style Z) or two class B (style Y) circuits with a maximum of three A for one class A or one of the two class B circuits. NACs have integrated synchronization protocol for audible or visual notification appliances.

- All NAC circuits are supervised and protected for over current and direct short-circuited output.

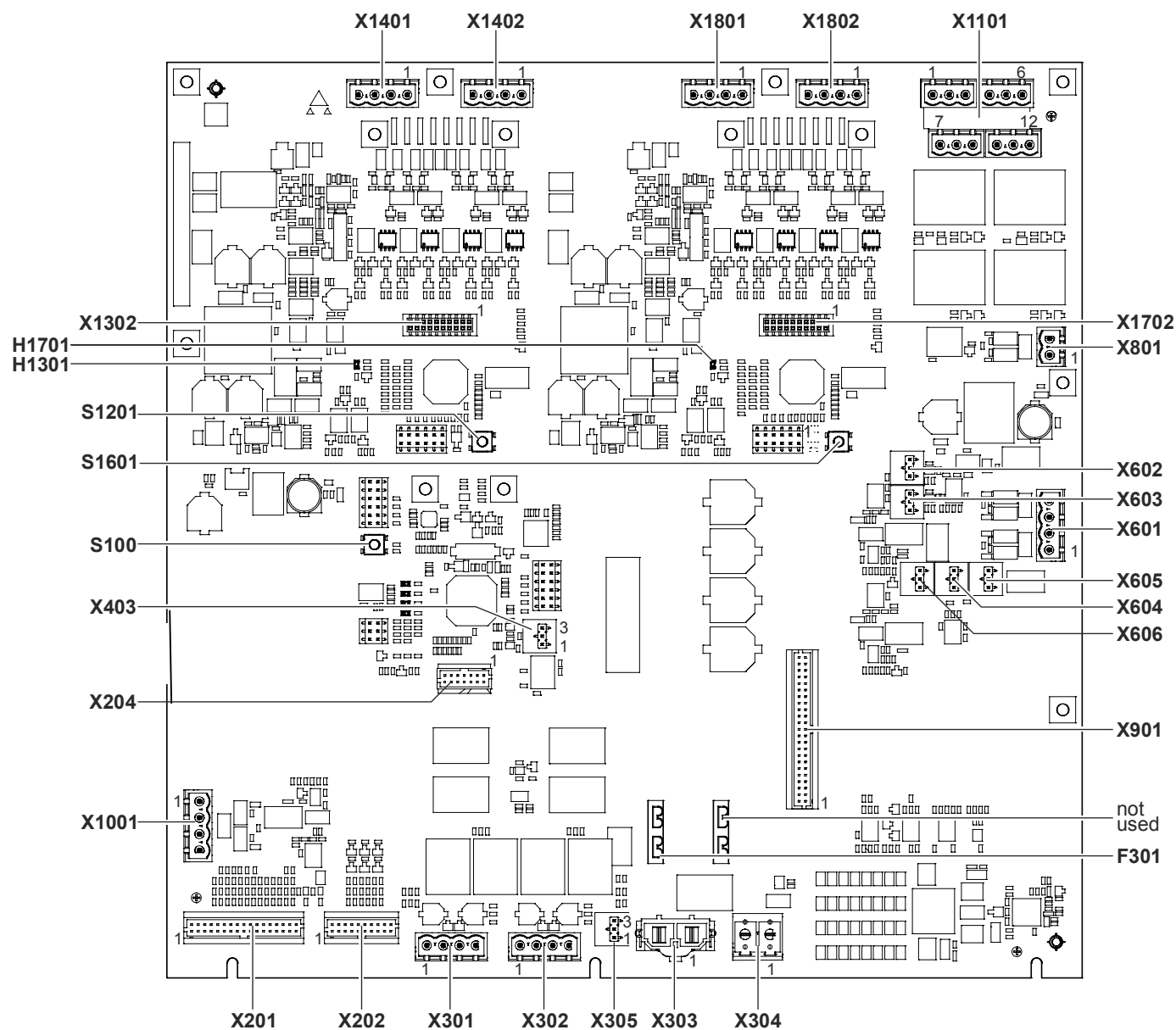
Two slots for optional extensions, one of which is for NAC module (1A/2B) or releasing module (XCI2001-U1):

- NAC module (1A/2B) FCI2001-U1 for one additional class A circuit or two class B circuits (same data as integrated NAC circuits) (P/N S54400-A54-A1). The module connects to X901.
- Releasing module (XCI2001-U1) (P/N S54400-A69-A1) The module connects to X901.

Additional peripheral data bus connection (X202) for LED or DACT modules.

Main CPU and detector core CPUs capable of being updated in the field through the Operating Unit.

11.2 Views



Printed circuit board view for FCI2017

Element	Des.	Function
Fuses	F301	30 A fuse for battery
LEDs	H1301	Status indicator for detector core A (circuits 1 and 2)
	H1701	Status indicator for detector core B (circuits 3 and 4)
Reset buttons	S100	Reset button for microprocessor for periphery board circuitry (not including detector circuits)
	S1201	Reset button for detector core A microprocessor
	S1601	Reset button for detector core B microprocessor
Jumper	X403	DEGRADE ALARM SILENCEABLE/NONSILENCEABLE
	X602	DEGRADED MODE ENABLE/DISABLE for NAC 1 class A or NAC 1-1 class B
	X603	DEGRADED MODE ENABLE/DISABLE for NAC 1-2 class B
	X604	NAC 1 class A/B selection
	X605	NAC 1 class A/B selection
	X606	NAC 1 class A/B selection
	X305	Power supply 2 ON/OFF
Connector	X201	Operating Unit & Mainboard bus
	X202	Peripheral data bus output
	X204	Future expansion
	X301	Connector for power supply 1 (PS1)
	X302	Not connected
	X303	Battery connection
	X304	Not connected
	X601	NAC1 output
	X801	Bell follower input
	X901	NAC 2 expansion or releasing module
	X1001	Auxiliary DC 24 V output
	X1101	Common alarm relay positions 1...3
		Common trouble relay positions 4...6
		Common supervisory relay positions 7...9
		User programmable relay positions 10...12
	X1302	For future applications
	X1401	Detector circuit core A, circuit 1
	X1402	Detector circuit core A, circuit 2
	X1702	For future applications
	X1801	Detector circuit core B, circuit 3
	X1802	Detector circuit core B, circuit 4

11.3 Configuration Input Power and Battery

The periphery board system functions are configured by the jumper. The jumper settings are described in the following sections.

11.3.1 Wiring Specs

X301			
BROO	+		1
PSSI			2
GND			3
+26V			4

X303		
BAT -	-	2
BAT +	+	1

11.3.2 X301 Terminal Block – Power Supply 1

Verify the AC is disconnected. Link power supply (170W) connection to X301. X301 must always have a power supply connected.

Do not connect AC or batteries until all jumpers and modules are configured and connected in the system. Once everything is installed and connected, connect the AC first and then the batteries.




Once the system has powered down, first disconnect the batteries and then the AC.

Pin	Designation	Description
1	BROO	(White) AC Brown Out. Signals when the mains connection drops below AC 102 V.
2	PSSI	(Green) Power supply status indication. Used by the periphery board to know the health of the power supply.
3	GND	(Black) Return (ground)
4	+24 V	(Red) DC +24 V system supply

Admissible cable cross-section: 1 x 12...18 AWG or 2 x 16...18 AWG

11.3.3X305 Jumper – Power Supply 2 On/Off

The X305 jumper is used to configure the periphery board for one or two power supplies. The factory settings must not be changed, because only operation with one power supply is supported.

X305	Jumper position	Function	Definition
 3	1 - 2	Disable power supply #2	Default setting, do not change
2			
1			

11.3.4X303 Battery Terminal

A cable harness is required to connect batteries to the periphery board. The battery connector end that goes on the periphery board at X303 can only connect one way because it is keyed.



The battery connection is only made once the whole system has been configured through jumpers and modules, and after AC has been applied.

Pin	Designation	Description
1	BAT (+)	DC 24 V feed for battery (RED WIRE)
2	BAT (-)	Return (Ground) feed for battery (BLUE WIRE)

Admissible cable cross-section: 1 x 12...18 AWG or 2 x 16...18 AWG

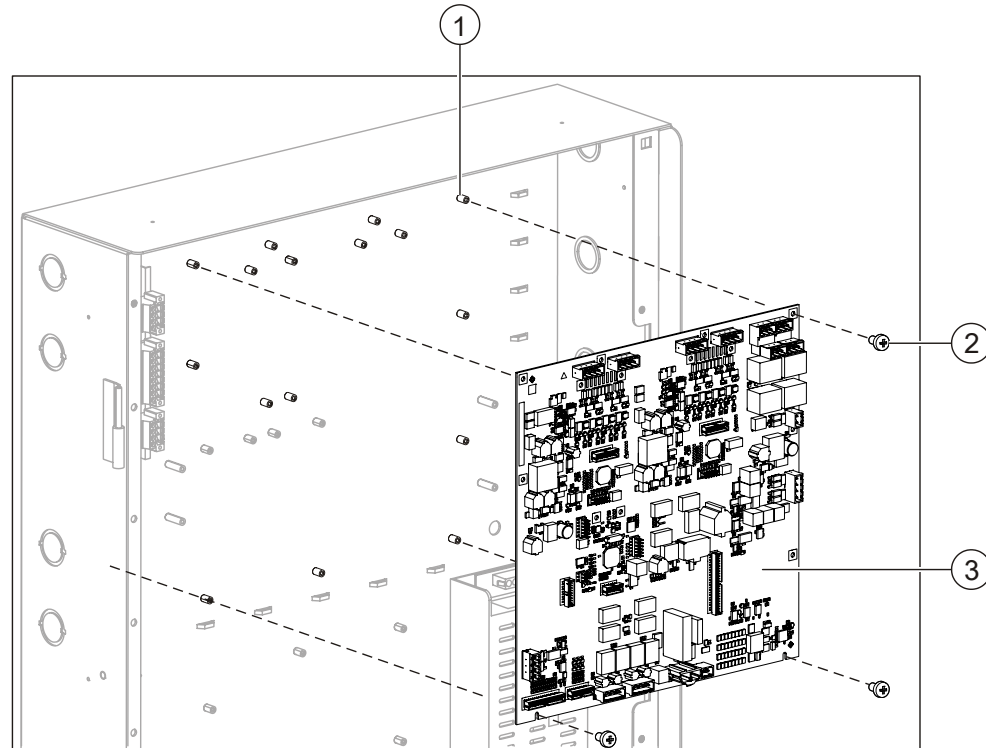


The hardware required to connect the batteries to the periphery board is located in the battery kit.

12 Periboard Installation, Wiring and Jumpers Set-Up

12.1 Installation of the Periphery Board

The chapter describes how to install periphery board FCI2016-U1/ FCI2017-U1 in the fire control panel.



Installing the periphery board

- 1 Threaded sleeves on back box
- 2 13x fixing screw
- 3 Periphery board

The Back Box is installed.

The openings for passing through cables have been broken out.

The mains cable is fed through and is disconnected from the power supply.

The batteries are not installed or connected.

1. Install the periphery board (3) on the threaded sleeves (1) of the back box with the 13 fixing screws (1).
2. Wire the periphery board according to the following pin assignment.
3. Set the jumpers
4. Re-install any module that you may have had to remove.

12.2 Notification Appliance Circuits

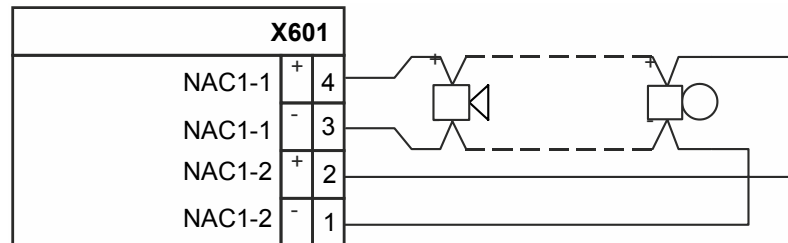
The following wiring diagrams displays the process to connect notification devices to the circuit, either as class A (style Z) or class B (style Y) circuit. For class A, no end-of-line resistor is required. It is built into the circuit.



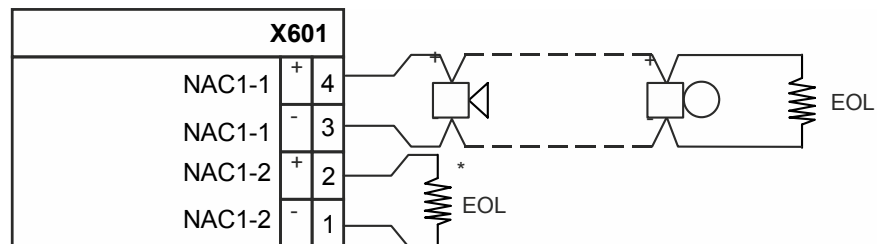
To ensure proper functioning, the jumpers must be set correctly for class A/B selection.

Polarity shown is in activated condition.

Notification appliance circuit supervised and power limited.



X601: Class A (style Z) supervised output connection



X601: Class B (style Y) supervised output connection

* EOL resistance must be connected during non-use.

EOL resistance: 2.4 kΩ, 0.5 W

See also

X602 Jumper – DEGRADED MODE ENABLE/DISABLE for NAC 1 class A or NAC 1-1 class B

X603 Jumper – DEGRADED MODE ENABLE/DISABLE for NAC 1-2 class B

X604, X605, X606 Jumper – NAC 1 class A/B

12.2.1 X601 Terminal Block


NAC 1 class A / NAC 1-1 class B / NAC 1-2 class B

Pin	Designation	Description
4	NAC1-1 (+)	Positive feed for notification appliances for NAC 1 class A or NAC 1-1 class B
3	NAC1-1 (-)	Return feed for notification appliances for NAC 1 class A or NAC 1-1 class B
2	NAC1-2 (+)	Positive feed for notification appliances for NAC 1 class A or NAC 1-2 class B
1	NAC1-2 (-)	Return feed for notification appliances for NAC 1 class A or NAC 1-2 class B

Admissible cable cross-section: 1 x 12...18 AWG or 2 x 16...18 AWG


12.2.2 X602 Jumper

Degraded Mode Enable/Disable for NAC 1 class A or NAC 1-1 class B

X602	Jumper position	Function	Definition
	3 - 2	Disable degrade	Disable degraded mode for NAC 1 class A or NAC 1-1 class B. Circuit will not activate the notification appliances if degraded mode is activated and an alarm is present.
	1 - 2	Enable degrade	Enable degraded mode for NAC 1 class A or NAC 1-1 class B. Circuit will activate the notification appliances if degraded mode is activated and an alarm is present.

12.2.3 X603 Jumper




Degraded Mode Enable/Disable for NAC 1-2 class B

X603	Jumper position	Function	Definition
	3 - 2	Disable degrade	Disable degraded mode for NAC 1-2 class B. Circuit will not activate the notification appliances if degraded mode is activated and an alarm is present.
	1 - 2	Enable degrade	Enable degraded mode for NAC 1-2 class B. Circuit will not activate the notification appliances if degraded mode is activated and an alarm is present.

12.2.4 X604, X605, X606 Jumper

NAC 1 class A/B

Class A/B Setting of the Onboard NAC Circuit




X604 X605 X606	Jumper position	Function	Definition
 3	3 - 2	Class A	Configures periphery board NAC 1 for class A wiring
 2	1 - 2	Class B	Configures periphery board NAC 1-1 and NAC 1-2 for class B wiring
 1			

The class A/B configuration of the jumpers on the periphery board must be transferred in the Engineering tool set. An error is generated if the configuration does not match.

12.2.5 X403 Jumper

Degrade Alarm Silenceable

Degraded Mode Behavior of the NAC Circuit During an Alarm

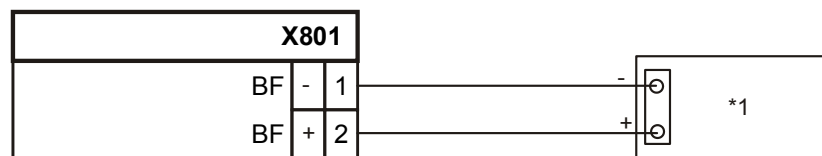
X403	Jumper position	Function	Definition
 3	3 - 2	NONSILENCEABLE	When degrade mode is active in the system, and an alarm is present, this setting prevents the user from turning off the notification appliances.
 2	1 - 2	SILENCEABLE	When degrade mode is active in the system, and an alarm is present, this setting allows the user to turn off the notification appliances. The notification devices remain switched off in the event of a further alarm.
 1			

12.3 Bell Follower Input

The periphery board has an input designed to connect to an external fire alarm control unit's NAC circuit so that the periphery board's NAC circuits can follow the activation of the NAC circuits from an external source.

12.3.1 Wiring Specs

NAC is active.



*1- Fire detection device or bell extender.

X801 Bell Follower Terminal Block

Pin	Designation	Description
1	BF (-)	Input from external fire control panel. The return feed from the external control unit's NAC circuit connects here.
2	BF (+)	Input from external fire control panel. The active positive output from the external control unit's NAC circuit connects here.

Admissible cable cross-section: 1 x 12-18 AWG or 2 x 16-18 AWG

12.4 Auxiliary 24VDC Output

The Auxiliary output DC 24 Volt with a maximum output current of 1.5 A; the output can be used for devices such as door holders, DACT, or RDT. The circuit is power limited and is protected against a direct shorted output. The output is power limited and supervised for over current. To configure the output to shut down during AC loss to conserve the battery, you must configure the system with the Engineering tool.

If the output is configured to turn off the battery, then the output is used for supplementary purposes only.

12.4.1 Wiring Specs

X1001			
AUX	+	1	
AUX	-	2	
AUX	+	3	
AUX	-	4	

12.4.2 X1001 Auxiliary Output Terminal Block

Pin	Designation	Description
1	AUX (+)	Positive feed for Aux circuit (DC +24 V)
2	AUX (-)	Return feed Aux circuit
3	AUX (+)	Positive feed for Aux circuit (DC +24 V)
4	AUX (-)	Return feed Aux circuit

Admissible cable cross-section: 1 x 12-18 AWG or 2 x 16-18 AWG

12.5 Relays

Common Alarm Relay

The alarm relay changes state whenever a fire alarm is detected. In degrade mode, the alarm relay will still activate in case of a fire, without processor control.

Common Trouble Relay

The trouble relay changes state whenever a system trouble is detected. In degrade mode, the trouble relay will still activate without processor control.

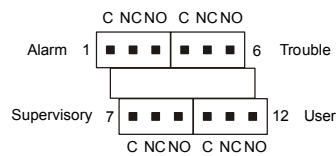
Common Supervisory Relay

The supervisory relay changes state whenever a supervisory trouble is detected. In degrade mode, the supervisory relay will not function.

Programmable User Relay

The user programmable relay changes state depending on the configuration set in the Engineering tool set. In degrade mode, the user relay will not activate.

12.5.1 Wiring Specs



12.5.2 X1101 Relay Terminal Block

Pin	Designation	Description
1	C	Common contact common alarm relay
2	NC	Normally closed contact common alarm relay
3	NO	Normally open contact common alarm relay
4	C	Common contact common trouble relay
5	NC	Normally closed contact common trouble relay
6	NO	Normally open contact common trouble relay
7	C	Common contact common supervisory relay
8	NC	Normally closed contact common supervisory relay
9	NO	Normally open contact common supervisory relay
10	C	Common contact programmable relay
11	NC	Normally closed contact programmable relay
12	NO	Normally open contact programmable relay

Admissible cable cross-section: 1 x 12...18 AWG or 2 x 16...18 AWG

NO/NC (normally open / normally closed) relates to the fire detection system's normal status.

12.6 Detector Circuits

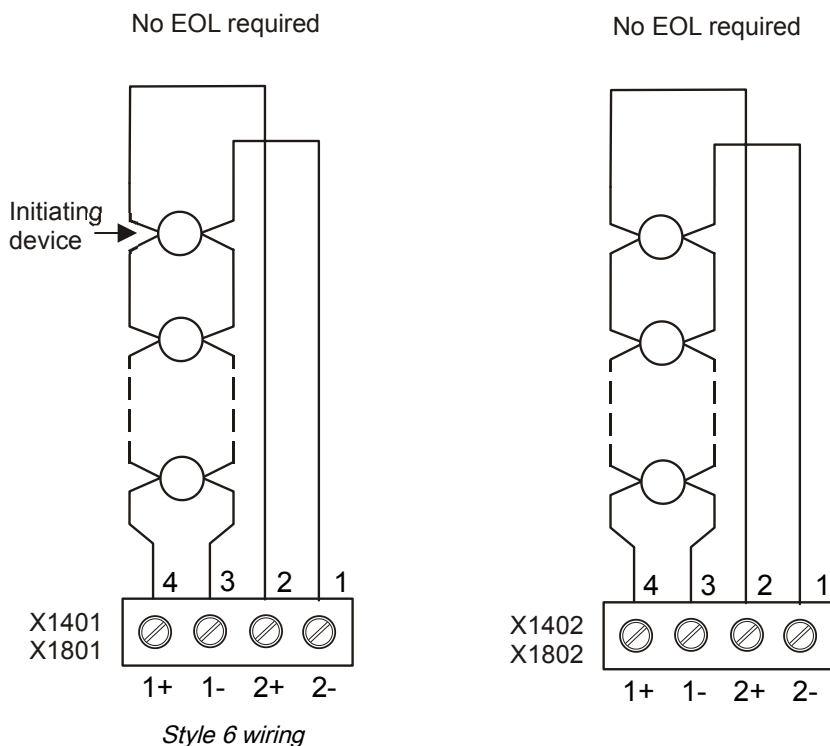
Detector Circuits, Circuit Driver 1 (Circuits 1 and 2) & Circuit Driver 2 (Circuits 3 & 4)

The peripheral board (250p) has one independent integrated circuit card, and the periphery board (500p) has two independent integrated circuit cards. Each integrated card is a driver that has two circuits that can handle a maximum of 252 devices. Circuit driver 1 supports circuits 1 & 2 and circuit driver 2 supports circuits 3 & 4.

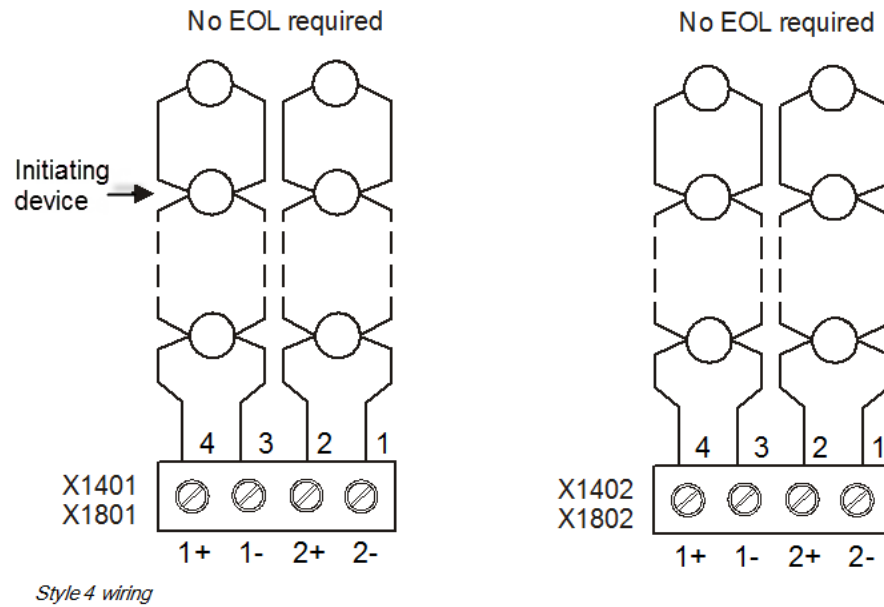
Each circuit driver can be configured for two style 6 circuits or four style 4 circuits.

The detector circuits are isolated from the periphery board's main circuit. Each circuit card has a microprocessor which supervises ground fault, short-circuit, open circuit, and line capacity.

Wiring



Both circuits are supervised and power limited.



Both circuits are supervised and power limited.

12.6.1 X1401 and X1801 Terminal Block

Detector Circuits 1 and 3

X1401: Circuit driver 1, circuit 1

X1801: Circuit driver 2, circuit 3

Pin	Designation	Description
1	2-	Return feed for circuit 1-2 or circuit 3-2
2	2+	Positive output for circuit 1-2 or circuit 3-2
3	1-	Return feed for circuit 1-1 or circuit 3-1
4	1+	Positive output for circuit 1-1 or circuit 3-1

Admissible cable cross-section: 1 x 12...18 AWG or 2 x 16...18 AWG

12.6.2 X1402 and X1802 Terminal Block

Detector Circuits 2 and 4

X1401: Circuit driver 1, circuit 2

X1801: Circuit driver 2, circuit 4

Pin	Designation	Description
1	2-	Return feed for circuit 2-2 or circuit 4-2
2	2+	Positive output for circuit 2-2 or circuit 4-2
3	1-	Return feed for circuit 2-1 or circuit 4-1
4	1+	Positive output for circuit 2-1 or circuit 4-1

Admissible cable cross-section: 1 x 12...18 AWG or 2 x 16...18 AWG

12.7 Indicators

Standard LED indicators

LED	Color	Condition	Definition
H1301	Yellow	OFF	Default
		ON	Startup problems network core A (clock)
		1 flash every 2 seconds	Failsafe active (no communication to the Operating Unit)
		2 fast flashes (every 2 seconds)	Failsafe active + local alarm
		1 fast flash (every 1 second)	Failsafe active + signaling (local alarm)
		Flash (every 1 second) and 2 fast flashes (every 2 seconds)	Failsafe active + local alarm + signaling
H1701	Yellow	OFF	Default
		ON	Startup problems network core B (clock)
		1 flash every 2 seconds	Failsafe active (no communication to the Operating Unit)
		2 fast flashes (every 2 seconds)	Failsafe active + local alarm
		1 fast flash (every 1 second)	Failsafe active + signaling (local alarm)
		Flash (every 1 second) and 2 fast flashes (every 2 seconds)	Failsafe active + local alarm + signaling

12.8 Reset Buttons

12.8.1 S100 RESET Periphery Board

Button	Function	Position	Definition
S100	Reset main microprocessor on periphery board	Not pressed	Normal
		Pressed	Resets only the main microprocessor on the periphery board

12.8.2 S1201 RESET Core 'A' Detector Circuit

Button	Function	Position	Definition
S1201	Reset main microprocessor for core A detector circuit	Not pressed	Normal
		Pressed	Resets only microprocessor on core A detector circuit

12.8.3 S1601 RESET Core 'B' Detector Circuit

Button	Function	Position	Definition
S1601	Reset main microprocessor for core B detector circuit	Not pressed	Normal
		Pressed	Resets only microprocessor on core B detector circuit

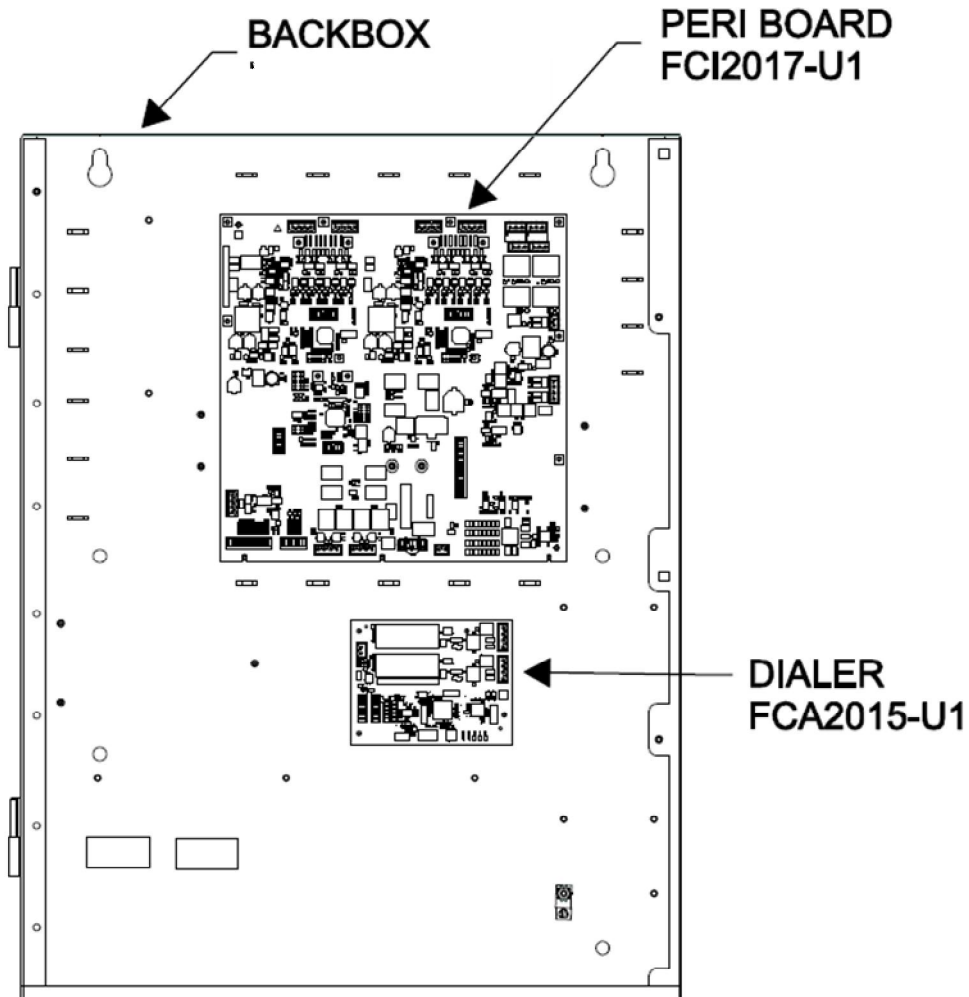
12.9 Technical Data

Supply Input	Plug strip	X301
	Operating voltage	24VDC nominal, filtered
	Operating current (standby)	120 mA
	Max. operating current.	136 mA
	Input current (active)	6.5 A for PS170W, 11.5 A for 1 PS300W
Battery	Design	Non-power limited
	Plug strip	X303
	Voltage	DC 20.4...26.4 V
NAC Circuit	Current	11.5 A
	Plug strip	X601
	Voltage	24VDC
		Special Application for strobe loads
		Regulated for non-pulsing loads
	Standby operating current	Max. 10 mA
	Active operating current	3 A (for a class A circuit or per class B circuit)
	Maximum circuit resistance	1.4 Ω @ 3.0 A
	Supervised for	Open circuit Short circuit Ground fault
	Design	Short-circuit protection Voltage surge protection Power limited
AUX Output	Plug strip	X1001
	Voltage	24VDC nominal "Special Application"
		For use with: HZM, HCP, FCA2018-U1, FT2015-U1, FTI2001-U1
	Current	Max. 1.5 A
	Design	Short-circuit protection Voltage surge protection Power limited
Bell Follower Input	Plug strip	X1001
	Voltage	24VDC filtered or full wave
	Current	Max. 4 mA
	Design	Voltage surge protection

Detector Circuits	Terminal strips	X1401 circuit card 1, circuit 1 X1402 circuit card 1, circuit 2 X1801 circuit card 2, circuit 3 X1802 circuit card 2, circuit 4
	Output voltage	24VDC, filtered
	Number of integrated circuit cards	2
	Output current per integrated circuit card	Max. 500 mA
	Addressable devices per integrated circuit card	Max. 252
	Connectable circuits per integrated circuit card	2 style 6 or 4 style 4 (mixed variants are possible)
	Protocol	Network
	Circuit resistance	Max. 180 Ω
	Capacity	500 nF per circuit
	Cable types	All (twisted recommended) For specifications detail, refer to the following documents: A6V10315013 for Designo
	Connectable devices	See List of compatibility
	Monitored for	Ground fault Short circuit Open circuit Circuit capacitance
	Design	Short-circuit-proof Voltage surge protection Open circuit Power limited
Relay Contacts	Plug strip	X1201
	Design	Relay output Break or make contact Nonpower limited Alarm and trouble active in degraded mode operation
	Switching voltage	30VDC or AC 120VAC ohmic
	Switching current	5 A, Max.
Connection Terminals	Inputs, outputs and detector circuits:	
	Design	Plug-in screw terminals
	Admissible cable cross-section	Once 12...18 AWG or twice 16...18 AWG 18 gauge twisted pair, shielded cable.

13 FCA2015-U1 Digital Alarm Communicator Transmitter (DACT)

The FCA2015-U1 Digital Alarm Communicator Transmitter (DACT) board is an optional module for FS20 Fire Alarm System Control Panels. The DACT provides telephone line connections for communication with a Digital Alarm Communicator Receiver (DACR). The DACT board is mounted on the FS20 Cabinet Main board. The DACT Board option is set through the control panel programming sequence.



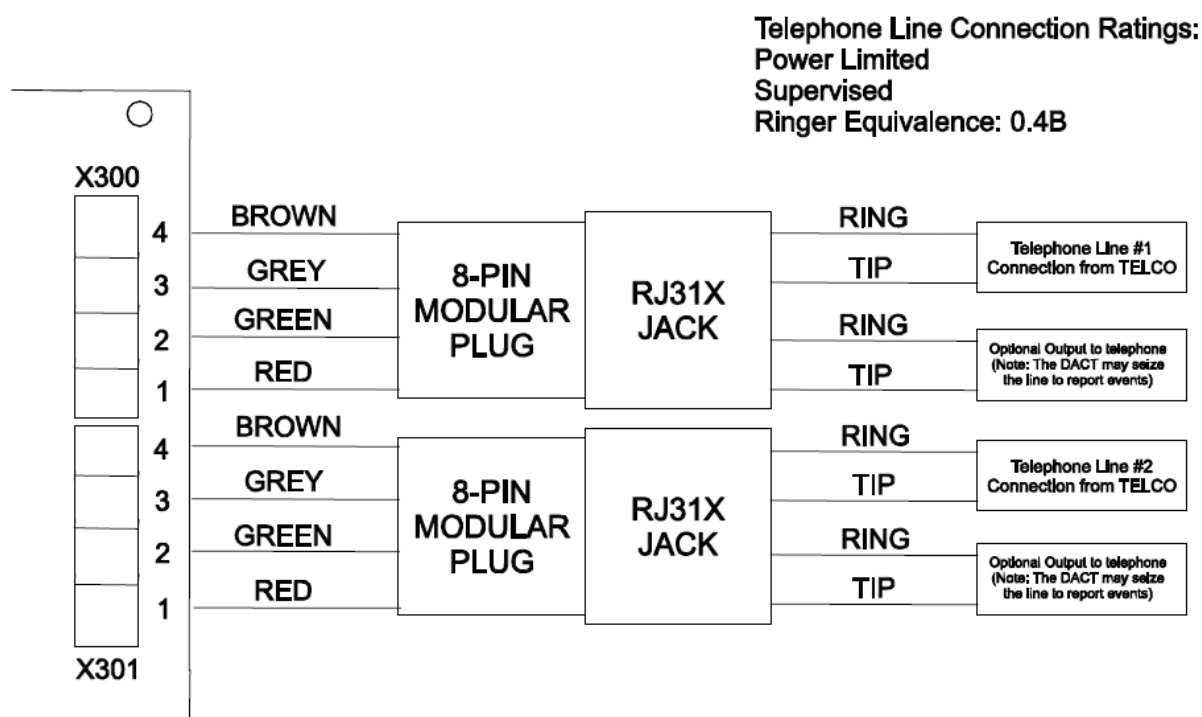
The FC2015-U1 module are supplied with the following parts:

- 1 DACT Board (Dialer)
- 4 Screws
- 1 Serial Communication Cable
- 4 1 x1/4Hex Male to Female Standoff
- 1 Installation Instruction

13.1 Installation

Steps	Instructions
1	Installation must be performed by qualified personnel, which is trained and understands the instructions.
2	Disconnect the batteries and AC on the cabinet prior to working on the equipment.
3	Mount FCA2015-U1 as shown, using the four screws to the FS20.
4	Attach conduit and run wires as required.
5	Connect wires to the fire alarm system control unit as required.
6	Apply power to system
7	Program for proper operation of functions
8	Ensure all functions are operating as designed.

FCA2015-U1 WIRING



The RJ31X provides a convenient connection allowing the DACT to be installed and removed without requiring re-wiring and can be installed by the telephone installer.

13.2 FCA2015-U1 Format Description

Format	Description
SIA DCS 8	Security Industry Association (SIA) Digital Communication Standard (DCS); format can send up to eight events per call. SIA 1997 Level 1 compatibility with support O (old) blocks and 300-Baud (FAST) operation. Sends an account number (up to six digits), a two character code and three-digit identifier up to four times with FSK frequency encoding
SIA DCS20	See SIA DCS 8, except format may send up to 20 events a call
Ademco Contact ID	Sends a four-digit account number, a three-digit code and three-digit identifier up to four rounds of dual tone multiple
3/1 1400HZ	Sends a three-digit account number and a one-digit code up to four rounds at 20 pps with 1400 Hz handshake frequency
3/1 2300HZ	Sends a three-digit account number and one-digit code up to four rounds at 20 pps with 2300 Hz handshake frequency
4/2 1400HZ	Sends a four-digit account number and a two-digit code up to four rounds at 20 pps with 1400 Hz handshake frequency
4/2 2300HZ	Sends a four-digit number and a two-digit code up to four rounds of 20 pps with 2300 Hz handshake frequency

13.3 Compatible Receivers / Formats

Receiver Manufacturer	Compatible Receiver	SIA DCS 8	SIA DCS 20	Ademco Contact ID	3/1 1400HZ	3/1 2300HZ	4/2 1400HZ	4/2 2300HZ
Honeywell	M8000	SIA DCS 8	SIA DCS 20	Ademco Contact ID	SK3/1	SK3/1	SK 4/2	SK 4/2
Bosch	D6100	SIA DCS 8	SIA DCS 20	Ademco Contact ID	SK 3/1	SK3/1	SK 4/2	SK 4/2
Silent Knight Security Corp	9800	X	X	Ademco Contact ID	SK 3/1	SK3/1	SK 4/2	SK 4/2
Surgard	System IV	SIA DCS 8	SIA DCS 20	Ademco Contact ID	SK 3/1	SK3/1	SK 4/2	SK 4/2

13.4 Compatible Alarm Communicator

The FCA2015-U1 is also compatible with alarm communicators that utilizes different communication technologies (IP and GSM) to connect to compatible protocols.

Manufacturer	Model #	Communication Technology	Installation Part Number
Tellular	TG7GFS04	GSM	56044102
Bosch	C900V2	IP	F01U87780-01
DSC	TL300CF	IP	29007636 / 29007842
DSC	3G3070-CF	GSM	29008179

13.5 FCA2015-U1 Event Codes


Event Type	SIA DCS (8 or 20) *	Ademco Contact ID *	3/1 1400 Hz or 2300 Hz	4/2 1400 Hz or 2300 Hz
Fire Alarm	FA pppp	1 110 0p ppp	0	01
Fire Alarm Restore (through Reset)	FH pppp	3 110 0p ppp	2	21
Smoke Alarm	FA pppp	1 111 0p ppp	0	1
Smoke Alarm Restore	FH pppp	3 111 0p ppp	2	21
Heat Alarm	FA pppp	1 114 0p ppp	0	1
Heat Alarm Restore	FH pppp	3 114 0p ppp	2	21
Pull Station Alarm	FA pppp	1 115 0p ppp	0	1
Pull Station Alarm Restore	FH pppp	3 115 0p ppp	2	21
Waterflow Alarm	SA pppp	1 113 0p ppp	0	02
Waterflow Alarm Restore	SH pppp	3 113 0p ppp	2	22
Supervisory	SS pppp	1 200 0p ppp	6	66
Supervisory Restore	SR pppp	3 200 0p ppp	7	76
AC Trouble	AT	1 301 00 000	8	80
AC Trouble Restore	AR	3 301 00 000	7	70
Trouble	FT pppp	1 373 0p ppp	8	83
Trouble Restore	FJ pppp	3 373 0p ppp	7	73
System Battery Trouble	YT	1 302 00 000	8	87
System Battery Trouble Restore	YR	3 302 00 000	7	77
Phone Line 1 Trouble	LT 1	1 351 00 000	8	81
Phone Line 1 Trouble Restore	LR 1	3 351 00 000	7	71
Phone Line 2 Trouble	LT2	1 352 00 000	8	82
Phone Line 2 Trouble Restore	LR2	3 352 00 000	7	72
Data Lost	RT 0	1 354 00 000	8	88
Automatic Test	RP	1 602 00 000	9	93
Manual Test	RX 0	1 601 00 000	9	99
Test Activation	FX pppp	1 611 0p ppp	9	91
Gas Alarm	GA pppp	1 151 0p ppp	0	03
Gas Alarm Restore	GH pppp	3 151 0p ppp	2	23
Communication Fail	YC	1 350 00 000	8	84
System Reset	OR 0	1 305 00 000	7	79
Test Begin	FI pppp	1 604 0p ppp	9	90
Test End	FK pppp	3 604 0p ppp	9	92
Mass notification Alarm	PA pppp	1 120 0p ppp	1	11
Mass notification Alarm Restore	PH pppp	3 120 0p ppp	3	31
Mass notification Trouble	PT ppp	1 375 0p ppp	8	83
Mass notification Trouble Restore	PJ ppp	3 375 0p ppp	7	73

* ppp is the dialer group or zone number

14 Installing DIN Rail FHA2031-U1

The DIN Rail model FHA2031-U1 is an optional module used to land heavy field wiring for network, RS-485, and the dialer modules to FH2071-UM enclosure. It will then interconnect, to the intended module.

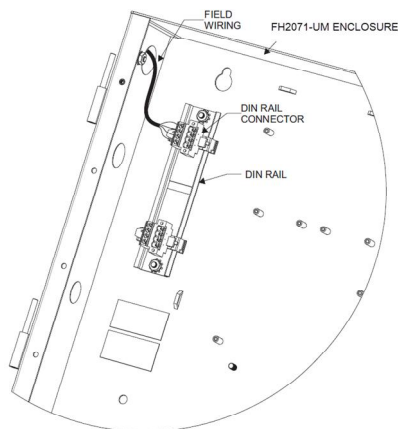
INSTALLATION

	WARNING
	Electrical Voltage Remove all system power before installation, first battery and then the AC. Restart the power by connecting the AC first and then the battery.

The DIN Rail Assembly includes the following parts:

- 1 Rail, 35MM x 7.5 MM deep
- 3 DIN Rail Connectors
- 2 # 10-32 hex nuts
- 3 Four-position plugs


The DIN Rail connectors snap onto the DIN Rail and then slide it into the desired position on the rail. Up to three connectors can fit on a single rail.



DIN Rail

Mounting the DIN Rail

1. Place the DIN Rail on the two stubs in the upper left corner of the backbox and secure it in place with the two #10-32 hex nuts.
2. Bring field wiring to network, RS-485 or dialer modules into the backbox through the knockout in the upper left corner of the backbox. Refer to the previous diagram.
3. Land the wiring on a connector as shown in the individual module wiring instruction.

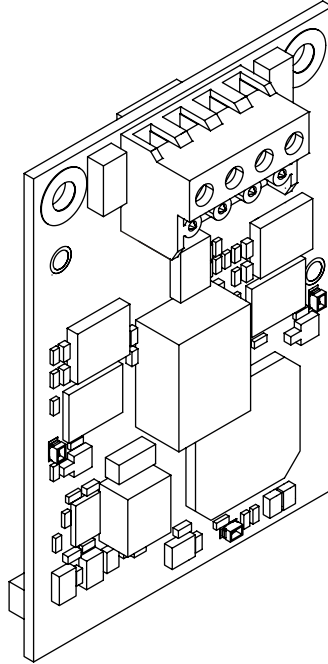
	WARNING
	<p>Installation and usage of equipment is not in accordance with instructions manual</p> <p>Radiation of radio frequency energy</p> <p>Interference to radio communications:</p> <ul style="list-style-type: none">• Install and use equipment in accordance with instructions manual• Read the following information

The equipment generates, uses, radiates radio frequency energy, and if not installed and used in accordance with the instructions manual, can cause interference to radio communications.

It has been tested and found to comply with the limits for a Class A computing device pursuant to Part 15 of FCC Rules, which is designed to provide reasonable protection against such interference when operated in a commercial environment.

Operation of the equipment in a residential area can cause interference in which the user at their own expense will be required to take whatever measures it is required to correct the interference.

15 FN2001-U1 Network Module



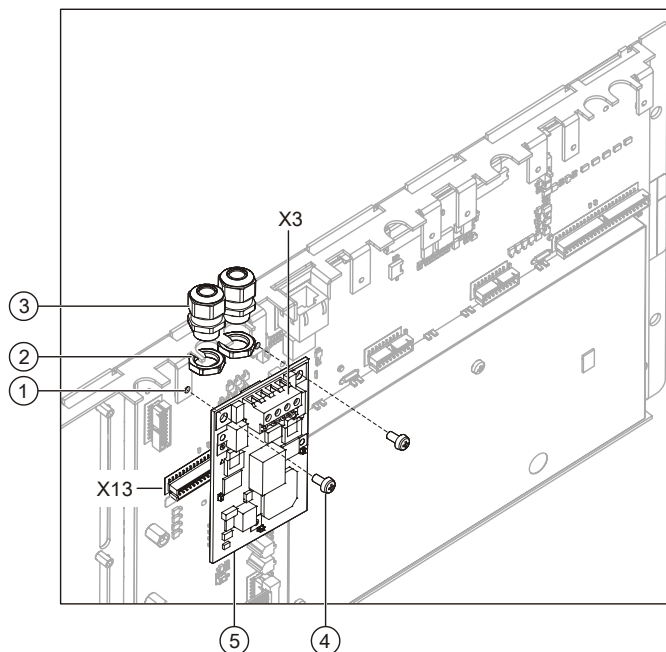
15.1 Description

The network module (SAFEDLINK) FN2001-U1 is used to associate several panels via the system bus FCnet. The network module is plugged onto the Operating Unit & Mainboard and has the following features:

- Connections for a system bus input and a system bus output
- Integrated degraded mode function
- Electrical isolation between the system bus and the panel
- Ground fault supervision
- Redundant networking with one network module per panel (simple line trouble)

15.2 Installation

The network module (SAFEDLINK) FN2001-U1 must be installed in the left slot (X13) (main module slot).



Installing the network module (SAFEDLINK) FN2001-U1

- 1 Fastening tabs on operating unit
- 2 Nut for screwed cable gland (2 per module)¹
- 3 Cable gland (2 per module)¹
- 4 2x fixing screw
- 5 Network module (SAFEDLINK) on X13 (master module)
- X3 FCnet/SAFEDLINK connection terminal
- X13 Connection terminal on Operating Unit & Mainboard

¹ When using shielded cables, the cable glands are needed to secure the shielding.

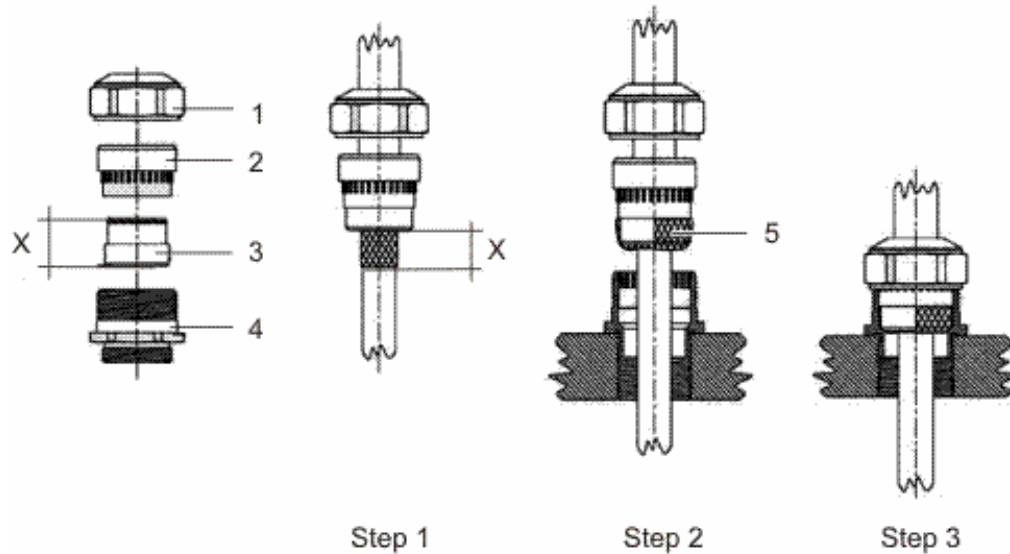


Ensure you install the network module (SAFEDLINK) in the correct position (plug X13) during installation.

1. When shielded cables are used, mount the two cable glands (3) with the nuts (2) on the flange between the fastening tabs (1).
2. Plug the network module (SAFEDLINK) (5) into the connector X13 as shown.
3. Fasten the network module to the fastening tabs (1) using the two fixing screws (4).
4. Check that the network module is secured correctly in order to prevent open circuits.
5. Wire up the system bus SAFEDLINK according to the pin assignment.

15.3 Installing the Shielding

If using shielded cables, the cable gland must be fitted.

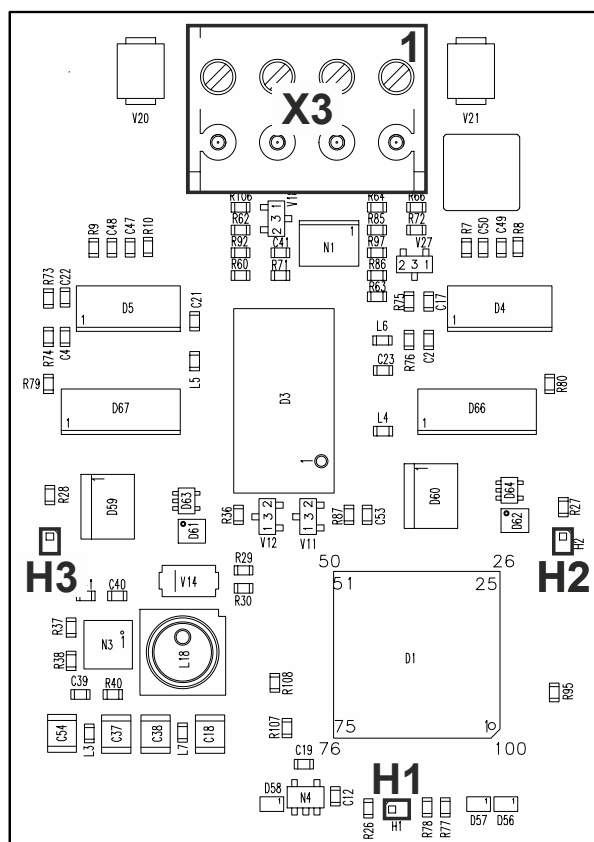


Installing the shielding

1	Nut	4	Bottom part of cable gland
2	Sealing element	5	Braid
3	Contact sleeve	X	Length of contact sleeve

1. Pull nut (1), sealing element (2) and contact sleeve (3) over cable.
2. Trim outer cable surrounding to the desired length.
3. Trim braid or shield film to the contact sleeve (X) length.
4. Slide nut (1), sealing element (2) and contact sleeve (3) to end of surround.
5. Place braid or shield film over contact sleeve (3). Cut off protruding material.
6. Guide the prepared cable into fitted bottom part of cable gland (4) until sealing element (2) and contact sleeve (3) are flush in bottom part.
7. Screw nut (1) to bottom part such that the cable is firmly pressed in.

15.4 Views



Frontal view of the network module (SAFEDLINK) FN2001

- | | |
|----|---|
| X1 | Connector to the Operating Unit & Mainboard (connector on rear panel) |
| X2 | Connector to the FCnet/C-WEB circuits (connector on rear) |
| X3 | Connector to FCnet circuits; used with FS20 |
| H1 | LED green, status indicator for the network module |
| H2 | LED yellow, status indicator for circuit 1 |
| H3 | LED yellow, status indicator for circuit 2 |

15.5 Pin Assignments

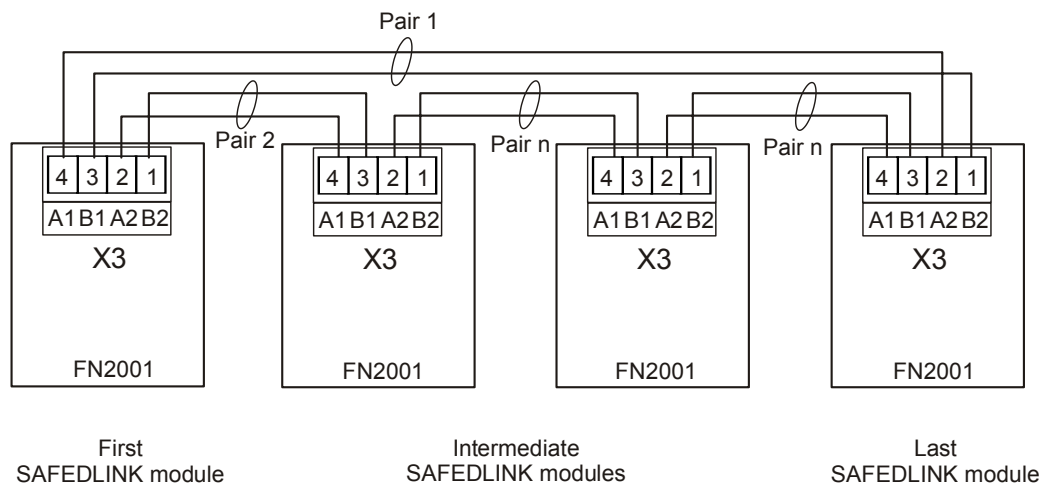
15.5.1 Connector X3

Pin	Designation	Description
4	A1	Circuit 1 (+)
3	B1	Circuit 1 (–)
2	A2	Circuit 2 (+)
1	B2	Circuit 2 (–)

Admissible cable cross-section: 12...26 AWG

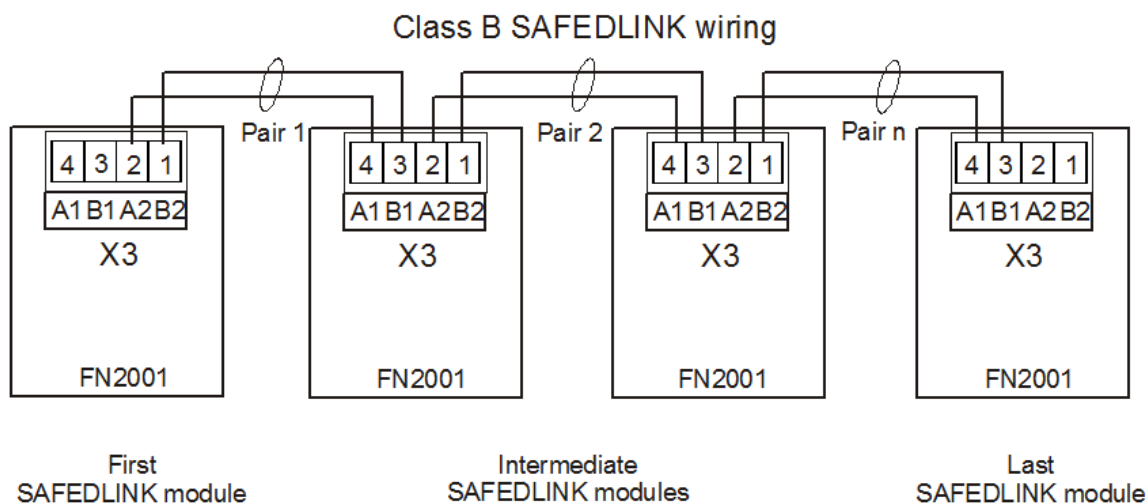
Wiring for class A network

Class A SAFEDLINK wiring



View of wiring for class A SAFEDLINK network

Wiring For Class B Network



Ground fault detected at $<1 \text{ k}\Omega$

Power limited accessory to NFPA 70 / NEC 760

No EOL required

Connect shields at one end only

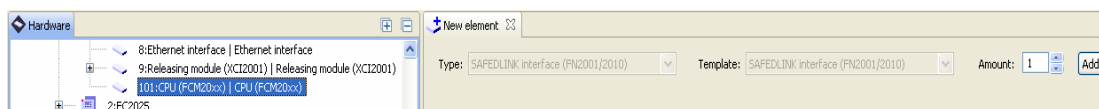
Max. length of SAFEDLINK wiring between two modules:

- 3300 ft or 10 dB loss at 100 kHz
- 3300 ft or 30 dB loss at 1 MHz

All wiring is supervised for open circuits and short-circuits

15.5.2 Configuring SAFEDLINK Interface -FN2001-U1

From the Engineering Tool, create an 'SAFEDLINK interface (FN2001)' element.



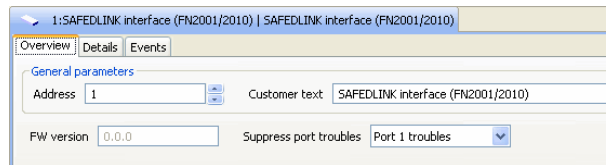
Creating SAFEDLINK interface

1. Select the 'Hardware' task card.
2. Open the 'Panel' in the tree view.
3. Highlight the 'CPU (FCC20xx)' element.
4. Open the 'New element' window.
5. Select 'SAFEDLINK interface (FN2001)' in the 'Type:' field.
6. Click 'Add'.

The 'SAFEDLINK interface (FN2001)' element is created.

Properties of the 'SAFEDLINK Interface (FN2001-U1)' Element

The following is set in the detail editor of the 'SAFEDLINK interface (FN2001-U1)' element for fire only devices:



Properties in the detail editor of the SAFEDLINK interface

'Suppress port troubles': You can use this property to configure a SAFEDLINK connection as a class B circuit. To do this, first select the 'Port 1 troubles' setting in the first 'Panel' of the SAFEDLINK connection. In the last 'Panel', select the 'Port 2 troubles' setting.

If you configure the SAFEDLINK connection as a class A circuit, select the ' - (none)' setting.

If the ' - (none)' setting is selected, troubles arise when wiring as a class B circuit.

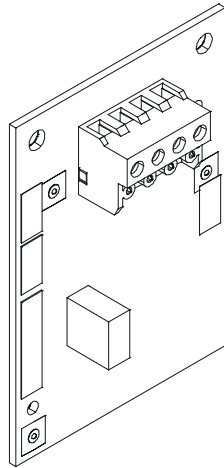
15.6 Indicators

LED	Color	Function	Condition	Definition
H1	Green	Condition of the network module (SAFEDLINK)	Off	Network module (SAFEDLINK) is defective
			On	Normal condition (H2 and H3 are off)
			Flashes	Normal condition for degraded mode module (H2 and H3 are off)
H2	Yellow	Status of circuit 1 (A1, B1)	Off	Normal condition (communication on circuit 1 is OK)
			On	Error on circuit 1 (no communication on circuit 1)
H3	Yellow	Status of circuit 2 (A2, B2)	Off	Normal condition (communication on circuit 2 is OK)
			On	Error on circuit 2 (no communication on circuit 2)

15.7 Technical Data

Supply	Voltage	24VDC
	Current	Standby 35 mA Alarm 35 mA
System bus SAFEDLINK	Voltage	5VDC
	Impedance	120 Ω
	Cable type: Shielded	
	Line-to-line capacitance	150 nF @ loop resistance 20 Ω 40 nF @ loop resistance 180 Ω
	Line-to-shield capacitance	150 nF @ loop resistance 20 Ω 40 nF @ loop resistance 180 Ω
	Cable type: Unshielded	
	Line-to-line capacitance	220 nF @ loop resistance 20 Ω 60 nF @ loop resistance 180 Ω
	Protocol	SAFEDNET (UDP/IP)
	Data rate in operation mode:	
	'Standard':	312 kbit/s
	'Low'	96 kbit/s
	Distance between two network modules	Max. 3300 ft
	Electrical isolation between the FCnet/C-WEB and panel	1 Kv
	Supervised for:	Short circuit Open circuit Ground fault Communication error
Connections	Wire gauge	12...26 AWG
	Operating unit	Plug-type connection

16 FCA2016-U1 RS-485 Class 'A' Module



16.1 Description

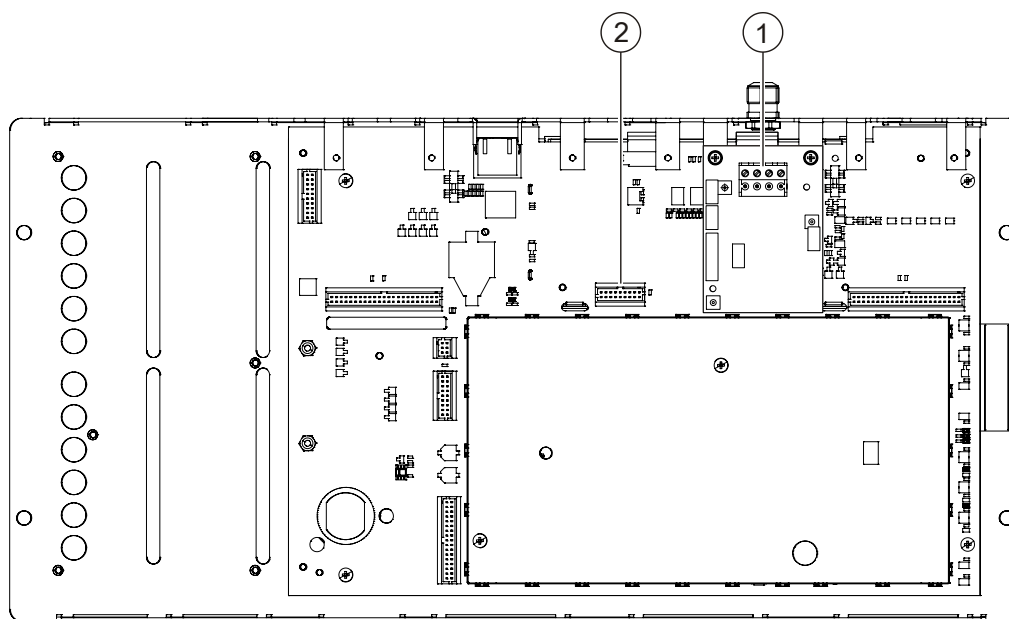
The RS-485 class 'A' module (iso.) FCA201-U1 is plugged into the Operating Unit & Main board and is intended for operating periphery devices on the RS-485 circuit, e.g. the remote peripheral module FCA2018-U1 for the external event printer (PAL-1) or the remote terminal FT2015 Series.

The RS-485 module has the following features:

- Dual, standardized RS-485 interface
- Supports style 4 (class B) and style 6 (class A)
- Up to eight devices on the RS-485 circuit style 6
- Electrical isolation between the RS-485 interfaces and the panel
- Ground fault supervision

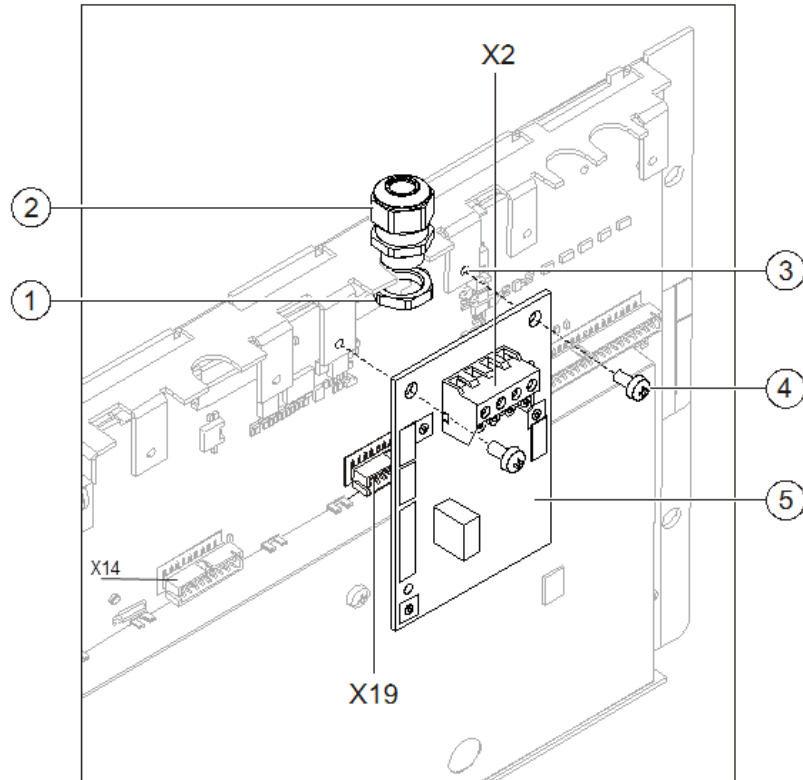
16.2 Installation

The RS-485 class 'A' serial module (iso.) FCA2016-U1 must be installed in the specified slots in the operating unit. Installation is the same for each slot.



Slots for serial modules in the operating unit

- 1 Serial module in slot X19
- 2 Serial module in slot X14



Installation of the serial modules

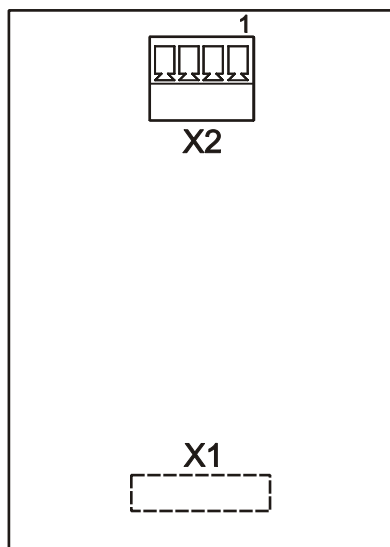
- | | |
|-----------|--------------------------------------|
| 1 | Nut for screwed cable gland |
| 2 | Screwed cable gland |
| 3 | Mounting links on support plate |
| 4 | 2x fixing screw |
| 5 | RS-485 class A module (iso.) |
| X2 | Connection terminal on RS-485 module |
| X19 (X14) | Slot for RS-485 module |



Cable glands do not have to be fitted for wiring inside the enclosure. When using shielded cables, the cable glands are needed to secure the shielding.

1. Install the cable gland (2) with the nut (1) on the flange between the fastening tabs (3).
2. Plug the serial module (5) into the corresponding connector (X14 or X19).
3. Fasten the serial module to the fastening tabs (3) using the two screws (4).
4. Wire the serial module with the appropriate assemblies according to the pin assignment.

16.3 Views



PCB view of RS-485 class A module (iso.) FCA2016-U1

- X1 Plug-type connection to the operating unit (rear panel)
- X2 Screw terminal for RS-485 interface

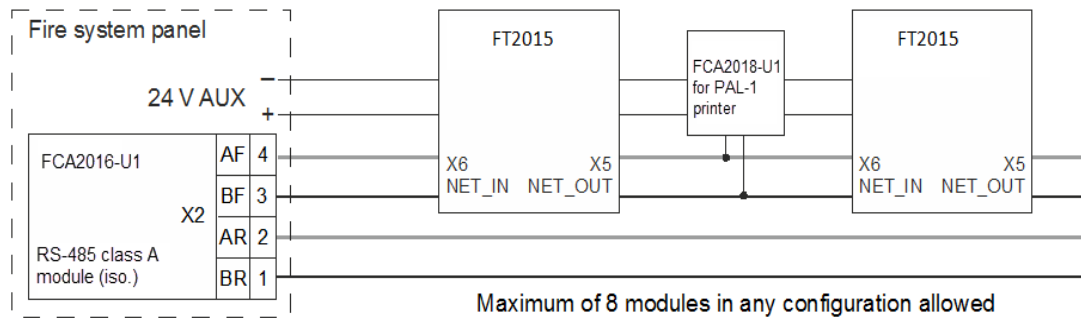
16.4 Pin Assignments

16.4.1 Plug X2

Pin	Designation	Description
4	X2-4 RS-485 AF	AF Circuit A feed
3	X2-3 RS-485 BF	BF Circuit B feed
2	X2-2 RS-485 AR	AR Circuit A return
1	X2-1 RS-485 BR	BR Circuit B return

Wire size: 12...26 AWG

Wiring Diagram RS-485 Network: Class B (style 4)

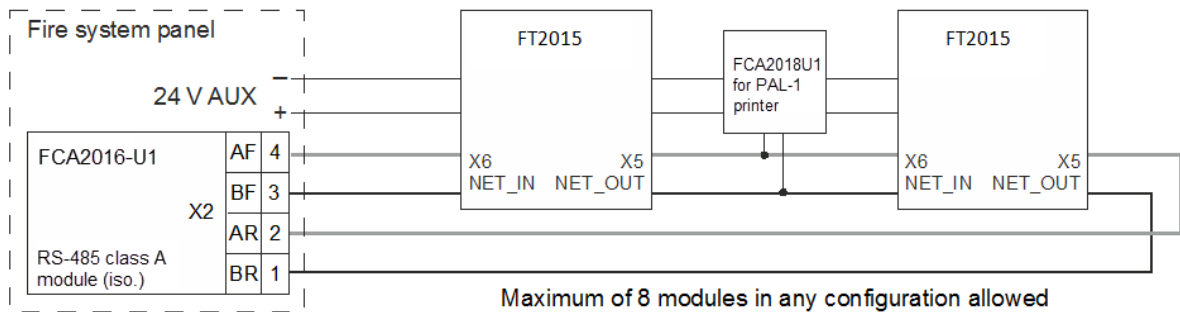


Class B (style 4)

Wiring diagram FCA2016-U1 class B (style 4)

RS-485 Network, supervised for ground fault, open and short circuit
 Class B circuits (style 4) must not exceed a maximum of 65 ft
 Class B circuits (style 4) must be terminated with 120 Ω
 Observe polarity for circuits A and B
 Power limited accessory to NFPA 70 / NEC 760 / Subchapter J of
 Title 46 of the Code of Federal Regulations
 Ground faults detected at <1 k Ω
 All wiring in accordance of article 760 of NEC or local building code

Class A (style 6)



Wiring diagram FCA2016-U1 class A (style 6)

Class A circuits of style 6 must not exceed a maximum of 3940 ft
 Observe polarity for circuits A and B
 Ground faults detected at <1 k Ω

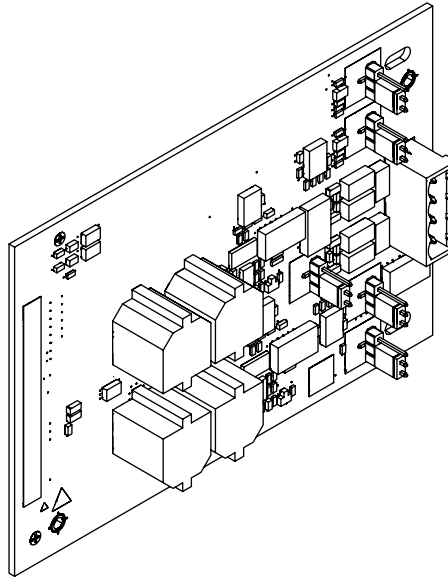


For further details of wiring for the modules for the RS-485 circuit, are located in the descriptions of the corresponding modules.

16.5 Technical Data

Supply input	Voltage	3.3 VDC
	Operating current:	
	Standby	Approx. 75 mA
RS-485 circuit	Alarm	Approx. 136 mA
	Number of participants	Max. 8
	Maximum length per class A circuit, twisted	3940 ft at 100 kbit/s
	Maximum length per class B circuit	65 ft
	Maximum loop resistance	80 Ω
	Maximum line-to-line capacitance	2.5 μ F
	Data rate:	Automatically regulated by processor
	<330 ft	12 Mbit/s
	>330...660 ft	1.5 Mbit/s
	>660...1310 ft	500 kbit/s
	>1310...3940 ft	93.75...9.6 kbit/s
	Electrical isolation between the RS-485 interface and the panel	1.5 kV
	Monitored for	Ground fault (at >1 k Ω to ground) Interruption Short circuit
	Wire gauge	12...26 AWG

17 FCI2011-U1 NAC Module (1A/2B)



17.1 Description

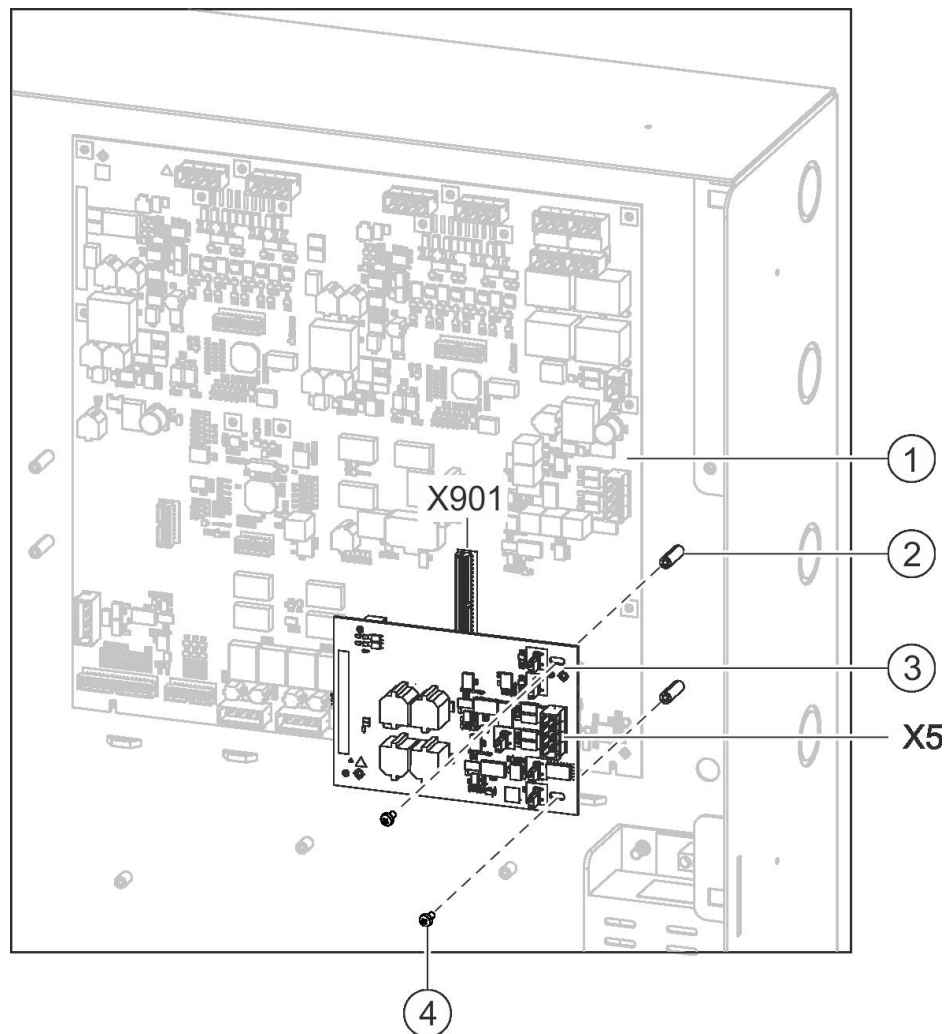
The notification appliance expansion module (NAC FCI2011-U1) provides an additional class A circuit or two class B circuits. Each is rated three A per each circuit. The header attaches to X901 on the periphery board. The same jumpers have to be configured on the card as with the periphery board for class A/B circuit selection and degraded mode. All jumpers must be configured, and the module is placed on X901 before power is applied to the system.

Properties

- Additional NAC circuits with three A power for one class A circuit or for each class B circuit
- Protected against voltage surge and shorted outputs
- Circuit monitored for short, open, and ground fault
- Ground faults detected at $<1 \text{ k}\Omega$
- Circuits are power limited

17.2 Installation

The NAC module (1A/2B) FCI2011-U1 is installed on the periphery board as shown and screwed onto the back box. Slot X901 is also used for the releasing module.

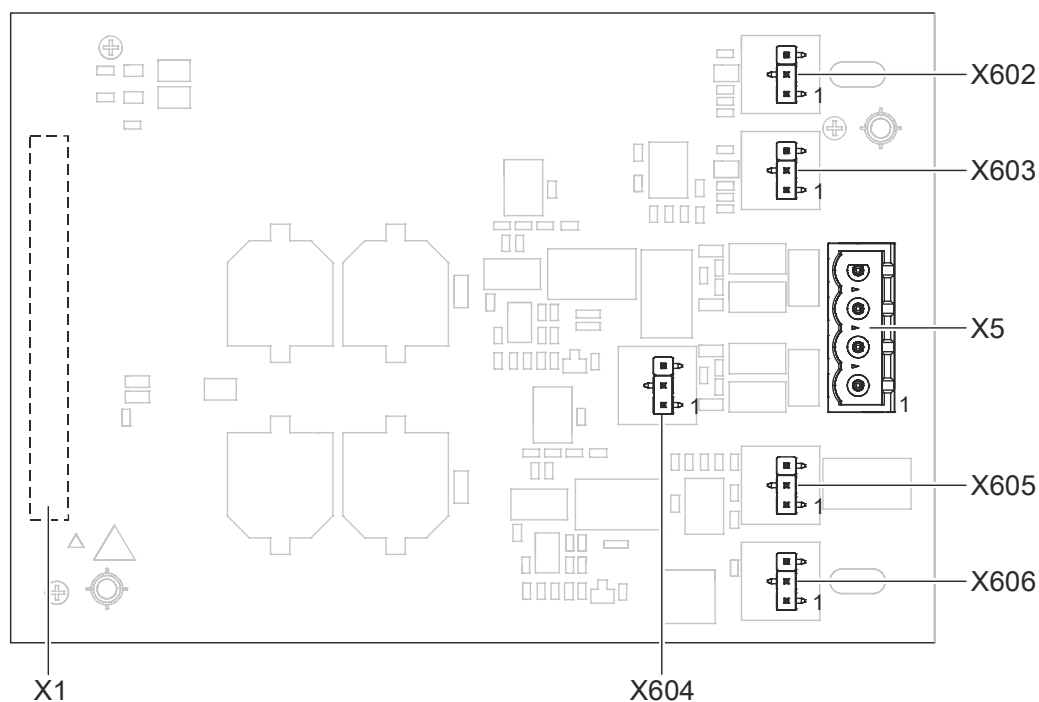


Installing the NAC module on the periphery board

- | | | | |
|---|--|------|---|
| 1 | Periphery board (250p) or periphery board (500p) | 4 | 2x fixing screw |
| 2 | Threaded sleeves on back box | X901 | Slot in periphery board |
| 3 | NAC module (1A/2B) FCI2011-U1 | X5 | Connection terminal on NAC module (1A/2B) |

1. Plug the NAC module (3) into slot X901 on the periphery board as shown.
2. Fasten the NAC module to the threaded sleeves (2) in the back box using the two fixing screws (4).
3. Wire up the NAC module according to the pin assignment.

17.3 Views



Printed circuit board view for FCI2011

Element	Des.	Function
Connector	X1	Connection to periphery board
	X5	NAC 2 output
	X602	DEGRADED MODE ENABLE/DISABLE for NAC 2 class A or NAC 2-1 class B
	X603	DEGRADED MODE ENABLE/DISABLE for NAC 2-2 class B
	X604	NAC 2 class A/B selection
	X605	NAC 2 class A/B selection
	X606	NAC 2 class A/B selection

17.4 Pin Assignments for NAC 2

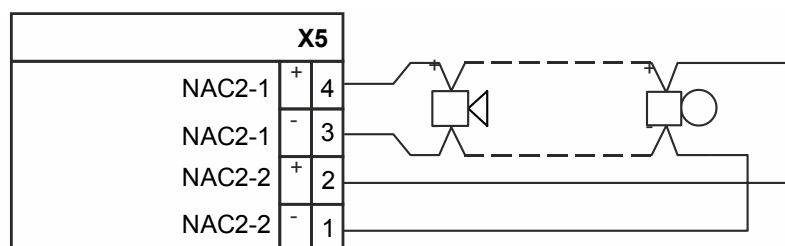
17.4.1 X5 NAC 2 class A and NAC 2-1 and NAC 2-2 class B terminal block

Pin	Designation	Description
4	NAC2-1 (+)	Positive feed for notification appliances for NAC 2 class A or NAC 2
3	NAC2-1 (-)	Return feed for notification appliances for NAC 2 class A or NAC 2
2	NAC2-2 (+)	Positive feed for notification appliances for NAC 2 class A or NAC 2
1	NAC2-2 (-)	Return feed for notification appliances for NAC 2

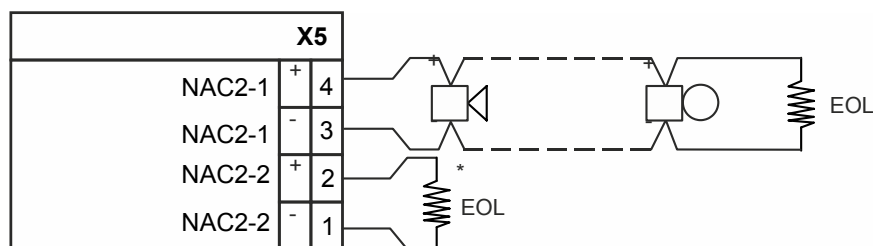
Admissible cable cross-section: 1 x 12...18 AWG or 2 x 16...18 AWG



The jumpers must be set correctly for the class A/B selection.



Pin assignment for NAC circuit class A



Pin assignment for NAC circuit class B


* EOL resistance must be connected during non-use. EOL resistance: 2.4 kΩ, 0.5 W.

17.5 Adjusting Elements for NAC 2

17.5.1 X602 Jumper


Degraded Mode Enable/Disable for NAC 2 class A or NAC 2-1 class B

Switching on the degraded mode function of the NAC circuit 2 class A or circuit 2-1 class B

X602	Jumper position	Function	Definition
	3 - 2	Disable degraded mode for NAC 2 class A or NAC 2-1 class B.	Circuit will not activate the notification appliances if degraded mode is activated and an alarm is present.
	1 - 2	Enable degraded mode for NAC 2 class A or NAC 2-1 class B.	Circuit will activate the notification appliances if degraded mode is activated and an alarm is present.


17.5.2 X603 Jumper Degraded Mode Enable/Disable for NAC 2-2 class B

Switching on the degraded mode function of the circuit 2-2 class B

X603	Jumper position	Function	Definition
	3 - 2	Disable degraded mode on NAC 2-2 class B.	Circuit will not activate the notification appliances if degraded mode is activated and an alarm is present.
	1 - 2	Enable degraded mode on NAC 2-2 class B.	Circuit will activate the notification appliances if degraded mode is activated and an alarm is present.

17.5.3 X604, X605 and X606 NAC 2 class A/B selection jumper

Class A/B setting of the additional NAC circuit

X604 X605 X606	Jumper position	Function	Definition
	3 - 2	Class A	Configures periphery board NAC 2 for class A circuit
	1 - 2	Class B	Configures periphery board NAC 2-1 and NAC 2-2 for class B circuit

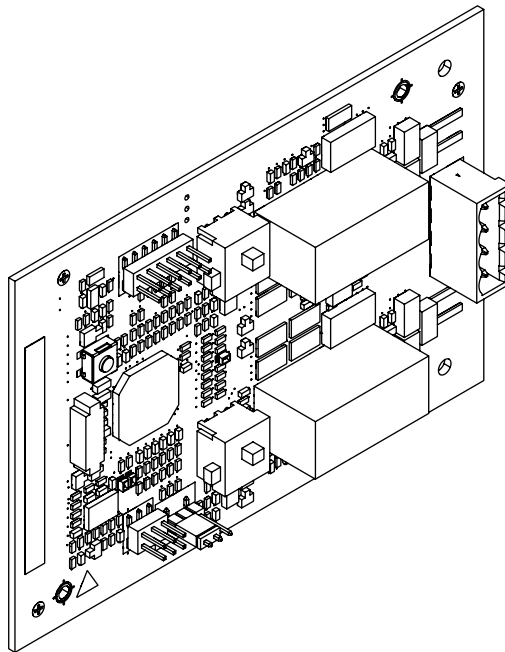


The setting for class A/B must also be configured with the Engineering tool set. If the configuration does not match the onboard jumper settings, an error will post on the Operating Unit.

17.6 **Technical Data**

Supply	Plug strip	X5
	Voltage	24VDC
		Special Application for strobe loads Regulated for non-pulsing loads
Outputs	Standby operating current	Max. 15 mA
	Active operating current	Max. 3 A (for a class A circuit or per class B circuit)
	Maximum circuit resistance	1.4 Ω @ 3.0 A
	Supervised for	Open circuit
		Short circuit
Ground fault		
Design		Short-circuit protection
		Voltage surge protection
		Power limited

18 XCI2001-U1 Releasing Module



18.1 Description

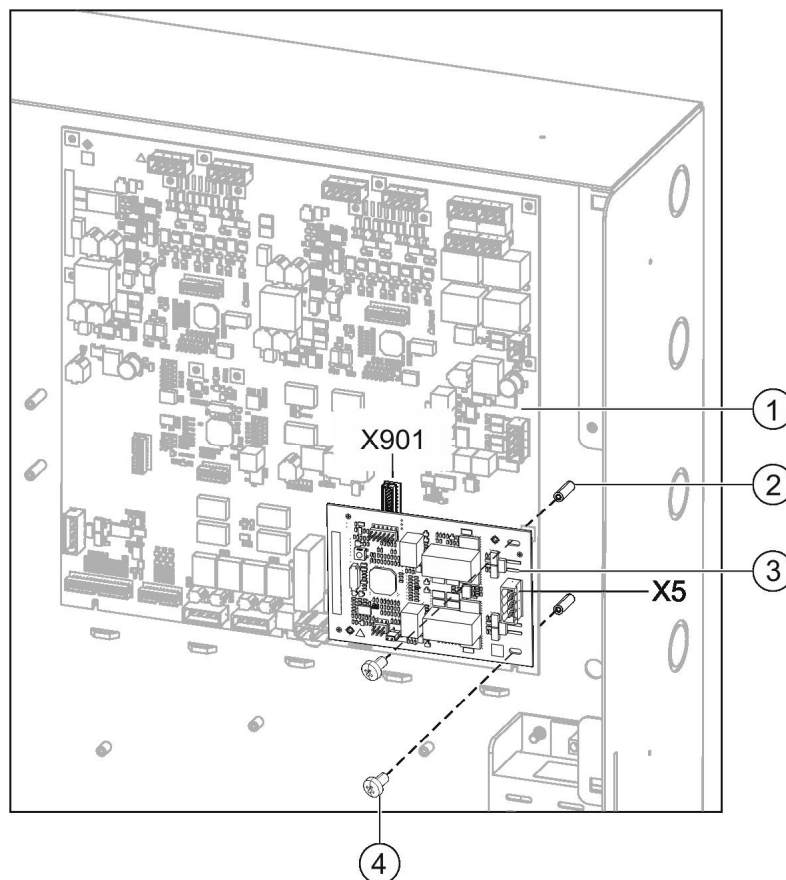
The releasing module XCI2001-U1 supports activation of releasing valves in releasing and sprinkler systems. Activation can be event-controlled or performed manually. The releasing module is mounted on the periphery board.

Properties

- Automatic or manual activation
- Dual-channel control
- Supervision of releasing circuit (wiring as class B circuit)
- Supports several valve systems
- Suited to indoor applications (not wet rooms)

18.2 Installation

The releasing module XCI2001-U1 is installed on the periphery board as shown and screwed onto the back box. Slot X901 is also used for the NAC module (1A/2B).

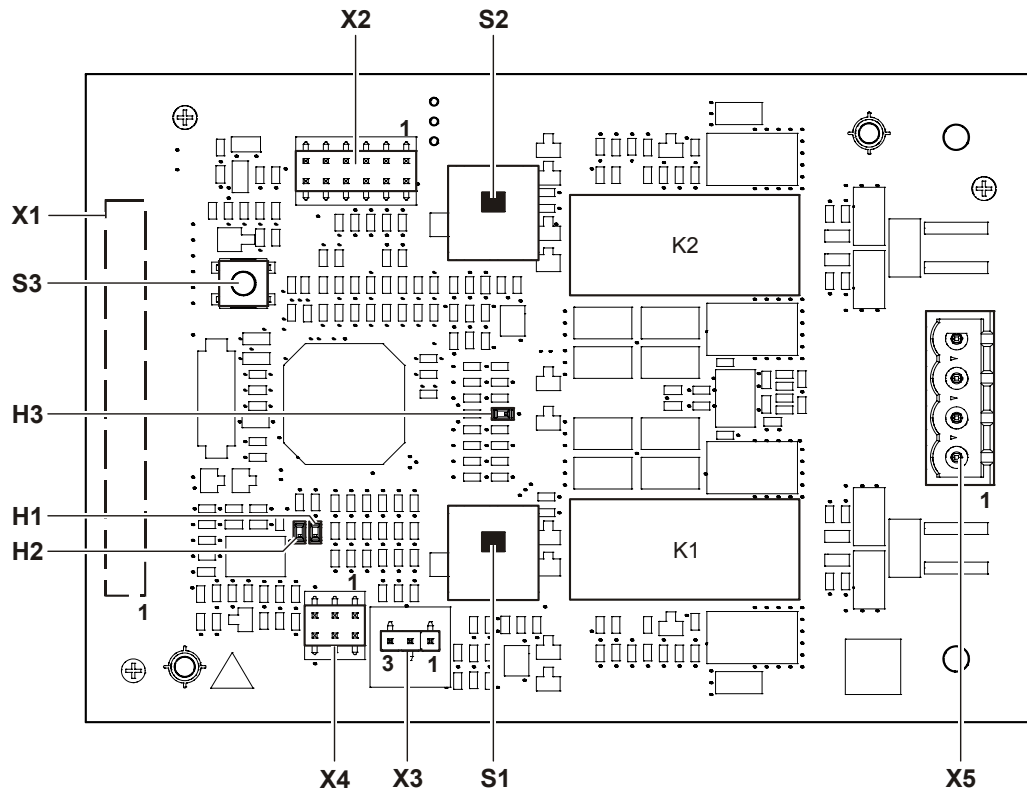


Installation of releasing module on the periphery board

- | | |
|------|--|
| 1 | Periphery board (250p) or periphery board (500p) |
| 2 | Threaded sleeves on back box |
| 3 | Releasing module XCI2001-U1 |
| 4 | 2x fixing screw |
| X901 | Slot in periphery board |
| X5 | Connection terminal on releasing module |

1. Plug the releasing module (3) into slot X901 on the periphery board.
2. Fasten the releasing module to the threaded sleeves (2) in the back box using the two fixing screws (4).
3. Wire up the releasing module according to the pin assignment.

18.3 Views



Printed circuit board view for XCI2001-U1

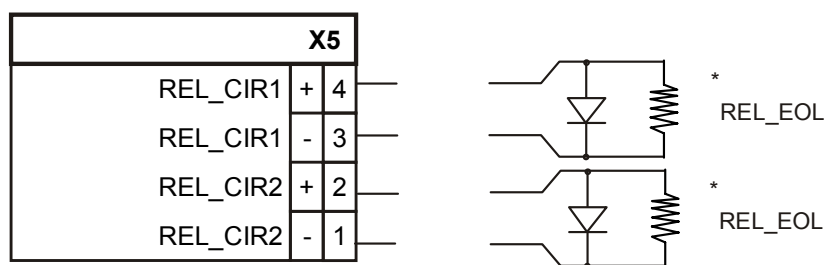
Element	Des.	Function
Connector	X1	Plug for periphery board connection
	X2	Service plug for programmed connection (not used)
	X4	Diagnostic service plug (not used)
	X5	Releasing relay outputs
Adjustment elements	S1	Switch: Arm/Disarm releasing output 1
	S2	Switch: Arm/Disarm releasing output 2
	S3	Reset key
	X3	Jumper for degraded mode enable
LEDs	H1	Display: Releasing output 1 status ON/OFF
	H2	Display: Releasing output 2 status ON/OFF
	H3	Flashing: Releasing module is active

18.4 Pin Assignments for Releasing Module

18.4.1 X5 plug connection for releasing relay output

Pin	Designation	Description
4	REL_CIR1 (+)	Relay output for releasing 1
3	REL_CIR1 (-)	Relay output for releasing 1
2	REL_CIR2 (+)	Relay output for releasing 2
1	REL_CIR2 (-)	Relay output for releasing 2

Admissible cable cross-section: 12...18 AWG, unshielded



*REL-EOL: Terminating resistor 24 kΩ and diode (Siemens part number 500-696359)

18.5 Indicators

18.5.1 LED indicators

LED	Color	Function	Condition	Definition
H1	Green	Status of releasing circuit 1	Off	Releasing circuit 1 inactive
			On	Releasing circuit 1 activated
H2	Green	Status of releasing circuit 2	Off	Releasing circuit 2 inactive
			On	Releasing circuit 2 activated
H3	Green	Status of processor	Off (steady)	Processor is not running
			Flashing	Processor is running
			On (steady)	Processor is not running

18.6 Adjusting Elements for Releasing Module

S1 and S2, Switches to Arm/Disarm the Releasing Outputs

Button	Function	Position	Definition
S1	Arming of releasing 1	OFF	Releasing output 1 disarmed (supervisory mode)
		ON	Releasing output 1 armed (normal)
S2	Arming of releasing 2	OFF	Releasing output 2 disarmed (supervisory mode)
		ON	Releasing output 2 armed (normal)

S1 and S2 Control Output




The outputs are disarmed in the OFF position. The relays are disarmed and supervised.

The outputs are armed in the ON position.

S3, Reset Key for Releasing Module

Button	Function	Position	Definition
S3	RESET	Pressed	The module is reset

18.6.1 Jumper X3, Degraded Mode Enable for Releasing

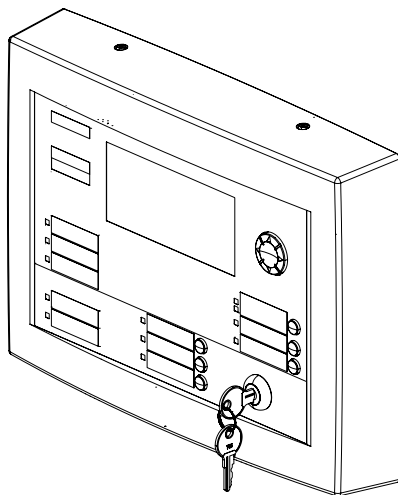
X3	Jumper position	Function	Definition
 3	3 - 2	Activated	No degrade operation allowed (Default)
 2	1 - 2	Deactivated	Degrade operation allowed
 1			

Jumper X3 must agree with the panel configuration or a trouble will be displayed.

18.7 Technical Data

Supply input	Voltage	24VDC
	Quiescent current	11 mA at 24VDC
	Output voltage	24VDC Special Application
	Output current	2.0 A per output channel
Connection terminals	Design	Screw terminals
	Admissible cable cross-section	12 AWG...18 AWG, not shielded
Mechanical data	Dimensions (W x H)	3.25 x 4.75 inches
	Weight	Approx. 90 g

19 FT2014-U2/U3/R2/R3, FT2015-U2/U3/R2/R3 Remote Display Terminal



Remote terminal FT2015

19.1 Description

Remote terminal Display FT20xx Series is synchronized with Fs20 FACP of the configured visibility and display the same event texts. The device is connected to the control panel via the RS-485 circuit. The remote terminal is available in the either **red** or **black**.

Common Features

- Connection to the RS-485 circuit as a class B circuit or class A circuit
- Power supply from the associated fire control panel
- External supply possible
- Operation enabled by key switch (FT2015-xx only)
- 8-line display each with 40 characters per line and backlight
- Buzzer
- Indication of alarms and troubles
- Bypass for installed buzzer
- Three LEDs configurable with the Engineering tool set.
- Inscription strips for sliding in

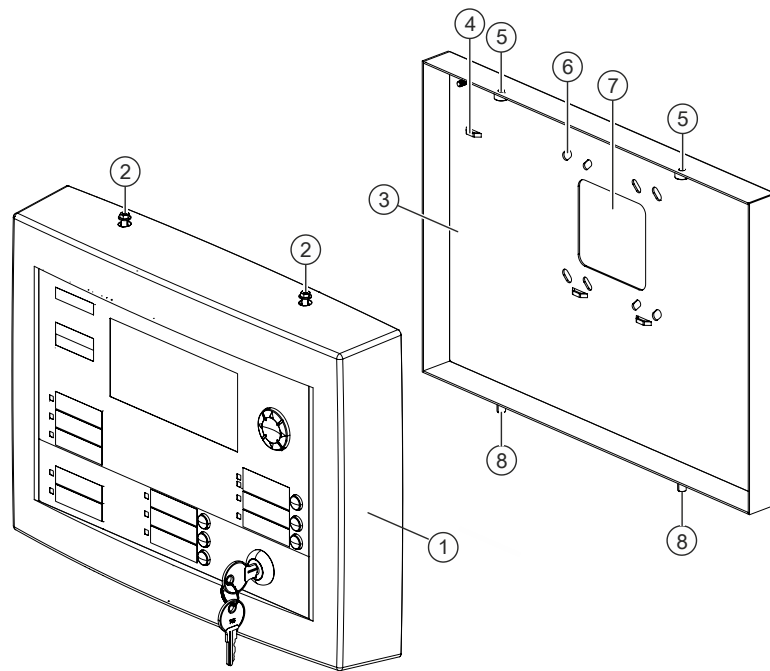
Additional Features

- Acknowledgement and resetting of alarms and troubles (F2015-xx only)
- Three buttons configurable with the Engineering tool set.

Document references

The templates for the inscription strips and the operating instructions with button and LED designations are located in the Appendix on page: 134.

19.2 Installation



FT2015-xx Installation view

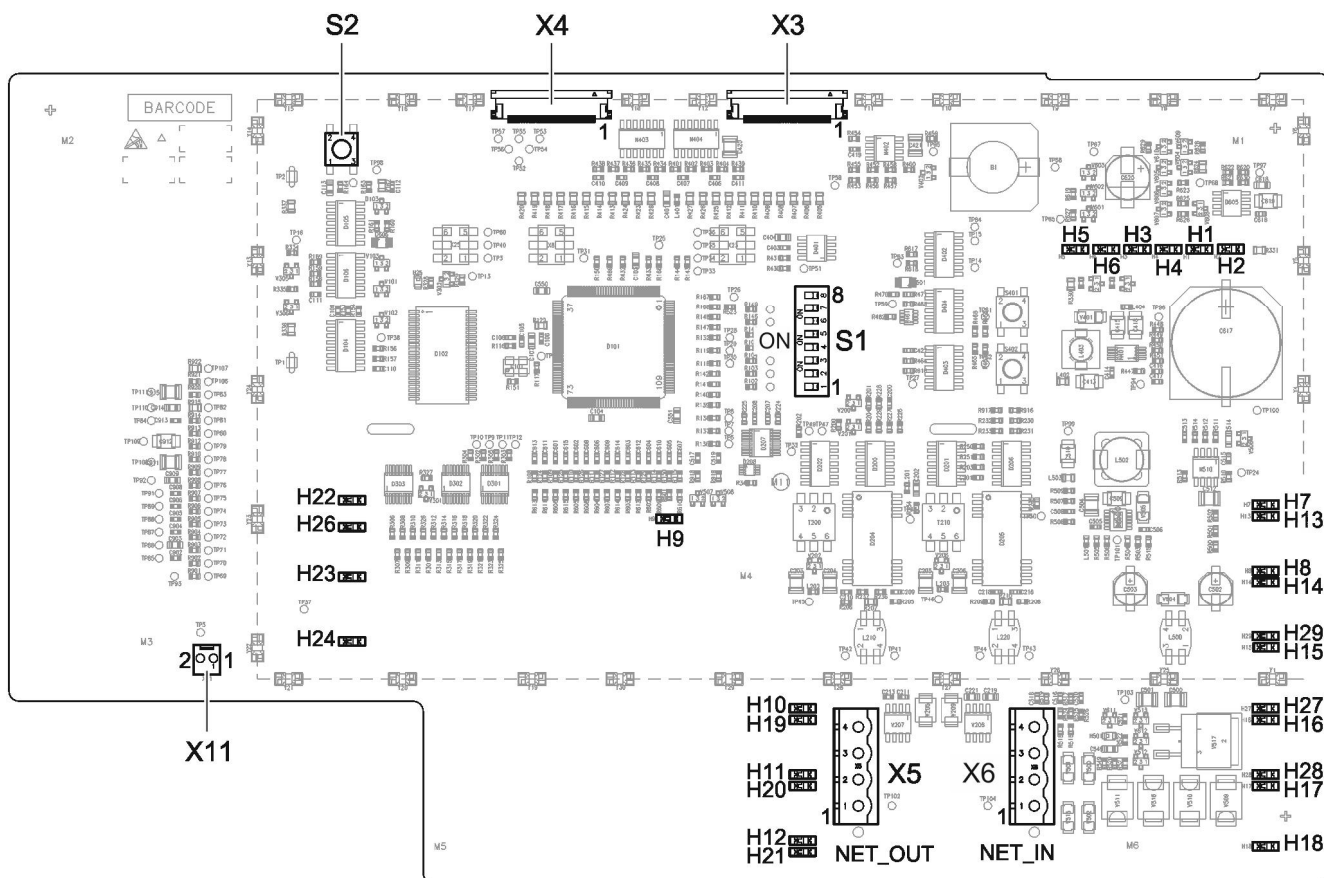
Installation for the FT2015 terminal

- | | | | |
|---|---|---|------------------------------------|
| 1 | Enclosure | 5 | 2x threaded hole for fixing screws |
| 2 | 2x fixing screw on the top of the enclosure | 6 | 8x fixing slot for wall mounting |
| 3 | Back box | 7 | Cable entry |
| 4 | 3x slot for cable tie | 8 | 2x holder cam for enclosure |

INSTALLATION

- Loosen the fixing screws (2) on the top part of the enclosure and remove the enclosure (1) from the back box (3), by gently lifting it up and pulling it forward.
- Position the back box such that the cables can be led correctly through the cable entry (7). Mark the fixing slots (6) in this position.
- Drill the holes and secure the back box (3) to the wall by inserting dowel screws through the fixing slots (6).
- Wire up the device according to the wiring diagram.
- Fix the cables to the slots (4) with cable ties and mount the enclosure on the back box in reverse order to the description under step 1.

19.3 Views



Printed circuit board view of remote display and remote terminal

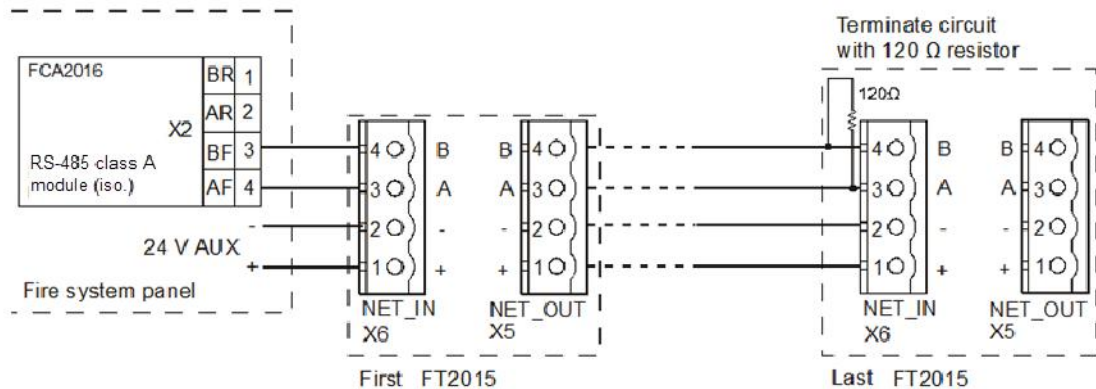
Element	Des.	Function
Connections	X3	Connection for ribbon cable to display
	X4	Connection for ribbon cable to display
	X5	Connection plug for supply and 'NET_OUT' circuit output
	X6	Connection plug for input supply and 'NET_IN' line input
	X11	Connection for key switch
Switch	S1	DIP switch, 8-pole, for address setting and other functions
	S2	Reset key
Indicators	H1...H29	LED indicators, front

19.4 Wiring

The circuit must not be terminated on the side of the RS-485 class 'A' module, because the RS-485 class 'A' module has integrated terminating resistors.

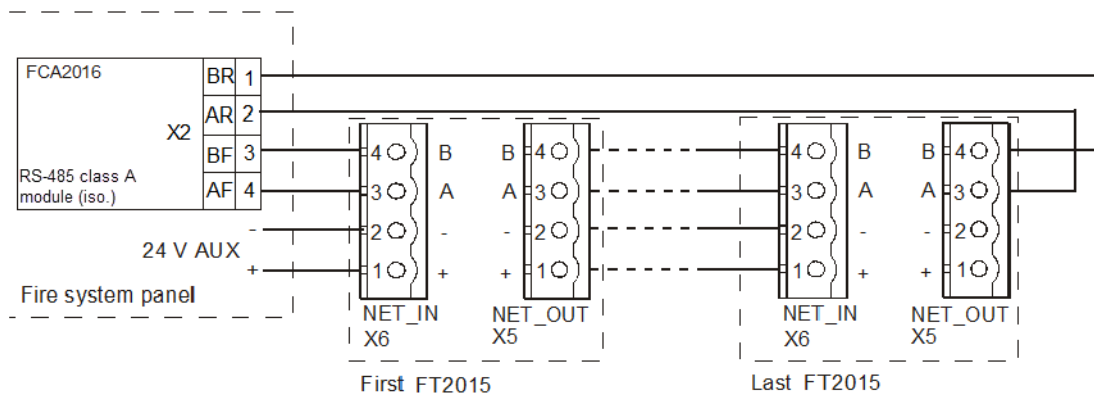
When wiring as a class 'B' circuit, the circuit on the last device must be terminated with a 120 Ω resistor.

Wiring from the Remote Terminal to the RS-485 Circuit as A Class 'B' Circuit



FT2015 class B, style 4 wiring

Wiring from the Remote Terminal to the RS-485 Circuit as a Class A Circuit



FT2015 class A, style 6 wiring

19.4.1 X5/X6, RS-485 Circuit Connection Terminals

Plug X6, NET_IN

Pin	Designation	Description
1	+	External supply input 24VDC
2	-	External supply input 0VDC
3	A	A port of RS-485 circuit input
4	B	B port of RS-485 circuit input

Plug X5, NET_OUT

Pin	Designation	Description
1	+	External supply output 24VDC (to cascade)
2	-	External supply output 0VDC (to cascade)
3	A	A port of RS-485 circuit output (to cascade)
4	B	B port of RS-485 circuit output (to cascade)

19.5 Adjustment Elements

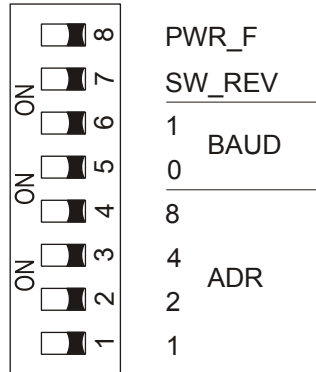
Reset key S2

The reset key S2 has two functions:

- Restart the processor to trigger the watchdog
- Read-in the set baud rate and address with DIP switch S1

DIP switch S1

All switches are set to the OFF position (right-hand position) at the factory.



View of DIP switch S1 with inscription

S1 switch	Designation	Function	Position	Definition
8	PWR_F	Third voltage source (not required for UL)	ON	Switches the third voltage source on
			OFF	Third voltage source is not connected (default)
7	SW_REV		ON	Activates the software update mode
			OFF	Normal operation (default)
6	1	Baud rate	Baud rate setting according to table below	
5	0			
4	8	Device address	Address setting according to table below. Every device must have a separate address. The first device must have the address 1.	
3	4			
2	2			
1	1			

Setting the Device Address

Address	Switch 1 (1)	Switch 2 (2)	Switch 3 (4)	Switch 4 (8)
0 (default)	OFF	OFF	OFF	OFF
Device 1	ON	OFF	OFF	OFF
Device 2	OFF	ON	OFF	OFF
Device 3	ON	ON	OFF	OFF
Device 4	OFF	OFF	ON	OFF
Device 5	ON	OFF	ON	OFF
Device 6	OFF	ON	ON	OFF
Device 7	ON	ON	ON	OFF
Device 8	OFF	OFF	OFF	ON
Device 9	ON	OFF	OFF	ON
Device 10	OFF	ON	OFF	ON
Device 11	ON	ON	OFF	ON
Device 12	OFF	OFF	ON	ON
Device 13	ON	OFF	ON	ON
Device 14	OFF	ON	ON	ON
Device 15	ON	ON	ON	ON

Setting the Baud Rate

Baud rate [kb/s]	Baud 0 / switch 5	Baud 1 / switch 6
9600	OFF	OFF
19200	ON	OFF

19.6 Technical Data

Supply	Designation	'+', '-'
	Voltage V_{sys}	24VDC
	Power consumption	34 mA
RS-485 circuit	Terminals	Plug-in terminals
	Circuit voltage	4...5 VDC
	Transmission rate	Adjustable: 9600 kbit/s 19200 kbit/s
	Number of participants	Max. 8
Length of line	Class B, style 4	Max. 4000 ft with AWG14 Max. 3300 ft with AWG18
	Class A, style 6	Max. 1640 ft
Functional data	Display	LCD 256 x 112 pixels 8 lines of 40 characters each
	Acoustic signaling	Tone interval can be configured with Engineering tool set
Ambient conditions	Operating temperature	-0...+49°C (120°F)
	Storage temperature	-20...+60°C (140°F)
	Max. application height	13100 ft. Above sea level
	Standards	UL 864

20 Audible Alarms

Alarm Locations and Requirements

Ten-inch bells are required to sound in the following location when any alarm initiating device is activated:

- Alarm bells must always sound on the bridge regardless of which zone is in alarm.
- Alarm bells must sound in the engine room, machinery spaces, and the control room when an alarm is initiated for any of these spaces. In case the control room is unattended at the time of alarm, bells must also be installed in the passageways and lounge area of the licensed engineer's quarters.
- If an alarm is not acknowledged (silenced or reset) at the control panel within two minutes, the control panel must automatically cause the General Alarm to sound.



Flexible conduit or cable with a maximum diameter of 3/4 inch and a minimum length of 18 inches from rigid connection should be used to house external wiring.

21 Manual Initiating Devices

Manual stations are recommended for use with automatic fire detectors. If a fire is observed before automatic detector response, the manual activation of the station results in the same system response as automatic detection. Manual stations should be installed throughout the accommodation spaces, the service station, and the control stations.

- Intelligent/Analog Manual Station HMS-M
- Conventional Manual Station MS-51/501
- Reference US Coast Guard Approval Equipment List



One (1) manual station should be located at each exit. The station should be readily accessible in the corridors of each deck so that no part of the corridor is more than 60 feet (20 meters) between each manual station.

22 Remote Annunciators

The U.S. Coast Guard does not required remote Annunciation when the main control panel is located on the navigation bridge; however, when the main control panel is located in a fire control station, which is not a constantly attended space, a supervised complete system status annunciator is required.

22.1 Smoke Detectors

Smoke detector is the generic name for photoelectric detectors; it senses visible smoke. The marine detectors must have a metal plate to protect it from the weather.

22.2 Spacing

For average area with smooth ceiling and normal air movement, the maximum recommended spacing is 900 square feet or no more than 30 feet between centers and 15 feet from a sidewall. In area with higher air movement, the detector spacing should be reduced accordingly.

22.3 Application Limitations

Description and Functions

On ceiling heights below eight feet, the possibility of unintentional alarms from tobacco smoke does exist, especially in area where people might congregate. It is recommended that smoke detectors in such area have their zones wired through alarm confirmation module.

Description and Functions

Smoke detectors should not be used in area where they could be subjected to steam or moisture condensation such as in galleys, laundries, etc. Thermal detectors should be used in such area.

22.4 Thermal Detectors

Description and Functions

All thermal detectors respond only to excessive heat, which is assumed to be generated from a flaming fire. The detectors are designed with different operating principles:

- Fixed Temperature
- Rate Compensated

22.4.1 Fixed Temperature

The air temperature has to exceed the set rating of the devices in order to activate it. The settings are 135°F - 190°F (57°C - 87°C) and higher (on special order).

22.4.2 Rate Compensated

This type of thermal detector is similar to the fixed temperature detectors in operation, but is compensated to eliminate the expected thermal lag and therefore, responds faster.

22.5 Spacing

Maximum approved spacing of thermal detectors is as follow:

Maximum Are Protected Type	(Square Feet)	Distance from Sidewalls
Fixed Temperature (DT-11)	625 (25 –x-25)	12.5 feet
Fixed and Rate of Rise	2500 (50-x-50)	25 feet
DT-135 CS, CL, and WP Rate Compensated	2500 (50-x-50)	25 feet
DR -200 CS, CL and WP Rate Compensated	2500 (50-x-50)	25 feet

23 Wiring Specifications for FS20 Fire



All wiring must comply with local and national codes and use stranded twisted pair wiring.

1. Intermixing of field wiring cable types is allowed.
 2. Radiated and Conducted Emissions Protection is achieved by the EMI Filter in the enclosure.
 3. For all Signaling Line Circuits (SLCs)
 - All SLCs are rated Power Limited, and should be wired in accordance with applicable codes.
 - The minimum permitted wire size is 18 AWG, maximum 14 AWG.
 - Multiple SLCs within the same cable or metal raceway do not have to be individually shielded.
 - The maximum line resistance: Style 4 (Class B) circuit (all wires) is 100 ohms.
 - Style 6 (Class A) circuit, acceptable resistance is 100 ohms, 25 ohms per line
 - Refer to the ALD-21 Loop Configuration Guide.
 - The maximum acceptable line capacitance for SLC is:
 - 0.4 UF Line to Line
 - 0.8 UF Line to Ground
 4. Non-addressable Initiating Device Circuits
 - All SLCs are rated Power Limited, and should be wired in accordance with applicable codes.
 - The minimum permitted wire size is 18 AWG, maximum 14 AWG.
 - The maximum acceptable line resistance per module is as follows:
 - Style D (Class A) – 70 ohms maximum 17.5 ohms per line. If a Relay Base is utilized, 40 ohms maximum, 10 ohms per line
 - Style D (Class A) – 35 ohms maximum, 8.7 ohms per line. Style B (Class B) both wires, maximum resistance is four ohms. Style D (Class A) maximum resistance is one ohm per wire.
 - Maximum Capacitance 0.04 UF Line to Line. Maximum Capacitance 0.08 UF Line to Ground.
- Note:** Reference U.S. Coast Guard Approval Equipment list.
- Parallel wiring (T-tapping) is not approved on any of the above style.
5. Local Network Communication Circuits (i.e. FS20 Fire to Remote Annunciator)
 - Minimum wire size permitted is 18 AWG, maximum is 14 AWG
 - The Maximum acceptable:
 - Line capacitance is 0.33 UF Line to Line and 0.66 UF Line to Ground for each network pair.
 - Parallel wiring (T-tapping) is not allowable unless the REP-1 is utilized. Each REP-1 provides two (2) Style 4 Circuits providing an additional 80 ohms line resistance.
 - 120 ohm, ¼ watt resistors **must be placed** at each end of the network circuit .

- All local network wiring is rated Power Limited and should be wired in accordance with applicable codes.
 - The local network utilized a modified RS-485. It is not presently compatible with modem transmission.
6. Global Network Circuits (i.e., FS20 Fire to FS20 Fire)
- Minimum wire size is 18 AWG, maximum is 14 AWG.
 - The maximum allowable:
 - Line resistance is 80 ohm (both wires)
 - Line capacitance is 0.33 UF Line to Line and 0.66 UF Line to Ground for each network pair.
 - These parameters also apply to the Foreign System Interface module; (RS-485).
 - Parallel wiring (T-tapping) is not allowable.
 - 120 ohm, ¼ watt resistors must be placed at each end of the network pair.
 - All network wiring is rated Power Limited and should be wired in accordance with applicable codes.
7. Multiple network utilized a modified RS-485 .
8. All NAC circuits must use a minimum 14 AWG
- Max Line resistance (all wires) is three ohms.
 - Line capacitance is 0.05 UF Line to Line and 0.1 UF Line to Ground.
 - These circuits and their associated wiring are rated Power Limited and should be wired in accordance with applicable codes.
 - Parallel wiring (T-tapping) is not allowed on any NAC circuit.
 - When programmed for leased line circuits, the external wiring resistance to the monitoring location must be between 2K and 5K ohms. This line must be a dedicated pair for fire-alarm use only.
 - When programmed for municipal tie circuits, the external wiring resistance to the municipal box shall not exceed 22.5 ohms (both wires).
 - When programmed for releasing service use the maximum line resistance is three ohms (both wires).

NOTES:

- When shielded cable is utilized, the wiring shields should only be connected at the point origin, as specified.
- Overhead, exterior wiring is not permitted.
- The standard twist for twisted-pair wires is six (6) turns per foot.
- For wire resistance information, refer to the latest edition of the National Electric Code, NFPA 70, or contact the manufacturer of the wire in question.

23.1 Typical Large FS20 Fire System Configuration

Compliance with Safety of Life at Sea (SOLAS) using USCG Approved Equipment

23.1.1 Power

Although the required two sources of power are available from the main and standby generators, optional short term battery backup is acceptable.

23.1.2 Audible Alarms

It is specified that bells are pulsed in order to distinguish fire signals from steady bells of the emergency alarms.

The SOLAS requirement of sounding bells in the crew's spaces if the alarm signals at the control panel have not received attention within 2 minutes.

23.2 Typical [Small] FS20 Fire System Configuration

Small cruise ships require six zones to cover the accommodation spaces. The low deck height of 7 feet 3 inches increases the possibility of smoke detectors alarming to tobacco smoke. The use of the alarm verification will tend to eliminate this concern by not reporting, but recording first alarm and requiring the device to alarm a second time within a time frame adjustable to one minute. In the event of a true fire, it would be undesirable to have manual station activation so delayed. Therefore, the manual stations are connected to their own zone not under the influence of alarm verification.



When designing Fire Control System for various types of vessels, the designer should be aware of the required vessel type, domestic and SOLAS regulation applicable for that vessel.

24 Removing/Replacing Hardware Components

The components are dismantled in reverse sequence of installation.



To replace components during servicing, proceed as follows:

- Decommission the panel.
- Disconnect the panel from the power supply.
- Remove the components that prevent access to the component.
- Unplug the connections and plug contacts.
- Label the cable.
- Replace the component.
- Install the removed components.
- Connect the connections and plug contacts.
- Start up the panel.



When returning the operating unit for services, remove all options, including the license key.

24.1 Uninstall

	⚠ WARNING
	Electrical voltage Electric shock <ul style="list-style-type: none"> • Disconnect the mains cable from the power supply. • Protect the mains from being inadvertently switched back on.
	NOTICE
	Damage to hardware <ul style="list-style-type: none"> • Decommission the panel properly before starting to disassemble it.

Disassembly takes place in reverse sequence of installation. If the disassembly steps deviate from this, information to this effect is provided in the installation description.

25 Commissioning

The following sections contain general commissioning steps summary. Refer to the FS20 Commissioning, Maintenance, Troubleshooting User documentation. Document ID A6V10315021 for Desigo panels and Document ID A6V10333434 for Cerberus Pro panels.

25.1 Preparing 'Panel' for Commissioning

The following step will guide you to preparing the FS20 Marine Fire panel.

1. Connect the cables for the detector circuits and the periphery devices.
2. Connect the power supply (mains and batteries)
 - The 'Panel' starts and reads in the internal hardware
 - During start-up the 'Trouble' LED flashes and the display shows the progress
 - During start-up, the firmware version F-FXS2001 is displayed
3. Wait until the display indicates the selection of the BDV.
4. Press the 'Install' softkey and confirm with the 'Yes' softkey.
 - The 'Panel' restarts
 - During the process, the 'Trouble' LED flashes and the display shows the progress.
5. Wait until only the green 'SystemPower' LED lights up, the display shows the normal condition and the 'Panel' can be operated.
6. Press <MENU> and select the 'Login/Logout' menu item.
 - A prompt is display to enter a PIN
7. Enter the PIN and confirm with <OK>.
 - The 'User successfully logged in' message is displayed
 - The main menu is displayed.
8. Check the firmware of the 'Panel' to ensure that it is up to date. To do this select the 'Topology' > 'Hardware tree' > 'Panel' > 'MoreOptions' > 'Show details', menu item.
 - The 'Panel' version and configuration data are displayed.
9. Update the firmware if necessary.
10. Enter the date and time. To do this, select the 'Settings/administration' > 'System commands' > 'Set system time' > 'Set system time', menu items.



Additional messages may be displayed depending on the configuration of the 'Panel'.

25.2 Preparing the 'Panel' for Commission ~ without Base Data Variant (BDV) Installation


The following steps are not necessary to install the BDV for the further procedure. This is used to save having to restart the panels.

1. Connect the cables for the detectors circuits and the periphery devices.
2. Connect the power supply (mains and batteries).
 - The 'Panels' start and reads in the internal hardware.
 - During the start-up, the 'Trouble' LED flashes and the display shows the progress.
 - During the start-up, the firmware version F-FXS2001 is displayed.
3. Wait until the display indicates the selection of the BDV.
 - The 'Panel' is prepared for commissioning.

25.3 Auto-Configuring 'Panel'


1. Select 'Topology' > 'Hardware tree' > 'Panel' in the main menu.
2. Press the 'MoreOptions' softkey and select 'Execute Commands'.
3. Select the 'Auto-configure panel' command.
 - The 'Panel' is auto-configure.
 - A message is displayed following a successful auto-configuration: '**Command execute**'.

25.4 Auto-Configuring the Detector Circuits

	<i>NOTICE</i>
	<p>Incorrect Order For Reading In A Class A Circuit</p> <p>Error when reading in a class A circuit The detector circuits are detected as class B during the first system start-up, e.g. 'Circuits' 11, 'Circuit 12 (2-digit circuit number) even if they are connected as a class A circuit.</p> <ul style="list-style-type: none"> • Always select the first 'Circuit' to read in a class A circuit, in this case, 'Circuit 11'. 'Circuit' 12 is then read in automatically. After reading in Class A circuit is indicated with a 1-digit number, in this case, as 'Circuit' 1. • Proceed in the same way from 'Circuit' 21/22 (class A circuit 2) to 'Circuit' 41/42 (class A circuit 4).

1. Select 'Topology' > 'Hardware tree' > 'Panel' > 'Circuit card' > Detector circuit in the main menu.
2. Press the 'MoreOptions' softkey and sleets 'Execute commands'.
3. Select the 'Auto-configure circuit' command.
 - The detector circuit is auto-configured.
 - A message is displayed following a successfully auto-configuration: '**Command executed**'.

25.5 Commissioning with Manual Configuration

	NOTICE
	Commissioning as standalone 'Panel' 'Panels' commissioned as standalone Panel cannot be combined to form a network 'Site' later on. <ul style="list-style-type: none"> • Initialize network 'Panels' using a network address at the beginning of the process.

Prerequisites:

- The detector circuits and Network devices are installed.
- The detector circuits and Network devices are configured and tested with the 'Device programming unit' DPU.
- The 'Panel' is installed.
- The batteries are installed but not connected.
- The cables for the detector circuits and mains supply have been fed into the 'Panel' but are not yet connected.
- The configuration tool is installed on the PC.
- The current firmware and BDV are available on the PC.


Commissioning for Standalone 'Panel'

1. Manually create and configure a 'Site' in the configuration tool.
2. Prepare the 'Panel' for commissioning – without BDV installation.
3. Connect the PC to the 'Panel'.
4. Load the configuration from the PC to the Panel.
5. Test the function of the 'Site'.
6. Rectify errors if necessary and load the correct configuration from the PC to the 'Panel'.
7. Disconnect the PC from the 'Panel'.
8. Perform the completion work.

Commissioning for Network 'Panel'

1. Manually create and configure a 'Site' in the configuration tool.
2. Individually prepare each 'Panel' for commissioning – without BDV installation.
3. Individually connect the PC to each 'Panel'
4. Individually initialize each 'Panel'
5. Test the function of the 'Site'.
6. Rectify errors if necessary and load the corrected configuration from the PC to the 'Panel'.
7. Disconnect the PC from the 'Panel'.
8. Perform the completion work.

25.6 Commissioning with Manual Configuration and Auto-Configuration

	NOTICE
	<p>Commissioning as a Stand-alone 'Panel'</p> <p>'Panels' commissioned as standalone Panel cannot be combined to form a networked 'Site' later on.</p> <ul style="list-style-type: none"> • Initialized networked 'Panel' using a network address from the beginning.

Prerequisites:

- The detectors circuits and devices are installed.
- The detectors circuits and devices are configured and tested with the 'Device programming unit', DPU.
- The 'Panel' is installed.
- The batteries are installed but not connected.
- The cables for the detector circuits and mains supply have been fed into the 'Panel' and not connected.
- The configuration tool is installed on the PC.
- The current firmware and BDV are available on the PC.

Commissioning for Standalone 'Panel' Variant 1

With commissioning variant, first auto-configures the 'Panel', then adapt the auto-configuration manually in the configuration tool.

1. Prepare the 'Panel' for commissioning
2. Perform the auto-configuration
 - 'Auto-configure Panel' or
 - Individually auto-configure detectors circuits
3. Connect the PC to the 'Panel'.
4. Load the automatically created configuration to the PC.
5. Adapt the configuration in the configuration tool.
6. Load the configuration from the PC to the 'Panel'.
7. Test the function of the 'Site'.
8. Rectify errors if necessary and load the corrected configuration from the PC to the 'Panel'.
9. Disconnect the PC from the 'Panel'.
10. Perform the competition work.

Commissioning for Standalone 'Panel' Variant 2

With commissioning variant, first manually configure a 'Site' as far as the 'Circuit' level in the configuration tool. Then auto-configure the detectors circuits and adapt the configuration manually the configuration tool.

1. Create a 'Site' in the configuration tool and configure it manually as far as the 'Circuit' level.
2. Prepare the 'Panel' for commissioning – without BDV installation.
3. Connect the PC to the 'Panel'.
4. Load the configuration from the PC to the 'Panel'.
5. Auto-configure the detector circuits.
6. Load the configuration from the 'Panel' to the PC.
7. Adapt the configuration in the configuration tool.
8. Load the configuration from the PC to the 'Panel'.
9. Test the function of the 'Site'.
10. Rectify errors if necessary and load the corrected configuration from the PC to the 'Panel'.
11. Disconnect the PC from the 'Panel'.
12. Perform the completion work.

Commissioning for Network 'Panels'

1. Create a 'Site' and the 'Panels' in the configuration tool.
2. Individually prepare each 'Panel' for commissioning – without BDV installation.
3. Individually connect the PC to each 'Panel'.
4. Individually initialize each 'Panel'.
5. Perform the auto-configuration on each 'Panel'.
 - 'Auto-configure Panel' or
 - Individually auto-configure detector circuits.
6. Load the configuration form the 'Panel' to the PC.
7. Adapt the configuration in the configuration tool.
8. Load the configuration from the PC to the 'Panel'.
9. Test the function of the 'Site'.
10. Rectify errors if necessary and load the corrected configuration from the PC to the 'Panel'.
11. Disconnect the PC from the 'Panel'.
12. Perform the completion work.

25.7 Commissioning with Auto-Configuration without a PC



This procedure applies to standalone 'Panels' only

With commissioning variant, a 'Panel' is commissioned without a PC and the configuration tool.

Prerequisites:

- The detector circuits and devices are installed.
- The detector circuits and devices are configured and tested with the 'Device Programming Unit' DPU.
- The 'Panel' is installed.
- The batteries are installed, but not connected.
- The cables for the detectors circuits and mains supply have been fed into the 'Panels' and are not connected.

Commissioning

1. Prepare the 'Panel' for commissioning.
2. Perform the auto-configuration
 - 'Auto-configure Panel' or
 - Individually auto-configure detector circuits.
3. Adapt the auto-configuration on the Operating Unit.
 - Change customer texts
 - Set the properties of the devices.
4. Test the function of the 'Site' and rectify errors if necessary.
5. Perform the completion work.

25.8 Adding a 'Panel' to an Existing Site

Prerequisites:

- The detector circuits and devices are installed.
- The detector circuits and devices are configured and tested with the 'Device Programming Unit' (DPU)
- The 'Panel' is installed.
- The batteries are installed but not connected.
- The cables for the detector circuits and mains supply have been fed into the 'Panel', and not connected.
- The configuration tool is installed on the PC.
- The current firmware and BDV are available on the PC.



You can commission the new 'Panel' with manual configuration or with auto-configuration.

Commissioning with Manual Configuration

1. Create the new 'Panel' in the existing 'Site' in the configuration tool.
2. Configure the 'Panel' manually in the configuration tool.
3. Prepare the 'Panel' for commissioning –without BDV installation.
4. Connect the PC to the 'Panel'.
5. Initialize the 'Panel'.
 - The configuration is then loaded from the PC to the 'Panel'.
6. Test the function of the 'Site'.
7. Rectify errors if necessary and load the corrected configuration from the PC to the 'Panel'.
8. Disconnect the PC from the 'Panel'.
9. Perform the completion work.

Commissioning with Auto-Configuration

1. **Create the new 'Panel'** in the existing 'Site' in the configuration tool.
2. Prepare the 'Panel' for commissioning – without BDV installation.
3. Connect the PC to the 'Panel'.
4. Initialize the 'Panel'.
5. Perform the auto-configuration on the new 'Panel'.
 - 'Auto-Configuration Panel' or
 - Individually auto-configure detector circuits.
6. Load the configuration from the 'Panel' to the PC.
7. Adapt the configuration in the configuration tool.
8. Load the configuration from the PC to the 'Panel'.
9. Test the function of the 'Site'.
10. Rectify errors if necessary and load the corrected configuration from the PC to the 'Panel'.
11. Disconnect the PC from the 'Panel'.
12. Perform the completion work.

26 Trouble Shooting

26.1 Temporarily Removing an Individual Base Device

It may be necessary to replace a device or temporarily removed it from the base. Once the device is ready for replacement, it must be re-inserted at the exact location.

1. Remove the device.

The control panel detects that the device is missing and reports a 'Trouble'.

2. Perform the necessary activities.
3. Re-insert the devices in the previous position.
4. Acknowledge the 'Trouble'.

If the 'Trouble' is no longer displayed, the control panel updates the setting of the re-inserted device.

If the 'Trouble' is still displayed, and/or the 'Circuit' is not in normal operation, the 'Circuit' has to be restarted.



The steps may be performed when the detector circuit is enabled.

26.2 Temporarily Removing Multiple Based Devices

When temporarily removing a device for the purpose of maintenance, ensure each device is returned to its original based. The devices must not be swapped.



Mark the location of the devices to the respective base to avoid additional steps.

1. Bypass the 'Zone'
2. Remove the device from the base and insert the dummy detector if necessary.
3. Perform the tasks.
4. Re-insert the devices to the respective position.
5. Enable the 'Zone'.

A localization trouble is displayed on all re-inserted devices.

6. Re-start the detector circuit.

If detectors have been swapped or missing, the following message is displayed on the

Operating Unit:

`'Zone', Serial no.', 'Dev.loc' trouble'`




The steps are performed when the detector circuit is enabled.

26.3 Permanently Removing Based Devices

1. Bypass the detector circuit.
2. Uninstall the devices and bases.
3. Enable the detector circuit.
4. Individually delete the devices using the Operating Unit on the control panel.
5. Connect the PC to the 'Panel'.
6. Load the configuration from the 'Panel' to the PC.
7. Remove the elements in the configuration tool.
8. Load the configuration from the PC to the 'Panel'.
9. Disconnect the PC from the 'Panel'.
10. Process is completed.

27 Preparation and Security

	WARNING
	<p>Fire detection installation is deactivated during the firmware update.</p> <p>Fire may spread unhindered.</p> <ul style="list-style-type: none"> • Supervision by people is required. • Re-activate the fire detection installation as soon as possible.

Before updating the firmware, the following points must be observed:

Each 'Panel' must individually be update with the firmware.

Data backup

- When the firmware is updated, the configuration data, event memories and alarm counter value are deleted. Load the configuration data and event memories before updating the configuration tool.

Converting the configuration data

- Updating the firmware required the configuration data to be converted if the new firmware and existing configuration are not compatible with one another.

BDV Compatibility

- The BDVs are compatible when the major and the minor versions are identical. The Bug fix version is not relevant for the compatibility.

The procedure for updating the firmware depends on the 'Panel' configuration. A 'Panel' can be configured as follow:


- Standalone 'Panel'
- SAFEDLINK 'Panel'
- Router-'Panel', Ethernet 'Panel'


Windows firewall setting

- To connect the PC to the 'Panel', the Windows firewall settings must be changed if possible.

After the main CPU is updated, the Network 'Panels' must be initialized.

Once the firmware has been updated, the 'Panel' configuration must be loaded to the configuration tool in order to update the LRC data to the current firmware status.

	<i>NOTICE</i>
	<p>Data Loss During the Firmware Update</p> <p>Configuration data and event memory are deleted in the 'Panel'.</p> <ul style="list-style-type: none"> • Load the configuration data and event memory to the configuration tool before updating the firmware.

	<i>NOTICE</i>
	<p>Power Failure During the Firmware Update</p> <p>Firmware is not updated and 'Panel' is not working. The firmware update cannot be repeated and must be performed by the manufacture.</p> <ul style="list-style-type: none"> • Do not disconnect the 'Panel' from the power supply during the firmware update.

28 Equipment Lists for Marine Application

Below are list of equipment for the FS20 panels for marine application.

28.1 Desigo Channel

28.1.1 System

Model Number	Part Number	Description	Data Sheet #
FC2025	S54400-C4-A1	Fire Alarm Panel 252 Point (Desigo)	6815
FC2050	S54400-C5-A1	Fire Alarm Panel 504 Point (Desigo)	6815

28.1.2 System Modules

Model Number	Part Number	Description
FT2014-R2	S54400-B75-A1	Remote Display (Red)
FT2015-R2	S54400-B15-A1	Remote Display Terminal (with control)
FT2014-U2	S54400-F67-A1	System Display (View, Black)
FT2015-U2	S54400-F68-A1	Remote Display Terminal (with control)
FCM2018-U2	S54400-C40-A1	Operating Interface Unit
FCM2019-U2	S54400-C41-A1	Operating Interface Unit w/LEDs

28.1.3 Initiating Devices

Model Number	Part Number	Description
FDO421	S54320-F4-A1	Optical Detector
FDOOT441	S54320-F7-A1	Dual Optical + Heat Detector
FDOOTC441	S54320-F8-A1	Dual Optical + Heat + CO Detector
FDOT421	S54320-F6-A1	Optical + Heat Detector
FDT421	S54320-F5-A1	Heat Detector

28.2 Cerberus Pro Channel

28.2.1 System

Model Number	Part Number	Description	Data Sheet #
FC922	S54400-C14-A1	Fire Alarm Panel 252 Point (Cerberus Pro)	9822
FC924	S54400-C15-A1	Fire Alarm Panel 504 Point (Cerberus Pro)	9822

28.2.2 System Modules

Model Number	Part Number	Description
FT2014-R3	S54400-B73-A1	Remote Display (Red)
FT2015-R3	S54400-B15-A1	Remote Display Terminal (with control)
FT2014-U3	S54400-B80-A1	Remote Display (Black)
FT2015-U3	S54400-F68-A1	Remote Display Terminal (with control)
FCM2018-U3	S54400-C40-A2	Operating Interface Unit
FCM2019-U3	S54400-C41-A2	Operating Interface Unit w/LEDs

28.2.3 Initiating Devices

Model Number	Part Number	Description
OP921	S54320-F4-A2	Optical Detector
OOH941	S54320-F7-A2	Dual Optical + Heat Detector
OOHC941	S54320-F8-A2	Dual Optical + Heat + CO Detector
OH921	S54320-F6-A2	Optical + Heat Detector
HI921	S54320-F5-A2	Heat Detector

28.3 Common for both Desigo and Cerberus-Pro channels

28.3.1 System Modules

Model Number	Part Number	Description
FCI2016-U1	S54400-A55-A1	Periphery Board [for 252-point system]
FCI2017-U1	S54400-A56-A1	Periphery Board [for 504-point system]
FN2001-U1	S54400-A60-A1	SafeDLink Network Module
FCA2015-U1	S54400-A63-A1	Digital Alarm Communication Transmitter (DACT)
FCA2016-U1	S54400-A39-A1	RS-485 Module
FCI2011-U1	S54400-A54-A1	NAC Expansion Module
XCI2001-U1	S54400-A69-A1	Releasing Module

28.3.2 Enclosure and Accessories

Model Number	Part Number	Description
FH2071-UM	S54400-C144-A1	2HUMarine Enclosure
BP62	S54400-Z62-A1	Battery BP-62 16AH (Qty. 2)
FHA2031-U1	S54400-B44-A1	DIN Rail Kit
FHD2004-U1	S54400-B52-A1	Inner Door (supports the Operating Unit)
FP2011-U1	500-450222	170-Watt Power Supply
USCG-Hplate	S54319-F22-A1	Cover metal plate for H series I/O, USCG applications used to protect against RFI/EMI.

28.3.3 Peripherals

Model Number	Part Number	Description
DB-11	500-094151	Detector Base Assy.
DB-11E	500-094151E	Detector Base Assy.
DB11-Seal	500-695622	Seal Package (24 pc)
DB2-HR	S54370-F12-A1	Relay Base
DB-Seal	500-692211	Detector Gasket 36 Box
FDBZ492 ¹	S54319-B22-A1	Duct Housing
FDBZ492-HR ¹	S54319-B23-A1	Duct Housing with Addressable Relay
FDBZ492-R ¹	S54319-B24-A1	Duct Housing with Conventional Relay
FDBZ492-RP ¹	S54319-B25-A1	Powered Duct Housing with Conventional Relay
FDBZ492-RTL	S54319-S27-A1	Remote Alarm Indicator
FDBZ-WP	S54319-B26-A1	Weatherproof Housing Duct
FDCIO422	S54322-F4-A1	4 Input 4 Output Module

Model Number	Part Number	Description
FDCIO-EOL	S54312-F7-A1	EOL for FDCIO422
HZM	500-034850	Conventional Zone Module
OH121	S54372-F2-A1	Conventional Photo Heat Detector
OP121	S54372-F1-A1	Conventional Photo Detector
HI121	S54372-F3-A1	Conventional Heat Detector
HMS-M	500-033450	Manual Pull Station (Metal)
HTRI-D*	500-033360	Intel Interface (Dual)
HTRI-M	500-034000	Mini Interface Module
HTRI-R*	500-033300	Intel Interface W relay
HTRI-S*	500-033370	Intel Interface Module
TB-EOL	S54322-F4-A2	Terminal Block for FDCIO-EOL
TM121	S54370-S12-A1	Test Magnet

* For Marine installation, the plastic face for the HTRI Series of detectors must be replaced with a metal plate using the ground wire. The P/N for the metal plate is: S54319-F22-A1

¹ When ordering the Duct Housing, Model FDBZ-WP is the required duct housing for Marine installation.

28.3.4 Notification Appliances

± For Marine and/or where vibration is a concern, remove the cover plate on the device. Punch out the boss and secure the device by using the two # 6 self-tapping screws that is supplied.

Model Number	Part Number	Description
MBDC-10	500-688448	10" DC Motor Bell
MBDC-6	500-688449	6" DC Motor Bell
ZH-R	500-636159	Z Horn: Red
ZH-HMC-R±	500-636163	Z Horn HI Multi Candela Wall: red
ZH-MC-CR	500-636165	Z Horn Multi Candela Ceiling: red
AS-75-R-WP	500-636016	AS Horn 75CD Weatherproof: red
AS-75-CR-WP	500-636015	AS Horn 75CD Ceiling Weatherproof: red
ST-75-CR-WP	500-636104	Strobe Weatherproof Ceiling: red
ST-75-R-WP±	500-636106	Strobe Weatherproof Wall: red
ST-HMC-CR-WP	500-636177	Strobe HI Multi Candela Ceiling Weatherproof: red
ST-HMC-R-WP±	500-636179	Strobe HI Multi Candela Wall Weatherproof: red
ZR-MC-R±	500-636169	Z Horn Multi Candela Wall: red
ZR-MC-CR±	500-636173	Z Horn HI Multi Candela Ceiling: red
WPSBBS-R	500-636139	ST Strobe Weatherproof back box: red
WPBBS-R	500-636137	AS Horn Weatherproof back box: red
ZB-R	500-636193	Z Mounting Back Box: red

29 Installation checklist

The following list serves as a checklist and task list for the installation personnel. The list contains all the components that can be installed.

Type	Component / task	Notes	Complete
FCM2017-UM	Assemble enclosure	Inner doors, outer door, window (Marine Enclosure)	
FCM2018-U2 FCM2018-U3	Install operating unit		
FCI2016-U1 FCI2017-U1	Installing the periphery board or fire terminal board		
FP2011-U1	Install the power supply (170 W)		
FHA2031-U1	Install the DIN Rail kit		
FN2001-U1	Install the network module (SAFEDLINK)	Ensure correct installation site	
FCI2011-U1	Install the NAC module (1A/2B)	Same slot as releasing module	
XCI2001-U1	Install releasing module	Same slot as NAC module	
FCA2016-U1	Install RS-485 module	Max. 2 modules	
FT2014-R2/-R3/-U2/-U3 FT2015- R2/-R3/-U2/-U3	Install the Remote Display Terminal	R2 = Red, Desigo R3 = Red, Cerberus PRO U2 = Black, Desigo U3 = Black, Cerberus PRO	
BP-62	Marine Batteries	Only connect when commissioning	

Due date:	Ordering unit:	Date
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Appendix A: Inscription Strips Instructions

Installing Fonts

The 'Siemens Sans' font is required in order to display the inscription correctly on the system-operating unit.

A zip file with various 'Siemens Sans' fonts is included in this help set. A link to the zip file is provided in the HTML web of the FS20 documentation under Mounting/Installation in the STEP Portal.

<https://workspace.sbt.siemens.com/content/00001123/default.aspx>

Key word: **A6V10361327**

1. Download and unzip the zip file locally on your PC.
2. Install all fonts via System control
or
3. Open the 'Fonts' directory on your PC and use 'drag and drop' to move all 'Siemens Sans' fonts into this directory.

'Siemens Sans' is installed on your PC.

Entering/Changing Text

The figures showing inscription strips in this document are in EMF file format and can be changed within the document. The correct font is 'Siemens Sans'.

Microsoft Office Word 2003 or higher is installed on your PC.

'Siemens Sans' is installed on your PC.

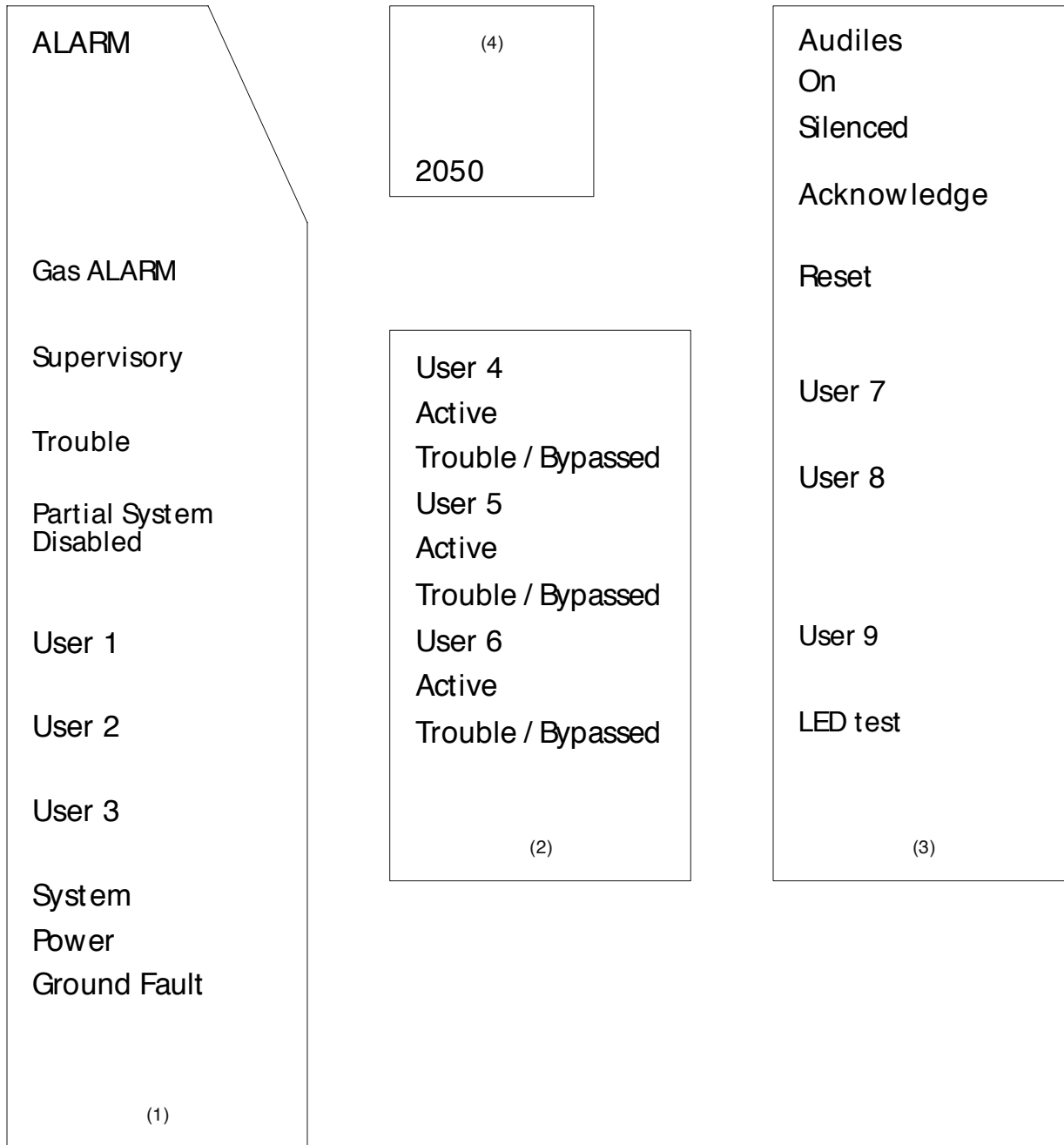
1. Left-click to select the figure.
2. Right-click on the figure.

The context menu is opened.

3. Select 'Edit Picture'.

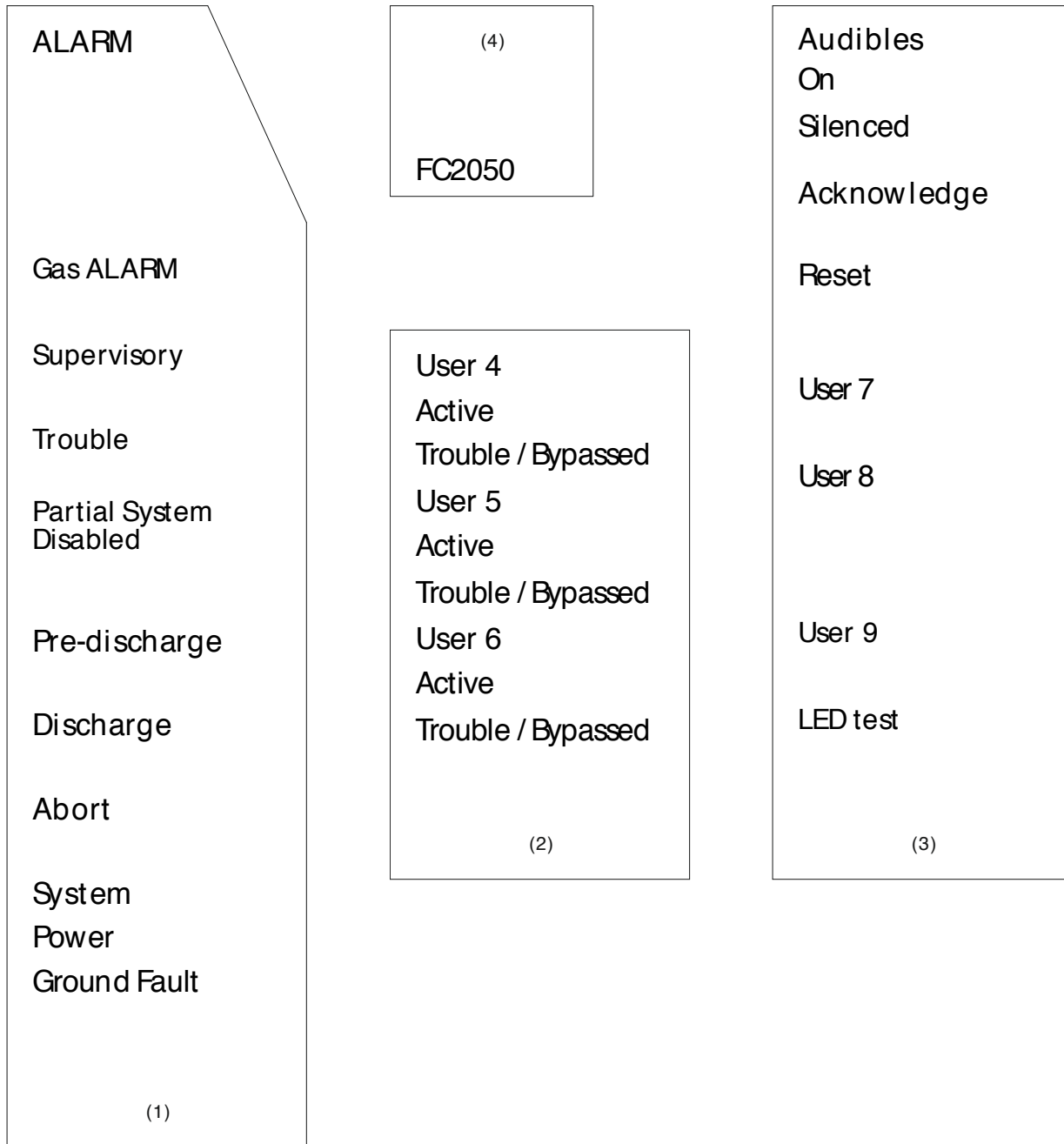
You can modify the text.

Fire Control Panel/Network Terminal, Without Releasing



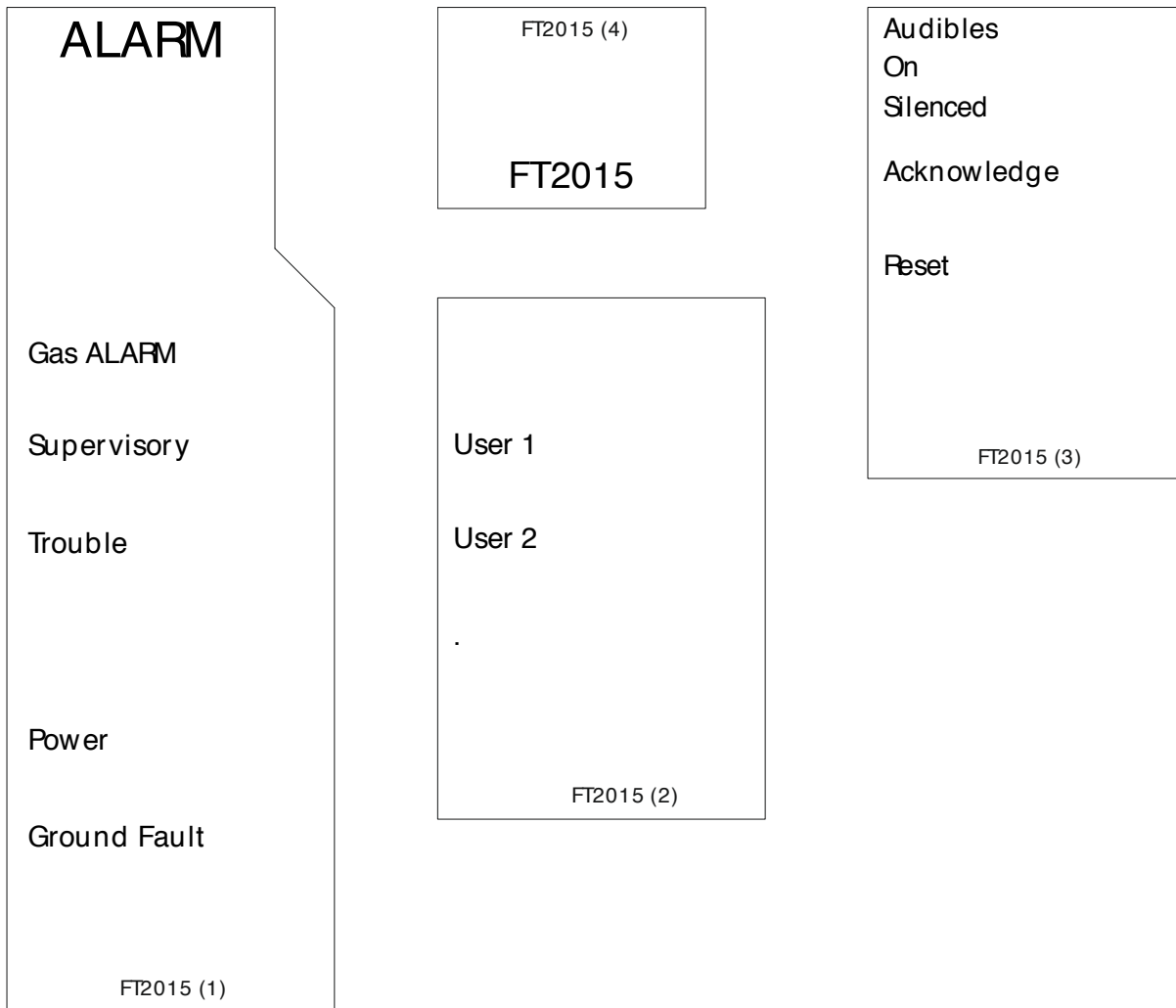
Fire control panel / network terminal

Fire Control Panel/Network Terminal, With Releasing



Fire control panel / network terminal

Remote Terminal, Without Releasing



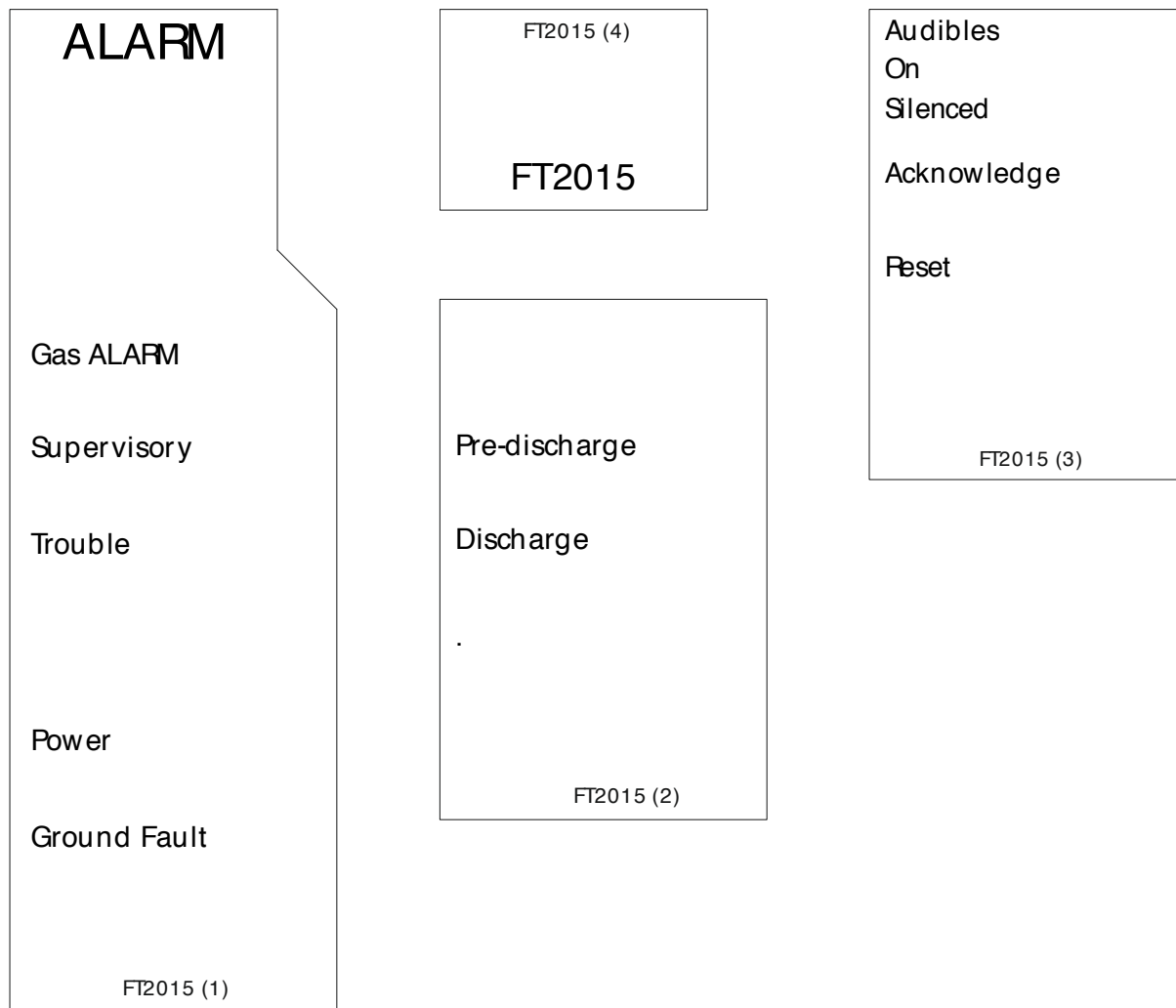
Remote terminal FT2015

Additional Panel Labels



Further UL panels

Remote Terminal, With Releasing



Remote terminal FT2015

LED Indicator

Text	Text	Text	Text
Text	Text	Text	Text
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FCM2019-U1	FCM2019-U1	FCM2019-U1	FCM2019-U1

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Glossary

Acronym	Definition
AC	Alternate Current
AI	Alarm Indicator
AWG	American Wire Gauge
BDV	Base Data Variant- A set of files configuring the embedded software. It can include Country-specific templates, all texts, definition for the message layout, definition for menus, definition for the actuation of LEDs on the Operating Unit, detector parameters sets, or/and definitions for the system-specific parts of the tool interfaces , etc.
CPU	Central Processing Unit
DC	Direct Current
DACT	Digital Alarm Communication Transmitter (Dialer Module)
DPU	Device Programming Unit: A device use to program network devices and to test network Circuits.
EMC	ElectroMagnetic Compatibility
EMI	ElectroMagnetic Interference
EOL	End of Line
FDnet device	Hardware that sense fire/smoke, which is part of the fire detector network.
GAP	Global Access Point- Participant in the Ethernet sub-net for the connection between the Ethernet sub-net and a management station (BACnet client) and/or for remote access with the configuration tool.
HTML	Hyper Text Markup Language
IEC	Intelligent Environmental Compensation: When compensation of dust build-up on a detector's photo sensor.
LRC	Lifecycle Responsibility Concept: Software License Server for the engineering.
NC	Normally Close
NO	Normally Open
NEC	National Electrical Code (NFPA-70)
NFPA	National Fire Protection Association
PC	Personnel Computer
PCB	Printed Circuit Board
RDT	Remote Display Terminal
RFI	Radio Frequency Interference
RO/RO	Roll On / Roll Off
RT	Remote Transmission (Terminal)
RTD	Resistance Temperature Detector
SLC	Signal Line Circuits
U.S.C.G.	United States Coast Guard (USCG)

