FS 720

Fire detection system

System Description

IP 7
Imprint

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## Networking of the stations

### 7.1 Networking types – overview
- SAFELINK networking
- Extended SAFELINK networking
- Ethernet networking
- SAFELINK and Ethernet networking

### 7.2 License key

### 7.3 Access components/function and access type
- Access to the standalone station
- Access to the SAFELINK station
- Local access to extended network
- Internal access to extended network via GAP

### 7.4 Redundancy and degraded mode
- Guidelines for a station’s redundant SAFELINK connection
- Degraded mode with extended networking

### 7.5 SAFELINK networking
- Fiber optic cable network module (SM/MM) FN2006/FN2007
- Repeater (SAFELINK) FN2002-A1
- Interface module DL485/13-xx-ST-SBT

### 7.6 Networking via Ethernet

### 7.7 Networking via SAFELINK and Ethernet

### 7.8 Extended networking
- Redundant networking
- Restrictions on extended networking

### 7.9 Remote access

## Function

### 8.1 Overview

### 8.2 Topology
- Hardware tree
- Detection tree
- Control tree
- Operating tree
- Assigning with the hardware tree
- Functional allocation
- Network tree
- Visibility

### 8.3 Acquisition

### 8.4 Evaluation

### 8.5 Control
- Fire control
- Evacuation control
- Extinguishing standard interface SST [DE]
1 About this document

Goal and purpose
This document describes the fire detection system FS 720. It provides an overview of the structure and functions of the system as a whole as well as of the individual devices. This document does not contain any instructions for planning, installation or commissioning. You will find these instructions in the corresponding documents (see chapter 'Documentation structure').

This document also contains information on country-specific components. Country-specific components are marked with square brackets, e.g. [DE]. It may be the case that these cannot be used in your country.

Scope
The information contained in this document is valid for introduction package IP 7.
## Target groups

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

<table>
<thead>
<tr>
<th>Target group</th>
<th>Activity</th>
<th>Qualification</th>
</tr>
</thead>
</table>
| System owner       | ● According to EN 50110-1, 'nominated person with the overall responsibility to ensure the safe operation of the electrical installation by setting rules and organisation or framework.' | ● 'This person can be the owner, employer, proprietor or a delegated person.'  
                                                                   ● 'Some of these duties can be delegated to others as required. For large or complex electrical installations or networks, the duties can be delegated for parts of the installations or the network.' |
| Product Manager    | ● Is responsible for information passing between the manufacturer and regional company.  
                                                                   ● Coordinates the flow of information between the individual groups of people involved in a project. | ● Has obtained suitable specialist training for the function and for the products.  
                                                                   ● Has attended the training courses for Product Managers. |
| Project Manager    | ● Coordinates the deployment of all persons and resources involved in the project according to schedule.  
                                                                   ● Provides the information required to run the project.                               | ● Has obtained suitable specialist training for the function and for the products.  
                                                                   ● Has attended the training courses for Project Managers. |
| Project engineer   | ● Sets parameters for product depending on specific national and/or customer requirements.  
                                                                   ● Checks operability and approves the product for commissioning at the place of installation.  
                                                                   ● Is responsible for troubleshooting.                                                  | ● Has obtained suitable specialist training for the function and for the products.  
                                                                   ● Has attended the training courses for Product Engineer. |
| Installation personnel | ● Assembles and installs the product components at the place of installation.  
                                                                   ● Carries out a function check following installation.                                | ● Has received specialist training in the area of building installation technology or electrical installations. |
| Commissioning personnel | ● Configures the product at the place of installation according to customer-specific requirements.  
                                                                   ● Checks the product operability and releases the product for use by the operator.  
                                                                   ● Searches for and corrects malfunctions.                                            | ● Has obtained suitable specialist training for the function and for the products.  
                                                                   ● Has attended the training courses for commissioning personnel.                     |
| Maintenance personnel | ● Carries out all maintenance work.                                           
                                                                   ● Checks that the products are in perfect working order.  
                                                                   ● Searches for and corrects malfunctions.                                            | ● Has obtained suitable specialist training for the function and for the products. |
Source language and reference document
- The source/original language of this document is German (de).
- The reference version of this document is the international version in English.
The international version is not localized.

Document identification
The document ID is structured as follows:

<table>
<thead>
<tr>
<th>ID code</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>ID_ModificationIndex_Language_COUNTRY -- = multilingual or</td>
<td>A6V10215123_a_de_DE</td>
</tr>
<tr>
<td>international</td>
<td></td>
</tr>
<tr>
<td>A6V10215123_a_en_--</td>
<td></td>
</tr>
<tr>
<td>A6V10315123_a_--_--</td>
<td></td>
</tr>
</tbody>
</table>

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

Conventions for text marking
Markups
Special markups are shown in this document as follows:

<table>
<thead>
<tr>
<th>Requirement for a behavior instruction</th>
<th>Requirement for a behavior instruction</th>
</tr>
</thead>
<tbody>
<tr>
<td>⊳</td>
<td>⊳</td>
</tr>
<tr>
<td>1, 2.</td>
<td>1, 2.</td>
</tr>
<tr>
<td>Version, option, or detailed information for a behavior instruction</td>
<td>Version, option, or detailed information for a behavior instruction</td>
</tr>
<tr>
<td>⇨ Intermediate result of a behavior instruction</td>
<td>⇨ Intermediate result of a behavior instruction</td>
</tr>
<tr>
<td>⇨ End result of a behavior instruction</td>
<td>⇨ End result of a behavior instruction</td>
</tr>
<tr>
<td>● Numbered lists and behavior instructions with an operation sequence</td>
<td>● Numbered lists and behavior instructions with an operation sequence</td>
</tr>
<tr>
<td>[→ X] Reference to a page number</td>
<td>[→ X] Reference to a page number</td>
</tr>
<tr>
<td>'Text' Quotation, reproduced identically</td>
<td>'Text' Quotation, reproduced identically</td>
</tr>
<tr>
<td>&lt;Key&gt; Identification of keys</td>
<td>&lt;Key&gt; Identification of keys</td>
</tr>
<tr>
<td>&gt; Relation sign and for identification between steps in a sequence, e.g., 'Menu bar' &gt; 'Help' &gt; 'Help topics'</td>
<td>&gt; Relation sign and for identification between steps in a sequence, e.g., 'Menu bar' &gt; 'Help' &gt; 'Help topics'</td>
</tr>
<tr>
<td>↑ Text Identification of a glossary entry</td>
<td>↑ Text Identification of a glossary entry</td>
</tr>
</tbody>
</table>

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

See also
- Documentation structure [→ 20]
1.1 Applicable documents

<table>
<thead>
<tr>
<th>Document ID</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>A6V10210368</td>
<td>Product data</td>
</tr>
<tr>
<td>A6V10210362</td>
<td>Planning</td>
</tr>
<tr>
<td>A6V10210390</td>
<td>Mounting/Installation</td>
</tr>
<tr>
<td>A6V10211076</td>
<td>Operation</td>
</tr>
<tr>
<td>A6V10210416</td>
<td>Commissioning / Maintenance / Troubleshooting</td>
</tr>
<tr>
<td>A6V10210424</td>
<td>Configuration</td>
</tr>
<tr>
<td>008723</td>
<td>FD720 Detector system overview of documentation</td>
</tr>
<tr>
<td>A6V10229261</td>
<td>FD720 detector system List of compatibility</td>
</tr>
<tr>
<td>A6V10211118</td>
<td>Outline quantities tool</td>
</tr>
<tr>
<td>d825b</td>
<td>Key figures &quot;Collective detector line&quot;</td>
</tr>
<tr>
<td>001508</td>
<td>Cerberus DS11, FD20 guidelines, AnalogPLUS, interactive, Sinteso connection factors</td>
</tr>
<tr>
<td>A6V10323158</td>
<td>Modernizing fire detection installations with multiple protocol detectors</td>
</tr>
</tbody>
</table>

1.2 Download center

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

https://siemens.com/bt/download

Enter the document ID in the search field.

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

1.3 Technical terms and abbreviations

You will find details of technical terms and abbreviations in the 'Glossary' chapter.

1.4 Revision history

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

The first edition of a language version or a country variant may, for example, be version 'd' instead of 'a' if the reference document is already this version.
The table below shows this document's revision history:

<table>
<thead>
<tr>
<th>Version</th>
<th>Edition date</th>
<th>Brief description</th>
</tr>
</thead>
</table>
| l       | 2018-08-29   | Changes and additions  
• In accordance with EN54-13, for C-NET line with stubs and sub-stubs:  
  Information on load limitations added. See chapter Line topology [➙ 94]. |
| k       | 2018-06-25   | Edition for IP7  
New  
• FS720 extinguishing control panels [➙ 24]  
• Extinguishing system components [➙ 77]  
Changes and additions  
• Evacuation control [➙ 149]: updated with voice evac. controls  
• Application height for power supply (150 W) updated in chapter General technical data [➙ 36]  
• Specifications for firewall updated in chapter Remote access [➙ 123].  
• Chapter Stations [➙ 34] - ‘Technical data’ of all stations: Approvals updated.  
• Print server changed in External printer FUJITSU DL3750+ [➙ 70]  
• Battery capacities changed from 26 to 25 Ah as the battery type FHA2006-A1,  
  26 Ah, has been replaced by the new type BAT12-25, battery (12 V, 25 Ah,  
  VdS).  
• S4 adjusted in License key [➙ 103] |
| j       | 2016-03-21   | Changes and additions  
• Application height for power supply (150 W) in ‘General technical data’ chapter  
• Specifications for firewall in ‘Remote access’ chapter  
• Chapter 'Stations' - 'Technical data' of the stations: Approvals updated.  
• Print server changed in External printer FUJITSU DL3750+ [➙ 70] |
| i       | 2015-12-15   | Edition: Introduction Package IP6  
New  
• Power supply unit (70 W) FP 2015  
• Power supply kit (70 W) FP 120  
• Ethernet switch (modular) FN2012  
• Ethernet module (MM/SM) VN2002/VN2003  
• New C-NET detector devices  
• Operating unit [AU] in chapters 'Operation and indication devices' and  
  'Operation'  
• Chapter ‘Cyber security disclaimer’ |
### Revision History

<table>
<thead>
<tr>
<th>Version</th>
<th>Edition date</th>
<th>Brief description</th>
</tr>
</thead>
</table>
| h       | 2013-11-14   | **Edition: Introduction Package IP5**  
Change to date format according to ISO 8601  
**New**  
License keys (Sx) replace license keys (Lx)  
LED module FTO2008-A1  
Fire control panel FC723:  
- Arrangement of rear panel (Comfort) components  
- Card cage (2 slots)  
Line card (SynoLOOP) FCL7201-Z3  
**Changes and additions**  
- Access to the SAFEDLINK station  
- Network addresses in the chapter 'Networking the stations'  
- Chap. 'System overview' and 'FS720 fire detection system setup'  
- Chap.: Stations – Fire terminals  
- Guidelines for mimic display driver FT2001  
- C-NET devices added: FDCI723, FDM223-Ex, OOH740-A9-Ex, FDCL221-Ex, FDA221, FDA241, FDM233, FDM234, FDM273, FDM243H  
- 'Applicable documents' chapter extended  
**CPR replaces CPD:** The Construction Products Regulation (CPR 305/2011) replaces the previous Construction Products Directive (CPD 89/106).  
**Corrections**  
- Note on Ethernet loop FN2008 added.  
- RS485 module: Slot address assignment |
| g       | 04.2012      | **Edition: Introduction Package IP4:**  
- New detectors (SWING, DBS721, DBS729, OOH740, OOHC740)  
- I/O card (horn/monitored) FCI2009-A1  
- I/O card (remote transmission) FCI2007-A1  
| f       | 07.2010      | **Revision history redefined and standardized**  
**Network description revised**  
**PMI & mainboard FCM2027 integrated** |
| e       | 03.2010      | **Second edition MP 3.0 XS for VdS:**  
**Assignment of manufacturer designation "Scalance" to BT designation** |
<table>
<thead>
<tr>
<th>Version</th>
<th>Edition date</th>
<th>Brief description</th>
</tr>
</thead>
</table>
| d       | 10.2009      | First edition MP 3.0 XS for VdS Integration of:  
|         |              |   • Fire control panel (modular) FC726  
|         |              |   • Housing (Large) and housing (Large Extension)  
|         |              |   • Line card (FDnet/C-NET  
|         |              |   • I/O card (programmable)  
|         |              |   • Extended networking  
|         |              |   • Scalance switch X204-2  
|         |              |   • Scalance firewall/router S612  
| c       | 03.2009      | Second revised edition MP1XS  
| b       | 02.2009      | First extended edition MP1XS  
| a       | 09.2008      | First edition MP1XS  


2 Safety

2.1 Safety instructions
The safety notices must be observed in order to protect people and property.
The safety notices in this document contain the following elements:
- Symbol for danger
- Signal word
- Nature and origin of the danger
- Consequences if the danger occurs
- Measures or prohibitions for danger avoidance

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

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

<table>
<thead>
<tr>
<th>General danger</th>
<th>Explosive atmosphere</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage/electric shock</td>
<td>Laser light</td>
</tr>
<tr>
<td>Battery</td>
<td>Heat</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Signal word</th>
<th>Danger level</th>
</tr>
</thead>
<tbody>
<tr>
<td>DANGER</td>
<td>'DANGER' identifies a dangerous situation, which will result directly in death or serious injury if you do not avoid this situation.</td>
</tr>
<tr>
<td>WARNING</td>
<td>'WARNING' identifies a dangerous situation, which may result in death or serious injury if you do not avoid this situation.</td>
</tr>
<tr>
<td>CAUTION</td>
<td>'CAUTION' identifies a dangerous situation, which could result in slight to moderately serious injury if you do not avoid this situation.</td>
</tr>
<tr>
<td>NOTICE</td>
<td>'NOTICE' identifies a possibly harmful situation or possible damage to property that may result from non-observance. 'NOTICE' does not relate to possible bodily injury.</td>
</tr>
</tbody>
</table>
How risk of injury is presented
Information about the risk of injury is shown as follows:

<table>
<thead>
<tr>
<th>WARNING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nature and origin of the danger</td>
</tr>
<tr>
<td>Consequences if the danger occurs</td>
</tr>
<tr>
<td>Measures / prohibitions for danger avoidance</td>
</tr>
</tbody>
</table>

How possible damage to property is presented
Information about possible damage to property is shown as follows:

<table>
<thead>
<tr>
<th>NOTICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nature and origin of the danger</td>
</tr>
<tr>
<td>Consequences if the danger occurs</td>
</tr>
<tr>
<td>Measures / prohibitions for danger avoidance</td>
</tr>
</tbody>
</table>

2.2 Safety regulations for the method of operation

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

Electrical installations

<table>
<thead>
<tr>
<th>WARNING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrical voltage</td>
</tr>
<tr>
<td>Electric shock</td>
</tr>
<tr>
<td>Work on electrical installations may only be carried out by qualified electricians or by instructed persons working under the guidance and supervision of a qualified electrician, in accordance with the electrotechnical regulations.</td>
</tr>
</tbody>
</table>

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

Noncompliance with the following safety regulations
Risk of injury to persons and damage to property
- Compliance with the following regulations is required.

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

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

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

Modifications to the system design and the products
Modifications to the system and to individual products may lead to faults, malfunctioning and safety risks. Written confirmation must be obtained from Siemens and the corresponding safety bodies for modifications or additions.
Modules and spare parts
- Components and spare parts must comply with the technical specifications defined by Siemens. Only use products specified or recommended by Siemens.
- Only use fuses with the specified fuse characteristics.
- Wrong battery types and improper battery changing lead to a risk of explosion. Only use the same battery type or an equivalent battery type recommended by Siemens.
- Batteries must be disposed of in an environmentally friendly manner. Observe national guidelines and regulations.

Disregard of the safety regulations
Before they are delivered, Siemens products are tested to ensure they function correctly when used properly. Siemens disclaims all liability for damage or injuries caused by the incorrect application of the instructions or the disregard of danger warnings contained in the documentation. This applies in particular to the following damage:
- Personal injuries or damage to property caused by improper use and incorrect application
- Personal injuries or damage to property caused by disregarding safety instructions in the documentation or on the product
- Personal injury or damage to property caused by poor maintenance or lack of maintenance

2.3 Standards and directives complied with
A list of the standards and directives complied with is available from your Siemens contact.
2.4 Release Notes
Limitations to the configuration or use of devices in a fire detection installation with a particular firmware version are possible.

<table>
<thead>
<tr>
<th>WARNING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limited or non-existent fire detection</td>
</tr>
<tr>
<td>Personal injury and damage to property in the event of a fire.</td>
</tr>
</tbody>
</table>
- 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.

<table>
<thead>
<tr>
<th>NOTICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incorrect planning and/or configuration</td>
</tr>
<tr>
<td>Important standards and specifications are not satisfied.</td>
</tr>
<tr>
<td>Fire detection installation is not accepted for commissioning.</td>
</tr>
<tr>
<td>Additional expense resulting from necessary new planning and/or configuration.</td>
</tr>
</tbody>
</table>
- 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.

2.5 Reliability of the fire detection installation
The reliability of a fire detection installation depends on the quality and availability of the system concerned.

A fire detection installation is a software-controlled system with an extremely high level of availability and a very low probability of failure. However, faults leading to non-availability can still occur and if it does fail it will take time to repair.

There are various things that the operator can and must do to influence the reliability of a fire detection installation throughout its entire life cycle:
- The effectiveness of a fire detection installation is determined by the fire detection concept and whether this is suitable and conforms to the relevant standards.
- The quality of the fire detection installation is directly related to whether it is serviced and modernized and whether the maintenance intervals are respected.

The operator's obligations are determined on the basis of various standards and directives including, for example, the following:
EN 54, NF S61-933 (FR), VDE 0833-1 (DE)...

You will find an analysis of fire detection installation reliability in the following document:
'ZVEI-Merkblatt 33009:2012-09' – 'Verfügbarkeit von Brandmeldeanlagen'
2.5.1 Responsibility of the operator

A fire detection installation is a piece of safety engineering equipment that protects people, buildings and equipment through early detection of fires and alarming. The fire detection installation has to be maintained in order to satisfy this requirement. Within the European Union, the maintenance intervals are defined in the EN 54 standard and/or are also governed by national and local requirements. Servicing is required in order for the fire detection installation to function correctly. The fire detection installation consists of components the function of which may be impaired by ambient conditions and aging. Servicing of a fire detection installation is governed by the EN 54 standard.

Manufacturer's recommendations

The following work should be carried out at regular intervals to service the fire detection system:

- Visual check for damage on the devices or possible sources of error.
- Quarterly inspection of system parts including test triggering of fire alarm.
- Annual maintenance including inspection work, checking the power supply and emergency power supply.
- Replacement of batteries by the date stated by the battery manufacturer at the latest.
- Keep a logbook to document system messages, isolations and servicing work.

The frequency of inspections and service work is dependent on the ambient conditions.

If using fire detection systems in critical ambient conditions, e.g. in rooms with a high concentration of dust, high air humidity or large temperature fluctuations, shorter inspection intervals may be needed.

2.6 Cyber security disclaimer

Siemens provides a portfolio of products, solutions, systems and services that includes security functions that support the secure operation of plants, systems, machines and networks. In the field of Building Technologies, this includes building automation and control, fire safety, security management as well as physical security systems. In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art security concept. Siemens' portfolio only forms one element of such a concept.

You are responsible for preventing unauthorized access to your plants, systems, machines and networks which should only be connected to an enterprise network or the internet if and to the extent such a connection is necessary and only when appropriate security measures (e.g. firewalls and/or network segmentation) are in place. Additionally, Siemens' guidance on appropriate security measures should be taken into account. For additional information, please contact your Siemens sales representative or visit https://www.siemens.com/global/en/home/company/topic-areas/future-of-manufacturing/industrial-security.html.

Siemens’ portfolio undergoes continuous development to make it more secure. Siemens strongly recommends that updates are applied as soon as they are available and that the latest versions are used. Use of versions that are no longer supported, and failure to apply the latest updates may increase your exposure to cyber threats. Siemens strongly recommends to comply with security advisories on the latest security threats, patches and other related measures, published, among others, under https://www.siemens.com/cert/en/cert-security-advisories.htm.
3 Documentation structure

The following figure shows the documentation structure.
The table below describes the contents and target groups of the individual documents.

<table>
<thead>
<tr>
<th>Document (document ID)</th>
<th>Content</th>
<th>Target group</th>
</tr>
</thead>
<tbody>
<tr>
<td>FS720 Description A6V10210355</td>
<td>Overview over the structure and the functions of the fire detection system. It is assumed that project planning and service personnel have read and understood this information before starting their work.</td>
<td>Product Manager, Project Manager, Commissioning personnel, Maintenance personnel</td>
</tr>
<tr>
<td>FS720 Planning A6V10210362</td>
<td>Information on project planning for the system and the individual devices.</td>
<td>Project Manager</td>
</tr>
<tr>
<td>FS720 Components / Spare Parts A6V10227652</td>
<td>List of all components with their ordering details.</td>
<td>Product Manager, Project Manager, Commissioning personnel, Maintenance personnel</td>
</tr>
<tr>
<td>FS720 Commissioning/Maintenance/Repair A6V10210416</td>
<td>Instructions for commissioning, maintenance and repair of the whole fire detection system. Overview of individual activities, for example the procedure for commissioning a connected fire detection system. Detailed information is described in the referenced documents, for example configuration.</td>
<td>Commissioning personnel, Maintenance personnel</td>
</tr>
<tr>
<td>Mounting instructions for devices which are connected to C-NET A6V10210390, 008860</td>
<td>Instructions for installing devices which are to be connected to C-NET. The mounting instructions are enclosed with the individual devices.</td>
<td>Installation personnel, Commissioning personnel, Maintenance personnel</td>
</tr>
<tr>
<td>Fx72x Installation A6V10210390</td>
<td>Describes the exact sequence of activities for the installation of the stations.</td>
<td>Commissioning personnel, Maintenance personnel</td>
</tr>
<tr>
<td>FS720 Configuration A6V10210424</td>
<td>Use of the Cerberus Engineering Tool and step-by-step instructions with detailed descriptions, for configuration of the fire detection system.</td>
<td>Commissioning personnel, Maintenance personnel</td>
</tr>
<tr>
<td>Fx72x Operation A6V10211076</td>
<td>Operating instructions for the stations.</td>
<td>Commissioning personnel, Maintenance personnel, End customer</td>
</tr>
<tr>
<td>FS720 Product Data A6V10210368</td>
<td>Hardware reference document. Detailed data of the components, such as connections, adjustment elements, technical data, and more.</td>
<td>Product Manager, Project Manager, Commissioning personnel, Maintenance personnel</td>
</tr>
</tbody>
</table>

Table 1: Documentation structure

The document A6V10224825 contains a list of all FS720 documents.
4 System overview

4.1 FS720 fire detection system

The FS720 system is a modular, networkable fire detection system. It comprises all the components required for the detection, evaluation and alarming in the event of fire.

In the fire detection system FS720, the stations (fire control panels and fire terminals) are networked via the ↑ system bus ↑ C-WEB/SAFEDLINK.

![Diagram of the SAFEDLINK network](image)

**Figure 1: System overview in the SAFEDLINK network**

### Networkable stations

The following fire control panels are available in the FS720 system:

<table>
<thead>
<tr>
<th>Fire control panel</th>
<th>Number of ↑ C-NET loops</th>
<th>Max. number of ↑ C-NET devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>FC722 fire control panel (2-loop)</td>
<td>2</td>
<td>252</td>
</tr>
<tr>
<td>FC723 fire control panel (modular)</td>
<td>2 + additional C-NET loops</td>
<td>756</td>
</tr>
<tr>
<td>FC724 fire control panel (4-loop)</td>
<td>4</td>
<td>504</td>
</tr>
<tr>
<td>FC726 fire control panel (modular)</td>
<td>4 + additional C-NET loops</td>
<td>1512</td>
</tr>
</tbody>
</table>

### Non-networkable stations

The fire control panel FC721 is a standalone control panel and cannot be networked.

<table>
<thead>
<tr>
<th>Fire control panel</th>
<th>Number of C-NET loops</th>
<th>Max. number of C-NET devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>FC721 fire control panel (1-loop)</td>
<td>1</td>
<td>126</td>
</tr>
</tbody>
</table>

You will find more information about control panel FC721 in document A6V10211100 Technical Manual FC721.

All fire control panels have an integrated operating unit. In addition, fire terminal FT724 provides a separate operating terminal.

The fire control panels FC722, FC723, FC724, and FC726 are also referred to as FC72x below.
Networking
FS720 fire control panels and fire terminals are networked by default via the system bus 'C-WEB / SAFEDLINK'. The system bus enables system-wide alarming and access to every single device.
Up to 32 stations can be networked redundantly via a SAFEDLINK network. Several SAFEDLINK networks can be connected to form one extended network. A maximum of 64 stations can be networked in an extended network.

Detector lines
The FC720 fire control panels support the C-NET detector line. In addition to the detectors and input/output modules, indicating and operating devices may be connected to this detector line. These devices facilitate system-wide access to the most important functions. Power supply for these devices is ensured by the detector line. An additional supply installation is thus not necessary. The one exception to this is the transponder FDCIO223, which needs its own supply.
Fire control panels FC723 and FC726 can also be fitted with module bus cards to support migration processes, other detector lines and I/O cards.

Configuration and operation
The FS720 system is configured with the PC software FXS7212 (Engineering Tool Cerberus Engineering Tool). A simple system can also be configured on the station using the 'Auto-configuration' function.
4.2 FS720 extinguishing control panels

The FS720 extinguishing system provides integrated single-sector extinguishing for FS720 fire control panels with additional extinguishing control. The FS720 extinguishing system can replace existing XC10 extinguishing systems.

**Integrated single-sector extinguishing**

The single-sector extinguishing function with an FS720 fire control panel can be integrated into FC722 and FC724 with a 150 W power supply in the Comfort and Large housing, provided there is enough space for the extinguishing components to be installed.

The following variants are possible:
- Standalone control panel with one flooding zone
- Networked control panels with one flooding zone each

![Figure 2: Example: Single-sector extinguishing with monitoring and control from one fire control panel](image-url)
4.3 Extended networking

An Ethernet switch (modular) FN2012 can be used to consolidate several networked FS720 fire detection systems to make one composite network (C-WEB/LAN).

This C-WEB/LAN is connected via an Ethernet switch (modular) to the individual C-WEB/SAFEDLINK sub-nets in a loop by means of fiber optic cables. This allows smaller sub-nets to be networked over large distances using a fast main network. Individual buildings can therefore be connected to a network as sub-networks, for example.
4.3.1 **Extended redundant networking**

To retain redundant networking in an extended network in accordance with EN 54, all network nodes in a sub-net must be connected to the C-WEB/LAN via two Ethernet switches (modular) or stations. Stations are configured as routers and monitor one another. If the active router station fails, the standby router station automatically takes over its function.

This type of redundant networking is used for sub-networks with one or more of the following criteria:

- More than 512 C-NET detectors
- On a monitored surface of more than 12,000 m²
- If a station takes over system-wide remote transmission

---

*Figure 3: Overview of extended networking*
1. C-WEB/LAN (optical Ethernet via Ethernet switch (modular) FN2012)
2. C-WEB/SAFEDLINK sub-net with ≤512 C-NET line devices, less than 12000 m² of monitored surface, and without remote transmission
3. C-WEB/SAFEDLINK sub-net with >512 C-NET line devices or more than 12000 m² of monitored surface
4. C-WEB/SAFEDLINK sub-net with external alarming
5. Terminal or Ethernet station
6. Redundant networking on the C-WEB/LAN via coupled router stations (router station and standby router station) with Ethernet switch (modular)
7. Simple networking on the C-WEB/LAN with Ethernet switch (modular)
8. System-wide remote transmission
4.4 System setup

The following block diagram shows an example of the system setup.

1. Fire terminal FT724 as standard operating unit
2. License key e.g. for operating the Cerberus-Remote tool
3. Loop-shaped networking by means of C-WEB/SAFEDLINK
4. Fire control panel FC724 with two integrated C-NET line cards
5. Fire control panel FC722 with integrated C-NET line card
6. Fire control panel FC726 with two integrated C-NET line cards, additional line cards and I/O card
7. Fire control panel FC723 with integrated C-NET line card, additional line cards and I/O card
8. Integrated addressable C-NET detector lines

Figure 4: FS720 system setup
9  Additional C-NET line cards for the FC723 and FC726
10 Additional line cards for detector migration (SynoLOOP) for the FC723 and FC726
11 Additional I/O cards for the FC723 and FC726
12 Input/output module for connecting an extinguishing control unit
13 Alarm sounder on the C-NET detector line
14 Input/output module for connecting collective detector lines or universal I/Os to the C-NET
15 Floor repeater display FT2011 for the system-wide indication of the most important information
16 Floor repeater terminal FT2010 for the system-wide indication and operation of the most important information and functions
17 Mimic display driver FT2001 for the system-wide optical signaling of events
18 System-wide remote transmission, is possible from one fire control panel
19 PC-based Engineering Tool (Cerberus Engineering Tool) for the configuration of the complete system
20 PC-based operating unit for system-wide operation (Cerberus Remote Operating Tool)
21 Connection of a management system via BACnet/Ethernet

4.5 Operation and indication devices

The following operation and indication devices are available in the fire detection system FS720:

**Stations**
- Fire control panels FC722, FC723, FC724 and FC726
- FT724 fire terminal

**Integrated operation and indication devices**
- LED indicator (internal) FTO2002-A1 (24 LEDs red & yellow)
- LED module FTO2008-A1 (24 LEDs red/green & yellow)
- Event printer FTO2001-A1
- EVAC-NL operating unit FTO2007-N1 [NL]
- Operating add-on (2xEVAC term.) FCM7221-H3 [NL]
- Operating unit FCM7222-X3 (AU)

**Remote operation and indication devices**
- Floor repeater terminal FT2010-A1, FT2010-C1
- Floor repeater display FT2011-A1
- Mimic display driver FT2001-A1
- Mimic display driver (EVAC) FT2003-N1
- Fire brigade operating panel (FBF) [DE]
- Fire brigade operation and indication panel (FAT) [DE] / [AT]
- Telecommunications system via ESPA-4.4.4 interface
- Event printer Fujitsu DL3750+
### PC-based operation and indication

- Cerberus Remote Operating Tool FX7220
- MM8000 danger management system, DESIGO™ INSIGHT

### Overview

The table below shows the interfaces to which the different operation and indication devices are connected, and how the power supply is ensured. In addition, the visibility relating the different operation and indication devices is listed.

<table>
<thead>
<tr>
<th>Operation and indication devices</th>
<th>Connection</th>
<th>Supply via</th>
<th>Visibility (configurable)</th>
</tr>
</thead>
</table>
| Fire control panel               | System bus (C-WEB/SAFEDLINK) | Station-internal power supply | • Max. 5 stations have system-wide visibility ²
|                                  |            |           | • All other stations have a visibility of no more than any other 2 stations. |
| Fire terminal                    | System bus (C-WEB/SAFEDLINK) | • External 24 V supply
|                                  |            | • Station-internal power supply (optional) |
| LED indicator (internal)         | Station-internal bus | Station-internal supply | System-wide |
| LED module                       | Station-internal bus | Station-internal supply | System-wide |
| Event printer (internal)         | Serial port RS232 | Station-internal supply | System-wide |
| Event printer (external)         | Serial port RS232 | External supply | System-wide |
| 10 zones EVAC-NL operation [NL]   | Station-internal bus | Station-internal supply | 10 zones, system-wide |
| 20 zones EVAC-NL operating add-on [NL] | Station-internal bus | Station-internal supply | 20 zones, system-wide |
| Operating unit FCM7222-X3 (AU)   | Station-internal bus | Station-internal supply | System-wide |
| Floor repeater terminal          | ↑ C-NET detector line | • Detector line
|                                  |            | • External AC or DC supply (optional) ³ | • System-wide
|                                  |            | • System-wide configuration. |
| Floor repeater display           | C-NET detector line | • Detector line
|                                  |            | • External AC or DC supply (optional) ³ | • System-wide
|                                  |            | • System-wide configuration. |
| Cerberus-Remote (Standalone)     | Ethernet interface | PC ¹ | Same visibility as the station which is indicated using Cerberus-Remote |
| Cerberus Mobile                  | Ethernet interface | Smartphone ¹ | System-wide
|                                  |            | • System-wide configuration |
| Mimic display driver             | C-NET detector line | • Detector line
|                                  |            | • External AC or DC supply (optional) ³ | System-wide |
| Mimic display driver (EVAC)      | Serial interface RS485 | • From the station or external AC or DC supply ³ | System-wide |
4.6 System features

4.6.1 Stations

Properties
- Integrated operating unit
- Integrated line cards in the fire control panels for C-NET detector lines
- Integrated power supply in the fire control panels
- Components for country-specific adaptations
- Optional power supply in the fire terminal

4.6.2 Detector lines

Properties
- Connection of 1 C-NET detector lines to all fire control panels
- C-NET detector line:
  - Automatic device recognition
  - Automatic topology recognition
  - Different topologies are possible
  - Operating and indication devices can be connected for system-wide alarm indication and acknowledgement
  - Alarm sounder FDS221 or alarm sounder with supplementary optical indication FDS229 can be connected
  - Detector line devices are fed via the detector line (with the exception of the input/output module FDCIO223)

Notes
1 Only in conjunction with license key.
2 System-wide visibility is ensured when the station, or a component connected to the station, has been configured for system-wide visibility (e.g., FT2010, FT2011, printer, or FAT).
3 Observe the notices provided for the corresponding components.

Table 2: Connection, power supply and visibility of the operation and indication devices

<table>
<thead>
<tr>
<th>Operation and indication devices</th>
<th>Connection</th>
<th>Supply via</th>
<th>Visibility (configurable)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cerberus Remote Operating Tool</td>
<td>Ethernet interface</td>
<td>Runs on PC</td>
<td>Same visibility as the station which is displayed with the Cerberus Remote Operating Tool 1</td>
</tr>
<tr>
<td>FBF [DE]</td>
<td>Fire brigade periphery module or serial interface RS485</td>
<td>Station-internal supply</td>
<td>System-wide</td>
</tr>
<tr>
<td>FAT [DE]</td>
<td>Serial interface RS485</td>
<td>Station-internal supply</td>
<td>System-wide</td>
</tr>
<tr>
<td>Telecommunications system via ESPA-4.4.4 interface</td>
<td>Serial interface RS485</td>
<td>Station-internal supply</td>
<td>System-wide</td>
</tr>
</tbody>
</table>
● Fire control panels FC723 and FC726 can also be fitted with module bus cards to support:
  - C-NET detector lines.
  - SynoLOOP detector lines
  - Various I/O cards
● Connection of fire detectors with collective address (GMT line and GMT line with safety barrier SB3 for ex areas) to the C-NET detector line via the input/output module FDCIO223

4.6.3 Networking of the stations

Properties
● Loop-shaped networking of all stations via the system bus C-WEB/SAFEDLINK with electrical or optical SAFEDLINK module
● Redundant C-WEB/SAFEDLINK networking of all stations
● Up to 32 stations can be networked via C-WEB/SAFEDLINK
● Up to 64 stations can be networked via C-WEB/LAN extended networking
● Distance between two stations up to 1000 m when networked via electrical C-WEB/SAFEDLINK
● Extension of the distance between two stations via repeater or optical interface module
● Up to 4 km distance between two stations via optical network module (MM) in multi-mode
● Up to 40 km distance between two stations via optical network module (SM) in single mode
● Additional networking via Ethernet (C-WEB/Ethernet) possible
● Remote access for operation, configuration and diagnosis
● BACnet interface for the connection of a management station (BACnet/Ethernet)
● Configurable visibility of the individual stations

4.6.4 Function

Properties
● High real alarm reliability
● Situation-dependent alarming and intervention control
● Universal controls (OR-, AND- and NOT relations)
● Station-overlapping controls
● Support for hierarchized evacuation
4.6.5 Operation

Properties

- System-wide configuration possible from one station
- Configuration data is stored in the station
- Automatic configuring of the fire control panels without 'Cerberus-Engineering-Tool'
- PC-supported configuring with 'Cerberus-Engineering-Tool'
- Upload of the saved configuration data from the stations into 'Cerberus-Engineering-Tool' possible
- Pre-configuration of the logical structure in 'Cerberus-Engineering-Tool' without hardware possible
- Automatic loading of hardware
- Update of the firmware via 'Cerberus-Engineering-Tool'
- Service devices for easy commissioning and maintenance of the detector line
- Remote access for maintenance
- The additional line cards (for control panels with a card cage) can be replaced if defective without shutting down the control panel.
## 5 Stations

### 5.1 Station overview

You will find information about the country-specific availability of devices in document 'Delivery Release'.

<table>
<thead>
<tr>
<th>Detector lines</th>
<th>FC722</th>
<th>FC723</th>
<th>FC724</th>
<th>FC726</th>
<th>FT724</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of device addresses (total)</td>
<td>252</td>
<td>756</td>
<td>504</td>
<td>1512</td>
<td>–</td>
</tr>
<tr>
<td>Number of C-NET addresses (max.)</td>
<td>252</td>
<td>756</td>
<td>504</td>
<td>1512</td>
<td>–</td>
</tr>
<tr>
<td>Number of integrated C-NET lines</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Without loop extension</td>
<td>2 loops ²</td>
<td>2 loops ²</td>
<td>4 loops ²</td>
<td>4 loops ²</td>
<td>–</td>
</tr>
<tr>
<td>With loop extension</td>
<td>4 loops ²</td>
<td>4 loops ²</td>
<td>8 loops ²</td>
<td>8 loops ²</td>
<td>–</td>
</tr>
<tr>
<td>Card cage (2 slots)</td>
<td>–</td>
<td>1</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Card cage (5 slots)</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>1</td>
<td>–</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Module bus cards</th>
<th>FC722</th>
<th>FC723</th>
<th>FC724</th>
<th>FC726</th>
<th>FT724</th>
</tr>
</thead>
<tbody>
<tr>
<td>Line card (FDnet/C-NET)</td>
<td>–</td>
<td>Max. 2 ³</td>
<td>–</td>
<td>Max. 5 ³</td>
<td>–</td>
</tr>
<tr>
<td>Line card (SynoLOOP)</td>
<td>–</td>
<td>Max. 2 ³</td>
<td>–</td>
<td>Max. 5 ³</td>
<td>–</td>
</tr>
<tr>
<td>Number of SynoLOOP devices</td>
<td>–</td>
<td>Max. 756</td>
<td>–</td>
<td>Max. 1512</td>
<td>–</td>
</tr>
<tr>
<td>I/O card (programmable)</td>
<td>–</td>
<td>Max. 2 ³</td>
<td>–</td>
<td>Max. 5 ³</td>
<td>–</td>
</tr>
<tr>
<td>I/O card (horn-monitored)</td>
<td>–</td>
<td>Max. 1</td>
<td>–</td>
<td>Max. 1</td>
<td>–</td>
</tr>
<tr>
<td>I/O card (RT)</td>
<td>–</td>
<td>Max. 1</td>
<td>–</td>
<td>Max. 1</td>
<td>–</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Supply</th>
<th>FC722</th>
<th>FC723</th>
<th>FC724</th>
<th>FC726</th>
<th>FT724</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power supply</td>
<td>70/150 W</td>
<td>150 W</td>
<td>150 W</td>
<td>150 W</td>
<td>Optional (70 W)</td>
</tr>
<tr>
<td>Batteries</td>
<td>Max. 25 Ah</td>
<td>Max. 25 Ah</td>
<td>Max. 25 Ah</td>
<td>Max. 45 Ah</td>
<td>Optional (7 Ah)</td>
</tr>
<tr>
<td>External DC supply (24 V)</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>Possible</td>
</tr>
</tbody>
</table>
## Inputs and outputs

<table>
<thead>
<tr>
<th></th>
<th>FC722</th>
<th>FC723</th>
<th>FC724</th>
<th>FC726</th>
<th>FT724</th>
</tr>
</thead>
<tbody>
<tr>
<td>RT alarm, relay</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>–</td>
</tr>
<tr>
<td>RT fault, relay</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>–</td>
</tr>
<tr>
<td>RT alarm monitored</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>–</td>
</tr>
<tr>
<td>RT fault monitored</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>–</td>
</tr>
<tr>
<td>Horn output, monitored</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>–</td>
</tr>
<tr>
<td>Freely configurable</td>
<td>8</td>
<td>8</td>
<td>12</td>
<td>12</td>
<td>–</td>
</tr>
</tbody>
</table>

## Options

<table>
<thead>
<tr>
<th>Feature</th>
<th>FC722</th>
<th>FC723</th>
<th>FC724</th>
<th>FC726</th>
<th>FT724</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loop extension (C-NET) ¹</td>
<td>Max. 1</td>
<td>Max. 1</td>
<td>Max. 2</td>
<td>Max. 2</td>
<td>–</td>
</tr>
<tr>
<td>Network module (SAFEDLINK)</td>
<td>Max. 2</td>
<td>Max. 2</td>
<td>Max. 2</td>
<td>Max. 2</td>
<td>Max. 2</td>
</tr>
<tr>
<td>Ethernet switch (modular) ²</td>
<td>Max. 1</td>
<td>Max. 1</td>
<td>Max. 1</td>
<td>Max. 1</td>
<td>External</td>
</tr>
<tr>
<td>RS232 module</td>
<td>Max. 1</td>
<td>Max. 1</td>
<td>Max. 1</td>
<td>Max. 1</td>
<td>Max. 1</td>
</tr>
<tr>
<td>RS485 module</td>
<td>Max. 2</td>
<td>Max. 2</td>
<td>Max. 2</td>
<td>Max. 2</td>
<td>Max. 2</td>
</tr>
<tr>
<td>Fire brigade periphery module [DE]</td>
<td>Max. 1</td>
<td>Max. 1</td>
<td>Max. 1</td>
<td>Max. 1</td>
<td>–</td>
</tr>
<tr>
<td>Event printer (built-in)</td>
<td>Max. 1</td>
<td>Max. 1</td>
<td>Max. 1</td>
<td>Max. 1</td>
<td>Max. 1</td>
</tr>
<tr>
<td>LED indicators</td>
<td>Max. 5</td>
<td>Max. 5</td>
<td>Max. 5</td>
<td>Max. 5</td>
<td>Max. 5</td>
</tr>
<tr>
<td>EVAC-NL operating unit [NL]</td>
<td>Max. 1</td>
<td>Max. 1</td>
<td>Max. 1</td>
<td>Max. 1</td>
<td>Max. 1</td>
</tr>
<tr>
<td>Sounder module</td>
<td>Max. 2</td>
<td>Max. 2</td>
<td>Max. 2</td>
<td>Max. 2</td>
<td>–</td>
</tr>
<tr>
<td>RT interface [NL]</td>
<td>Max. 1</td>
<td>Max. 1</td>
<td>Max. 1</td>
<td>Max. 1</td>
<td>–</td>
</tr>
<tr>
<td>License keys</td>
<td>Max. 1</td>
<td>Max. 1</td>
<td>Max. 1</td>
<td>Max. 1</td>
<td>Max. 1</td>
</tr>
<tr>
<td>Key switch (Kaba)</td>
<td>Max. 1</td>
<td>Max. 1</td>
<td>Max. 1</td>
<td>Max. 1</td>
<td>Max. 1</td>
</tr>
<tr>
<td>Key switch (nordic)</td>
<td>Max. 1</td>
<td>Max. 1</td>
<td>Max. 1</td>
<td>Max. 1</td>
<td>Max. 1</td>
</tr>
<tr>
<td>Door contact kit [DE]</td>
<td>Max. 1</td>
<td>Max. 1</td>
<td>Max. 1</td>
<td>Max. 1</td>
<td>–</td>
</tr>
</tbody>
</table>

Table 3: Overview of the stations

¹ For 2-loop and 4-loop periphery board only
² It is also possible to connect two stubs instead of one loop.
³ Mixed variants possible
⁴ Only installed for stations in Comfort and Large housings
5.2 General technical data

- **Mains connection**: AC 115/230 V nominal +10/-15 %
  50 ... 60 Hz
- **Protection category**: IP30, dry rooms (no moisture condensation)
- **Voltage surge protection**: Integrated
- **Operating temperature**: -8... +42 °C
- **Storage temperature**: -20... +60 °C

**Application height**
- With power supply (70 W) FP 2001 Max. 4000 m
- With power supply (70 W) FP 2015 Max. 4000 m
- With power supply (150W) SV 24 V-150 W-A4 Max. 2000 m
- With power supply (150W) SV 24 V-150 W-A5 Max. 3700 m

**Application range** Only in solid buildings (stationary)

**Conformity** CE label

5.3 Fire control panel (2-loop) FC722

![Fire control panel (2-loop) FC722](image)

*Figure 5: Example of a fire control panel (2-loop) FC722 in Standard housing*

5.3.1 Description

The FC722 is a compact 2-loop fire control panel. It has the following features:
- Integrated C-NET line card
- Integrated inputs/outputs for the periphery
- Integrated operating unit
- Integrated power supply
- Auto-configuration
- Networkable via system bus C-WEB/SAFEDLINK or via C-WEB/Ethernet

The fire control panel is available in several variants for different applications. These variants differ regarding the following features:
- Country-specific operating units or options
- Different housing sizes (batteries and installation-specific extensions)
5.3.2 Technical data

Detector lines C-NET

Number of addresses Max. 252
Number of integrated line cards 1
Number of lines:
- Without loop extension 2 loops
- With loop extension 4 loops

Inputs and outputs
1 relay output for RT alarm
1 relay output for RT fault
1 monitored output for RT alarm
1 monitored output for RT fault
1 monitored horn output
8 configurable inputs/outputs 24 V

Supply
Power supply 70 W or 150 W
Batteries 2 batteries 12 V / 7...25 Ah
Supply input 3 [FR] DC 9 V

Mechanical data (without cover cap)
Dimensions of housing (Standard) 398 x 430 x 160 mm (H x W x D)
Dimensions of housing (Comfort) 796 x 430 x 160 mm (W x H x D)
Weight in housing (Standard) 7.3 kg

Approvals
VdS G209076
LPCB 126nb/06
FM 3051081
DNV GL (marine) FC722-ZA/-ZE, see document A6V10339425

1 The maximum number of addresses always remains the same; two stubs can also be connected instead of one loop.
2 Depending on the housing and version.
5.3.3 Setup

The figure below shows the typical structure of the fire control panel (2 loops) FC722 in the Standard housing with open operating unit.

The following figure shows the operating unit with the PMI & mainboard FCM2027. The assignment of components is identical to the operating unit with the PMI & mainboard FCM2004. You will find detailed information about this in document A6V10210368. See chapter 'Applicable documents'.

1 Power supply
2 Batteries
3 Mains connection on DIN rail
4 Periphery board with integrated line card
5 Shield connection terminal blocks [DE]
6 Operating unit with options (opened)
7 Key switch (option)
8 Space for options (e.g. printer etc.)
### 5.3.4 Function

Block diagram of fire control panel (2 loops) FC722

- **Standard component**
- **Option**
- **Station-internal bus**
- **Option, country-specific**
5.3.5 Options

The following table shows all options that can be integrated in the fire control panel (2-loop) FC722.

<table>
<thead>
<tr>
<th>Designation</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loop extension (C-NET)</td>
<td>FCI2003-A1</td>
</tr>
<tr>
<td>Fire brigade periphery module [DE]</td>
<td>FCI2001-D1</td>
</tr>
<tr>
<td>Relay module</td>
<td>Z3B171</td>
</tr>
<tr>
<td>Door contact kit [DE]</td>
<td>FCA2009-A1</td>
</tr>
<tr>
<td>Country kit [DE]</td>
<td>FA2001-D1x</td>
</tr>
<tr>
<td>Network module (SAFEDLINK)</td>
<td>FN2001-A1</td>
</tr>
<tr>
<td>RS232 module (isolated)</td>
<td>FCA2001-A1</td>
</tr>
<tr>
<td>RS485 module (isolated)</td>
<td>FCA2002-A1</td>
</tr>
<tr>
<td>Event printer (internal)</td>
<td>FTO2001-A1</td>
</tr>
<tr>
<td>LED module</td>
<td>FTO2008-A1 *</td>
</tr>
<tr>
<td>Operating add-on (2xLED indicator)</td>
<td>FCM7213-Y3 2</td>
</tr>
<tr>
<td>Operating add-on (4xLED indicator)</td>
<td>FCM7214-Y3 2</td>
</tr>
<tr>
<td>EVAC-NL operating unit [NL]</td>
<td>FTO2007-N1 3</td>
</tr>
<tr>
<td>Operating add-on (2xEVAC term.) [NL]</td>
<td>FCM7221-H3 2</td>
</tr>
<tr>
<td>Sounder module</td>
<td>FCA2005-A1</td>
</tr>
<tr>
<td>RT interface [NL]</td>
<td>FC12005-N1</td>
</tr>
<tr>
<td>License key (Sx)</td>
<td>Yes 3</td>
</tr>
<tr>
<td>Key switch (Kaba) [CH]</td>
<td>FTO2005-C1 1</td>
</tr>
<tr>
<td>Key switch (nordic)</td>
<td>FTO2006-B1 1</td>
</tr>
</tbody>
</table>

Table 4: Options for the fire control panel (2-loop) FC722

1 Can also be permanently integrated, depending on the operating unit
2 Only available in Comfort housing
3 See the chapter 'License keys' under 'Networking the stations'
5.4 Fire control panel (modular) FC723

Figure 6: Sample view of the fire control panel FC723

5.4.1 Description

The FC723 is a modular fire control panel with the following features:

- Integrated line cards (C-NET/C-NET) (2 loops)
- Can be extended with additional line cards for C-NET, SynoLOOP detectors or I/O cards (module bus cards)
- Integrated inputs/outputs for the periphery
- Integrated operating unit
- Integrated power supply
- Auto-configuration possible
- Networkable via system bus C-WEB/SAFE LINK or via C-WEB/Ethernet

The fire control panel is available in several variants for different applications. These variants differ regarding the following features:

- Country-specific operating units
- Different operating add-ons
5.4.2 Technical data

Detector lines C-NET
Number of addresses Max. 756
Number of integrated line cards 1
Number of lines:
- Without loop extension 2 loops ¹
- With loop extension 4 loops ²

Additional line cards
Line card (FDnet/C-NET) 4 loops each with a maximum of 252 addresses (max. 252 addresses) ¹
Line card (SynoLOOP) 4 loops of max. 128 devices or 4 stubs of 32 devices (max. 512 devices)

Inputs and outputs
1 relay output for RT alarm
1 relay output for RT fault
1 monitored output for RT alarm
1 monitored output for RT fault
1 monitored horn output
8 configurable inputs/outputs 24 V

Additional I/O cards
Max. 2
I/O card (programmable) 12 configurable inputs/outputs 24 V
2 supply outputs 24 V
I/O card (horn/monitored) 8 horn outputs, monitored
I/O card (RT)
- 1 alarm relay output
- 1 fault relay output
- 1 voltage output 24 V
- 2 GPIO (e.g. RT confirmation)
- 1 monitored fault output
- 2 configurable outputs, monitored

Supply
Power supply 150 W
Batteries 2 batteries 12 V / max. 25 Ah ²

Mechanical data
Dimensions of housing (Comfort) (without cover cap) 796 x 430 x 160 mm (W x H x D)
Weight 12.2 kg

Approvals
VdS G214021
LPCB

¹ The maximum number of addresses always remains the same; two stubs can also be connected instead of one loop.
² Depending on the housing and version.
5.4.3 Setup

The figure below shows the typical structure of the fire control panel (modular) FC723 with open operating unit and operating add-on.

The following figure shows the operating unit with the PMI & mainboard FCM2027. The assignment of components is identical to the operating unit with the PMI & mainboard FCM2004. You will find detailed information about this in document A6V10210368. See chapter 'Applicable documents'.
5.4.4 Function

Figure 7: Block diagram for fire control panel (modular)

Standard component

Station-internal bus

Options

Option, country-specific
### 5.4.5 Options

The table below shows all options that can be integrated in the fire control panel (modular) FC723.

<table>
<thead>
<tr>
<th>Designation</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loop extension (C-NET)</td>
<td>FCI2003-A1</td>
</tr>
<tr>
<td>Line card (FDnet/C-NET)</td>
<td>FCL2001-A1</td>
</tr>
<tr>
<td>Line card (SynoLOOP)</td>
<td>FCL7201-Z3</td>
</tr>
<tr>
<td>I/O card (programmable)</td>
<td>FCI2008-A1</td>
</tr>
<tr>
<td>I/O card (horn/monitored)</td>
<td>FCI2009-A1</td>
</tr>
<tr>
<td>I/O card (RT)</td>
<td>FCI2007-A1</td>
</tr>
<tr>
<td>Power supply kit 150 W (additional)</td>
<td>FP2004-A1</td>
</tr>
<tr>
<td>Fire brigade periphery module [DE]</td>
<td>FCI2001-D1</td>
</tr>
<tr>
<td>Relay module</td>
<td>Z3B171</td>
</tr>
<tr>
<td>Door contact kit [DE]</td>
<td>FCA2009-A1</td>
</tr>
<tr>
<td>Country kit [DE]</td>
<td>FA2001-D1</td>
</tr>
<tr>
<td>Network module (SAFEDLINK)</td>
<td>FN2001-A1</td>
</tr>
<tr>
<td>RS232 module (isolated)</td>
<td>FCA2001-A1</td>
</tr>
<tr>
<td>RS485 module (isolated)</td>
<td>FCA2002-A1</td>
</tr>
<tr>
<td>Event printer (internal)</td>
<td>FTO2001-A1</td>
</tr>
<tr>
<td>FBA terminal [CH]</td>
<td>FTO2004-C1 1</td>
</tr>
<tr>
<td>LED module</td>
<td>FTO2008-A1 1</td>
</tr>
<tr>
<td>EVAC-NL operating unit [NL]</td>
<td>FTO2007-N1 1</td>
</tr>
<tr>
<td>Operating add-on (2xEVAC term.) [NL]</td>
<td>FCM2008-N1 2</td>
</tr>
<tr>
<td>Operating add-on (2xLED indicator)</td>
<td>FCM7213-Y3 2</td>
</tr>
<tr>
<td>Operating add-on (4xLED indicator)</td>
<td>FCM7214-Y3 2</td>
</tr>
<tr>
<td>Sounder module</td>
<td>FCA2005-A1</td>
</tr>
<tr>
<td>RT interface [NL]</td>
<td>FCI2005-N1</td>
</tr>
<tr>
<td>License key (Sx)</td>
<td>Yes 3</td>
</tr>
<tr>
<td>Key switch (Kaba) [CH]</td>
<td>FTO2005-C1 1</td>
</tr>
<tr>
<td>Key switch (nordic)</td>
<td>FTO2006-B1 1</td>
</tr>
</tbody>
</table>

*Table 5: Options for the fire control panel (modular) FC723*

1 Can also be permanently integrated, depending on the operating unit
2 Only available in Comfort housing
3 See the chapter 'License keys' under 'Networking the stations'
5.5 Fire control panel (4-loop) FC724

Figure 8: Example of a fire control panel (4-loop) FC724

5.5.1 Description

The FC724 is a 4-loop fire control panel with the following features:
- Two integrated C-NET line cards
- Integrated inputs/outputs for the periphery
- Integrated operating unit
- Integrated power supply
- Auto-configuration
- Networkable via system bus C-WEB/SAFEDLINK or via C-WEB/Ethernet

The fire control panel is available in several variants for different applications. These variants differ regarding the following features:
- Country-specific operating units
- Different operating add-ons
5.5.2 Technical data

Detector lines C-NET
Number of addresses Max. 504
Number of integrated line cards 2
Number of lines:
- Without loop extension • 4 loops ¹
- With loop extension • 8 loops ¹

Inputs and outputs
1 relay output for RT alarm
1 relay output for RT fault
1 monitored output for RT alarm
1 monitored output for RT fault
2 monitored horn outputs
12 configurable inputs/outputs 24 V

Supply
Power supply 150 W
Batteries 2 batteries 12 V / max. 25 Ah ²
Supply input 3 [FR] DC 9 V

Mechanical data
Dimensions of housing (Comfort) (without cover cap) 796 x 430 x 160 mm (W x H x D)
Weight 11.6 kg

Approvals
VdS G209077
LPCB 126bn/07
FM 3051081
DNV GL (marine) See document A6V10339425

¹ The maximum number of addresses always remains the same; two stubs can also be connected instead of one loop.
² Depending on the housing and version.
5.5.3 Setup

The figure below shows the typical structure of the fire control panel (4 loops) FC724 in the Comfort housing with open operating unit and operating add-on.

The following figure shows the operating unit with the PMI & mainboard FCM2027. The assignment of components is identical to the operating unit with the PMI & mainboard FCM2004. You will find detailed information about this in document A6V10210368. See chapter 'Applicable documents'.

1. Power supply
2. Batteries
3. Mains connection on DIN rail
4. Periphery board with two integrated line cards
5. Shield connection terminal blocks [DE]
6. DIN rail with relay module (option)
7. Operating unit with options (opened)
8. Key switch (option)
9. Space for options (e.g. printer etc.)
10. Operating add-on (empty or with options)
### 5.5.4 Function

Block diagram of fire control panel (4 loops) FC724

#### Station-internal bus
- Option, country-specific

#### Standard component
- Options

#### C-WEB/Ethernet
- RT Interface [NL]
- FTO2007

#### C-WEB/SAFEDLINK
- Loop extension
- FCI2003

#### Peripheryboard (4-Loop) FCI2004
- Sounder module FCA2005-A1
- Loop extension FCI2003
- Power Supply (150W) SV 24V-150W
- EVAC-NL FSE ÜE ÖA KL
- FCA2005-A1
- I/O's
- 4 Sounder module FCA2005-A1
- DC 24 V
- Loop extension FCI2003
- Event printer FTO2001
- RS232

#### PMI- & Mainboard
- EVAC-NL FTO2007
- Network-Modul FCI2001
- Network-Modul FCI2001
- FCI2001

#### Network-Modul FCI2001
- LED module FTO2008

#### RT Fault
- RT Alarm

#### C-NET Loop extension
- 1...12

#### C-NET
- Sounder
- Event printer FTO2001
- RT Interface [NL] FCI2005-N1
- Loop extension FCI2003

#### FCI2004
- 1...12
- Sounder
- Loop extension FCI2003
- I/O's
- Event printer FTO2001
### 5.5.5 Options

The table below shows all options that can be integrated in the fire control panel (4-loop) FC724.

<table>
<thead>
<tr>
<th>Designation</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loop extension (C-NET)</td>
<td>FCI2003-A1</td>
</tr>
<tr>
<td>Power supply kit 150 W (additional)</td>
<td>FP2004-A1</td>
</tr>
<tr>
<td>Fire brigade periphery module [DE]</td>
<td>FCI2001-D1</td>
</tr>
<tr>
<td>Relay module</td>
<td>Z3B171</td>
</tr>
<tr>
<td>Door contact kit [DE]</td>
<td>FCA2009-A1</td>
</tr>
<tr>
<td>Country kit [DE]</td>
<td>FA2001-D1</td>
</tr>
<tr>
<td>Network module (SAFEDLINK)</td>
<td>FN2001-A1</td>
</tr>
<tr>
<td>RS232 module (isolated)</td>
<td>FCA2001-A1</td>
</tr>
<tr>
<td>RS485 module (isolated)</td>
<td>FCA2002-A1</td>
</tr>
<tr>
<td>Event printer (internal)</td>
<td>FTO2001-A1</td>
</tr>
<tr>
<td>LED module</td>
<td>FTO2008-A1</td>
</tr>
<tr>
<td>Operating add-on (2xLED indicator)</td>
<td>FCM7213-Y3</td>
</tr>
<tr>
<td>Operating add-on (4xLED indicator)</td>
<td>FCM7214-Y3</td>
</tr>
<tr>
<td>EVAC-NL operating unit [NL]</td>
<td>FTO2007-N1</td>
</tr>
<tr>
<td>Operating add-on (2xEVAC term.) [NL]</td>
<td>FCM7221-H3</td>
</tr>
<tr>
<td>Sounder module</td>
<td>FCA2005-A1</td>
</tr>
<tr>
<td>RT interface [NL]</td>
<td>FCI2005-N1</td>
</tr>
<tr>
<td>License key (Sx)</td>
<td>Yes</td>
</tr>
<tr>
<td>Key switch (Kaba) [CH]</td>
<td>FTO2005-C1</td>
</tr>
<tr>
<td>Key switch (nordic)</td>
<td>FTO2006-B1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Designation</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating add-on (2xEVAC term.) [NL]</td>
<td>FTO2005-C1</td>
</tr>
<tr>
<td>License key (Sx)</td>
<td>Yes</td>
</tr>
<tr>
<td>Key switch (nordic)</td>
<td>FTO2006-B1</td>
</tr>
</tbody>
</table>

*Table 6: Options of the fire control panel (4-loop) FC724*

1 Can also be permanently integrated, depending on the operating unit
2 See the chapter 'License keys' under 'Networking the stations'
5.6 Fire control panel (modular) FC726

Figure 9: Sample view of fire control panel (modular) FC726

5.6.1 Description

The FC726 is a modular fire control panel with the following characteristics:

- Two integrated C-NET line cards
- Can be extended with additional line cards for C-NET, SynoLOOP detectors or I/O cards (module bus cards)
- Integrated inputs/outputs for the periphery
- Can be extended with additional cards for programmable I/Os
- Integrated operating unit
- Integrated power supply
- Auto-configuration
- Can be networked via the system bus C-WEB/SAFEDLINK or via C-WEB/Ethernet

The fire control panel is available in several variants for different applications. These variants differ regarding the following features:

- Country-specific operating units
- Different operating add-ons
5.6.2 Technical data

Detector lines C-NET
Number of addresses Max. 1512
Number of integrated line cards 2
Number of lines:
- Without loop extension 4 loops
- With loop extension 8 loops

Additional line cards
- Line card (FDnet/C-NET) 4 loops each with a maximum of 252 addresses (max. 252 addresses)
- Line card (SynoLOOP) 4 loops of max. 128 devices or 4 stubs of 32 devices (max. 512 devices)

Inputs and outputs
1 relay output for RT alarm
1 relay output for RT fault
1 monitored output for RT alarm
1 monitored output for RT fault
2 monitored horn outputs
12 configurable inputs/outputs 24 V

Additional I/O cards
- I/O card (programmable) 12 configurable inputs/outputs 24 V
- I/O card (horn/monitored) 8 horn outputs, monitored
- I/O card (RT) 1 alarm relay output
  1 fault relay output
  1 voltage output 24 V
  2 GPIO (e.g. RT confirmation)
  1 monitored fault output
  2 configurable outputs, monitored

Supply
Power supply 150 W
Batteries 2 batteries 12 V / 27...45 Ah

Mechanical data
Dimensions of housing (Large) (without cover cap) 796 x 430 x 260 mm (H x W x D)
Weight (without batteries) 17 kg

Approvals
VdS G210084
LPCB 126bn/08
FM 3051081

1 The maximum number of addresses always remains the same; two stubs can also be connected instead of one loop.
5.6.3 Setup
The figure below shows the typical structure of the fire control panel (modular) FC726 in the housing (Large) with open operating unit and operating add-on.

The following figure shows the operating unit with the PMI & mainboard FCM2027. The assignment of components is identical to the operating unit with the PMI & mainboard FCM2004. You will find detailed information about this in document A6V10210368. See chapter 'Applicable documents'.

1. Power supply
2. Batteries
3. DIN rail for options (relay module)
4. Mains connection on DIN rail
5. Card cage (5 slots)
6. Periphery board with two integrated line cards
7. Mounting plate for peripherals and shield connection terminal blocks [DE] (option)
8. Space for options (e.g. printer)
9. Key switch (option)
10. Operating unit with options (opened)
11. Operating add-on (empty or with options)
5.6.4 Function

Figure 10: Block diagram for fire control panel (modular)
### 5.6.5 Options

The table below shows all options that can be integrated in the fire control panel (modular) FC726.

<table>
<thead>
<tr>
<th>Designation</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loop extension (C-NET)</td>
<td>FCI2003-A1</td>
</tr>
<tr>
<td>Line card (FDnet/C-NET)</td>
<td>FCL2001-A1</td>
</tr>
<tr>
<td>Line card (SynoLOOP)</td>
<td>FCL7201-Z3</td>
</tr>
<tr>
<td>I/O card (programmable)</td>
<td>FCI2008-A1</td>
</tr>
<tr>
<td>I/O card (horn/monitored)</td>
<td>FCI2009-A1</td>
</tr>
<tr>
<td>I/O card (RT)</td>
<td>FCI2007-A1</td>
</tr>
<tr>
<td>Power supply kit 150 W (additional)</td>
<td>FP2004-A1</td>
</tr>
<tr>
<td>Fire brigade periphery module [DE]</td>
<td>FCI2001-D1</td>
</tr>
<tr>
<td>Relay module</td>
<td>Z3B171</td>
</tr>
<tr>
<td>Door contact kit [DE]</td>
<td>FCA2009-A1</td>
</tr>
<tr>
<td>Country kit [DE]</td>
<td>FA2001-D1</td>
</tr>
<tr>
<td>Network module (SAFEDLINK)</td>
<td>FN2001-A1</td>
</tr>
<tr>
<td>RS232 module (isolated)</td>
<td>FCA2001-A1</td>
</tr>
<tr>
<td>RS485 module (isolated)</td>
<td>FCA2002-A1</td>
</tr>
<tr>
<td>Event printer (internal)</td>
<td>FTO2001-A1</td>
</tr>
<tr>
<td>LED module</td>
<td>FTO2008-A1 1</td>
</tr>
<tr>
<td>Operating add-on (2xLED indicator)</td>
<td>FCM7213-Y3</td>
</tr>
<tr>
<td>Operating add-on (4xLED indicator)</td>
<td>FCM7214-Y3</td>
</tr>
<tr>
<td>EVAC-NL operating unit [NL]</td>
<td>FTO2007-N1 1</td>
</tr>
<tr>
<td>Operating add-on (2xEVAC term.) [NL]</td>
<td>FCM7221-H3</td>
</tr>
<tr>
<td>Sounder module</td>
<td>FCA2005-A1</td>
</tr>
<tr>
<td>RT interface [NL]</td>
<td>FCI2005-N1</td>
</tr>
<tr>
<td>License key (Sx)</td>
<td>Yes 2</td>
</tr>
<tr>
<td>Key switch (Kaba) [CH]</td>
<td>FTO2005-C1 1</td>
</tr>
<tr>
<td>Key switch (nordic)</td>
<td>FTO2006-B1 1</td>
</tr>
</tbody>
</table>

*Table 7: Options for the fire control panel (modular) FC726*

1 Can also be permanently integrated, depending on the operating unit
2 See the chapter 'License keys' under 'Networking the stations'
5.7 Fire control panel for single-sector extinguishing

The components for single-sector extinguishing can be integrated in all fire control panels FC722 and FC724 in the Comfort and Large housing with 150 W power supply, provided there is enough space for installation.

The card cage for the extinguishing card can only be installed in fire control panels from IP7 onward.

The following fire control panel FC724-ZA provides an example of the installation situation.

Figure 11: FC724-ZA with extinguishing card and one extinguishing terminal

1 Fire control panel FC724-ZA in the Comfort housing
2 FCA2046 card cage (1 sector exting.)
3 XCI2005 extinguishing card
4 Metal bracket for cable attachment (FCA2046 scope of supply)
5 Power supply (150 W)
6 XCM2002-A2 exting. terminal (1 sector)
7 Operating unit
5.8 FT724 fire terminal

Figure 12: Example of a fire terminal FT724

5.8.1 Description
The fire terminal FT724 is a pure operating terminal with the following features:
- Integrated operating unit
- Separate 24 V supply input, monitored
- Redundant 24 V supply input
- Networkable via ↑ system bus C-WEB/SAFEDLINK or via C-WEB/Ethernet
- Power supply (70 W) and batteries as an option
- System-wide ↑ visibility configurable

Depending on the application, the fire terminal is available with country-specific operating units.

5.8.2 Technical data

Supply
System supply 24 V DC (2 inputs)
Supply input 3 [FR] DC 9 V

Mechanical data
Dimensions of housing (Eco) 398 x 430 x 80 mm (H x W x D)
Weight (without batteries) 4.7 kg

Approvals
VdS G209078
LPCB 126bn/R02
FM 3051081
DNV GL (marine) See document A6V10339425
5.8.3 Setup

The figure below shows the typical structure of a fire control panel FT724 in the housing (Eco) with open operating unit.

The following figure shows the operating unit with the PMI & mainboard FCM2027. The assignment of components is identical to the operating unit with the PMI & mainboard FCM2004. You will find detailed information about this in document A6V10210368. See chapter ‘Applicable documents’.

1. Power supply (option)
2. Batteries (option)
3. DIN rail (for optional mains connection)
4. Fire terminal board
5. Shield connection terminal block [DE]
6. Operating unit with options (opened)
7. Key switch (option)
8. Space for options (e.g. printer)
5.8.4 Function

Block diagram for fire terminal FT724
5.8.5 **Options**

The table below shows all the options that can be integrated into the fire terminal FT724.

<table>
<thead>
<tr>
<th>Designation</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power supply kit (70 W)</td>
<td>FP 2015-A1</td>
</tr>
<tr>
<td>Batteries 7 Ah</td>
<td>FA2003-A1</td>
</tr>
<tr>
<td>Country kit [DE]</td>
<td>FA2001-D1</td>
</tr>
<tr>
<td>Network module (SAFEDLINK)</td>
<td>FN2001-A1</td>
</tr>
<tr>
<td>RS232 module (isolated)</td>
<td>FCA2001-A1</td>
</tr>
<tr>
<td>RS485 module (isolated)</td>
<td>FCA2002-A1</td>
</tr>
<tr>
<td>LED module</td>
<td>FTO2008-A1</td>
</tr>
<tr>
<td>EVAC-NL operating unit [NL]</td>
<td>FTO2007-N1</td>
</tr>
<tr>
<td>License key (Sx)</td>
<td>Yes 2</td>
</tr>
<tr>
<td>Key switch (Kaba) [CH]</td>
<td>FTO2005-C1</td>
</tr>
<tr>
<td>Key switch (nordic)</td>
<td>FTO2006-B1</td>
</tr>
</tbody>
</table>

*Table 8: Options of the fire terminal*

1 Can also be permanently integrated, depending on the operating unit
2 See the chapter 'License keys' under 'Networking the stations'
### 5.9 Housing

#### 5.9.1 Housings available for stations

From a mechanical standpoint, the stations are built from the following components:

- Rear panel
- Operating unit
- Cover

The electronic components and the batteries are built in the rear panel. The operating unit is mounted to the rear panel so that it is can be pivoted. The cover cap serves as lid.

The table below shows the housings available for the stations:

<table>
<thead>
<tr>
<th>Housing (Eco)</th>
<th>Housing (Standard)</th>
<th>Housing (Comfort)</th>
<th>Housing (Large)</th>
<th>Housing (Large Extension)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FH7201-Z3</td>
<td>FH7202-Z3</td>
<td>FH7203-Z3</td>
<td>FH7205-Z3</td>
<td>FH7204-Z3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dimensions (mm)</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Width</td>
<td>430</td>
<td>430</td>
<td>430</td>
<td>430</td>
</tr>
<tr>
<td>Height</td>
<td>398</td>
<td>398</td>
<td>796</td>
<td>398</td>
</tr>
<tr>
<td>Depth (rear panel)</td>
<td>80</td>
<td>160</td>
<td>160</td>
<td>260</td>
</tr>
<tr>
<td>Depth (total)</td>
<td>103</td>
<td>183</td>
<td>183</td>
<td>283</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Max. battery capacity (empty housing)</th>
<th>2 x 7 Ah</th>
<th>2 x 17 Ah</th>
<th>2 x 25 Ah</th>
<th>2 x 65 Ah</th>
<th>2 x 65 Ah</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Typical application</th>
<th>FT724</th>
<th>FC722</th>
<th>FC722</th>
<th>FC726</th>
<th>Optional extensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optional extensions</td>
<td>FC722</td>
<td>FC724</td>
<td>FC723</td>
<td>FC726</td>
<td></td>
</tr>
</tbody>
</table>

*Limited to 65 Ah due to the weight.*
5.9.2 Empty housing
All housings are available as ‘empty’ housings. Empty housings are used to install other devices and options. Examples include:
- Operating add-on
- Separate decentralized supply
- Extra batteries
- Extra devices on DIN rail such as relay, transponder etc.

Empty housings consist of the following parts:
- Eco, Standard and Large Extension housings
  - Rear panel
  - Carrier plate with foil
  - Cover
- Comfort and Large housings
  - Rear panel
  - Two carrier plates with foil
  - Two covers

5.10 Options
Some of the components described in this chapter are not individually available. Depending on the type and design of the station, these components are permanently integrated in the station.

You will find information about the country-specific availability of devices in document 'Delivery Release'.

You will find details regarding the individual versions and available options in document A6V10210362. See chapter 'Applicable documents'.

5.10.1 Power supplies

5.10.1.1 Power supply (70 W) FP 2015
Power supply (70 W) FP 2015 is installed in fire terminal FT724 or in an additional empty housing for supplying remote devices in conformity to the EN standard.
Power supply (70 W) FP 2015 is an installation kit that also includes the relevant mounting materials and cable kit.
5.10.1.2 **Power supply kit (150 W)**

The power supply kit (150 W) is required in fire control panels with a 150 W power supply for installation as an additional power supply to increase performance. Depending on the space, up to 3 power supplies (150 W) can be connected in parallel.

The power supply (150 W) can also be installed in an additional empty housing for the purpose of supplying remote devices.

The following kits are available:
- FP 2004-A1 power supply kit (150 W, A), power supply (150 W) with accessories (cable kit, disconnect terminals) for installation in an empty housing.
- FP 2005-A1 power supply kit (150 W, B), power supply (150 W) with accessories for installation as an additional power supply connected in parallel.
- You will find detailed information on how to connect power supplies (150 W) in parallel in product data document A6V10210368.

5.10.1.3 **Power supply kit (70 W) FP120**

Power supply kit (70 W) FP120 is a standalone power supply for the decentralized supply of external devices in conformity to the EN 54 and VdS standards. The wall housing of the FP120 is large enough to accommodate back-up batteries with a capacity of up to 17 Ah and to allow the installation of max. 7 I/O modules or relay modules for transmitting faults.

5.10.2 **Options of the detector lines**

5.10.2.1 **Loop extension (C-NET) FCI2003-A1**

The loop extension for the ↑ C-NET detector lines increases the number of loops of the integrated line cards on the periphery board. The loop extension is mounted on the fire control panel periphery board. With the loop extension, the number of ↑ loops that can be connected per integrated line card is doubled from two to four. The number of C-NET addresses remains unchanged.
5.10.2.2 Line card (FDnet / C-NET) FCL2001-A1

The line card (FDnet/C-NET) is a module bus card for installation in fire control panels with a card cage. It is used for additional C-NET detector lines and has the same functionality as built-in line cards.

Four loops or eight stubs and max. 252 devices can be connected to a line card (FDnet/C-NET). A loop extension cannot be connected.

5.10.2.3 Line card (SynoLOOP) FCL7201-Z3

The line card (SynoLOOP) FCL7201-Z3 is a module bus card for installation in fire control panels with a card cage. It is used to migrate Synova detectors.

Up to 512 devices can be connected to a line card (SynoLOOP) using four loops or four stubs. A maximum of 128 devices can be connected per loop.

5.10.3 Networking and communication options

5.10.3.1 Network module (SAFEDLINK) FN2001-A1

With the network module (SAFEDLINK) FN2001, the station can be networked via C-WEB/SAFEDLINK.

By default only one network module is built in. For network module redundancy according to EN 54, a second network module can be built in.

5.10.3.2 Fiber optic cable network module (SM/MM) FN2006/7

The fiber optic cable network modules are active fiber optic cable couplers for the system bus C-WEB/SAFEDLINK. The C-WEB networking can thus be extended to a distance of up to 40 km while remaining in conformance with EN 54. The following modules are available:

- Fiber optic cable network module (SM) FN2006 A1, single mode transmission up to 40 km
- Fiber optic cable network module (MM) FN2007-A1, multi-mode transmission up to 4 km

The fiber optic cable network module can be mounted in the housing of the station or remotely with separate power supply.
5.10.3.3 Ethernet switch (modular) FN2012

Ethernet switch (modular) FN2012 is used to connect a station to an optical C-WEB/LAN.

5.10.3.4 Ethernet module (MM/SM) VN2002/VN2003

Ethernet module (MM) VN2002 and Ethernet module (SM) VN2003 are options that can be mounted inside Ethernet switch (modular) FN2012. These modules provide an optical Ethernet connection for a C-WEB/LAN. The two Ethernet modules offer different optical transmission methods:

- Ethernet module (MM) VN2002 for multi-mode transmission
- Ethernet module (SM) VN2003 for single-mode transmission

5.10.3.5 Repeater (SAFEDLINK) FN2002-A1

The repeater (SAFEDLINK) FN2002 enables the distance of the C-WEB/SAFEDLINK between two stations to be extended from 1000 m to 2000 m.

5.10.3.6 RS232 module (isolated) FCA2001-A1

The RS232 module (isolated) FCA2001 is used e.g. to operate an event printer. It is attached to the PMI & mainboard.

The RS232 module (isolated) is not included in the event printer set.
5.10.3.7 RS485 module (isolated) FCA2002-A1

The RS485 module (isolated) FCA2002 is used for the operation of the following modules:
- Fire brigade indication panel (FAT) [DE]
- Fire brigade indication panel with integrated fire brigade operating panel (FAT and FBF) [DE]
- Serial fire brigade operating panel (FBF) [DE]
- Remote EVAC FCM7221-H3 [NL]
- ESPA-4.4.4 interface

The RS485 module (isolated) is assembled on the PMI & mainboard.

5.10.3.8 Fire brigade periphery module FCI2001-D1 [DE]

The fire brigade periphery FCI2001 module [DE] is connected to the periphery board and is mounted either on the rear panel or on the mounting plate, depending on the control panel.

With this module, the following devices can be connected in compliance with the VdS regulations:
- Parallel fire brigade operating panel (FBF)
- Fire brigade key depot (FSD)
- Releasing element (FSE)
- Remote transmission (RT)
- Signal transmitter for local alarming (LA)
- Identification lamp

5.10.3.9 RT interface FCI2005-N1 [NL]

The RT interface FCI2005 is connected to the configurable I/O of the periphery board. Depending on the control panel, it is mounted on the rear panel or on the mounting plate.

The RT interface allows a wide range of functions to be controlled in an electrically isolated manner via the programmable I/Os.

5.10.3.10 Sounder module FCA2005-A1

The sounder module FCA2005 is connected to the sounder output of the periphery board. It may be mounted onto the DIN rail or on the rear panel of the housing.

The sounder module makes it possible to divide the horn line output into four lines. The lines are activated in parallel and each monitor one horn.
5.10.3.11 Cable kit (communication) FCA2014-A1

The cable kit (communication) FCA2014 enables connection with flexible cables between the options of the operating unit and the incoming solid conductors. The cable kit (communication) consists of a terminal strip with two shield connection terminal blocks and eight cable clamps mounted instead of shield connection terminal blocks.

5.10.3.12 I/O card (programmable) FCI2008-A1

The I/O card (programmable) FCI2008-A1 is a module bus card for installation in the card cages of the FC723 and FC726. The I/O card is used for extension with potential-free inputs and outputs. The following I/Os are available:
- Twelve programmable I/Os
- Two supply outputs
- Configurable failsafe behavior in degraded mode.

5.10.3.13 I/O card (horn/monitored) FCI2009-A1

The I/O card (horn/monitored) FCI2009-A1 provides 8 monitored outputs for alarm and fault transmission. The I/O card (horn/monitored) is a module bus card for installation in the card cages of the FC723 and FC726.

5.10.3.14 I/O card (remote transmission) FCI2007-A1

The I/O card (remote transmission) FCI2007-A1 provides programmable and horn outputs. The I/O card (remote transmission) is inserted in the card cages of the FC723 and FC726. The I/O card (RT) has the following features:
- 2 programmable inputs/outputs
- 1 alarm relay and 1 fault relay
- 1 supply output
- Configurable fail-safe and degraded mode behavior
5.10.4 Indication and operation options

The operating units are not separately available. They are permanently integrated in the different stations.

Depending on the type and execution, the operating units provide space for one option (e.g. event printer or LED indicator). If additional options are desired, an operating add-on is required. The operating add-on provides space for four options.

The operating add-on is installed in the lower part of the Comfort housing in stations. When an operating add-on is required for Standard housings, it is mounted into a separate housing below or beside the station.

Figure 13: Example: Station in housing (Comfort)

1. Space for options in the operating unit
2. Operating unit (upper housing part)
3. Operating add-on (lower housing part)
5.10.4.1 LED indicator (internal) FTO2002-A1

The LED indicator (internal) FTO2002-A1 comprises 24 indicator zones. Each zone includes a red and a yellow LED.

Any events can be assigned to the LEDs. Each LED may be configured as a static or flashing indicator. Normally the LED indicator is used as a zone indicator.

The LED indication (internal) is connected to the station-internal bus and is cascadable up to a maximum number of five LED indicators (internal).

The LED indicator (internal) is not individually available as an option. It is permanently integrated in the following components:

- Operating unit with LED indicator (internal) FCM7202-Y3 (with PMI & mainboard FCM2004)
- Operating unit with LED indicator (internal) FCM7205-Y3 (with PMI & mainboard FCM2027)
- Operating add-on with 2 LED indicators (internal) FCM7211-Y3
- Operating add-on with 4 LED indicators (internal) FCM7212-Y3

The operating units and operating add-ons are permanently integrated depending on the station type. The number of indicator zones required determines which station must be ordered.

5.10.4.2 LED module FTO2008-A1

The LED module FTO2008-A1 contains 24 indicator zones. Each zone contains one red / green bicolor LED and one yellow LED.

Any events can be assigned to the LEDs. Each LED may be configured as a static or flashing indicator. Normally the LED indicator is used as a zone indicator.

The LED module is connected to the station-internal bus and can be cascaded to up to a maximum of five LED modules.

The LED module is not individually available as an option. It is permanently integrated in the following components:

- Operating unit (+LED indicator) FCM7215-Y3
- Operating add-on (2x LED indicators) FCM7213-Y3
- Operating add-on (4x LED indicators) FCM7214-Y3

The operating units and operating add-ons are permanently integrated depending on the station type. The number of indicator zones required determines which station must be ordered.
5.10.4.3 Event printer FTO2001-A1

The event printer FTO2001 is a thermal printer that logs all important events:
- Alarms
- Faults
- Isolations
- Test

An RS232 module (isolated) FCA2001 is required to operate the event printer. This is not included in the printer set and must be ordered separately.

5.10.4.4 External printer FUJITSU DL3750+

Siemens recommends the FUJITSU DL3750+ printer as the external printer because it supports printer monitoring for faults.

Connection of FUJITSU DL3750+
- Via the RS232 module FCA2001-A1
- To the Ethernet interface via the print server PS104 from SEH

5.10.4.5 Key switch (Kaba) FTO2005-C1

The key switch (Kaba) FTO2005-C1 serves as an access protection for operation. It is mounted on the operating unit.
5.10.4.6 Key switch (nordic) FTO2006-B1

The key switch (Nordic) FTO2006-B1 serves as access protection for operation. It is mounted on the operating unit.

5.10.5 EVAC-NL indicators [NL]

5.10.5.1 Structure and function

20-zone EVAC indicator FCM7221-H3

The EVAC-NL operating unit FTO2007-N1 is connected to the peripheral data bus and is integrated in the operating unit as a 10-zone indicator.

With operating add-on (2xEVAC term.) FCM7221-H3 with 20-zone indicator, two EVAC-NL operating units FTO2007-N1 are integrated in the operating add-on with various indicator panels.
Remote EVAC

![Remote EVAC Diagram](image)

**Figure 15: EVAC-NL remote in separate housing**

1. External housing
2. Operating add-on FCM7221-H3 with 20-zone EVAC indicator

FTO2007 EVAC-NL operating unit

FTI2002 EVAC-NL connector board (mimic display)

FCA2002 RS485 module on the control panel PMI & mainboard

The EVAC-NL indicator can also be operated in a separate housing, e.g., in an Eco housing, at a distance of up to 1000 m from the station. In this case the EVAC-NL operating unit FTO2007-N1 is connected via an additional connector board FTI2002-N1 to the RS485 module on the PMI & mainboard.

The supply comes via the fire control panel or via a separate supply.
Mimic display driver (EVAC)

Figure 16: EVAC-NL remote as mimic display

1. External housing
2. LED mimic display panel (34 LED connections, 16 outside buttons and 1 key switch)

FTO2007 EVAC-NL operating unit
FTI2002 EVAC-NL connector board (mimic display)
FT2003 Mimic display driver (EVAC)

The EVAC-NL indicator can also be operated as a remote mimic display at a distance of up to 1000 m from the station. The EVAC-NL mimic display driver FT2003-N1 consists of the additional connector board FTI2002-N1 and an EVAC-NL operating unit FTO2007-N1 without indicator panel.

The mimic display driver FT2003-N1 is fitted in a customer-specific housing, and the associated LED displays are arranged according to the layout plan. The connection is made to the RS485 module on the control panel PMI & mainboard. The supply comes via the fire control panel or via a separate supply.

5.10.5.2 EVAC-NL operating unit FTO2007-N1 [NL]

The EVAC-NL operating unit is an evacuation control unit for the Dutch market. It enables the operation of a maximum of ten evacuation zones.

The EVAC-NL operating unit is connected to the station-internal bus.

The EVAC-NL operating unit is not individually available as an option.
5.10.5.3 EVAC-NL connector board FTI2002-N1 [NL]

The EVAC-NL connector board FTI2002-N1 is the interface card of the EVAC-NL operating unit FTO2007-N1 for the serial RS485 module. The EVAC-NL connector board permits remote operation of an EVAC operating unit with ten evacuation zones and is also used with the mimic display driver (EVAC).

5.10.5.4 Mimic display driver (EVAC) FT2003-N1 [NL]

The EVAC-NL mimic display driver FT2003-N1 is a remote EVAC operating unit without LED indicator. The EVAC-NL operating unit is mounted on a connector board that is operated via the RS485 interface. The EVAC-NL mimic display driver is installed in a separate housing by the operator and the LED display are arranged according to the layout plan.
5.10.6 Housing options

5.10.6.1 Mounting plate FHA2007-A1

The mounting plate can be fitted in all Standard and Comfort housings. Components that cannot be mounted elsewhere in the housing (e.g. fire brigade periphery module or RT interface in the Standard housing) are mounted on the mounting plate. The mounting plate is mounted above the periphery board.

Figure 17: Installation site of mounting plate taking the example of the Standard housing

1 Mounting plate, mounted above the periphery board
2 Fire brigade periphery module, mounted on the mounting plate
5.10.6.2 19" mounting kit FHA2016-A1

The 19" mounting kit serves as a mounting aid for fitting a station into a 19" housing or into a 19" frame. The kit includes two mounting units which are screwed down on a 19" frame. One kit is required per housing.

![Diagram of 19" mounting kit](https://example.com/diagram.png)

Figure 18: View of the 19" mounting kit

1 19" frame or cabinet
2 19" mounting kit
3 Station or empty housing

5.10.7 Additional options

5.10.7.1 Relay module Z3B171

The relay module is controlled by means of an I/O (24 V) and is used for higher switching capacities or for potential-free contacts. The module is mounted onto the DIN rail.

5.10.7.2 Shield connection terminal blocks [DE]

The shield connection terminal blocks are enclosed in the country kit (DE) FA2001-D1. The shield connection terminal blocks are required to connect the shields of the signal lines to ground.
5.10.8 Extinguishing system components

**XCI2005-A1 extinguishing card**

The extinguishing card XCI2005 is a module bus card for single-sector extinguishing for installation in FC722 and FC724 in the Comfort housing.

**FCA2046-A1 card cage (1 sector exting.)**

The card cage (1 sector exting.) FCA2046 is a carrier for an extinguishing card with plug-in contacts for internal and external signal transmission to the extinguishing terminals.

The FCA2046 is designed for mounting in FC722 and FC724 fire control panels in the Comfort housing. The scope of delivery includes a metal container for securing the cables.

**XCM2002-A2 exting. terminal (1 sector)**

Operating add-on with extinguishing terminal for one sector.

For installation in one FS720 fire control panel with extinguishing for one sector.

**XT2001-A2 extinguish. terminal (remote)**

Remote extinguishing terminal for one sector.

- Required as a primary extinguishing terminal for fire control panels if no space is available for installation of a primary extinguishing terminal.
- Can be connected as a secondary extinguishing terminal in addition to the primary extinguishing terminal. A maximum of five secondary extinguishing terminals can be connected per flooding zone.
XTO2002-C1 key switch (Kaba)

The key switch (Kaba) XTO2002 is a country-specific option for installation in an extinguishing terminal.

XTO2003-B1 key switch (nordic)

The key switch (nordic) XTO2003 is a country-specific option for installation in an extinguishing terminal for the Nordic countries.

FCA2047 accessories kit (FCA2046)

Accessories kit for the card cage (1 sector exting.) FCA2046 for single-sector extinguishing control panels with 400 mm power supply cable, 5x spacers M3 x 6.5, and cable ties.
6 Detector lines

This chapter describes the different detector lines that are supported by the fire detection system.

All fire control panels support the addressed detector line 'C-NET'.

Collective detector lines may also be connected to all fire control panels via the C-NET using the input/output module FDCIO223.

6.1 C-NET detector line

6.1.1 Devices which can be connected to the C-NET detector line

Other devices can be operated on the addressed C-NET detector line in addition to the fire detectors. The following picture shows which devices can be connected to the C-NET detector line.

The list applies to installed line cards and to the optional line card (FDnet/C-NET) FCL2001-A1 for the fire control panels with a card cage.

You will find information about the country-specific availability of devices in document 'Delivery Release'.

The table below contains a list of all devices which can be connected to the C-NET detector line. It also highlights which devices feature an alarm indicator (AI) and to which devices an external alarm indicator (ext. AI) or a sounder base (DBS720) can be connected.

![Diagram showing devices connected to C-NET detector line]

Figure 19: Devices which can be connected to the C-NET detector line
<table>
<thead>
<tr>
<th>Device type</th>
<th>Type</th>
<th>Description</th>
<th>AI</th>
<th>Ext. AI</th>
<th>DBS 720</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heat detector</td>
<td>HI720</td>
<td>Heat detector for demanding applications</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>HI722</td>
<td>Heat detector for standard applications</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Flame detector</td>
<td>FDF241-9</td>
<td>Flame detector with three sensors for demanding applications with many deceptive phenomena</td>
<td>X</td>
<td>X</td>
<td>-</td>
</tr>
<tr>
<td>Smoke detector</td>
<td>FDL241-9</td>
<td>Linear smoke detector for demanding applications with many deceptive phenomena</td>
<td>X</td>
<td>X</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>OP720</td>
<td>Optical smoke detector for standard applications with few deceptive phenomena</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Multi-sensor detector</td>
<td>OH720</td>
<td>Simple optical-thermal point detector</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>OOH740</td>
<td>Optical-thermal multi-sensor fire detector for demanding applications</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>OOHC740</td>
<td>Optical-thermal multi-sensor fire detector with CO measurement</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>OOH740-A9-Ex²</td>
<td>Optical-thermal multi-sensor fire detector with ambient supervision with collective DualIProtocol and FDnet/C-NET. For areas at risk of explosion</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Aspirating smoke detector</td>
<td>FDA221</td>
<td>Aspirating smoke detector up to a monitoring area of 500 m²</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>FDA241</td>
<td>Aspirating smoke detector up to a monitoring area of 800 m²</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Manual call point</td>
<td>FDM221</td>
<td>Direct activation for indoor applications</td>
<td>X</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>FDM223</td>
<td>Indirect activation (large housing)</td>
<td>X</td>
<td>X</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>FDM223H</td>
<td>Indirect activation (large housing)</td>
<td>X</td>
<td>X</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>FDM223-Ex</td>
<td>Indirect activation (large housing) for areas at risk of explosion</td>
<td>X</td>
<td>X</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>FDM224</td>
<td>Indirect activation (large housing)</td>
<td>X</td>
<td>X</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>FDM224H</td>
<td>Indirect activation (large housing)</td>
<td>X</td>
<td>X</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>FDM225</td>
<td>Direct activation for indoor applications</td>
<td>X</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>FDM226</td>
<td>Direct activation for outdoor applications</td>
<td>X</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>FDM233</td>
<td>Indirect activation, suitable for migration from existing SIGMASYS systems to Cerberus systems</td>
<td>X</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>FDM234</td>
<td>Direct activation, suitable for migration from existing SIGMASYS systems to Cerberus systems</td>
<td>X</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>FDM243H</td>
<td>Indirect activation, robust housing for use outdoors and in humid rooms, suitable for migration from existing SIGMASYS systems to Cerberus systems</td>
<td>X</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Input module</td>
<td>FDCI221</td>
<td>1 potential-free contact input</td>
<td>X</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>FDCI222</td>
<td>4 potential-free contact inputs</td>
<td>X</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Device type</td>
<td>Type</td>
<td>Description</td>
<td>AI</td>
<td>Ext. AI</td>
<td>DBS 720</td>
</tr>
<tr>
<td>--------------------------</td>
<td>------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>----</td>
<td>---------</td>
<td>---------</td>
</tr>
<tr>
<td>Zone module</td>
<td>FDCI723</td>
<td>1-zone module for connecting to collective or conventional fire detectors,</td>
<td>X</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>with external supply. With safety barrier SB3 for areas at risk of explosion as well</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Input/output module</td>
<td>FDCIO221</td>
<td>1 potential-free contact input and 1 control output for any control</td>
<td>X</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>FDCIO222</td>
<td>4 potential-free contact inputs and 4 control outputs for any controls</td>
<td>X</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>FDCIO223</td>
<td>2 inputs/outputs can be alternatively used either for controlling sounders or connecting collective detector lines. Mixed operation, i.e. 1 input channel and 1 output channel, is also possible.</td>
<td>X</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>FDCIO224</td>
<td>4 potential-free contact inputs and 4 control outputs for the connection of the VdS extinguishing interface in compliance with the VdS or realization of fire controls in compliance with EN 54.</td>
<td>X</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Line separator</td>
<td>FDCL221</td>
<td>Line separator for the correct connection of several stub lines at one point on a loop</td>
<td>X</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>FDCL221-M</td>
<td>Multi line separator module for the correct connection of several stub lines on a loop via a line separator</td>
<td>X</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Ex loop separators</td>
<td>FDCL221-Ex</td>
<td>Line separator for the correct connection of a stub line at one point on a loop in an area at risk of explosion</td>
<td>X</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Alarm sounder</td>
<td>FDS221</td>
<td>Acoustic alarm device with various tones and sound levels</td>
<td>X</td>
<td>X</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>FDS229</td>
<td>Acoustic alarm sounder with supplementary optical indication with various tones and sound levels and beacon</td>
<td>X</td>
<td>X</td>
<td>-</td>
</tr>
<tr>
<td>Sounder base</td>
<td>DBS720</td>
<td>Detector base with integrated alarm device</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Interbase</td>
<td>DBS721</td>
<td>Sounder interbase with integrated acoustic alarm device</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>DBS728</td>
<td>Interbase with integrated alarm device, acoustic and optical</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>DBS729</td>
<td>Interbase with integrated alarm device, acoustic and optical</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Detector base</td>
<td>DB721</td>
<td>Detector base with loop contact</td>
<td>X</td>
<td>X</td>
<td>-</td>
</tr>
<tr>
<td>Floor repeater terminal</td>
<td>FT2010</td>
<td>For the system-wide indication and operation of the most important information and functions</td>
<td>X</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Floor repeater display</td>
<td>FT2011</td>
<td>For the system-wide indication of the most important information</td>
<td>X</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
### Device type | Type | Description | AI | Ext. AI | DBS 720
---|---|---|---|---|---
Mimic display indication | FT2001 | For the system-wide indication of events | X | - | -
External alarm indicator | DJ 119x | For optical indication in the event of alarm | - | - | -
External alarm indicator | FDCAI221 | Addressable alarm indicator that can be assigned to any cause using a control | - | - | -
Radio gateway | FDCW221 | For the wireless transmission of detector signals to the C-NET | X | X | -
Radio smoke detector | DOW1171 | Smoke detector for the wireless transmission to the radio gateway FDCW221 | X | -- | -
Manual call point with radio base | SMF6120 SMF121 | Manual call point for the wireless transmission to the radio gateway FDCW221 | -- | -- | -
SWING radio gateway | FDCW241 | Gateway for the wireless transmission of detector signals to the C-NET | X | X | -
Neural radio fire detector (SWING) | FDOOT271 | Optical-thermal fire detector with radio transmission to the radio gateway FDCW241 | X | X | -
Radio manual call point (SWING) | FDM273 | Indirect activation via radio gateway FDCW241 | X | - | -
| FDM275 | SWING manual call point, activation via radio gateway FDCW241 | X | - | -
Aspirating smoke detector | VLF | VESDA LaserFocus (laser monitoring) | - | - | -

*Table 10: Devices which can be connected to the C-NET detector line*

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>Possible / available</td>
</tr>
<tr>
<td>-</td>
<td>Not possible / not available</td>
</tr>
<tr>
<td>1</td>
<td>Availability is communicated with the delivery release</td>
</tr>
<tr>
<td>2</td>
<td>Check with your country representative that this detector is approved for C-NET in your country.</td>
</tr>
</tbody>
</table>

Most devices are supplied via the detector line.
The input/output module FDCIO223 must have an external power supply.
All C-NET devices have an integrated line separator.

---

**NOTICE**

**Influencing the earth fault monitoring**

**Faults**

- For devices on the C-NET with a separate supply, the supply must be electrically isolated. FDCIO223 is an exception to this rule.
Additional documentation
- You will find detailed information about device compatibility in document List of compatibility.
- Detailed information on the products can be taken from the Technical Documentation of the different devices.
- For the connection of the VdS extinguishing interface in compliance with the VdS provisions, the input/output module FDCIO224 must be used, see document 007023.

See also
- Floor repeater terminal FT2010 and floor repeater display FT2011 ([→ 84])
- Mimic display driver FT2001-A1 ([→ 86])
- Input/output module FDCIO223 ([→ 87])

6.1.2 Connectable 'voice sounder beacon/voice sound. beacon base' devices
In addition to fire detectors, other devices can be operated on the ↑ C-NET detector line; these devices communicate via the C-NET protocol.

The table of connectable Voice alarm sounder beacon/Voice al. sound. beacon base below applies to all fire control panels from MP7 with installed ↑ line cards and to the optional line card (FDnet/C-NET) FCL2001-A1 in fire control panels with card cages.

You will find information about the country-specific availability of devices in document 'Delivery Release'.

The following table lists all 'Voice alarm sounder beacon/Voice al. sound. beacon base' devices that can be connected to the C-NET detector line.

<table>
<thead>
<tr>
<th>Device type</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alarm sounder</td>
<td>FDS224-R</td>
<td>Sounder, red housing</td>
</tr>
<tr>
<td></td>
<td>FDS224-W</td>
<td>Sounder, white housing</td>
</tr>
<tr>
<td>Alarm sounder with supplementary optical indication</td>
<td>FDS226-RW</td>
<td>Sounder beacon, red housing, white LED</td>
</tr>
<tr>
<td></td>
<td>FDS226-WW</td>
<td>Sounder beacon, white housing, white LED</td>
</tr>
<tr>
<td></td>
<td>FDS226-RR</td>
<td>Sounder beacon, red housing, red LED</td>
</tr>
<tr>
<td></td>
<td>FDS226-WR</td>
<td>Sounder beacon, white housing, red LED</td>
</tr>
<tr>
<td>Voice alarm device</td>
<td>FDS225-R</td>
<td>Voice sounder, red housing</td>
</tr>
<tr>
<td></td>
<td>FDS225-W</td>
<td>Voice sounder, white housing</td>
</tr>
<tr>
<td>Voice alarm sounder with supplementary optical indication</td>
<td>FDS227-RW</td>
<td>Voice sounder, red housing, white LED</td>
</tr>
<tr>
<td></td>
<td>FDS227-WW</td>
<td>Voice sounder, white housing, white LED</td>
</tr>
<tr>
<td></td>
<td>FDS227-RR</td>
<td>Voice sounder, red housing, red LED</td>
</tr>
<tr>
<td></td>
<td>FDS227-WR</td>
<td>Voice sounder, red housing, red LED</td>
</tr>
<tr>
<td></td>
<td>FDS227-RW-C</td>
<td>Voice sounder, red housing, white LED, voice-configured</td>
</tr>
<tr>
<td></td>
<td>FDS227-WW-C</td>
<td>Voice sounder, white housing, white LED, voice-configured</td>
</tr>
<tr>
<td></td>
<td>FDS227-RR-C</td>
<td>Voice sounder, red housing, red LED, voice-configured</td>
</tr>
<tr>
<td></td>
<td>FDS227-WR-C</td>
<td>Voice sounder, red housing, red LED, voice-configured</td>
</tr>
</tbody>
</table>
### Device type

<table>
<thead>
<tr>
<th>Device type</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sounder base with supplementary optical indication</td>
<td>FDSB226-WW</td>
<td>Sounder beacon base, white housing, white LED</td>
</tr>
<tr>
<td></td>
<td>FDSB226-WR</td>
<td>Sounder beacon base, white housing, red LED</td>
</tr>
<tr>
<td>Voice sounder base with supplementary optical indication</td>
<td>FDSB227-WW</td>
<td>Voice sound. beacon base, white housing, white LED</td>
</tr>
<tr>
<td></td>
<td>FDSB227-WR</td>
<td>Voice sound. beacon base, white housing, red LED</td>
</tr>
<tr>
<td></td>
<td>FDSB227-WW-C</td>
<td>Voice sound. beacon base, white housing, white LED, voice-configured</td>
</tr>
<tr>
<td></td>
<td>FDSB227-WR-C</td>
<td>Voice sound. beacon base, white housing, red LED, voice-configured</td>
</tr>
</tbody>
</table>

*Table 11: 'Voice alarm sounder beacon/Voice al. sound. beacon base' devices that can be connected to the C-NET detector line*

The 'Voice alarm sounder beacon/Voice al. sound. beacon base' devices are supplied via the detector line. All C-NET devices have an integrated line separator.

**Additional documentation**

- You will find detailed information on functions, connection factors, and device compatibility in document 'List of compatibility'.

See chapter 'Applicable documents'.

### 6.1.3 Floor repeater terminal FT2010 and floor repeater display FT2011

The floor repeater terminal FT2010 and the floor repeater display FT2011 are for the decentralized indication and operation of the most important events throughout the entire system (system-wide visibility). Power supply is possible via the detector line or by an external electrically isolated power source.

#### Floor repeater terminal FT2010

![Figure 20: View of the floor repeater terminal FT2010](image)

The floor repeater terminal is an indication and operation unit in a fire detection installation with the following functions:
Indication of events
- ALARM (↑ pre-alarm)
- Fault
- Isolation
- ↑ Technical message

Operation
- Switch off alarm delay
- Switch off buzzer
- Acknowledge
- Reset events
- ↑ Switch off ↑ section or ↑ zone (pre-configured)
- Show lists
  - Pre-alarm
  - Isolation
  - Fault
- Start display test

The indication on the floor repeater terminal is synchronized with the ↑ station(s) of the configured visibility and displays the same event texts.

**Floor repeater display FT2011**

![Figure 21: View of the floor repeater display FT2011](image)

The floor repeater display is an indication and operation unit in a fire detection installation with the following functions:

Indication of events
- ALARM (pre-alarm)
- Fault
- Isolation
- Technical message

Operation
- Scrolling through lists
- Switch off buzzer

The indication on the floor repeater terminal is synchronized with the station(s) of the configured visibility and displays the same event texts.
6.1.3.1 Properties
- Connection to the C-NET detector line
- Power supply via the **↑** detector line
- External power supply 24 V DC (electrically isolated) or AC possible
- Operation functions:
  - Display
  - LED indicators, buttons
  - Buzzer
- Optional:
  - Key switch (Kaba) (only floor repeater terminal FT2010)
- Dimensions (W x H x D): 200 x 207 x 79 mm

6.1.3.2 Structure and function

![Diagram](image-url)

*Figure 22: Integration of the floor repeater terminal and/or floor repeater display into the fire detection installation*

1. Floor repeater terminal or floor repeater display
2. Optional external DC or AC supply

6.1.4 Mimic display driver FT2001-A1

The mimic display driver FT2001-A1 is a parallel LED indication for the system-wide signaling of events and is connected to the C-NET detector line. It has 48 LEDs that are installed on a ground plan panel.

![Diagram](image-url)

*Figure 23: Integration of the mimic display driver into the fire detection installation*

1. Mimic display driver
2. Optional external DC or AC supply
Guidelines

- External, electrically isolated power supply is possible with DC or AC.
- Mimic display drivers that are not fed by the detector line (external power supply) must be electrically isolated from the system voltage.
- Multiple externally supplied mimic display drivers, floor repeater terminals, and floor repeater displays which are connected to the same line card must each be operated via a separate electrically isolated supply.

**NOTICE**

**Influencing the earth fault monitoring**

- Electrical isolation for the system supply and other external supplies must be present for devices on the C-NET that are fed separately (with the exception of the transponder).

- When an external supply unit is used, it must be taken into account that should the external supply unit fail, the maximum current connection factor increases significantly (line failure is possible).
- When power supply is ensured via the detector line, the high maximum current connection factor (MK) must be taken into account.
- A maximum of 20 mimic display drivers can be connected per fire control panel.

6.1.5 **Input/output module FDCIO223**

The input/output module FDCIO223 is operated on the C-NET and has two inputs/outputs. The FDCIO223 may be configured either for the operation of collective detector lines or for controlling sounders.

Mixed operation is possible as of FDCIO223 ES ≥40.

The figure below shows the integration of the input/output module FDCIO223 in the fire detection system.

*Figure 24: Input/output module FDCIO223 in the fire detection system*

**Properties**

- Connection of two collective detector lines to the C-NET
- Connection of two monitored sounders
- With the safety barrier, it is also possible to connect intrinsically safe detectors (ex-zone 1)
Connectable detector generations
The following detector generations can be connected to the input/output module FDCIO223:

- Collective detector line configured as Siemens/Cerberus PRO:
  - MS6 detectors
  - MS7 detectors
  - MS9 detectors
  - AlgoRex collective DS11
  - SIGMACON (SIGMASYS GMT)
  - Special detectors
- Collective detector line configured as SynoLINE300:
  - Synova300
  - Third-party products in accordance with 'Industrial conventional'

If multiple protocol detectors are operated on a collective detector line, a short-circuit on the line is indicated as an 'open line' error.

It is not possible to operate Siemens/Cerberus PRO detectors and SynoLINE300 detectors simultaneously on the same detector line.

The input/output module FDCIO223 cannot be used for hierarchized evacuation control when it has ES <40. ¹

You will find detailed information on the input/output module FDCIO223 in document 009122. See chapter 'Applicable documents'.

¹ ES = product version
6.1.6 Functionality

6.1.6.1 Danger levels

↑ Automatic fire detectors recognize fire phenomena (e.g., smoke) and transmit this information to the control panel in the form of ↑ danger levels (0…3).

Manual call points can transmit only the danger levels 0 and 3 to the control panel.

6.1.6.2 Diagnosis levels

All C-NET devices have a comprehensive self-diagnosis. That means they are largely self-monitored or transmit a message to the control panel as soon as an incident or fault occurs. In self-diagnosis there are the following levels:

<table>
<thead>
<tr>
<th>Diagnosis level</th>
<th>Meaning</th>
<th>Possible cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>• Trouble-free</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• No impairment</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>• Observe information</td>
<td>Slightly soiled</td>
</tr>
<tr>
<td></td>
<td>• No impairment of the function</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• The device should be checked occasionally</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>• Replacement recommended</td>
<td>Due to soiling, the optical smoke detector gradually reaches the critical range (drift).</td>
</tr>
<tr>
<td></td>
<td>• Device should be checked during the next servicing</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>• Replacement necessary</td>
<td>Failure of one or both thermal sensors of a neural fire detector.</td>
</tr>
<tr>
<td></td>
<td>• The device should be exchanged immediately.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Detection is still possible.</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>• Fault</td>
<td>Failure of one or both thermal sensors in the heat detector.</td>
</tr>
<tr>
<td></td>
<td>• The device is no longer working.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Detection is no longer ensured.</td>
<td></td>
</tr>
</tbody>
</table>

Table 12: Diagnosis levels of the devices

The device is fully functional at diagnosis levels 0…2.
6.1.6.3 **Line separation function**

All C-NET devices have an integrated line separator. It has two functions:
- Short-circuit and open line monitoring
- Allows branching of a stub between two C-NET devices

**Short-circuit monitoring**

In the case of a short-circuit on the detector line, the line separator automatically isolates the faulty line section. This is to ensure that, in the case of a short-circuit, only the faulty line section fails, not the complete detector line.

**Open line**

If the detector line is a loop, no devices fail in the case of open line.

**Branching off from a stub**

- Only one stub is permitted between two C-NET devices.
- If there is more than one stub between two C-NET devices, a line separator must be fitted between the stubs.
- One stub is permitted at the start and end of the loop, between the connection terminals of the line card and the first line device.

*Figure 25: Use of line separators on a loop*
6.1.6.4 Connecting external alarm indicators

Some C-NET devices have an output where normally an external alarm indicator is connected. The output can, however, also be used for any other controls. The output for the external alarm indicator is controlled by the fire control panel and is freely configurable.

Depending on the configuration, the output is activated for the external alarm indicator if the following is true:

- The connected detector is in danger level 2 or 3 (together with the internal alarm indicator).
- The assigned zone has triggered an alarm or pre-alarm.
- The assigned control is active.

The following external alarm indicators are available:

- DJ119x/FDA19x – external alarm indicators that must be connected to the detector to be displayed.
- FDCAI221 – addressable alarm indicator that can be assigned to any cause using a control.

Figure 26: Examples of an external alarm indicator

1 External AI configured in parallel to the zone
2 External AI configured in parallel to the internal AI of the connected detector (e.g. false ceiling)
3 External AI configured in parallel to any other zone (via control)
6.1.7 **Line distribution and loop extension**

All FS720 fire control panels are designed for C-NET detector lines and have permanently integrated line cards. The integrated line cards are installed on the periphery board.

Each integrated line card supports a maximum of 252 addresses and has ports for two loops. As an option, the number of connectable loops can be doubled. To do so, the loop extension (C-NET) is equipped. The maximum number of addressable devices remains limited to 252. The loop extension has no electrical isolation between the two partial loops.

A maximum of 252 devices can be connected per loop.

The line card (FDnet/C-NET) FCL2001-A1 (can be fitted in the card cages of the FC723 and FC726) supports a maximum of 252 addresses and four loops or eight stubs.

The following figures show the line distribution of the line cards in the respective fire control panels.

**Periphery board with an integrated line card for FC722 and FC723**

![Figure 27: Line distribution on periphery board (2 loops)](image)

**Periphery board with two integrated line cards for FC724 and FC726**

![Figure 28: Line distribution on periphery board (4 loops)](image)
Line card (FDnet/C-NET) for card cage

![Line card (FDnet/C-NET) diagram](image)

Figure 29: Line distribution on line card (FDnet/C-NET)

<table>
<thead>
<tr>
<th>Station</th>
<th>Addresses (max.)</th>
<th>Line cards integrated</th>
<th>Qty. Loops integrated</th>
<th>Loop extensions</th>
<th>Card cage</th>
<th>Additional line card (FDnet/C-NET)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FC722</td>
<td>252</td>
<td>1</td>
<td>2 loops</td>
<td>+2 loops</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>FC723</td>
<td>756</td>
<td>1</td>
<td>2 loops</td>
<td>+2 loops</td>
<td>2 slots</td>
<td>Max. 8 loops</td>
</tr>
<tr>
<td>FC724</td>
<td>504</td>
<td>2</td>
<td>4 loops</td>
<td>+4 loops</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>FC726</td>
<td>1512</td>
<td>2</td>
<td>4 loops</td>
<td>+4 loops</td>
<td>5 slots</td>
<td>Max. 20 loops</td>
</tr>
</tbody>
</table>

Table 13: Overview of line distribution C-NET

Properties
- Each C-NET line card contains two line drivers, which each support two loops or four partial loops.
- One loop can be split into two loops with the loop extension (C-NET).
- The additional line cards (FDnet/C-NET) FCL2001-A1 have the loop extension permanently built-in by default.

Guidelines
- A maximum of 252 addresses can be operated per line card on one loop.
- The following restrictions apply if more than 126 devices are connected to a loop (a maximum of 252 may be connected):
  - Line separation is not supported
  - Restricted loop length (see outline quantities tool FX7210)
  - A total of 252 addresses are possible per line card
  - Line tester only supports a maximum of 126 addresses
- It is also possible to connect two stubs instead of a loop and mixed variants are possible.

According to EN 54, a maximum number of 32 detectors may fail in the event of a fault.
6.1.8 Line topology

In the C-NET, the following topologies are admissible.

<table>
<thead>
<tr>
<th>Topology</th>
</tr>
</thead>
<tbody>
<tr>
<td>↑ Loop</td>
</tr>
<tr>
<td>↑ Stub</td>
</tr>
<tr>
<td>Sub-stubs on loop</td>
</tr>
</tbody>
</table>

Table 14: Permissible topologies

No other topologies are admitted. The 'Sub-stub on sub-stub' topology in particular is not permitted.

<table>
<thead>
<tr>
<th>Topology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sub-stub on sub-stub with a loop</td>
</tr>
<tr>
<td>Sub-stub on stub</td>
</tr>
</tbody>
</table>

Table 15: Impermissible topologies

Technical specifications

- All C-NET devices have an integrated ↑ line separator.
- Only one stub may branch off between two adjacent devices.
- When there are several stubs next to one another, a line separator FDCL221 must be connected between each one.
Maximum number of stubs/sub-stubs on loop:

<table>
<thead>
<tr>
<th>Maximum number of stubs/sub-stubs on loop</th>
<th>Loop resistance $R_{cable} + R_{iso}$</th>
<th>Pure cable resistance $R_{cable}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>&lt;240 Ω</td>
<td>&lt;180 Ω</td>
</tr>
<tr>
<td>10</td>
<td>&lt;210 Ω</td>
<td>&lt;150 Ω</td>
</tr>
<tr>
<td>20</td>
<td>&lt;150 Ω</td>
<td>&lt;100 Ω</td>
</tr>
<tr>
<td>40</td>
<td>&lt;100 Ω</td>
<td>&lt;60 Ω</td>
</tr>
</tbody>
</table>

*Table 16: Number of sub-stubs depends on line resistance*

$R_{cable}$: Pure cable resistance of loop (measured on the loop terminal)

$R_{iso}$: Total of isolating resistors of line devices on loop (0.5 Ω per line device)

**Load limitation for stubs**

As well as the number of devices that can be connected to a stub, the maximum current connection factor is also limited. This ensures standard-compliant protection against creeping line interruptions as per EN54-13.

- The total of the maximum current connection factor [MK] of all devices on a stub must not exceed 64.

**Load limitation for sub-stubs**

As well as the number of devices and sub-stubs that can be connected in one loop, the maximum current connection factor of the devices in a sub-stub is also limited. This ensures standard-compliant protection against creeping line interruptions as per EN54-13.

- The total of the maximum current connection factor [MK] of all devices on a sub-stub must not exceed 32.
6.1.9 Degraded mode in the C-NET

When communication between the C-NET line card and the main processor of the fire control panel fails, the C-NET detector line is in degraded mode operation. The C-NET line card assumes the most important functions relating to detection and alarming in degraded mode. A fire alarm occurring during degraded mode is called a degraded fire alarm.

Detection is still ensured in degraded mode. However, this is only possible with collective lines. This means that in the case of a degraded fire alarm only the detector line can be identified, not the detector triggering alarm.

The following table shows the behavior of the individual C-NET devices in degraded mode and in the event of a degraded fire alarm.

<table>
<thead>
<tr>
<th>Device</th>
<th>Conditions</th>
<th>Behavior in degraded mode</th>
<th>Behavior in the event of a degraded fire alarm in the system</th>
</tr>
</thead>
</table>
| Output for an external alarm indicator | • Configured as control output  
 • ES ≥30                                              | Output changes into the configured failsafe position | Output remains in the configured failsafe position               |
| Input/output module FDCIO222 and FDCIO224 | • Output configured as control line  
 • ES ≥30                                              | Output changes into the configured failsafe position | Output remains in the configured failsafe position               |
|                              | • The output is configured in a way that it is activated upon degraded alarm  
 • ES ≥30                                              | Not Activated                                   | The output is activated if a degrade alarm has been triggered on that detector line |
| Input/output module FDCIO223 | • The output is configured in a way that it is activated upon degraded alarm  
 • ES ≥4                                                  | Not Activated                                   | The output is activated if a degrade alarm has been triggered on that detector line |
| Alarm sounders FDS221 and FDS229 | ES ≥30                                             | Not Activated                                   | The output is activated when a degraded alarm has been triggered on that detector line |
| Sounder base DBS720          | Sounder base and detectors have the product version ≥30. | Not Activated                                   | The buzzer of the sounder base is activated when a degraded alarm has been triggered on that detector line |

Table 17: Behavior in degraded mode and in the event of a degraded fire alarm
6.2 SynoLoop detector line

6.2.1 Devices that can be connected to the SynoLOOP line card

The line card (SynoLOOP) FCL7201-Z3 is a module bus card which can be used in the card cages of the FC723 and FC726 fire control panels. The purpose of the line card (SynoLOOP) is to migrate SynoLOOP and Synova line devices in the event of modernizations.

**Figure 30: Example overview of the line devices that can be connected to the line card (SynoLOOP) FCL7201-Z3**

1) Collective stub
2) Collective Ex detector line
3) SynoLINE 300C

**Topologies**

The following topologies are possible on the line card (SynoLOOP):

- 4 loops each with a maximum of 128 SynoLOOP line devices
- 4 stubs each with a maximum of 32 SynoLOOP line devices
- Mixed variants possible
- Number of devices that can be addressed: max. 512
- Max. loop length 2000 m
External supply for line devices
The line card (SynoLOOP) has no supply output for line devices. A separate power supply may need to be provided.

Supported detectors
The line card (SynoLOOP) supports the same recording peripheral equipment as the corresponding AlgoRex line plug-in modules E3M110, E3M111, K3M111:
- Optical smoke detectors: DO113x
- Multi-sensor smoke detectors: DOT1131
- Heat detectors: DT113x
- Flame detectors: DF119x
- Manual call points: DM113x, DMA1133
- Contact detectors: DC113x
- Input modules: DC1131
- Output modules: DC1134, DC1136
- Collective detectors above DC1192
- Collective Ex detectors above DC1192 and SB3
- SynoLINE300 above CB320A

Additional documentation
- You will find detailed information on the line card (SynoLOOP) in the A6V10210368 product data.
- You will find detailed information on device compatibility in the 'List of compatibility'.
- You will find information on the SynoLOOP line devices in the corresponding device documents.
- You will find information about key detector figures in the AlgoRex document Guidelines 001508.
- You will find information on modernization and migration in the documents A6V10323158 'Modernizing fire detection installations with multiple protocol detectors' and in the configuration A6V10210424 in the chapter 'AlgoRex/SIGMASYS data migration'.
- You will find information about configuration and commissioning in documents A6V10210416 and A6V10210424.

See the chapter 'Applicable documents'.
7 Networking of the stations

7.1 Networking types – overview

The stations in the fire detection system can be networked in the following way:

- SAFEDLINK (system bus) and/or C-WEB/SAFEDLINK
- SAFEDLINK, extended: Coupling of several SAFEDLINK sub-nets via C-WEB/LAN (optical Ethernet)
- Electric Ethernet (does not comply with EN 54)
- SAFEDLINK and Ethernet mixed and/or C-WEB/Ethernet (does not comply with EN 54)

The stations in the network can have the following connection types/functions:

- Standalone station
- SAFEDLINK station: Station in the SAFEDLINK network
- Router station: Station in the SAFEDLINK sub-net connected to the C-WEB/LAN
- Ethernet station: Station in the Ethernet sub-network to which no more stations are connected via SAFEDLINK
- GAP station: Station in the network for connecting to a management station via BACnet client or to Cerberus-Engineering-Tool
  - The GAP station can be configured with the DHCP server function.
  - The DHCP server automatically issues IP addresses to the clients from a defined IP address space. This enables a PC to receive local access, for example.
  - A route to an external IP router can be defined for the GAP station.

7.1.1 SAFEDLINK networking

![Diagram: Example: Networking via SAFEDLINK](image)

1. C-WEB/SAFEDLINK network
2. C-WEB/SAFEDLINK stations
3. Central remote transmission
7.1.2 Extended SAFEDLINK networking

Extended SAFEDLINK networking is the coupling of several SAFEDLINK sub-nets via C-WEB/LAN (optical Ethernet).

![Diagram of Extended SAFEDLINK network]

**Figure 32: Example: Extended SAFEDLINK network**

1. C-WEB/LAN
2. C-WEB/SAFEDLINK sub-nets
3. Terminal or Ethernet station
4. SAFEDLINK station with central remote transmission
5. Router station
6. GAP station
7.1.3 Ethernet networking

Networking via Ethernet is not in compliance with EN 54.

![Diagram of Ethernet networking]

Figure 33: Networking via Ethernet

1 Ethernet stations
2 Ethernet network
3 Ethernet hub or switch
7.1.4 SAFEDLINK and Ethernet networking

Networking via Ethernet is not in compliance with EN 54.

Figure 34: Example: Networking via SAFEDLINK and Ethernet

1 ↑ Stations in the C-WEB/SAFEDLINK sub-net
2 C-WEB/SAFEDLINK sub-net
3 Ethernet hub or switch
4 C-WEB/Ethernet sub-net (does not comply with EN 54)
5 C-WEB/Ethernet stations
7.2 License key

License keys are needed to enable stations for network functions. Stations which communicate with a management station with Cerberus-Remote and/or BACnet third-party product must have a license key installed.

A maximum of 2 management stations can be connected per SAFEDLINK network.

The following license keys are available:

<table>
<thead>
<tr>
<th>Function</th>
<th>License key from IP5</th>
<th>License key up to IP4</th>
</tr>
</thead>
<tbody>
<tr>
<td>BACnet for Siemens management station (2)</td>
<td>Possible without</td>
<td>L2</td>
</tr>
<tr>
<td>Cerberus-Remote</td>
<td>S1</td>
<td>L1</td>
</tr>
<tr>
<td>BACnet third-party product: supervision only</td>
<td>S1 (2)</td>
<td>--</td>
</tr>
<tr>
<td>BACnet third-party product: Monitoring and basic control</td>
<td>S2 (2)</td>
<td>--</td>
</tr>
<tr>
<td>BACnet third-party product: Monitoring and advanced control plus Cerberus Mobile</td>
<td>S3 (1 (2)</td>
<td>--</td>
</tr>
<tr>
<td>BACnet third-party product: Monitoring and advanced control plus specific activation functions</td>
<td>S4 (1 (2)</td>
<td>--</td>
</tr>
</tbody>
</table>

(1) Backward compatible with license key (L2)
(2) Not supported by FC 721

Each license key is backward compatible with the key below.

Each individual FS720 station which communicates via BACnet third-party products must be enabled with a license key.

Cerberus-Remote has the same visibility as the connected 'Station'. You can therefore gain global visibility with Cerberus-Remote in a networked 'site. To do so, the license key must be installed in a 'Station' with global visibility and connected to Cerberus-Remote.

7.3 Access components/function and access type

In addition to operation at the 'stations, the fire detection system can be accessed using the following components:

- Cerberus-Engineering-Tool, e.g., to initialize the station, update firmware, upload / download configuration
- Cerberus-Remote
- Management station via BACnet / Ethernet

The stations can be accessed as follows:

- Local access to 'standalone station or 'SAFEDLINK station via the station's Ethernet interface
- Internal access via 'GAP station
- Internal access via address: Direct access via the IP address to a station
- External access via GAP or address (remote access)

Select the access type in the 'Connect' window with Cerberus-Engineering-Tool. The management station receives access via the configured network addresses.
Overview of access component/function and access type

<table>
<thead>
<tr>
<th>Access component/function</th>
<th>Internal access type</th>
<th>Remote access (external access) ¹</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Local</td>
<td>GAP</td>
</tr>
<tr>
<td>Cerberus-Engineering-Tool and Cerberus-Remote</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Management station (BACnet/Ethernet)</td>
<td>-</td>
<td>X</td>
</tr>
<tr>
<td>Initializing the station</td>
<td>X</td>
<td>-</td>
</tr>
<tr>
<td>Updating the firmware</td>
<td>X</td>
<td>-</td>
</tr>
<tr>
<td>Uploading / downloading the configuration via the PC with Cerberus-Engineering-Tool</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

¹ Remote access only via firewall
² Direct address access is possible and should only be used for special applications.

7.3.1 Access to the standalone station

![Figure 35: Example of standalone station](image)

Local access

<table>
<thead>
<tr>
<th>Item no.</th>
<th>Designation/function</th>
<th>Address Ethernet connection</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Standalone station</td>
<td>192.168.200.1</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>Ethernet connection</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>Uploading, downloading, Initializing the † station, Updating the firmware, Cerberus-Remote</td>
<td>192.168.200.5</td>
<td>Ethernet client is configured to automatically reference an IP address</td>
</tr>
</tbody>
</table>

Table 18: Local access
Access via GAP

The standalone station must be configured as GAP for this access type. A management station can only receive local access via a GAP station.

<table>
<thead>
<tr>
<th>Item no.</th>
<th>Designation/function</th>
<th>Address Ethernet connection</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>GAP station (standalone)</td>
<td>192.168.201.1</td>
<td>Configured as GAP with DHCP server function</td>
</tr>
<tr>
<td>2</td>
<td>Ethernet connection</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>• Uploading, downloading</td>
<td>192.168.201.5</td>
<td>Ethernet client is configured to automatically reference an IP address</td>
</tr>
<tr>
<td></td>
<td>• Cerberus-Remote</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Management station</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Table 19: Access via GAP*

Access via address

<table>
<thead>
<tr>
<th>Item no.</th>
<th>Designation/function</th>
<th>Address Ethernet connection</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>GAP station (standalone) and router</td>
<td>192.168.100.1</td>
<td>Configured as GAP without DHCP server function (sample address)</td>
</tr>
<tr>
<td>2</td>
<td>Ethernet connection</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>• Uploading, downloading</td>
<td>192.168.100.100</td>
<td>Sample address, manually configured (in the same address range as IP address for GAP station)</td>
</tr>
<tr>
<td></td>
<td>• Cerberus-Remote</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Management station</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Table 20: Access via address*
7.3.2 Access to the SAFEDLINK station

Figure 36: Example of SAFEDLINK stations

If a ↑ SAFEDLINK Station is configured as ↑ ‘GAP’ or ‘Secondary GAP’, it must also be configured as a router or a standby router; otherwise, local or general access via the Ethernet port will not be possible.

Local access

<table>
<thead>
<tr>
<th>Item no.</th>
<th>Designation/function</th>
<th>Ethernet address</th>
<th>SAFEDLINK address</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ethernet interface on SAFEDLINK station</td>
<td>192.168.200.1</td>
<td>-</td>
<td>IP address of Ethernet interface. A DHCP server runs on the Ethernet interface of each SAFEDLINK station to assign the address 192.168.200.5 to the connected PC</td>
</tr>
<tr>
<td>2</td>
<td>SAFEDLINK stations</td>
<td>-</td>
<td>192.168.1.x</td>
<td>IP address range for SAFEDLINK network</td>
</tr>
<tr>
<td>3</td>
<td>SAFEDLINK network</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>4</td>
<td>Ethernet connection</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
| 5        | • Uploading, downloading  
          • Initializing the station  
          • Updating the firmware  
          • Cerberus-Remote | 192.168.200.5 | - | Ethernet client is configured to automatically reference an IP address (see item 1) |

Table 21: Local access
### Access via GAP station

<table>
<thead>
<tr>
<th>Item no.</th>
<th>Designation/function</th>
<th>Ethernet address</th>
<th>↑ SAFEDLINK address</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>↑ GAP station</td>
<td>192.168.201.1</td>
<td>-</td>
<td>Configured as GAP with DHCP server function.</td>
</tr>
<tr>
<td></td>
<td>↑ Router station</td>
<td>192.168.100.3</td>
<td>-</td>
<td>Configured as router station (192.168.100.3 is an example of an Ethernet address)</td>
</tr>
<tr>
<td>2</td>
<td>↑ SAFEDLINK stations</td>
<td>-</td>
<td>192.168.1.x</td>
<td>Standard address range for SAFEDLINK stations is 192.168.1.x (can be changed)</td>
</tr>
<tr>
<td>3</td>
<td>SAFEDLINK network</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>4</td>
<td>Ethernet connection</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>5</td>
<td>• Uploading, downloading</td>
<td>192.168.201.5</td>
<td>-</td>
<td>Ethernet client is configured to automatically reference an IP address (see item 1)</td>
</tr>
<tr>
<td></td>
<td>• Cerberus-Remote</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• ↑ Management station</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Table 22: Access via GAP station*

### Access via address

<table>
<thead>
<tr>
<th>Item no.</th>
<th>Designation/function</th>
<th>Ethernet address</th>
<th>↑ SAFEDLINK address</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>GAP station</td>
<td>-</td>
<td>-</td>
<td>Configured as GAP without DHCP server function</td>
</tr>
<tr>
<td></td>
<td>Router station</td>
<td>192.168.100.3</td>
<td>-</td>
<td>Configured as router station (192.168.100.3 is an example of an Ethernet address)</td>
</tr>
<tr>
<td>2</td>
<td>SAFEDLINK stations</td>
<td>-</td>
<td>192.168.1.x</td>
<td>Standard address range for SAFEDLINK stations is 192.168.1.x (can be changed)</td>
</tr>
<tr>
<td>3</td>
<td>SAFEDLINK network</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>4</td>
<td>Ethernet connection</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>5</td>
<td>• Uploading, downloading</td>
<td>192.168.100.100</td>
<td>-</td>
<td>IP address manually configured in the same address range as IP address for GAP station</td>
</tr>
<tr>
<td></td>
<td>• Cerberus-Remote</td>
<td></td>
<td></td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>• ↑ Management station</td>
<td></td>
<td></td>
<td>-</td>
</tr>
</tbody>
</table>

*Table 23: Access via address*
7.3.3 Local access to extended network

<table>
<thead>
<tr>
<th>Item no.</th>
<th>Designation/function</th>
<th>Ethernet address</th>
<th>↑ SAFEDLINK address</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ethernet interface to ↑ SAFEDLINK station</td>
<td>192.168.200.1</td>
<td>-</td>
<td>IP address of Ethernet interface. A DHCP server runs on the Ethernet interface of each SAFEDLINK station to assign the address 192.168.200.5 to the connected PC</td>
</tr>
<tr>
<td>2</td>
<td>SAFEDLINK stations</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>↑ Router stations</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>4</td>
<td>↑ Standby router stations</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>5</td>
<td>↑ Ethernet station (standby station or terminal)</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>6</td>
<td>SAFEDLINK sub-net 1</td>
<td>-</td>
<td>192.168.1.x</td>
<td>IP address range for sub-net 1 (pre-setting, can be changed)</td>
</tr>
<tr>
<td>7</td>
<td>C-WEB/LAN</td>
<td>192.168.100.x</td>
<td>-</td>
<td>IP address range for Ethernet sub-net (pre-setting, can be changed)</td>
</tr>
</tbody>
</table>

Figure 37: Example: Extended network, local access
<table>
<thead>
<tr>
<th>Item no.</th>
<th>Designation/function</th>
<th>Ethernet address</th>
<th>↑ SAFEDLINK address</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>SAFEDLINK sub-net 2</td>
<td>-</td>
<td>192.168.2.x</td>
<td>IP address range for sub-net 2 (presetting, can be changed)</td>
</tr>
<tr>
<td>9</td>
<td>Ethernet switch (modular) FN2012</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>10</td>
<td>Ethernet connection</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
| 11      | • Uploading, downloading  
• Initializing the ↑ station  
• Updating the firmware  
• Cerberus-Remote | 192.168.200.5 | -       | Ethernet client is configured to automatically reference an IP address (see item 1) |

Table 24: Local access to extended network
7.3.4 Internal access to extended network via GAP

The PC is connected to any point in the C-WEB/LAN. All stations can then be reached via the GAP. The GAP must be in the C-WEB/LAN.

![Diagram](image)

**Figure 38: Example: Internal access to extended network via GAP**

<table>
<thead>
<tr>
<th>Item no.</th>
<th>Designation/function</th>
<th>Address Ethernet</th>
<th>Address ↑ SAFEDLINK</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>GAP station</td>
<td>192.168.201.1</td>
<td>-</td>
<td>Configured as GAP with DHCP server function</td>
</tr>
<tr>
<td>2</td>
<td>↑ SAFEDLINK stations</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>↑ Router stations</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>4</td>
<td>↑ Standby router stations</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>5</td>
<td>↑ Ethernet station (standby station or terminal)</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>6</td>
<td>SAFEDLINK sub-net 1</td>
<td>-</td>
<td>192.168.1.x</td>
<td>IP address range for SAFEDLINK sub-net 1 (pre-setting, can be changed)</td>
</tr>
<tr>
<td>7</td>
<td>C-WEB/LAN</td>
<td>192.168.100.x</td>
<td>-</td>
<td>IP address range for Ethernet sub-net (pre-setting, can be changed)</td>
</tr>
</tbody>
</table>
7.4 Redundancy and degraded mode

For networking via the C-WEB/SAFEDLINK, each station must be equipped with a network module (SAFEDLINK).

Redundant networking

The C-WEB/SAFEDLINK system bus wiring is loop-shaped. The stations can continue to communicate even when the bus has been interrupted at one point or a short-circuit has occurred.

Degraded mode in the SAFEDLINK system

If the CPU of a station fails, the station can still trigger a collective alarm.

If the network module fails, the affected station and all of the connected peripheral devices (e.g. detector, alarm horns and remote transmission device) are disconnected from the network. When a second network module (degraded mode module) is used, degraded mode is ensured in the system. When the main module fails, the degraded mode module assumes the most important functions.

Only the following signals are transmitted in degraded mode:
- Degraded fire alarm
- Switching-off of the acoustic alarming equipment

7.4.1 Guidelines for a station's redundant SAFEDLINK connection

A station is incorporated redundantly into the SAFEDLINK network if two network modules (SAFEDLINK) are used. The stations’ redundant SAFEDLINK connection complies with EN 54 and is specified for the following applications:

- Fire control panels with more than 512 fire detectors (irrespective of the remote transmission connection) must be equipped with two network modules (SAFEDLINK) (EN 54).
- Fire control panels with superordinate functions (remote transmissions, alarming devices, master operation) must be equipped with two network modules (SAFEDLINK) (various country-specific ‘Codes of Practice’).
- Fire control panels monitoring surfaces larger than 12,000 m² must be equipped with two network modules (SAFEDLINK) (VDE 0833-2).
### Overview of requirements for a station's redundant SAFEDLINK connection

<table>
<thead>
<tr>
<th>Number of detectors in the fire control panel</th>
<th>Number of detectors in the system</th>
<th>Monitored surface</th>
<th>Superordinate function</th>
<th>Redundant SAFEDLINK connection</th>
<th>Redundant display (only [DE])</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤512</td>
<td>Not networked</td>
<td>yes / no</td>
<td>no</td>
<td>no</td>
<td>no</td>
</tr>
<tr>
<td>&gt;512</td>
<td>Not networked</td>
<td>yes / no</td>
<td>no</td>
<td>no</td>
<td>no</td>
</tr>
<tr>
<td>≤512</td>
<td>≤512</td>
<td>no</td>
<td>no</td>
<td>no</td>
<td>no</td>
</tr>
<tr>
<td>≤512</td>
<td>≤512</td>
<td>Yes</td>
<td>Yes</td>
<td>no</td>
<td>no</td>
</tr>
<tr>
<td>≤512</td>
<td>&gt;512</td>
<td>no</td>
<td>no</td>
<td>no</td>
<td>no</td>
</tr>
<tr>
<td>&gt;512</td>
<td>&gt;512</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>no</td>
</tr>
<tr>
<td>&gt;512</td>
<td>&gt;512</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>no</td>
</tr>
<tr>
<td>≤512</td>
<td>≤512</td>
<td>&gt;12000 m²</td>
<td>no</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

1 Remote transmission (RT), alarming devices, master operation
2 The redundant display can be realized using a fire terminal or a fire control panel. A redundant SAFEDLINK connection is not required in the redundant display.

---

**Figure 39: Example: Redundant networking and degraded mode**
1 System bus C-WEB/SAFEDLINK
2 Station with one network module (SAFEDLINK)
3 Redundantly connected station with two network modules (SAFEDLINK)
4 Fire terminal FT724
5 Fire control panel with central remote transmission device
6 Fire control panel with >512 detectors
7 Fire control panel with ≤512 detectors

7.4.2 Degraded mode with extended networking
In addition to the guidelines for SAFEDLINK networking, the following must be noted for the degraded mode characteristics of extended networking:

If a 'Station' is in 'Degraded mode' and has a 'Degraded FIRE ALARM', all 'Stations' on the same sub-net generate a 'Degraded FIRE ALARM'. The 'Stations' in other sub-nets which are networked via 'C-WEB/LAN' do not generate a 'Degraded FIRE ALARM'.

'RT' and 'External sounder'
- Because the 'RT' has the global 'Visibility', the 'RT' is always activated by a 'Degraded FIRE ALARM'.
- An 'External sounder' has the 'Station' 'Visibility' as standard and is therefore not activated by a 'Degraded FIRE ALARM' from another sub-net.

You can change the behavior of the 'External sounder' element by extending the 'Visibility' of the 'External sounder' element to include all 'Stations' on the other sub-nets or by configuring the global 'Visibility'.
- An alarm signal can only be switched off within a SAFEDLINK sub-net in 'Degraded mode'. If, for example, a station is in sub-net 1, in 'Degraded mode' and has an alarm, all the horns in sub-net 2 are also switched on. The horns that are switched on in sub-net 2 can however no longer be deactivated by the station in 'Degraded mode' (in sub-net 1).
- If horns are connected to the station in 'Degraded mode' in sub-net 1, they can only be deactivated by a station in sub-net 1.

7.5 SAFEDLINK networking
The stations are networked in compliance with EN 54 via the system bus C-WEB/SAFEDLINK. Data exchange is possible between all stations connected to the SAFEDLINK system bus. This makes system-wide operation, control and alarming possible.
Features of networking via SAFEDLINK

- Wiring using wire pairs
- Redundant transmission paths thanks to loop-shaped wiring
- Increased security thanks to degraded mode capability
- No additional degraded mode cabling required, even with more than 512 detectors in the system

![Diagram of networking via the SAFEDLINK system bus](image)

**Figure 40: Networking via the SAFEDLINK system bus**

1. System bus C-WEB/SAFEDLINK
2. Fire control panels, e.g., FC724, FC726
3. Fire control panel FC722
4. Fire terminal FT724

Depending on the prevailing conditions, the transmission speed of the system may have to be changed from 'Standard' to 'Low' in the configuration settings of Cerberus-Engineering-Tool, e.g., if cables of inferior quality are used.

**Characteristics**

- Stations that can be networked via C-WEB/SAFEDLINK, without BACnet configuration (e.g., management station) Max. 32

- Stations that can be networked via C-WEB/SAFEDLINK, with BACnet configuration (e.g., management station) Max. 16

- Distance between the stations Max. 1000 m

- Data rate 'Standard' Max. 315 kbit/s

- 'Low' data rate Max. 115 kbit/s
7.5.1 Fiber optic cable network module (SM/MM) FN2006/FN2007

The two fiber optic cable network modules enable an optical C-WEB/SAFEDLINK network over several kilometers that is in conformance with EN 54. The fiber optic cable network modules have two separate channels and thus also enable the redundant linkage of one SAFEDLINK station in accordance with EN 54. They can be installed in a station or remotely.

The following fiber optic cable network modules are available:

- Fiber optic cable network module (SM) FN2006-A1 with single-mode transmission
- Fiber optic cable network module (MM) FN2007-A1 with multi-mode transmission

![Figure 41: SAFEDLINK networking via fiber optic cable with fiber optic cable network module](image)

1 Optical C-WEB/SAFEDLINK system bus
2 SAFEDLINK station
3 Fiber optic cable network module (SM/MM) installed in the station
4 Remote SAFEDLINK station
5 Electrical C-WEB/SAFEDLINK connection
6 External fiber optic cable network module (SM/MM)
Networking of the stations
SAFEDLINK networking

Characteristics

Length of the fiber optic cable (module/module):
- With fiber optic cable network module (SM) FN2006-A1 Max. 40,000 m
- With fiber optic cable network module (MM) FN2007-A1 Max. 4000 m

Length of the electrical C-WEB line from all fiber network modules to the stations Total max. 1000 m at 315 kbit/s

Optical connection at the fiber optic cable network module Type SC

7.5.2 Repeater (SAFEDLINK) FN2002-A1

If the C-WEB/SAFEDLINK networking is to cover a distance >1000 m, a repeater (↑ SAFEDLINK) FN2002-A1 must be used to boost the signal.

The repeater is an intermediate amplifier and is not recognized as a ↑ station in the C-WEB/SAFEDLINK. It requires external power supply, possibly from one of the stations.

Figure 42: Line extension with repeater (SAFEDLINK) FN2002-A1

1 ↑ System bus C-WEB/SAFEDLINK
2 Station in the C-WEB/SAFEDLINK network
3 Supply from station
4 Repeater (SAFEDLINK) FN2002-A1
5 Extended system bus C-WEB/SAFEDLINK
Networking of the stations
SAFEDLINK networking

Characteristics

Distance between repeater and stations \( \text{Max. 1000 m} \)
Number of repeaters between two stations \( \text{Max. 1} \)
Number of repeaters per SAFEDLINK network \( \text{Max. 32} \)
Data rate 'Standard' \( \text{Max. 315 \, kbit/s} * \)
Data rate 'Low' \( \text{Max. 115 \, kbit/s} \)

* For uninterrupted transmission on the data line at 315 kBit/s, twisted and shielded cables must be used.

The repeater (SAFEDLINK) FN2002-A1 is an external component and cannot be seen in 'Cerberus-Engineering-Tool'. Document use in the site documentation.

7.5.3 Interface module DL485/13-xx-ST-SBT

If the C-WEB/SAFEDLINK networking is to be managed over large distances, the system bus can be extended with the interface module DL485/13-xx-ST-SBT and fiber optic cables.

You will find detailed information about using fiber optic cables and the interface module DL485/13-xx-ST-SBT in document A6V10210368. See chapter 'Applicable documents'.

Figure 43: SAFEDLINK system bus extension with interface module DL485/13-xx-ST-SBT via fiber optic cables

1 System bus C-WEB/SAFEDLINK
2 Stations in the C-WEB/SAFEDLINK network
3 Interface module DL485/13-xx-ST-SBT
4 Fiber-optic cables for extending the C-WEB/SAFEDLINK system bus
### Characteristics

Length of the fibre optic cable:
- **Multi-mode**: Max. 2000 m
- **Single mode**: Max. 15000 m

Connection length to station: Max. 100 m

Required converter between two stations: 2

Optical connection: ST

Number of fibers between two interface modules: 2

Data rate 'Standard': Max. 315 kbit/s

'Data rate 'Low': Max. 115 kbit/s

---

#### 7.6 Networking via Ethernet

Stations can be networked via Ethernet. In this case, the connection is established with a commercially available Fast Ethernet cable (CAT5 or CAT6).

**Restrictions on the Ethernet:**
- The networking is not in compliance with EN 54 (no degraded mode possible)
- No redundant networking possibilities
- A maximum of 32 stations can be networked with
  - Additional stations can be networked via C-WEB/SAFEDLINK

**Ethernet networking of two stations**

![Diagram](image)

*Figure 44: Ethernet connection between two stations*

1. Fire control panel FC72x
2. Ethernet connection
3. Fire terminal FT724

If only two stations are to be networked, the connection is established directly with one crossed Fast Ethernet cable.
**Ethernet networking of several stations**

If more than two stations are to be networked via Ethernet, they must be connected to each other via a hub or a switch.

A router must not be used for Ethernet networking, i.e. all stations must be in the same IP sub-network.

![Diagram](image)

*Figure 45: Ethernet networking with several stations via Ethernet hub or switch*

1. Ethernet stations
2. Ethernet network (does not comply with EN 54)
3. Ethernet hub or switch

**Characteristics**

- Stations that can be networked with Ethernet network alone: Max. 32
- Cable type: Fast Ethernet CAT5/CAT6
- Data rate: 100/10 Mbit/s
- Max. length of individual Ethernet connections: 100 m
### 7.7 Networking via SAFEDLINK and Ethernet

You will find details on the technical terms ‘C-WEB’, ‘C-WEB/SAFEDLINK’ and ‘C-WEB/Ethernet’ in the ‘Glossary’ chapter.

In addition to networking via the system bus C-WEB/SAFEDLINK, additional stations can be networked via a station’s Ethernet interface (C-WEB/Ethernet). This networking type does not comply with EN 54.

![Figure 46: Combined networking via the system bus SAFEDLINK and Ethernet](image)

1. Stations on the C-WEB/Ethernet sub-net
2. C-WEB/Ethernet sub-net
3. Switch or hub
4. Router station on the C-WEB/SAFEDLINK sub-net
5. C-WEB/SAFEDLINK sub-net

The connection station from the C-WEB/SAFEDLINK sub-net to the C-WEB/Ethernet sub-net is a router station. This station has the function of a router and addresses the stations on the C-WEB/Ethernet sub-net.

### Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>C-WEB/Ethernet sub-nets on the C-WEB/SAFEDLINK network</td>
<td>Max. 1</td>
</tr>
<tr>
<td>Networkable stations via C-WEB/Ethernet</td>
<td>Max. 14 (incl. router station)</td>
</tr>
<tr>
<td>Stations that can be networked in both sub-networks</td>
<td>Max. 32</td>
</tr>
</tbody>
</table>
7.8 Extended networking

Extended networking is the merging of several SAFEDLINK sub-nets via C-WEB/LAN, which is managed as optical Ethernet in loop topology via the Ethernet switch (modular) FN2012. The sub-nets communicate via the router stations.

**Malfunctions during a partial upgrade**

Ethernet switch (modular) FN2012 is not compatible with Ethernet switch (MM) FN2008 and so may only be used in panels ≥MP6.

A router station has an integrated Ethernet switch (modular) and is configured as a router station with 'Cerberus-Engineering-Tool'.

In extended networking, no additional Ethernet sub-net may be connected in a SAFEDLINK sub-net.

**Properties**

- Structure of large and efficient networks
- Merging of several SAFEDLINK sub-networks
- High data rate and not sensitive to electric interference (fiber optic cables)
- Redundant network topology (loop-shaped networking)
- Redundant networking of sub-nets possible (complies with EN 54)

7.8.1 Redundant networking

A sub-net is networked redundantly by connecting the sub-net to the C-WEB/LAN via two router stations. This networking type is specified according to EN 54 in the following cases:

- A total of more than 512 C-NET devices in the sub-net
- Central remote transmission in the sub-network
- The monitored surface in the sub-net is greater than 12,000 m²

Degraded mode is guaranteed because the router stations monitor one another. If the router station fails, the standby router station automatically takes over the function of the router station.
Figure 47: Extended, redundant networking of SAFEDLINK sub-networks

1. C-WEB/LAN
2. C-WEB/SAFEDLINK sub-net with ≤512 C-NET line devices (not networked redundantly)
3. C-WEB/SAFEDLINK sub-net with >512 C-NET line devices or with a monitored surface of >12,000 m² (networked redundantly)
4. C-WEB/SAFEDLINK sub-net with external alarming or >512 C-NET line devices
5. Ethernet switch (modular) FN2012
6. ↑ Router station
7. ↑ Standby router station
8. ↑ Ethernet station (terminal or individual station) connected to the Ethernet switch (modular) on the C-WEB/LAN
9. Cerberus-Engineering-Tool or Cerberus-Remote connected via the Ethernet switch (modular) (high performance)
10. Cerberus-Remote or Cerberus-Engineering-Tool connected via a ↑ station's Ethernet connection (performance lower)
Characteristics

To ensure EN-54-compliant networking, you may only use the permitted Ethernet switches, i.e., Ethernet switch (MM) FN2008 or Ethernet switch (modular) FN2012.

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stations that can be networked via all sub-nets</td>
<td>Max. 64</td>
</tr>
<tr>
<td>Number of C-WEB/SAFEFLINK sub-nets that can be networked</td>
<td>Max. 14</td>
</tr>
<tr>
<td>Number of stations per ↑ SAFEFLINK sub-net</td>
<td>Max. 16</td>
</tr>
<tr>
<td>Number of Ethernet stations/router stations in the C-WEB/LAN</td>
<td>Max. 32</td>
</tr>
<tr>
<td>Distance between the nodes in the C-WEB/LAN</td>
<td>Max. 3000 m</td>
</tr>
<tr>
<td>Data rate in the C-WEB/LAN</td>
<td>100 Mbit/s</td>
</tr>
</tbody>
</table>

7.8.2 Restrictions on extended networking

The following restrictions apply when using stations in extended networking:
- The fire control panels FC726 can be used as routers or standby routers as long as the outline quantities or system limits of a FC724 are not exceeded.
- All stations throughout the entire extended network must be equipped with the PMI & mainboard FCM2027.
- Compact stations with the PMI & mainboard FCM2004 must not be used in the extended network.

7.9 Remote access

Connection to or access from external networks must be configured via a firewall for security reasons. Individual ↑ stations or the entire network can be protected against the following events with a firewall:
- Access and attacks which impair the functionality of the FS720 system
- Unauthorized access
- Spying on data
- Data manipulation

⚠️ WARNING

System manipulation due to unauthorized access

No alarm in the event of fire.
- Use a firewall to protect a networked fire detection system in accordance with the following specifications.
**Specifications for firewall**
For sites on which the fire detection system is connected to a customer network, access to the fire detection system must be protected with an up-to-date and professional firewall that has been configured correctly. The following requirements must be met:

- State-of-the-art hardware firewall
- Support for remote maintenance with up-to-date IT standards
- Continuous device updates and patches during the service life of the product
- Updates and patches must be installed as soon as possible and no later than within two months of a security gap being announced

Optional: VLAN, VPN, routing

**Recommendation for firewall**
- Provision of firewall by customer IT
- Configuration and maintenance in accordance with installer of firewall

---

**Figure 48: Remote access from external network**

1. Internal C-WEB/SAFEDLINK sub-net
2. Router station in the C-WEB/SAFEDLINK sub-net
3. Firewall
4. External network
5. External management station
8 Function

This chapter describes the function, topology, networking, alarm verification concept, and intervention concept of the fire control panel.

8.1 Overview

### Acquisition
- Automatic fire detector
- Sounder
- Manual call point
- Switching
- Remote transmission

### Evaluation
- Global alarming (e.g., fire brigade)
- Local alarming (e.g., horns)
- Fire control (e.g., doors)
- Service intervention

### Alarming and control

**Figure 49: Graphic representation of a fire detection system**

**Acquisition**

Fire detectors detect fire phenomena, e.g., smoke, heat or carbon monoxide, and transmit signals to the control panel in the form of different danger levels.
**Evaluation of the danger levels**

The control panel evaluates the danger levels and decides whether to trigger alarms or not. In doing so, the control panel distinguishes between automatic and manual fire alarms, † 'Pre-ALARM' and 'Degraded FIRE ALARM'.

Alarm events are allocated to the following event categories:

<table>
<thead>
<tr>
<th>Event category for alarm events</th>
<th>Typical example</th>
<th>Activation/cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>'Pre-ALARM'</td>
<td>The detector detects a fire phenomenon with a low danger level</td>
<td>Detector sensor</td>
</tr>
<tr>
<td>'ALARM'</td>
<td>The detector detects a fire phenomenon with a high danger level</td>
<td>Detector sensor</td>
</tr>
</tbody>
</table>

*Table 26: Event categories for alarm events*

**Evaluation of the system events**

The fire control panel has comprehensive monitoring and self-monitoring functions. Deviations from the normal operation mode are recognized as a system event.

System events are allocated to the following event categories:

<table>
<thead>
<tr>
<th>Event category for system events</th>
<th>Typical example</th>
<th>Activation/cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>'Fault'</td>
<td>● Faulty ↑ detector line&lt;br&gt;● Mains failure detector</td>
<td>Short-circuit, open line or malfunction</td>
</tr>
<tr>
<td>'Isolation'</td>
<td>A detector zone has been switched off</td>
<td>Operation or control</td>
</tr>
<tr>
<td>'Test'</td>
<td>A detector zone is switched to Test</td>
<td>Operation</td>
</tr>
<tr>
<td>↑ 'Technical message'</td>
<td>Fault or danger from extraneous equipment</td>
<td>Sensor or contact</td>
</tr>
<tr>
<td>'Activation'</td>
<td>A control is activated</td>
<td>Operation or control</td>
</tr>
<tr>
<td>'Information'</td>
<td>● Access level&lt;br&gt;● 'Manned operation' operation mode</td>
<td>State</td>
</tr>
</tbody>
</table>

*Table 27: Event categories for system events*

**Alarming**

The different fire alarms and system events are verified independently from one another. Depending on the configuration, † local alarming or direct or delayed † global alarming is actuated.

- **Local alarming:**
  - Local ↑ alarming equipment (e.g., acoustic or optical alarm devices) is actuated in order to call up immediately available intervention personnel (e.g., in-house staff) and to alert people of a possible fire hazard.
- **Global alarming:**
  - Global alarming equipment (e.g. remote transmission) is actuated and external intervention forces (e.g. the fire brigade) are alerted.

The following points influence the type of alarming:

- **Configuration of the alarming process**
- **Position of 'Manned operation'/'Unmanned operation' operation mode**
  - 'Manned operation': Personnel present on site
  - 'Unmanned operation': No personnel present on site
- **Type of alarm activation (automatic or manual)**
Control
In the event of fire it makes sense to initiate first, decisive actions automatically. Automatic measures are carried out by controls, e.g., by the control of building services, evacuation or extinguishing.

8.2 Topology
The configuration of an 'FS720' fire detection installation is created in the following structure trees:
- 'Hardware tree'
- 'Detection tree'
- 'Control tree'
- 'Operation tree'
- 'Network tree'
The structure is created by installing in the building and configuring the fire detection installation. The elements of the individual structure trees are assigned to one another via channels.
Thanks to a hierarchical topology and arrangement into zones, events can be assigned geographically and shown accordingly. This enables commands to be given to consolidated parts of the site, for example.
8.2.1 Hardware tree

The 'Hardware tree' represents the installed hardware. The individual elements of the 'Hardware tree' are structured as follows:

- 'Station'
- 'Module'
- 'Line'
- 'Device'
- 'Physical channel'

'Hardware tree' example

```
+---+   +---+   +---+   +---+
| 1 |   | 2 |   | 3 |   |
|   |   |   |   |   |
| 'Station' | 'Module' | 'Device' |
| Dotted line | 'Line' |
```
8.2.2 Detection tree

The 'Detection tree' is an image of the geographic and functional conditions in a 'Site'. It is adapted to the building structure and room use. The 'Detection tree' is independent from the line arrangement of the detector network.

'Detection tree' elements and typical representation

- 'Area'
  - Building
- 'Section'
  - Floor or staircase
- 'Zone'
  - Room
- 'Channel'
  - Logical detector function

'Detection tree' example

1 'Area'
2 'Section'
3 'Zone'
4 'Channel' / 'Detector'
8.2.2.1 Elements of the detection tree

'Aera'
- 'Area' typically corresponds to a building.
- 'Area' combines 'Sections' which are subject to the same 'Manned operation'/Unmanned operation' operation mode.
- 'Area' actuates the alarming equipment (acoustic and optical alarm devices as well as remote transmission).
- 'Area' is assigned the following functions:
  - Switching assigned 'Sections' on/off

'Sections' are possible per control panel:
- FC722, FC723, FC724: up to four 'Areas'
- FC726 up to eight 'Areas'

There is an 'Area' that groups together the functions of alarm verification (AVC), e.g. collective alarms and degraded mode operation.

'Section'
- 'Section' combines 'Zones' to form logical units. Such a unit can be e.g. a floor or a staircase.
- 'Section' is assigned the following function:
  - Switching assigned 'Zones' on/off

'Zone'
- 'Zone' generally combines the detectors in a room.
- 'Zone' evaluates the danger levels transmitted by the detectors. The configured combination of different danger levels defines the conditions upon which an 'ALARM' is triggered.
- The following fire alarm zone types exist:
  - 'Automatic zone'
  - 'Manual zone'
  - 'Technical zone'
  - 'FSE zone'
  - 'Flow switch zone' (sprinkler)
  - 'Sub-system zone'
- The following extinguishing zone types exist:
  - 'Sprinkler zone'
  - 'XC10 zone'

'Channel'
The 'Channel' in 'Detection tree' represents the functionality of the inputs and outputs of an C-NET device.
8.2.2.2 Operation modes of the detection tree elements

'Area'

- **'Manned operation'**
  In 'Manned operation' operation mode, operating personnel are present and can investigate the fire location. The detectors are set to normal sensitivity, in accordance with the selected parameter set.

- **'Unmanned operation'**
  In the 'Unmanned operation' operation mode, there are no operating personnel present to investigate the fire location. The sensitivity level of the detectors or their parameter sets are typically increased by switching to 'Unmanned operation' operation mode.

The settings for the 'Manned operation'/Unmanned operation' operation modes are defined in the chapter Alarm Verification Concept (AVC).

'Zone'

- **Switched on (normal operation)**
  Danger levels are evaluated and 'ALARMS' produced in normal operation. The detectors have a normal sensitivity level, in accordance with the selected parameter set.

- **Switched off**
  If a 'Zone' is switched off, the channels assigned to the 'Zone' are isolated. No signals are evaluated, neither danger levels nor 'Faults'.
  There are two isolation functions:
  - Isolation without time limits
  - Isolation with time limits

- **' --Renovation mode'**
  This operation mode is not assigned a function.

- **'Detector test'**
  In the 'Detector test' operation mode, detectors can be actuated for test purposes. When a detector is triggered, a test activation message is generated.
  ↑ Alarm devices or controls are not activated.
  The following devices are activated:
  - Internal alarm indicators
  - ↑ External alarm indicators in accordance with the configuration
  - Base sounders if they are in the base of the activated detector
  During testing the detectors must react quickly so that the holding times are short. During the 'Detector test', the detectors are switched to increased sensitivity with the 'Test' parameter set for this purpose.
  After terminating the 'Detector test' operation mode, the detectors and 'Zones' are reset to the condition they were in before the 'Detector test'.

- **'Installation test'**
  An 'Installation test' can be performed during normal operation. The alarm devices and controls are activated.
  In the test the detectors must react quickly so that the holding times are short. During the 'Installation test', the detectors are switched to increased sensitivity with the 'Test' parameter set for this purpose.
  After terminating the 'Installation test' operation mode, the detectors and 'Zones' are reset to the condition they were in before the 'Installation test' operation mode.
8 Function
Topology

'Channel'
- Switched on (normal operation)
  In the normal operation, the danger levels of the detector as well as any 'Faults'
  are transmitted to the 'Zone' for evaluation.
- Switched off
  If a 'Channel' is switched off, no signals are forwarded to the 'Zone', neither
danger levels nor 'Faults'.

8.2.2.3 Functions of the detection tree elements

'Area': Switching the operating mode
- The 'Unmanned operation' operation mode is manually switched to 'Manned
  operation'. Switching is not possible when 'ALARMS' have occurred and need
  to be dealt with.
- The 'Manned operation' operation mode is automatically or manually
  (configurable) switched to 'Unmanned operation'. Four time settings can be
  configured for this, regardless of the day of the week:
  - The first time setting is for automatic changeover.
  - The second, third and fourth time setting is for safety reasons, in case
    somebody switches to 'Manned operation' after the expiry of the first,
    second or third automatic changeover.
- Blocking switchover
  - If an 'ALARM' has occurred in the 'Area' and is waiting for treatment, the
    switchover function from 'Manned operation' to 'Unmanned operation' is
    blocked.
  - It is still possible to switch from 'Unmanned operation' to 'Manned
    operation'.
- Switching functions on and ✈ off
  - All functions available for the 'Zones' are also available as collective
    functions at area level.
Examples:
  - Switching all automatic 'Zones' on and off.
  - Switching all manual 'Zones' on and off.
- 'Poll alarm counter'
  - The alarm counter counts the number of alarm states of the 'Area'.
  - The alarm state is the state from the first 'ALARM' to the successful reset.

'Section': Switching the 'Zones' on and off
- All 'Zones' of the same kind (automatic/manual) can be switched off and on
  within the section. 'Zones' with automatic fire detectors and 'Zones' with manual
  call points are treated differently.
Zone': Reset behavior of the manual call points

- The reset behavior of an activated manual call point can be selected:
  - 'ALARM' can always be reset; 'Glass broken' is indicated.
  or
  - 'ALARM' cannot be reset.

- Blocking of the isolation
  - If the isolation blocking function has been configured, the 'Zone' cannot be switched off.

- 'Detector test' timeout
  - After the expiry of a configurable delay the system automatically cancels the 'Detector test' state. This function can be deactivated.

- Switching devices back on
  - When devices are switched back on, they are in an undefined state for a short period. The 'Station' changes to the 'Not ready' state for this timespan.

- Simulation function
  - With the simulation function the 'Zone' switches from the normal operation mode to 'Pre-ALARM' and then to 'ALARM'. The controls are activated as if the detectors had triggered an 'ALARM'. Reset is performed by means of the keys on the PMI.

8.2.3 Control tree

The 'Control tree' represents the control in the fire detection system. Control groups are grouping units for configuration and operation.

Control groups in 'Control tree'

- 'Alarming control group'
- 'Fire control group'
- 'Evac control group'
- 'Counter control group'

Each control group has one or more elements, each of which includes an input (cause) and an output (effect).

- Elements of the 'Alarming control group' are controls for internal and external alarm devices
  - Remote transmission outputs for 'Fire' and 'Fault'
  - Eight more remote transmission outputs

- Elements of 'Fire control group' are controls for building equipment.
- Elements of 'Evac control group' are controls for alarm and announcement devices.
Effects in 'Control tree' (example)

C  'Control tree'
1 5 control groups (a - e)
2 Controls
3 Devices and remote transmission, 2 circuits
Lines Logical ↑ assignment
Arrows Signal transfer
a  'Evac control group'
b  'Fire control group', e.g., for door controls
c  'Fire control group' for alarm indicators (external AI)
d  'Fire control group' for commands
X E.g., ↑ switching off, commands to other parts in the site
e  'Alarming control group' for alarm devices and remote transmission
Y ↑ Local or ↑ global alarming
8.2.4 Operating tree

The following elements and settings are represented in the Operation tree:

- **Global system configuration**
- **Display and operator units** such as:
  - Person Machine Interface (PMI)
  - Floor repeater terminal and floor repeater display
  - Mimic display
  - Event printer

### Global system configuration

The global system configuration has the following elements:

- **Global behaviour**
  - Events (event configuration)
  - Commands ('Access level' assignment)

The behavior set here is always valid unless a different behavior is set locally.

- **Master clock**: The master clock is automatically assigned to the first station (address 1).
- **Country settings**: Settings are undertaken here for localization and changing between summer and winter time.

### Person Machine Interface (PMI)

The PMI is a permanent part of the station. The following settings can be configured in the Operation tree:

- **Basic settings** with definition of default access level for the key switch and time period during which the display returns to the normal display from an operating display.
- **Visibility**: A detailed description of the visibility can be found in the corresponding chapter.
  - Standard visibility
  - Standby visibility
  - Expanded visibility
- **LEDs for signaling events and statuses (causes)**:
  - Event with defined, local visibility.
  - Event with optional, global visibility on a particular element from the Hardware tree, Detection tree, or Control tree.
- **Standard keys**: Frequently used functions can be assigned to the configurable standard keys.
  - Views, e.g. message indicator, customer text view, fire brigade view
  - Commands, e.g. activate/deactivate, test, configuration ('Set PS MANNED', 'Switch to UNMANNED', etc.).
- **Favorite keys**: The favorite keys are in the display menu. There is a maximum of eight favorite keys of which three are preconfigured. Frequently used functions can be assigned to the favorite keys.

### Floor repeater terminal FT2010

The following settings can be configured in the Operation tree:

- **Visibility**
- **Cause for activating the LEDs**
- **Views and commands for the function keys**
Floor repeater display FT2011
The following settings can be configured in the Operation tree:
- Visibility
- Cause for activating an LED

Mimic display
There are two possible ways of configuring the LED indicator (internal) FTO2002 and the LED module FTO2008-A1:
- Visibility of the 24 LED groups (red/yellow) or (red/green, yellow) on a ↑ Section or ↑ Zone.
- Visibility of each of the 48 LEDs on any event.

Mimic display driver FT2001
The mimic display driver activates up to 48 LEDs which are fitted on a ground plan panel. Communication is via the C-NET.
The mimic display driver also has two control outputs for local buzzer and 'System On' LED along with two inputs for 'Silence buzzer' and 'START LED test'.

Event printer
The event printer logs all events of the ↑ site in the configured view.

Fire brigade periphery [DE]
The fire brigade periphery comprises the following devices:
- Fire brigade operating panel (FBF)
- Fire brigade key depot (FSD)
- Fire brigade display terminal (FAT)
- FAT with FBF
FSD is assigned to the fire brigade periphery module FCI2001.
FBF can either be connected via the fire brigade periphery module FCI2001 or an RS485 interface.
FAT and FAT with FBF are connected to the station via a serial interface RS 485.
To configure the devices, the logical element must be created in the 'Operation' task card and assigned to the corresponding hardware element.

See also
Visibility [➡ 141]
8.2.5 Assigning with the hardware tree

Components can be allocated to a geographical location in the system. This assignment is a ↑ link.

Geographical allocation

Each device in the ↑ 'Hardware tree' has a unique address. In ↑ 'Detection tree', it is possible to allocate room x on floor y to the device, for example.

![Diagram](image)

*Figure 50: Sample assigning of the detection tree to the hardware tree*

<table>
<thead>
<tr>
<th>D</th>
<th>'Detection tree'</th>
</tr>
</thead>
<tbody>
<tr>
<td>L</td>
<td>Assignment</td>
</tr>
<tr>
<td>HW</td>
<td>'Hardware tree'</td>
</tr>
</tbody>
</table>

The physical and the ↑ logical channel of a device are assigned between the 'Detection tree' and 'Hardware tree'.

The ↑ physical channel is the lowest level in the 'Hardware tree' and maps the physical function of a device.

The logical channel is the lowest level in the 'Detection tree' and maps the logical function of a device.
8.2.6 **Functional allocation**

In the ↑ 'Control tree', a function is assigned to a device from the ↑ 'Hardware tree', for example a monitoring function (cause) is assigned to an input or a control function (effect) is assigned to an output.

In the 'Control tree', the function of a logical element from the ↑ 'Detection tree' is evaluated (cause) or controlled (effect). For example, the alarm condition of the 'Zone' is evaluated or the 'Zone' is switched on or off.

The figure below shows the interrelations of the aforementioned structures by way of example.

---

**Figure 51: Example of functional assignment**

- **D** 'Detection tree'
- **C** 'Control tree'
- **L** ↑ Assignment
- **HW** 'Hardware tree'
- **a - e** ↑ Control groups
- **f** Controls
- **X** E.g., ↑ switching off, commands to other parts of the site
**L**  Local alarming
- Alarming equipment (e.g., acoustic or optical alarm devices) is actuated in order to call up immediately available intervention personnel (e.g., in-house staff) and to alert people of a possible fire hazard.

**G**  Global alarming
- Alarming equipment (e.g., remote transmission) is actuated and external intervention forces (e.g., the fire brigade) are alerted.

Visualization of the assignment from causes and effects via controls

**Lines**  Signal transfer or logical assignment
8.2.7 Network tree
The network tree represents the networking of an FS720 system.

Networking types
The stations in the fire detection system can be networked in the following way:
- SAFEDLINK (system bus)
- SAFEDLINK, extended: Coupling of several SAFEDLINK sub-nets via CWEB/LAN (optical Ethernet)
- Electric Ethernet (does not comply with EN 54)
- SAFEDLINK and Ethernet mixed (does not comply with EN 54)

Connection types/functions
The stations in the network can have the following connection types/functions:
- Standalone station
- SAFEDLINK station: Station in the SAFEDLINK network
- Router station: Station in the SAFEDLINK sub-net connected to the CWEB/LAN
- Ethernet station: Station in the Ethernet sub-network to which no more stations are connected via SAFEDLINK
- GAP station: Station in the network for connecting to a management station (BACnet client)
  - The GAP station has the function of a DHCP server (configurable)
  - The DHCP server automatically issues IP addresses to the clients from a defined IP address space. This enables a PC to receive local access, for example
- A route to an external IP router can be defined for the GAP station

Extended networking
Extended networking is the merging of several SAFEDLINK sub-nets via CWEB/LAN, which is managed as optical Ethernet in loop topology. The sub-networks communicate via the router stations.

Private/external network
- Private network: FS720 fire detection installations have their own cabling. The IP addresses come from a reserved range for private networks
- External network: Fire detection installations can be incorporated in an existing IT infrastructure as sub-nets
- Integration in an external network does not comply with EN 54

Connection with management stations
The connection between management stations or other sub-systems and the FS720 sub-system is established via BACnet/Ethernet.
A management station is connected to the FS720 sub-system via the GAP's Ethernet interface. Every single station that is to use the BACnet protocol must be enabled with a license key. The license key must support the BACnet function for management stations.

You will find more information about license keys in document A6V10210362. See chapter ‘Applicable documents’.
8.2.8 Visibility

Several fire control panels and fire terminals ('Stations') can be integrated into a fire detection installation. The visibility defines which part of a fire detection installation on 'Station' is visible and can be operated.

The visibility is configured in Cerberus-Engineering-Tool.

The visibility for a fire control panel can be configured in the following topology levels of a fire detection installation:

- ↑ 'Site'
- ↑ 'Station'
- ↑ 'Area'

The visibility for this 'Station' is configured by selecting and assigning event categories from the topology to the visibility for this 'Station'. For example, all the 'ALARMS' for the 'Site' or just the 'Faults' for the 'Area' of a 'Station' are indicated.

Two other modes are available for configuring the visibility:

- 'PMI standby visibility'
- 'PMI expanded visibility'

8.2.8.1 Standby visibility

The ↑ 'Station' with the 'PMI standby visibility' configuration monitors one or more other 'Stations', or a ↑ management station in the configured visibility.

- When the fire detection installation is in normal operating condition, 'PMI standby visibility' is deactivated. The 'Station' configured in this way and the display are then in quiescent condition.
- If a monitored 'Station' fails or if the connection to a monitored 'Station' is interrupted, the configured 'PMI standby visibility' becomes active and the fire detection installation can be operated in the configured visibility via this 'Station' exactly as was previously the case with the failed 'Station'.

In addition to 'PMI standby visibility', 'PMI expanded visibility' can also be configured for a 'Station'.

See also

- Expanded visibility [→ 141]

8.2.8.2 Expanded visibility

If configured, you can use a command to activate 'PMI expanded visibility' for a 'Station' and this gives you the configured visibility.

For a 'Station' with 'PMI standby visibility', 'PMI expanded visibility' can also be configured.

The 'PMI expanded visibility' configuration is however also available regardless of 'PMI standby visibility'.

The 'PMI expanded visibility' function can be configured with dependencies.

Possible dependencies

- 'PMI expanded visibility' can only be activated if a monitored 'Station' fails.
8.3 Acquisition

The detectors detect the fire phenomena, e.g., smoke, heat, or carbon monoxide, and transmit the ↑ danger level to the ↑ 'Zone'.

![Diagram showing the information flow of danger levels]

**Figure 52: Information flow of the danger levels**

**Overview of danger levels, divided according to line type and detector type**

<table>
<thead>
<tr>
<th>Danger level</th>
<th>Addressed detector line</th>
<th>↑ Collective detector line</th>
<th>Technical input</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Automatic</td>
<td>Manual</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>No danger</td>
<td>No danger</td>
<td>No danger</td>
</tr>
<tr>
<td>1</td>
<td>Possible danger</td>
<td>Button not pressed</td>
<td>↑ Detector line resetting</td>
</tr>
<tr>
<td>2</td>
<td>Probable danger</td>
<td>-</td>
<td>Alarm verification of the first alarm is running</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Highly probable danger</td>
<td>Button pressed, danger</td>
<td>Highly probable danger</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Table 28: Danger levels*
8.4 Evaluation

The evaluation of the danger level and the decision to trigger an 'ALARM' or not takes place in the 'Zone'. The danger levels of several alarming detectors are combined in the 'Zone'. The following zone types exist:

- 'Manual zone'
- 'Automatic zone'
- 'Technical zone'
- 'FSE zone'
- 'Sprinkler zone'
- 'XC10 zone'

Figure 53: Information flow of alarm and pre-alarm

D → 'Detection tree'
1 → 'Area'
2 → 'Section'
3 → 'Zone'
m → 'Manual zone'
ax → Automatic detector zone with multi-detector dependency
a1 → Automatic detector zone with single-detector dependency
I/O → 'Technical zone'
Dashed arrows → 'ALARM' / 'Pre-ALARM'
'Manual zone'
A 'Manual zone' combines the 'Manual call points'. Danger signals are evaluated by means of an OR relation. Each detector of a 'Manual zone' can generate 'ALARM', but not 'Pre-ALARM'.

'Automatic zone'
A 'Automatic zone' combines 'Automatic detectors'. The 'Automatic zone' can generate 'Pre-ALARM' and 'ALARM'. A distinction is made between the following detector dependencies:

- ↑ Multi-detector dependency
  With multi-detector dependency, the ↑ danger levels of several detectors are linked (AND relation) and evaluated. A 'Pre-ALARM' or 'ALARM' is generated when the defined danger levels have been reached.
  Several evaluation variants are possible in multi-detector dependency.
- ↑ Single-detector dependency
  With single-detector dependency the danger levels of one or more detectors are linked (OR relation). A 'Pre-ALARM' or 'ALARM' is generated as soon as at least one detector has reached the defined danger level.

Sample criteria for 'Pre-ALARM' or 'ALARM'

<table>
<thead>
<tr>
<th>Alarm level</th>
<th>Single-detector dependency</th>
<th>Multi-detector dependency</th>
</tr>
</thead>
<tbody>
<tr>
<td>'Pre-ALARM'</td>
<td>1 x danger level 2</td>
<td>1 x danger level 2 or 3</td>
</tr>
<tr>
<td>'ALARM'</td>
<td>1 x danger level 3</td>
<td>2 x danger level 2 or 3</td>
</tr>
</tbody>
</table>

Table 29: Alarm levels

'Technical zone'
In a 'Technical zone', inputs for ↑ technical messages are combined, e.g., fault or danger by extraneous equipment.

'FSE zone'
A release element is assigned to this zone. With the release element, a fire alarm is generated manually, which in turn releases the lock to the 'Key depots' with the keys for the building. To operate the release element, a key is required which is exclusively in the possession of the fire brigade.
‘Sprinkler zone’
A sprinkler system is a piping system that is terminated at several locations with sprinkler heads. It is normally fed by the public network of hydrants. The sprinkler station is installed directly after the house feed. It separates the sprinkler network from the hydrant network due to overpressure in the sprinkler network. The sprinkler station signals when the sprinkler network is opened somewhere and water begins to flow. This condition is reported to the fire control panel via a contact (or two as an option) and triggers an alarm with immediate response from the fire brigade. In larger sprinkler systems, the piping system is distributed over several floors and the supply network has an outlet on every floor. Flow rate indicators are built into each outlet. The flow rate indicators generate a signal when there is a flow.

Figure 54: Information flow for sprinklers

D  ↑ ‘Detection tree’
F  Flow rate indicator
S  Sprinkler station with one or two contacts (cause)
H  Hydrant network
ZF  ‘Flow switch zone’
ZS  ‘Sprinkler zone’
Arrows  Signal transfer
'XC10 zone'
Extinguishing is actuated and monitored by the autonomous extinguishing control unit XC10.

An interface to the extinguishing control unit makes it possible to send extinguishing control unit functions to the fire control panel, and to transmit commands from the fire control panel to the extinguishing control unit.

![Diagram](image-url)

**Figure 55: Information flow from the extinguishing control unit XC10**

- **D** 'Detection tree'
- **XC10** Extinguishing control unit
  - **I** Extinguishing control unit inputs: 'Extinguishing activated', 'Fault', 'Pre-alarm', 'Autom. + manual extinguishing OFF'
  - **O** Extinguishing control unit outputs: 'Reset', 'Autom. Blocking extinguishing activation, 'Autom. + manual extinguishing activation blocked'
- **Z** 'XC10 zone'

You will find detailed information in the Technical Documentation of the extinguishing control unit XC10, document 008399. See chapter 'Applicable documents'.
8.5 Control

Alarm events and system events may occur in a fire detection installation. It is the task of the fire control unit to alert people and/or initiate appropriate actions based on the different event categories. This is achieved with the different control types:

- Alarming control
- 'Fire control'
- 'Evac control'
- Extinguishing control

The alarming control is described in the chapter "Alarm Verification Concept (AVC)".

Sample control

![Diagram of control function]

**Figure 56: Sample control function**

<table>
<thead>
<tr>
<th>I</th>
<th>Causes</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>Control</td>
</tr>
<tr>
<td>O</td>
<td>Effects</td>
</tr>
<tr>
<td>E</td>
<td>Events ('ALARM', 'Fault', 'Isolation', test mode, etc.)</td>
</tr>
<tr>
<td>act / deact</td>
<td>Activate / deactivate</td>
</tr>
<tr>
<td>com</td>
<td>Command</td>
</tr>
</tbody>
</table>

**Causes** are any events such as 'ALARM', 'Fault', 'Isolation', test mode as well as signal inputs (contacts).

The **control** has an 'OR / AND / NOT' combination of the causes that have occurred.

The **effects** of the control are the activation or deactivation of outputs. The actuated outputs can be combined with inputs for confirmation.

Effects are also commands within the fire detection system, e.g. for the isolation of a 'Zone' or for changing a detector parameter set.
8.5.1 Fire control

In the event of a fire, different measures are initiated automatically, such as:

- The closing of fire dampers and fire doors
- Switching off fans and air conditioning systems
- The descending of elevators

Figure 57: Information flow for fire control

D ↑ 'Detection tree'
C ↑ 'Control tree'
b ↑ 'Fire control group'
f 'Fire control'
HW ↑ 'Hardware tree'
8.5.2 Evacuation control

'Evac control' makes it possible to configure a complete evacuation function for each alarm device zone, e.g., on one floor.

Two function blocks are available for each control:

- **Alert**
  - The assigning of all conditions, so that the corresponding alarm devices transmit a warning signal.

- **Evac**
  - The assigning of all conditions, so that the corresponding alarm devices transmit an evacuation signal.

![Diagram](image)

*Figure 58: Information flow for evacuation control*

In 'Evac control group' two different controls are possible:

- 'Universal sounder evac control' ('Evac')
- 'Phased sounder evac control' ('Alert' / 'Evac')
- 'Phased voice evac control' ('Alert' / 'Evac')
- 'Prioritized voice evac control' ('Alert' / 'Evac')

Events from 'Station', 'detector line', 'Section', or 'Zone' (cause) trigger an 'Evac control'.
'Universal sounder evac control'

'Universal sounder evac control' is suited for horns that do not allow two-phased (multi-channel) alarming.

For the alarming equipment (outputs, alarm devices) on the control outputs (effects), it is possible to choose different tones for alerting ('Alert') and evacuation ('Evac').

'Phased evac control'

With 'Phased evac control', initiation of the alarming equipment (outputs, alarm devices) is effected separately for alerting ('Alert') and evacuation ('Evac').

Application [GB]: First, all floors are warned ('Alert'). After that, the evacuation ('Evac') of individual floors is performed at particular intervals (phases), starting with the floor on which the seat of the fire is located, in order to prevent blocking of the escape routes.

This application may be different for different parts of a building.

• In the first phase the floor on which the fire is located as well as the one above and the two top floors, all basement floors and possibly the ground floor are evacuated.

• In additional phases, one upper and one lower floor are also evacuated at predefined intervals. If need be, additional floors can be evacuated during the same phase.

Example of evacuation in the event of a fire on the 4th Floor

Sequence 'Phased evac control'

<table>
<thead>
<tr>
<th>Floor</th>
<th>Alert</th>
<th>Evac</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>'Alert'</td>
<td>'Evac'</td>
</tr>
<tr>
<td>9</td>
<td>'Alert'</td>
<td>'Evac'</td>
</tr>
<tr>
<td>8</td>
<td>'Alert'</td>
<td>'Evac'</td>
</tr>
<tr>
<td>7</td>
<td>'Alert'</td>
<td>'Evac'</td>
</tr>
<tr>
<td>6</td>
<td>'Alert'</td>
<td>'Evac'</td>
</tr>
<tr>
<td>5</td>
<td>'Alert'</td>
<td>'Evac'</td>
</tr>
<tr>
<td>4</td>
<td>'Alert'</td>
<td>'Evac'</td>
</tr>
<tr>
<td>3</td>
<td>'Alert'</td>
<td>'Evac'</td>
</tr>
<tr>
<td>2</td>
<td>'Alert'</td>
<td>'Evac'</td>
</tr>
<tr>
<td>1</td>
<td>'Alert'</td>
<td>'Evac'</td>
</tr>
<tr>
<td>EG</td>
<td>'Alert'</td>
<td>'Evac'</td>
</tr>
<tr>
<td>UG</td>
<td>'Alert'</td>
<td>'Evac'</td>
</tr>
</tbody>
</table>

1...10 Floor 'Evac' Evacuation

EG Ground floor 'Alert' Alarming

UG Basement

The following 'Phased evac control' can be configured:

• 'Phased sounder evac control': For applications with pure alarm sounders without voice output

• 'Phased voice evac control': For applications with sounders that can play voice messages as well as tones
'Prioritized voice evac control'
Prioritized voice evac. controls are also suitable for phased evacuation applications with voice output. They do, however, have the following differences in comparison to phased voice evac controls:

- Except for the 'Causes EVAC FIRE (+DEGRADED MODE)' cause group, all other cause groups can be given an individual priority.
- For the 'Evac' phase, the 'Causes EVAC EMERGENCY' cause group can also be configured for emergencies that are not caused by fire.
- The 'Causes CUSTOM 1' and 'Causes CUSTOM 2' elements can be used to create cause groups for which all available voice messages can be configured.

8.5.3 Extinguishing standard interface SST [DE]
The extinguishing standard interface SST is used for the control and indication of the extinguishing activation of a third party extinguishing control installation. The input/output module FDCIO224, which is integrated in the fire control panel, is used as an interface between the fire control panel and the extinguishing control installation. The line to the extinguishing control installation is monitored for short-circuit and open line.

![Figure 59: Extinguishing standard interface SST](image)

D  ↑ Detection tree
C  ↑ Control tree
b  Extinguishing control group
f  ↑ Extinguishing control
SST  Standard extinguishing interface
I  Inputs from the extinguishing control installation:
   'Extinguishing activated', 'Fault'
O  Outputs to the extinguishing control installation:
   Extinguishing is controlled by the detector zone(s) of the fire control panel
8.6 Alarm verification concept (AVC)

The 'Alarm Verification Concept' serves the purpose of delayed alarm transmission and takes into account the interaction of the operating personnel in the alarming sequence.

Operating personnel are able to examine the indicated fire location in the event of a fire alarm. In the event of a false alarm or minor incident, the intervention of the fire brigade can be avoided.

Information flow of 'ALARM' and 'Pre-ALARM'

The 'Area' receives 'Pre-ALARMS' or 'ALARMS' from 'Zones'. Alarm verification takes place at 'Area' level.

Configuration for 'Pre-ALARMS' and 'ALARMS' is not related within 'AVC'. The type of verification and alarming can be separately configured for the 'Manned operation' and 'Unmanned operation' operation modes.

'ALARMS' of 'Manual zones' and 'Automatic zones' 'Zones' as well as 'Degraded FIRE ALARM' can be configured differently.

A maximum of one 'AVC' is possible per 'Area'.
8.6.1 Attendance check
Should an event (‘Pre-ALARM’, ‘ALARM’) arise, the operating personnel may acknowledge presence within the time t1. After acknowledgement, the investigation time t2 starts. If presence is not acknowledged within the given time t1, ↑ global alarming is activated.

8.6.2 Investigation time
During the investigation time t2 the operating personnel may examine the indicated source of alarm and check the cause of the ‘ALARM’:
- Is it a real fire = Major incident?
- Is it a smoldering waste-paper basket = Minor incident?
- Has the ↑ installation detected a deceptive phenomenon = False alarm?
In the event of a major incident (emergency), the nearest ‘Manual call points’ or <Alarm delay off> must be pressed. "Immediate global alarming" is then triggered. In the case of a ↑ minor incident or ↑ false alarm the operator may reset the ‘ALARM’ and cancel alarming.

If the ‘ALARM’ is not reset within the given time t2, ‘Immediate global alarming’ is activated.

8.6.3 Example of a verification process
Alarm verification proceeds as follows:
- An alarm event activates ↑ local alarming and starts the time t1 for attendance check.
- Operating personnel acknowledge ‘ALARM’ on the operating terminal prior to the expiry of t1. Acknowledging normally silences local alarming (configurable feature).
If there is no acknowledgment, ↑ global alarming is activated after the expiry of t1.
- After acknowledgement, the investigation time t2 starts. During time t2 operating personnel investigate the fire location.
  - In the case of a minor incident the operator resets the ‘ALARM’ at the nearest operating terminal. The alarming process stops, and no global alarming is activated.
  - In the event of a fire, the nearest ‘Manual call points’ or <Alarm delay off> must be pressed. ‘Immediate global alarming’ is triggered.
If there is no reset, ‘Immediate global alarming’ is also activated after the expiry of t2.
Figure 60: Alarm verification

1. Alarm event
2. Local alarming
3. Manual call point or <Alarm delay off> on 'Station'
4. 'Unmanned operation' operation mode
5. 'Manned operation' operation mode
6. Time t1 for attendance check
7. Time t1 has expired
8. Time t2 to investigate the source of alarm / the fire location
9. Time t2 has expired
10. Reset on 'Station'
11. Not reset
12. Acknowledge at 'Station'
13. Not acknowledged
14. Global alarming

mx  m  q  qx  r  rx  GA

mx 'Unmanned operation' operation mode
m  'Manned operation' operation mode

..t1 X Time t1 has expired
..t2 X Time t2 has expired
8.6.4 Fire alarming
Alarming is controlled at ↑ 'Area' level. During alarming the ↑ alarming equipment is activated, e.g., ↑ alarm devices and remote transmission devices.

Alarm devices
For ↑ local and ↑ global alarming, acoustic alarm devices, beacons, digital outputs, etc., can be used. The tone of the alarm devices can be configured differently for local and global alarming (the alarm devices must be suitable for this).

Remote transmission
The alarm message is transmitted to an intervention station. In the case of local alarming, this is usually the company fire brigade and for global alarm usually the state fire brigade. A remote transmission device must be used to transmit alarm messages via the public telephone network.

Figure 61: Information flow during alarming

AVC 'Alarm Verification Concept' f ↑ Alarming control
C ↑ 'Control tree' Y Local and global alarming
e 'Alarming control group'

The alarm devices and the remote transmission can be separately configured for:
- Alarm type (only with automatic zones)
  - 'Pre-ALARM'
  - 'ALARM'
- Zone type (only with 'ALARMS')
  - Manual alarm
  - Automatic alarm
  - Degraded fire alarm
- Operation mode:
  - 'Manned operation'
  - 'Unmanned operation'
- Alarming type:
  - 'Local alarming only'
  - 'Delayed alarming'
  - 'Global alarming only'

### 8.7 Intervention concept (IC)

The fire control panel features comprehensive monitoring and self-monitoring functions.

The different events in the system are acquired, classified into corresponding event categories and evaluated by the 'Intervention Concept'. After the evaluation, the 'Intervention Concept' activates the corresponding alarming equipment.

#### Flow of information to 'IC'

![Diagram showing information flow for intervention]

Figure 62: Information flow for intervention

- **D** → 'Detection tree'
- **HW** → 'Hardware tree'
- **IC** → 'Intervention Concept'
- **a** → Events from 'Hardware tree'
- **b** → Events from 'Detection tree' and 'Control tree'
- **L** → Assignment

The 'Intervention Concept' (‘IC’) is an integral part of the fire control panel and takes into account the interaction of the operating personnel. The 'Intervention Concept' can be used to define an intervention process which is initiated should an event occur or once a particular delay time has lapsed.
For each of the following event categories the behavior can be defined separately:
- 'Fault'
- 'Isolation'
- Test
- 'Technical message'
- 'Activation'
- 'Information'

The 'Intervention Concept' has two independent, parallel intervention processes:
- Attendance check (t1)
- Intervention monitoring (ts)

The intervention process can be configured according to the 'Manned operation'/Unmanned operation' operation mode.

---

**8.7.1 Attendance check**

Attendance check with the 'IC' serves for immediate intervention. Events such as technical deficiencies, 'Faults' and malfunctions can be investigated and possibly remedied directly by the operating personnel.

If an event is not acknowledged within the configured timespan (e.g. up to one hour), an external intervention station is informed (global alarming).

The remote transmission for 'Faults' is not interrupted by the acknowledgment. The external intervention center is also informed when the 'Fault' is acknowledged but the cause of the 'Fault' is not rectified after a specified time. This is ensured by parallel checking by the intervention center.

---

**8.7.2 Intervention monitoring**

Intervention monitoring is used to safeguard a service intervention. Events such as a 'Fault' caused by a soiled detector are monitored during a preconfigured period of time (up to one week).

If the normal operation conditions are not re-established within this period of time, service intervention is started and/or the maintenance personnel are informed.

---

**8.7.3 Example of an intervention process**

- A 'Fault' activates local alarming and starts the time t1 for attendance check.
- Operating personnel acknowledges presence on the operating terminal prior to the expiry of t1. Acknowledging silences the local alarming equipment. If there is no acknowledgment, global alarming is activated after the expiry of t1.
- The time ts for service intervention monitoring starts in parallel to the time t1. If the 'Fault' is not eliminated prior to the expiry of ts, maintenance personnel are called up.

---

A triggered intervention process (t1 and/or ts running) is not restarted when a 'Fault' of the same category occurs for a second time.
The figure below shows an exemplary intervention process for the 'Fault' event category.

![Intervention in case of fault](image)

**Figure 63:** Intervention in case of fault

A Attendance check  
A - Time \( t_1 \) for attendance check  
A - Time \( t_1 \) has expired  
G Global alarming

B Intervention monitoring  
B - Time \( t_{s} \) for service intervention monitoring  
B - Time \( t_{s} \) has expired  
S Service intervention
8.7.4 **Intervention alarming**

The alarming equipment, such as alarm devices and remote transmission devices, can be selected separately for 'Manned operation' and 'Unmanned operation':

**Alarm devices**

Alarm devices, strobes, digital outputs, etc. can be used for local and global alarming. The tone of the alarm devices can be configured differently for local and global alarming.

**Remote transmission**

For service intervention the event message is transmitted to intervention forces, in general the maintenance personnel. A remote transmission device must be to transmit event messages via the public telephone network.

---

**Table 30: Intervention alarming**

The alarm devices and the remote transmission can be separately configured for:

- **Operation mode:**
  - 'Manned operation'
  - 'Unmanned operation'
• Immediate intervention:
  - 'Local intervention only'
  - 'Delayed intervention'
  - 'Global intervention only'

• Service intervention:
  - 'Delayed intervention'
  - 'Direct intervention'
9 Operation

9.1 Commissioning

Installations with only one control panel may be commissioned with or without Cerberus-Engineering-Tool. Installations with several, networked control panels may only be commissioned with Cerberus-Engineering-Tool.

The table below provides an overview of the procedure for commissioning the 'Stations'. The letters A, B1, B2 and C refer to the detailed descriptions in the following chapters.

<table>
<thead>
<tr>
<th></th>
<th>Standalone control panel</th>
<th>Networked 'Stations'</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Without</strong></td>
<td><strong>No pre-configuration possible</strong></td>
<td><strong>Not possible.</strong></td>
</tr>
<tr>
<td>Cerberus-Engineering-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tool</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>With</strong></td>
<td><strong>Without pre-configuration</strong></td>
<td></td>
</tr>
<tr>
<td>Cerberus-Engineering-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tool</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>With</strong></td>
<td><strong>With pre-configuration</strong></td>
<td></td>
</tr>
<tr>
<td>Cerberus-Engineering-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tool</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **A**
  - Auto-configuration
  - Adaptations on the Person Machine Interface

- **B1**
  - Auto-configuration
  - Adaptations in Cerberus-Engineering-Tool

- **B2**
  - Read in the FDnet devices by line
  - Assign the logical elements to Cerberus-Engineering-Tool

- **C**
  - Initialize the 'Stations' for networking
  - Read in the C-NET devices by line
  - Assign the logical elements to Cerberus-Engineering-Tool

*Table 31: Commissioning variants*
9.2 Configuration

Cerberus-Engineering-Tool is needed for configuration. Cerberus-Engineering-Tool is also used for diagnosis and maintenance. You will find detailed information on Cerberus-Engineering-Tool in document A6V10210424. See chapter 'Applicable documents'.

9.2.1 Overview of the program window

1. Title bar
2. Menu bar
3. Task cards
4. Table
5. Detail editor
6. Hyperlinks
7. Status bar
8. Tree
9. Toolbar
9.2.2 Task cards
In the Cerberus-Engineering-Tool task cards, the required information and tools for a specific task are provided. Cerberus-Engineering-Tool has the following task cards:

- 'Hardware'
  In the task card 'Hardware', all hardware components of the site are represented as a hardware tree. The conditions for the intervention concept are defined here as well.
- 'Detection'
  The detection tree is created in the task card 'Detection. The conditions for the alarm verification concept are defined here as well.
- 'Control'
  The control tree is created in the task card 'Control. Alarming, evacuation, fire control, and extinguishing are configured here.
- 'Operation'
  In the task card 'Operation', the visibility on other stations, the PIN codes, LED indicators, and operation keys of the stations as well as third-party devices are visualized and configured.
- 'Network'
  In the task card 'Network' the network parameters are mapped and configured.

9.2.3 Cerberus Remote
The 'Cerberus Remote' register is used to open the Cerberus Remote integrated in the Cerberus Engineering Tool.
A station connected to the Cerberus Engineering Tool can be visualized and operated with the Cerberus Remote.
9.3 Operation

By default, the fire detection installation is operated by means of the Person Machine Interface integrated in the individual stations. In larger sites, the fire detection installation can also be operated via a management station. Cerberus-Engineering-Tool also offers the possibility of operating the fire detection installation remotely with a PC.

9.3.1 Operating unit

All stations (fire control panel or fire terminal) have an integrated operating unit. The operating unit includes the Person Machine Interface, through which the fire detection installation can be operated. All important information from the fire detection installation is indicated spontaneously on the PMI or can be polled there.

1. Alarm indicator
   - Light up red in the event of an alarm

2. Display
   - Event indication, e.g. type, place, status of event
   - Menu, element and command indication
   - Instructions may be displayed in the event of an alarm

3. Navigation buttons
   - For navigation in the display for e.g. menu and command selection and scrolling in lists.

4. Keypad with Menu key, ok key and Cancel key
   - Keypad for PIN entry (password), shortcut (menus), address entry (element ID), parameter entry, entry of customer text
   - The menu button opens the main menu
   - The <ok> button can be used to run a selected command or open a menu item. In windows with an entry field, the <ok> button moves the cursor to the next entry.
   - With the <C> cancel button, any operation sequence can be canceled, and any open list or window can be closed.
5 Area for fitting options
   • Printer
   • EVAC [NL]
   • LEDs

6 Key switch (optional)
   • An access level can be enabled with the key switch.
   • The accessible access level is configurable.
   • The key switch has two positions: On (horizontal position), Off (vertical position)

7 <Alarm device> button
   • Deactivates the↑alarm devices in the event of alarm (password required)

8 System fault LED (yellow)
   • Lights up yellow when a system fault is present

9 Operation LED (green)
   • Lights up green during operation

A <More alarms> button
   • Pressing <More alarms> opens the 'ALARMS' event list.
   • If the 'ALARMS' event list is already open, <More alarms> assumes the function of the button <▼>, changing to the next alarm event upon activation.

5 Softkeys 1-3
   • Softkeys are buttons by means of which functions may be carried out that are displayed in the three fields of the softkey line on the display.
   • These three black fields contain the names of the functions in white font.
   • The functions of the softkeys may change depending on the situation and the contents of the display.
   • Always the most important functions are assigned to the softkeys 1 and 2.

X <Silence buzzer>, <Acknowledge>, <Reset>, <Alarm delay off>, <Premises manned> standard buttons
   • <Silence buzzer> switches the buzzer off.
   • <Acknowledge> acknowledges all events that can be acknowledged. Confirms presence (↑AVC, ↑IC). Switches off the buzzer and internal sounders.
   • <Reset> resets all events that can be reset (password required).
   • <Alarm delay off> switches off the alarm delay for all events. In the event of an alarm, the remote transmission or global alarming is activated immediately.
   • <Premises manned> switches between 'Manned' and 'Unmanned' operation modes (password required). Opens the event list in the case of a "mixed" condition (↑visibility on several↑areas with different 'Manned' and 'Unmanned' settings).

k1 Configurable keys with LEDs
   • These two keys may, for example, be configured with the following functions: 'VdS counter' or 'Switch off detector zone' display.

k2 Configurable LEDs
   • Freely configurable for the indication of events or conditions

Inscription strips may be inserted to label the PMI.
You will find a template for this in document A6V10217440. See chapter 'Applicable documents'.
9.3.2 Operating unit [AU]

The operating unit [AU] includes the PMI [AU] with the 'Fire brigade panel' (FBP), through which the fire detection installation can be operated. All important information from the fire detection installation is indicated spontaneously on the PMI or can be polled there.

**Fire brigade operation**

Fire brigade operation is enabled with the key switch. The fire brigade has access level 2.1. The `<Silence buzzer>`, `<Silence Alarm>`, `<Reset>`, `<Disable>`, and `<SEVERAL ALARMS>` buttons can be operated by the fire brigade.

**Full operation**

Full operation of all buttons from access level 2.2 can only be enabled with the PIN.

---

1. **Alarm indicator**
   - Light up red in the event of an alarm

2. **Display**
   - Event indication, e.g., type, place, status of event
   - Menu, element and command indication
   - Instructions may be displayed in the event of an alarm

3. **Navigation buttons**
   - For navigation in the display for, e.g., menu and command selection and scrolling in lists
   - Access level 2.2 required
4 Keypad with Menu key, ok key and Cancel key
   • Keypad for PIN entry (password), shortcut (menus), address entry (element ID), parameter entry, entry of customer text
   • The menu button opens the main menu
   • The <ok> button can be used to run a selected command or open a menu item. In windows with an entry field, the <ok> button moves the cursor to the next entry.
   • With the <C> cancel button, any operation sequence can be canceled, and any open list or window can be closed.
   • PIN entry required

5 Operating unit (AU)
   • Pre-configured LEDs
   • LEDs which can be configured according to specific customer requirements

6 Key switch
   • Enabling fire brigade operation with access level 2.1
   • Pre-configured LEDs
   • LEDs which can be configured according to specific customer requirements

7 <Silence buzzer>, <Silence Alarm>, <Reset>, and <Disable> standard buttons
   • <Silence buzzer> switches the buzzer off
   • <Silence Alarm> deactivates alarm devices
   • <Reset> resets all events that can be reset
   • <Disable> stops the alarm in all 'Zones' which have issued an alarm

8 <Acknowledge> and <Premises manned> standard buttons
   • <Acknowledge> acknowledges all events that can be acknowledged. Confirms presence (AVC, IC).
   • <Premises manned> switches between 'Manned' and 'Unmanned' operation modes (PIN entry required). Opens the event list in the case of a "mixed" condition (visibility on several areas with different 'Manned' and 'Unmanned' settings).

9 Softkeys 1-3
   • Softkeys are buttons by means of which functions may be carried out that are displayed in the three fields of the softkey line on the display.
   • These three black fields contain the names of the functions in white font.
   • The functions of the softkeys may change depending on the situation and the contents of the display.
   • Always the most important functions are assigned to the softkeys 1 and 2.
   • Access level 2.2 required

10 Configurable buttons with LEDs (can be configured independently)
   • Functions can be configured according to specific customer requirements

11 <SEVERAL ALARMS> button
   • Pressing <More alarms> opens the 'ALARMS' event list.
   • If the 'ALARMS' event list is already open, <More alarms> assumes the function of the button <▼>, changing to the next alarm event upon activation.
   • Access level 2.1 required; fire brigade operation with key switch

12 Configurable LEDs
   • Freely configurable for the indication of events or conditions

13 System fault LED (yellow)
   • Lights up yellow when a fault is present

14 Operation LED (green)
   • Lights up green during operation

15 <Fire Protection Activated>, <Smoke Control Activated>, <Warning System Activated>, and <Alarm Routing Activated> standard LEDs
   • Light up red when activated
You can use inscription strips to inscribe the PMI. You will find a template for this in document A6V10479789.

Different access levels for Australia as of MP6
The following access levels apply to FS720 fire detection systems for the Australian market as of MP6:

<table>
<thead>
<tr>
<th>Access levels as of MP6</th>
<th>Access levels &lt;MP6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>2.1</td>
</tr>
<tr>
<td>3.1</td>
<td>2.2</td>
</tr>
<tr>
<td>3.2</td>
<td>3</td>
</tr>
</tbody>
</table>

The access levels that apply as of MP6 work in exactly the same way as the access levels for versions <MP6.

As stipulated by AS 4428.3, the operating elements within the 'Fire brigade panel' are disabled in the event of a fire alarm if the operator has access level 2. The introduction of access level 3.1 as of MP6 enables operating personnel who are present during a fire to operate the 'Fire brigade panel' accordingly.

9.3.3 Indication and operation

Indication and operation
The PMI includes a display on which the operating steps are executed by navigating through the menu. Navigation in the menus is possible by means of the context-sensitive pages or by the key pad.

In addition to the indication on the display, the most important information is indicated by LEDs on the PMI.

Frequently required operating sequences may be stored as Favorites and can be executed on demand at the push of a button. Menus that are called up very often can be selected by means of a shortcut.

![Figure 64: Display with list window](image)

You will find more information on the operation of the station in document A6V10211076. See chapter 'Applicable documents'.
9.3.4 Cerberus Remote Operating Tool

Cerberus-Remote is software for the PC which can be used to display the Person Machine Interface of a `Station` on the PC. For example, it can be used to access the site for maintenance purposes.

Depending on the operation mode, Cerberus-Remote can either be used for display purposes or for display and operation purposes.

The link between Cerberus-Remote and a 'Station' can be structured as follows:

- Local connection via any 'Station' in the system
- Connection via the Global Access Point (GAP)

Cerberus-Remote is an integrated part of Cerberus-Engineering-Tool, but can also be installed on a PC as the standalone application 'FX7220'.

You will need an installed license key and appropriate authorization for the 'Station' in order to use Cerberus-Remote. The license key must support the Cerberus-Remote function. The license key need only be installed in the 'Station' that has the Person Machine Interface that is to be displayed in Cerberus-Remote.

---

You will find more information about license keys in document A6V10210362. See chapter 'Applicable documents'.

---

The connection to a 'Station' with a license key is also possible via a 'Station' without a license key.

---

Cerberus-Remote has the same visibility as the connected 'Station'. You can therefore gain global visibility with Cerberus-Remote in a networked site. To do so, the license key must be installed in a 'Station' with global visibility and connected to Cerberus-Remote.

---

9.3.5 Danger management system

The fire detection system may also be connected to a danger management system via the BACnet interface. To make this possible, all connected stations must be enabled with at least license key (S2).

You will find detailed information on license keys in document A6V10210362, chapter 'License keys'.
9.4 Service

Service devices increase efficiency during commissioning, maintenance and repair.
The following chapters provide an overview of the test units available:

9.4.1 Testing and measuring instruments

The following table shows an overview of the test devices and measuring instruments used.

<table>
<thead>
<tr>
<th>Test</th>
<th>Required auxiliaries</th>
<th>Comment</th>
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9.4.2 Line tester FDUL221

Before you start commissioning the fire control panel, you should test the C-NET lines with the line tester FDUL221. Line faults can be efficiently detected and remedied in this way.

Line tester FDUL221 is used for the commissioning, maintenance and repair of an C-NET detector line. The following can be tested with the line tester:

- Correct topology
- Correct sequence and types of the installed devices
- Faultless cabling

With the line tester, faults such as defective cables in the detector line can be located safely and easily. It is also possible to poll and control C-NET devices. For example, alarm sounders or external alarm indicators can be activated. The line tester can be operated on the line supply or with batteries, and it is suitable for mobile use, e.g., on a ladder.

The scope of supply includes the FXS2017 line tester software so that the line tester can be operated via a USB adapter. FXS2017 offers a clear layout and additional functions.

The line tester provides the operating voltage required for the detector line and so can be used even before the control panel is installed.

You will find detailed information on how to use the line tester in document 008250. See chapter 'Applicable documents'.
Glossary

**Addressed detector line**
Detector line technique which assigns a unique address to each device.

**Alarm device**
Element in the fire detection system for acoustic and/or visual alarming, e.g. alarm sounder, beacon.

**Alarm indicator**
Visual display to signal an alarm or pre-alarm.

**Alarm verification concept**
Concept for preventing false alarms which takes into account the interaction of the operating personnel in the alarming sequence.

**Alarming control**
Monitoring and controlling the alarming equipment

**Alarming equipment**
Alarm devices and remote transmissions

**Area**
The top level in the detection tree. Sections and zones are assigned to the area.

**Assignment**
Creating a reference between two elements, e.g., logical channel and physical channel.

**Auto-configuration**
A zone is created for each sensor channel (automatic detector and manual call point). A control is created for each alarm sounder. IO-modules, FT2010, FT2011, and external alarm indicators are not auto-configured.

**Automatic fire detector**
Device which measures a physical parameter (e.g. warmth) in order to detect a fire.

**AVC**
Abbreviation for 'Alarm Verification Concept'.

**BACnet**
Abbreviation for 'Building Automation and Control Networks'. It is a network protocol for standardized communication between devices from different manufacturers in building automation, such as for communication between a management station (MMS) and a fire detection installation.

**Blocking of the isolation**
Setting to ensure that a zone cannot be switched off.

**C-NET**
Addressed detector line for C-NET devices.
C-NET device
A device connected to the C-NET detector line.

Collective detector line
Detector line technology in which all detectors that are connected to the same detector line have a collective address. This makes it impossible to identify individual detectors.

Control group
Combination of several similar controls.

Control tree
Structure tree with control group and control.

CPU
Abbreviation for ‘Central Processing Unit’. The computing unit of the fire control panel.

C-WEB
Protocol used in SAFEDLINK.

C-WEB/Ethernet
FS720-specific term for networking with electric Ethernet.

C-WEB/SAFEDLINK
FS720 system bus.

Danger level
A fire detector signal which conveys the possibility of fire. Automatic fire detectors, for example, have danger levels 0 to 3. Manual call points only have danger levels 0 and 3. 0 = no danger, 1 = possible danger, 2 = probable danger, 3 = highly probable danger.

Detection tree
Diagram of the geographical and organizational arrangements of sensors in a building. This is a hierarchical structure comprising the area, section, and zone.

Detector line
Electrical connection between the detectors and the fire control panel. There are collective detector lines and addressed detector lines.

Effect
An impact caused by a control, e.g., activation of a hardware output or a command.

Ethernet station
Participants in the Ethernet sub-net without local connection for the PC.

Extended networking
Connection of several SAFEDLINK networks.
External alarm indicator
Optical element for displaying the fire location, which is at some distance from the detector. It is normally mounted in the room at the point where the corresponding detector is accessible.

Extinguishing control
Control which controls a connected extinguishing system and evaluates and displays its states.

False alarm
Alarm not triggered by a danger.

FDnet
Addressed detector line for FDnet devices.

FDnet device
A device connected to the FDnet detector line.

Fire control
Control which is activated in the event of a fire alarm.

Floor repeater display
A display device without operating elements.

Floor repeater terminal
A display device with operating elements for acknowledging and resetting alarms and faults.

GAP
Abbreviation for '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 PC. If there is a secondary GAP, the GAP becomes the main GAP. Can be operated as a DHCP server in the Ethernet sub-net.

Global alarming
Global alarming equipment (e.g., remote transmission) is actuated and external intervention forces (e.g., the fire brigade) are alerted.

Hardware tree
Depiction of the hardware of a fire detection installation.

IC
Abbreviation for 'intervention concept'

Intervention concept
Concept with two independent verifications: Attendance check for quick intervention on-site and intervention check for servicing measures.

Isolation
Status of one part of the fire detection installation, which suppresses the evaluation of all signals.
License key
Hardware modules for activating functions.

Line card
Card for connecting peripheral devices. The card can be a plug-in card or it can be integrated into the periphery board.

Line separator
An electronic switch which automatically disconnects the defective part of the line in the event of a short-circuit.

Local alarming
Local alarming equipment (e.g., acoustic or optical) is actuated in order to call up intervention personnel and to alert people of a possible fire hazard.

Logical channel
Depiction of a logical device function in the detection or control tree. The logical channel is always the bottom level in the structure tree.

Loop
Detector line topology which runs from the fire control panel via the fire detectors and back to improve operational reliability. This type of wiring allows all detectors to communicate with the control panel even in the event of an open line or short-circuit.

Management station
A superordinate system for monitoring and operating safety-related sites and buildings, e.g., fire, intrusion, access, heating, ventilation.

Manned
Switching status of the alarm organization, if operating personnel are present and can intervene should an event arise (alarm, fault).

Maximum current connection factor
Calculation unit for planning the detector lines. Maximum current value that a device obtains from the detector line.

Minor incident
Alarm situation which the operating personnel can handle themselves and does not, therefore, trigger global alarming.

Multi-detector dependency
When using multi-detector dependency, the danger levels of several detectors are included in the alarm decision. Measures such as alarming or closing the fire doors are only initiated when the defined dependencies occur (e.g., two detectors detect danger level 3).

Network module (SAFEDLINK)
FS20/FS720 network card.

Network tree
Figure of the network in a fire detection installation.
Parameter set
Defined detector behavior, e.g. in terms of sensitivity, resistance to deceptive phenomena, response time. Detectors can be operated with different parameter sets.

Physical channel
Depiction of a device's physical function in the hardware tree. The physical channel is always the bottom level in the hardware tree.

PMI
The arrangement of operating and display elements on a fire control panel or on a fire terminal. Includes the LEDs, buttons, the display, and the operation options such as the key switch, fire brigade control and display (FBA), and the EVAC NL Person Machine Interface.

Pre-alarm
Stage before an alarm for information early on, should an event occur.

Remote transmission
Remote transmission.

Router station
Participant in the SAFEDLINK sub-net for the connection between the SAFEDLINK sub-net and the Ethernet sub-net (FCnet/C-WEB/LAN) via the Ethernet switch (modular) FN2012-A1.

SAFEDLINK
Physical network of an FS20 / FS720 fire detection system with the network module (SAFEDLINK) and the network cable.

SAFEDLINK station
Participants in the SAFEDLINK sub-net with local connection for the PC.

Section
Level in detection tree of the fire detection system. The section is assigned to the area. It is used for combining zones.

Single-detector dependency
With single-detector dependency, the alarm decision depends on the danger level of one detector. The first detector in the zone which detects the corresponding danger level, triggers the fire alarm.

Site
Depiction of fire detection installation: The top level in the figure showing the installed system. Combines hardware tree, detection tree, and control tree.

Standalone station
Standalone station with local connection for the PC.

Standby router station
Participant in the SAFEDLINK sub-net, in redundancy to the router station, for the connection between the SAFEDLINK sub-net and the Ethernet sub-net (FCnet/C-WEB/LAN) via Ethernet switch (modular) FN2012-A1.
**Station**
Unit for system control. Fire control panel or fire terminal.

**Stub**
Detector line which is only connected to the fire control panel on one side. In the event of an open line or short-circuit, it may no longer be possible for all fire detectors to communicate with the fire control panel.

**System bus**
Loop-shaped, redundant networking by means of FCnet / C-WEB / SAFEDLINK.

**Technical message**
Events (e.g., from third-party systems) evaluated via sensors or contacts which are forwarded to the fire control panel.

**Universal control group**
Level in control tree of the fire detection system. The fire control group contains the fire controls.

**Unmanned**
Switching status of the alarm organization, if operating personnel are not present and cannot intervene should an event arise (alarm, fault).

**VdS**
Abbreviation for 'Vertrauen durch Sicherheit', a company in the Gesamtverband der Deutschen Versicherungswirtschaft e.V. (GDV). Inspection and certification body for fire detection systems in Germany.

**Visibility**
Defines which part of a site is visible and can be operated on a station.

**Zone**
Level in the detection tree. The zone has at least one fire detector. The decision on alarm is made at zone level. The zone is assigned to a section or an area.
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