

SIEMENS

FC700A

Fire detection system

Maintenance instructions

Fire & Security Products

Siemens Building Technologies

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1 About this document

Purpose

These guidelines assume that commissioning has been carried out in accordance with the existing guidelines, i.e. that all functions have been tested, system data has been saved and archived.

Scope

This instruction covers the maintenance work on the control unit type FC700A with standard equipment. They are a basic part of the general maintenance guidelines for fire detection systems and must be applied for all periodic maintenance work.

Protocol

The values to be measured (as specified in this procedure) are part of the technical documentation in the system logbook.

Target groups

This product documentation and the work instructions are aimed at the following persons, who have a particular function and have the corresponding training and qualification.

Group of persons	Activity	Qualification
Commissioning personnel	The configuration of the products, devices or systems for specific customers at the place of installation. They check serviceability and officially clear the product, device or system for use by the operator / customer. They are also responsible for trouble-shooting.	They have had the professional training appropriate to their function and to the commissioning of the products, systems and devices and have attended the technical training courses for commissioning personnel.

Reference documents

Information in	Document
007831	Hardware description
007836	Planning
007827	Installation housing H26... /H28...
007832	Visualizer Customizing / End User (not yet available)
007835	Operating instructions
007828	Installation / Hardware Commissioning
007894	Templates for inscription stripes
007895	Operating platform for Tools

Work and operational safety



Before personnel begin work on the system they must have read and understood the related operating instructions, in particular chapter 2 "Safety regulations".



NOTE

Systems or parts of systems should not be left switched off unnecessarily in order that the system is not too long out of commission.

Never connect or disconnect electronic modules while the power supply is switched on. Always switch off the mains and battery supply first.

Avoid electrostatic discharge. The FC700A hardware consists mainly of circuits with CMOS technology. When working with the modules, use the ESD protection mat. Do not unnecessarily touch components or p.c.b. tracks.

Document identification

Place	Signification
Title page	<ul style="list-style-type: none">- System names- Product type- Document purpose
Last page bottom left bottom right	<ul style="list-style-type: none">- The document number consists of: Language, number, index- Version date- Manual- Register

Modification index

Version	Date	Brief description
007833_a_en_--	03. 2004	First edition

2 Safety regulations

This chapter describes the danger levels and the relevant safety regulations applicable for the use of our products. Please read the work instructions as well as the chapter "About this document" thoroughly before beginning any work.

2.1 Signal words and symbols

2.1.1 Signal words and their meaning

The danger level that is, the severity and probability of danger are indicated by the signal words listed below. Non-observance may lead to the consequences indicated:

DANGER

Imminent danger!

- May cause serious bodily injury or danger to life!

WARNING

Dangerous situation!

- May cause serious bodily injury or danger to life!

CAUTION

Possibly dangerous situation!

- May cause light injuries!

NOTE

Possibly harmful situation!

- May cause damage to the product or to objects in the immediate vicinity of the product!

2.1.2 Symbols and their meaning

The symbols listed below indicate the nature and origin of the danger.



Signal word	General danger
--------------------	----------------



Signal word	Electrical voltage
--------------------	--------------------

Example for a danger warning



DANGER External voltage	Disconnect the module from power supply.
--	--

2.1.3 Classification and meaning of additional symbols



Tips and information



Refers to extremely important or critical decisions to be taken into account before continuing the work.

2.2 Safety-relevant working instructions

Country-specific standards

The products are developed and produced in compliance with the relevant international and European safety standards. Should additional country-specific, local safety standards or regulations concerning project planning, assembly, installation, operation and disposal of the product apply in the place of operation, then these standards or regulations must also be taken into account in addition to the safety regulations mentioned in the product documentation.

Electrical installations



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

- Control units must be disconnected from the power supply during commissioning or maintenance work.
- Terminals with an external voltage supply must be provided with a sign "DANGER - External voltage".
- Mains leads to the control unit must be installed separately and provided with a clearly marked fuse.
- Earthing must be carried out in compliance with local safety regulations.
- When work is carried out in explosion-hazardous areas, the appropriate safety precautions must be taken.

Assembly, installation, commissioning and inspection work

- If any tools or accessories such as ladders are required, safe and suitable devices must be used.
- Prevention of spurious tripping of the remote transmission must be assured.
- Always inform the fire brigade before testing the remote transmission.
- The activation of fire control installations for test purposes must not cause damage to the system or parts thereof.
- Fire control installations must only be activated after the test has been completed and the system has been handed over to the customer.
- Third party systems or devices must only be activated in the presence of the responsible person.
- When work on management stations and system terminals are performed, the safety regulations of the connected sub-systems must be observed. This especially applies when switching-off system components.
- In the case of extinguishing systems, always use the "General installation instructions" as a guideline. This guideline is available on request.

Testing the product operability

- Evacuate and cordon off extinguishing sector.
- Inform people about the possibility of occurring fog and noise.
- Inform people before testing of alarm devices; take the possibility of panic reactions into account.
- Inform the alarm and fault receiving stations connected to the system before running the tests.

Modifications to the system design and the product

Modifications to a system or to individual products may cause faults or malfunctioning. Please request written approval from us, and the relevant authorities concerning intended system modifications and system extensions.

Modules and spare parts

- Locally procured modules and spare parts must comply with the technical specifications laid down by the manufacturer. This compliance is always ensured for original spare parts supplied by us.
- Only use fuses with the specific fuse characteristics.
- Wrong battery types and improper battery exchange may introduce the danger of explosion. Only use the specified battery type or an equivalent battery type recommended by the manufacturer.
- Batteries require environmentally safe disposal. They must be handed in at the local collecting points.
- Please take into account that the extinguishing agent cylinders are pressurized and must be exchanged in compliance with the local safety regulations.

3 Test and measuring equipment

Multimeter

Accuracy $\leq 2\%$

Internal resistance $\geq 20k\Omega$

Measuring ranges 1 to 500VAC / DC, 100mA to 5ADC, 10Ω to $10M\Omega$

Battery test set

Load resistor 5Ω

Maintenance-PC

System requirements see document 007895

Detector tester

Depending on detector type / detector system

- For all detectors **OP620**, **OH620** and **HI62x**
 - Detector exchanger DZ1191
 - Detector exchanger and tester DZ1193
- For smoke detectors **OP...** and **OH...**
 - Detector tester RE6 and test gas
- For heat detectors **HI...**
 - Detector tester RE6T
- For smoke detectors **DLO1191**
 - Detector tester RE10
 - Adjustment set DZL1191
- For flame detectors **DF1191/92**
 - Test lamp LE3, StabexHF for explosion hazard areas

Line tester

Depending on detector type

- For **collective** detector lines
 - Alarm test probe (5.6V Zener diode with 220Ω resistor)
- For **addressable** detector lines
 - Line test unit DZ1131

4 Preparatory work

Information of system owner

Inform the system owner how much work is involved and the time required completing it. Point out that system operation will be reduced.

In large systems, an out-of-commission report must be filled in and signed by the system owner.

Blocking of system parts

Blocking of:

- Remote alarm (advise monitoring station)
- Fire control installations and means of alarm

Time schedule

Time schedule must be determined with the system operator for the following test sequences:

- Alarm tests (incl. remote transmission)
- Performance check of fire control installations
- Any follow-up training
- Any clarification

5 System data

System logbook

Is the system logbook available and up-to-date?

Remote transmission

Are the telephone numbers and the names of the remote transmission recipients up-to-date?

System disk

Is the system data disk available and up-to-date?

If configuration changes are made, then update the system disk. One disk remains with the system and a copy is filed with the project-engineering department.

If no modifications are made, a new copy of the disk must be made every 5 years in order to prevent loss of data through ageing.

The date of the new version must be recorded in the logbook.

Equipment program

Check the equipment program version printed on the EPROM label. Replace older software versions with the latest if new functions and/or error corrections call for it.

Event memory

Check the content of the event memory and take the necessary counter-measures. Replace all detectors in "Drift" conditions.

Change of use

Inspect all reported changes to the building, especially rooms with new utilization. Make all necessary modifications to the FC700A system with regards to this change.

Planned modifications

Check whether all modifications have been carried-out, e.g. changes to diagrams, fire department plans?

6 Power supply check

Current consumption

Perform measurements of current consumption during emergency power operation and alarm mode at the highest alarm level (ALARM II and REMOTE ALARM).

Compare the measured value with the calculated value for emergency power capacity.

Batteries

Check of the batteries condition.

- Measure **batteries voltage** (min. 23.0V), asymmetry max. 1V.
- Measure **charging current**.
- **Battery load check**.

A load check may only be carried out if the battery charging current is less than 50mA.

Procedure:

1. Disconnect the batteries from the charging unit. Do not overstress the battery connections.
2. Connect the battery test set (5Ω resistor) via the two batteries and load for 30 minutes.
3. Measure the batteries voltage with connected test set.
During test, the battery voltage may not fall below 11.0V per battery and via both batteries not below 23.0V. Batteries with lower voltage must be replaced.

Power supply fault

Check one by one the following conditions:

1. Mains connection interruption = MAINS FAILURE.
2. Battery disconnection = BATTERY FAULT.

Mains

Has the mains lead been correctly protected with fuses and labelled (as "Fire protection system") at the customer's power distribution panel?

Are any surge protectors used still functioning correctly? If the mains fuse has blown due to lightning (ask customer), exchange surge protector.

Lithium batteries

Check the lithium auxiliary batteries by disconnecting the power supply for approx. 15 minutes.

After switching-on again, check the date, time and fault message. If there is any loss of date, replace the corresponding unit.

7 Control unit check

Hardware

Assess the condition of the housing, visual check on hardware modules and batteries.

Check mounting screws, terminals and plug-in connections.

8 Control terminal check

Hardware

Check conditions visually.

Earth connections

Repair damaged earth connections.

Labelling

Are the display equipment inscription strips correct and still clearly readable?

Performance check

Procedure:

1. Login by entering operating code.
2. Activate lamp test.
3. Check operation at PRESENT / ABSENT.
4. Switch 1 zone on/off.
5. Activate 1 ALARM, acknowledge and reset.
6. Activate 1 FAULT, acknowledge and reset.
7. Log-out.

Cleaning

Clean display window and front panel with mild soap. Do not use abrasive solvents.

9 System performance check

The operation and checking of indicators must be take place at the control unit terminal (Main terminal).

Modes for detector test

Two different modes can be chosen:

1. Detector test mode

- Alarm devices and control functions are disabled.
- If the detector responds, it signals, "Test activation" for about 10 seconds with alarm indicator blinking.

2. Installation test mode

- All control unit functions work normally; alarm devices and control functions are enabled.
- If the detector responds, it activates ALARM, the alarm indicator flashes. ALARM must be operated in the normal way.

For both test modes, in order to speed up the response time, the detectors themselves are switched to a special test mode bypassing the signal processing algorithms.

→ For details, refer to operating instructions document 007835

9.1 Schedule for the performance check

Detector self-test

Through the detector self-test the detectors are subjected automatically to an extensive electrical function check. However, it is still necessary to conduct a physical function test on site in regular intervals.

Recommendation

A visual check of the detectors must be performed once per year. Detectors that are strongly soiled or which are mechanically damaged must be replaced. Check the system for changes of use.

Intervals

We recommended the following schedule for the performance check. However, local national regulations have priority.

		Interval in years		
		1	2	5
SW clock	Check of date and time.	✓		
Detection lines collective	Check each line by means of detector activation and verify display.	✓		
	Activate all automatic fire detectors (can be done by customer).	✓		
	Activate 1 manual call point for each line.	✓		
	Activate all manual call points.		✓	
	Check detectors visually for soiling and proper application.	✓		
	With each line, check whether short-circuit or open line (remove detector) activates a FAULT signal.			✓
	Overhaul at the factory of all automatic fire detectors.	See chapter 9.2		
	Detection lines addressable	Activate 1 automatic detector and 1 manual call point for each line.	✓	
Activate all automatic fire detectors.			✓	
Activate all manual call points.				✓
Activate "Reconfigure D-Bus" for all lines.		✓		
Check detectors visually for soiling and proper application.		✓		
Check of the function of I/O modules (DC1192, EB, AB, ABI).			✓	
Check for each line whether a short circuit / open line activates a FAULT signal. → Check the loop line function. → During the short circuit also check the isolator function.				✓
Overhaul at the factory of all automatic fire detectors.		See chapter 9.2		

		Interval in years		
Fire control installations	Check activation up to and including interface.		✓	
	Check customer system shutdown operations (work charged to the customer or carried out by the customer himself). Fix a time schedule with the customer.		✓	
Emergency operation function	Activate ALARM with reset button depressed: <ul style="list-style-type: none"> - Collective lines with test probe (1 line per collective module). - Addressable lines with 1 detector per line. → Check activation of remote transmission. → Verify indicators on emergency operation FT.		✓	
Alarm organization	Check the functioning of the delay times V1 and V2.	✓		
	Check of the delay time at mains failure.	✓		
	Alarm activation by automatic fire detector set to ABSENT = ALARM II.	✓		
	Alarm activation by manual call point set to PRESENT and ABSENT = ALARM II.	✓		
	Verify the automatic switchover PRESENT / ABSENT using event memory entry.	✓		
	Check activation of remote transmission equipment with ALARM II.	✓		
	Check WARNING level by activation of a zone via FT.	✓		
Alarm equipment	In emergency power operation mode, check all alarm devices according to status level: <ul style="list-style-type: none"> - WARNING - ALARM I - ALARM II - REMOTE ALARM - FAULT 	✓		
	Check the activation periods (if programmed) for PRESENT and ABSENT modes.	✓		
	Check the remote transmission equipment according to instructions provided by the remote transmission equipment supplier.	✓		

9.2 Intervals for the detector overhaul at factory

- Heavy-duty applications in industrial areas (chemical processes, conveyor belts for raw material etc.) were not taken into consideration in the standard values below. The values have to be adapted accordingly.
- HI62x will not be overhauled at the factory.
- All detectors must be activated during "Detector test mode" after detector overhaul.

	Application range	Risk	Interval in years
Addressable Synova™ 600 detectors	Clean	Standard	6
		High	5
	Moderate soiling	Standard	5
		High	4
Collective Synova™ 600 detectors	Clean	Standard	5
		High	4
	Moderate soiling	Standard	3
		High	2

Definitions:

Application range "Clean", e.g.:

- EDP rooms
- Offices
- Theatre, museum, churches, hotel guest rooms
- Meeting halls, exhibition halls
- Department stores, shopping halls
- Hospitals

Application range "Moderate soiling", e.g.:

- Storage and stock rooms, warehouses
- Production halls and assembly areas
- Cable ducts, risers, elevated floors
- Wood industry, textile industry

High risk, e.g.:

- Rooms and areas with high value concentration or sensitive work processes.

10 Concluding work

Alarm test

Carry out an alarm test with remote transmission in the presence of the customer / system operator.

Training

Provide follow-up training.

System logbook

Check the system log book if it is complete and updated.

System disk

If changes have been made to the control unit configuration, update the system disk and send a copy to the project-engineering department.

Customer data

Check the customer data sheet (telephone no of contact person, etc.).

Spare parts

Refurbish spare parts like fuses, detectors, etc.

Deactivations, zone isolations

Restore all systems or parts of systems to their active status.

Confirmation

Have the customer / system operator sign the service report?

Siemens Building Technologies AG
Alte Landstr. 411
CH-8708 Männedorf
Tel. +41 1 - 922 6111
Fax +41 1 - 922 6450
www.sibt.com