



Panasonic

Technical/Programming Manual

FT1020G3

Rev 2.2.1

For Software V2.2.x

firetracker

FT1020G3 CIE

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1 Introduction

1.1 General introduction

FT1020G3 Technical / Programming Manual is a document with information of special interest for planning engineers as well as service / commissioning engineers.

This document should be read in conjunction with FT1020G3 Operation Manual since most of the information in one of the documents is not found in the other document and vice versa.

It should also be read in conjunction with the FT1020G3 connection diagrams according to the drawings / connection diagram list on Table 20 page 183.

When planning a fire alarm installation, the Australian standard AS1670.1 requirements must be followed. Detector type, detector coverage area, detector spacing and special applications in the building, etc. are concerns for the planning engineers and are not covered in this document.

Due to continual development and improvement, different S/W versions are to be found. This document is valid for **S/W version V2.2.x**. On the date / revision date of the document **x = 0**.

A **product** may be one of the following:

- FT1020G3 CIE Configured for 510 or 1020 alarm points and with or without printer.
- FT1020G3 CIE without front configured for 510 or 1020 alarm points.
- FT1020G3 CIE with 2 x 5010 and one front to increase the number of COM loops to 8 and optional I/O matrix board applications.

Hardware H/W:

A H/W (e.g. a printed circuit board) has:

- a part number (e.g. 5010)
- a product name (e.g. FT1020G3 Main Board 512 alarm points)
- a **PCB number** (e.g. **9290-2B**) and can also have a configuration (e.g. **CFG: 2**) and a revision (e.g. **REV: 1**)
- sometimes a **S/W**

Software S/W:

A S/W has:

- A version number (e.g. V2.2.x)
- Sometimes additional information, such as Convention (different functions / facilities), Language, etc. added.

PC S/W:

A PC S/W is a program used for programming, commissioning, etc. e.g. EBLWin. It has a version number e.g. V2.2.0.

1.2 Definitions / Explanations

Definitions / explanations / abbreviations / etc. frequently used, refer to FT1020G3 operation manual.

Refer to FT1020G3 Operation Manual for more details.

2 Overview

2.1 The FT1020G3 system

FT1020G3 is a microprocessor controlled intelligent fire alarm system, intended for Analogue addressable smoke detectors, as well as conventional detectors and manual call points. Programmable control outputs and output units are available. Up to 1020 addresses can be connected to each Control Unit (CIE). Figure 1 presents an overview of the FT1020G3 System.

FT1020G3 is available in several types, versions and configurations. It can be used as stand-alone Control Unit or connected to a TLOn network, i.e. in a "system" with up to 30 Control Units. Each Control Unit has access to all information.

FT1020G3 is designed and assessed to the Australian Standard AS7240.2, AS7240.4 and NZS4512:2010. The Fire Brigade Panel controls and indicators are incorporated as part of the faceplate and conform to AS4428.3:2010.

2.1.1 Printer

The Control Unit FT1020G3 can be fitted with an optional printer¹.

2.1.2 Expansion boards

Up to six expansion boards can be mounted in FT1020G3 CIE. The following expansion board types are available:

Product type no.	Product name
4580	8 zones expansion board
4581	8 relay outputs expansion board
4583	Inputs and outputs expansion board

For more details, refer to chapter "Expansion boards 458x", page 24 and drawings F728, F729 and F731.

2.1.3 Power supply

The primary power source is a switch mode power supply, 230 V_{AC} / 24 V_{DC}, 6.5 A (150 Watt).

The standby power source is a backup batteries (2 x 12 V). In the standard cabinet, up to 24 Ah batteries can be fitted. Larger batteries (up to 65 Ah) require additional battery box.

The batteries and the switch mode power supply are connected to the Main board (5010). See chapter "Power supply", page 177 for more information.

2.2 Software (S/W) versions

Due to continual development and improvement, S/W versions are being updated from time to time. When a new FT1020G3 Control Unit is required to be installed in a network system with "older" Control Units, the software in the older Control Units must be updated (or download an older version in the new Control Unit). **The S/W version must be the same in all Control Units** in a TLOn network.

¹ Printer 5058 is a spare part for the FT1020G3 with a printer, i.e. it comes without a mounting frame etc.

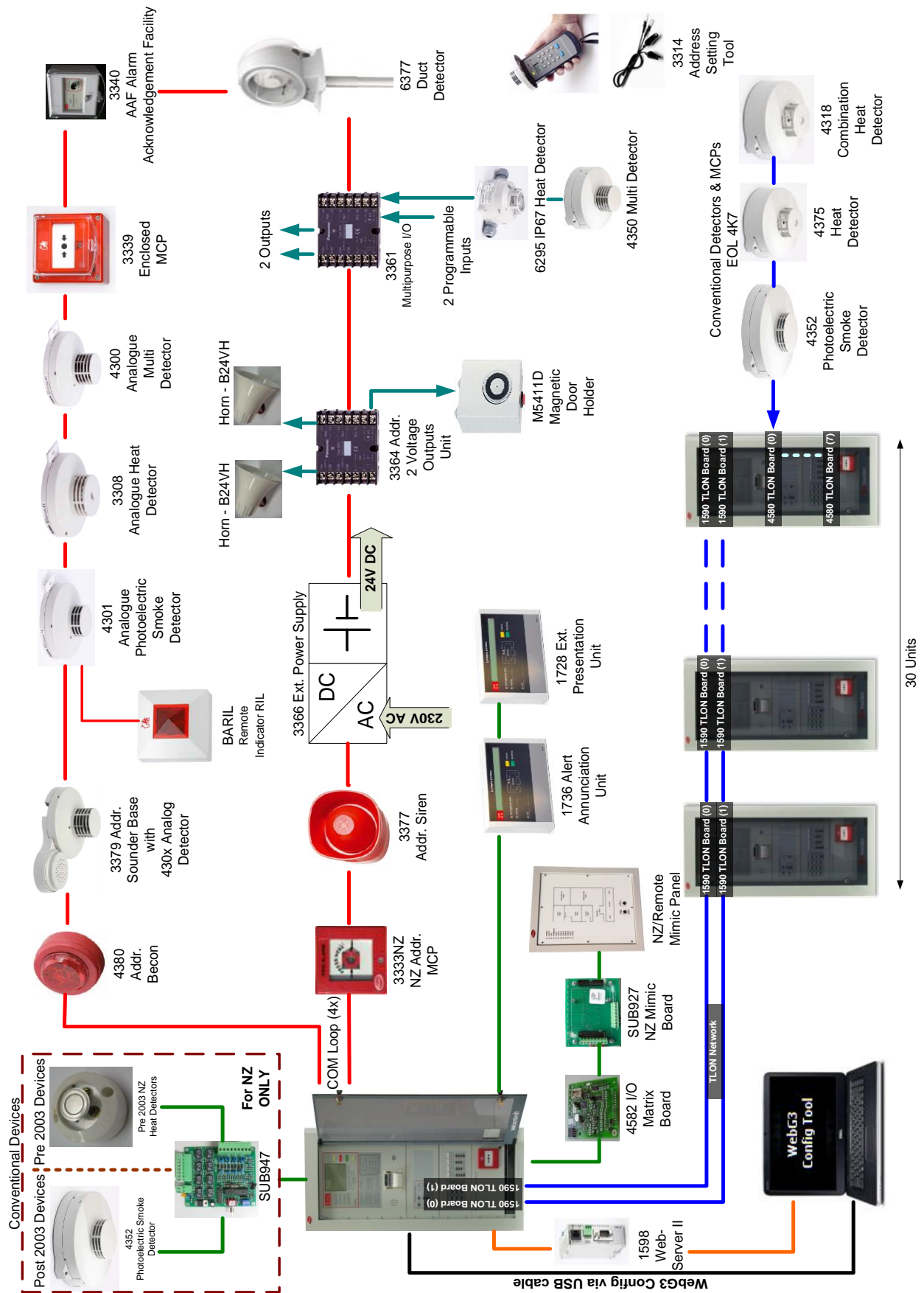


Figure 1 FT1020G3 System Overview

2.3 Documents

The following documents are available:

- Technical / Programming Manual (this document)
- Operation Manual
- Connection diagrams

Information found in one document is normally not to be found in another document, i.e. the documents complement each other. Product Leaflet for FT1020G3 and other units are available on Brooks web site: <http://www.brooks.com.au>.

Some important information might exist in the operation manual as well as this manual e.g. specifications / limitation, SSD and software download, etc.

2.4 Applications

The FT1020G3 system is intended for small, medium and large size installations. The intelligent Control Units offer the system designer and end user a technically sophisticated range of facilities and functions. Programming (PC software **EBLWin** and TLON Manager) and commissioning of the Control Units / system is very easy.

Start with one Control Unit and then when it is required, add more units. The TLON network makes it possible to install the Control Units in one building or in many buildings.

Separate documents are available for TLON Manager, Web-server, etc.

2.5 PC software (S/W)

The following PC programs are used together with the FT1020G3 system. For standalone FT1020G3, the TLON Manager is not used.

2.5.1 EBLWin

The PC program **EBLWin** is used for programming and commissioning of one or more Control Units, i.e. to:

- Autogenerate, i.e. to identify the units connected on a COM loop and make default settings, which can be edited, saved and used as site specific data (SSD).
- Create, download and backup (upload) of site specific data (SSD)
- Download new system software version, settings, conventions, configurations, Control Unit & system properties, etc.
- Create and download the user definable alarm text messages shown in the display in the Control Units and other Display Units (1728 & 1736).
- Display the fire alarms, faults and disablements as well as reset, acknowledge and re-enable, etc.
- Configure the Web-server II (5098); create and download / make a backup (upload) of the configuration data as well as download of Web-server software.

The **EBLWin** must have the same version number as the system software EBL512 G3 version number e.g. **2.2.x** and **2.2.x** respectively. Only x may be different, it indicates a small correction and is not required to be the same.

Old SSD files can be opened in a newer (higher) version of **EBLWin**, saved, edited and thereafter downloaded to an FT1020G3 units with the corresponding version.

EBLWin key 5094 is a USB dongle that is required on your PC in order to gain access to log on and download SSD files.



Notes: The SSD files saved in one version of EBLWin is not backward compatible with any other earlier versions of PC configuration e.g. WinG3.

It is highly recommended to backup (upload) the SSD file before the system software (EBL512 G3) can be downloaded,

2.5.2 TLON Manager

The PC program **TLON Manager** is used for the TLON Network programming, installation, etc. (TLON Manager 1.2 and TLON Manager 2.0.x can be used).

For more information refer to the TLON Manager technical manual and the next chapter.

3 TLON Network

For further details refer to "TLON Technical / Operation Manual" M437, see also chapter "TLON connection board 5090" page 50.

3.1 FT1020G3 TLON network

FT1020G3 system can be **one Control Unit (CIE)** or up to **30 Control Units** connected in a **TLON Network**.

In a TLON Network, each Control Unit operates independently but has nevertheless total access to all information in the system.

In a system with two or more Control Units in a TLON Network, pay attention to the following:

- A zone **must not be distributed over the system**, i.e. all alarm points in a zone have to be connected to one CIE
- When the "Fire door closing" function is used, the alarm points and the outputs activated by these alarm points must be connected to the same CIE
- When the interlocking function is used, the input, output and the Interlocking Combination (area-point) must be connected to one CIE. An input and an output can only be used in one Interlocking combination.
- When the AAF function is used, all devices within the same AAFC zone must be connected to the same CIE.

3.2 Redundant TLON Network

The FT1020G3 system can be build up as a **single TLON Network** or as a **redundant TLON Network**.

A single TLON Network is only allowed when more than one main board (5010) are mounted in the same cabinet. In this case, only one TLON connection board (5090) is required to be plugged in the main board. Whereas in a distributed systems, redundant TLON Network must be used, 2 TLON connection boards (5090) have to be used in each Control Unit.

In the single TLON Network, only one network (Network no. 0) connection is used but in a redundant TLON Network, two networks connections (Network no. 0 and Network no. 1) must be used. In normal conditions, Network no. 1 is only supervised / monitored until Network no. 0 fails to establish the communications between the control panels.

The redundant TLON Network supports full functionality. In case of a network fault (i.e. open circuit or short circuit) in one of the TLON networks, a fault for this TLON Network is generated as shown in the following fault message:

FAULT: Control Unit xx has no contact With control unit xx, network x
--

Where network x = Network no. 0 or Network no. 1.

3.3 Routers

In a TLON network, it is recommended to use TP/FT routers in order to split the TLON network into separate FTT-10 channels / segments with the following objectives:

- Provide galvanic isolation between TLON segments.

- Increase the maximum cable length between TLON segments.
- Reduce unnecessary communications traffic on the respective network links.
- Improve efficiency of the communications channel.
- Up to 6 control panels can be connected to one channel i.e. one segment.

When the TLON is divided into more than one segment, the short circuit will affect the communication between the Control Units in this segment only, the communication between Control Units in other segments are not affected. The fault messages will be generated in every Control Unit. However In a redundant system, the network will continue to communicate via the second TLON network.

Dividing the TLON network into segments may assist in fault finding, faults on the network e.g. disturbances etc., will be easier to locate and service.

Note: In retrofit network application where the cable integrity is uncertain, routers may also be required to improve the communications between the TLON segments.

The recommended TP/FT10 router is LPR10, Brooks stock number **FTG3 ROUTER**. It is also recommended to use the DIN rail mounting plate, stock number **FTG3 ROUT PLATE**.

3.4 Network connections

The communications between control panels in a network system can be established using one of the three following options:

3.4.1 Twisted pair TLON network

The twisted pair cable connection between control panels and cable specifications are shown in drawings F738-01, F738-02 and F738-03.

The recommended cable is twisted pair 1.5 mm², Brooks stock number BCA0898 or equivalent. 1 mm² Twisted pair cable can also be used depending on the distance between the control panels. If a screened cable is used, the shield must be connected to the CIE earth point.

3.4.2 Fibre optic TLON network

Third party TP/FT10 to fibre optic routers have become obsolete e.g. LRW112 series. However LRW102 series repeaters are still available.

It is possible to connect a TP/FT10 channel to a fibre optic channel using a Fibre Optic to TP/FT10 repeater.

A fibre optic network communications can be achieved by using fibre optic repeater e.g. LRW102 in conjunction with a TP/FT10 router e.g. LPR10. This combination replaces the fibre optic routers LRW112 series when more than 10 control panels connected in a TLON network. Great care shall be taken during planning, installation and commissioning.

The fibre optic link offers an easy way to extend the distance between TLON network segments using high speed back bone fibre optic network link. The maximum distance between the fibre optic routers varies between 5 Km to 30 Km depending on the type of fibre.

The fibre optic solution to network FT1020G3 control panels is shown in Figure 2 and Figure 3 below. The LPR10 router must be used when the number of networked control panels is more than 10 panels as shown in Figure 2.

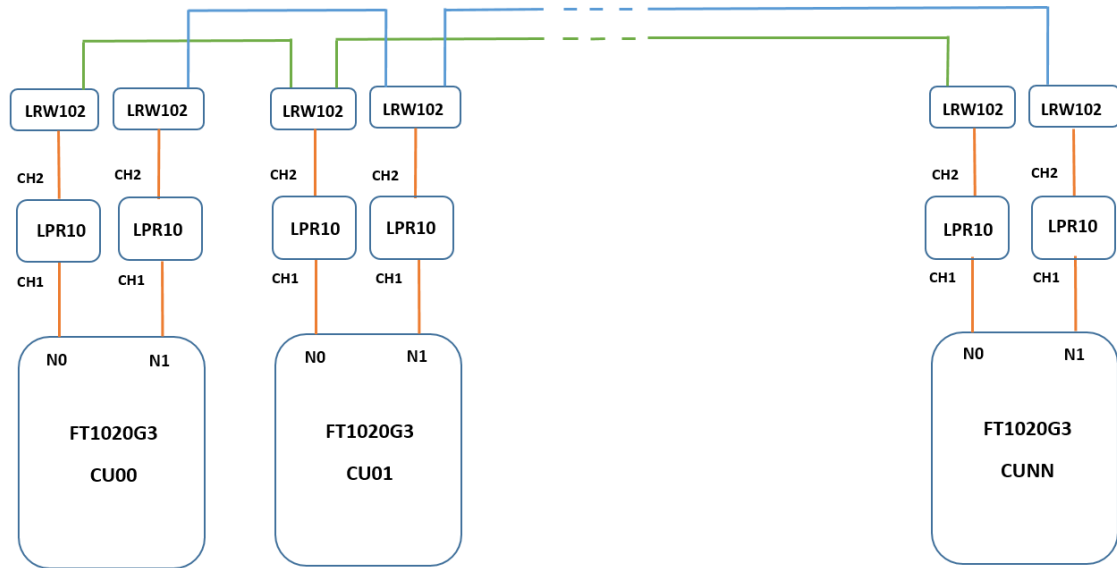


Figure 2 Redundant fibre optic network for more than 10 control panels

When a number of control panels less than 10 is required in a TLON network, the traffic will not be very heavy and the LPR10 router may not be required as shown in Figure 3

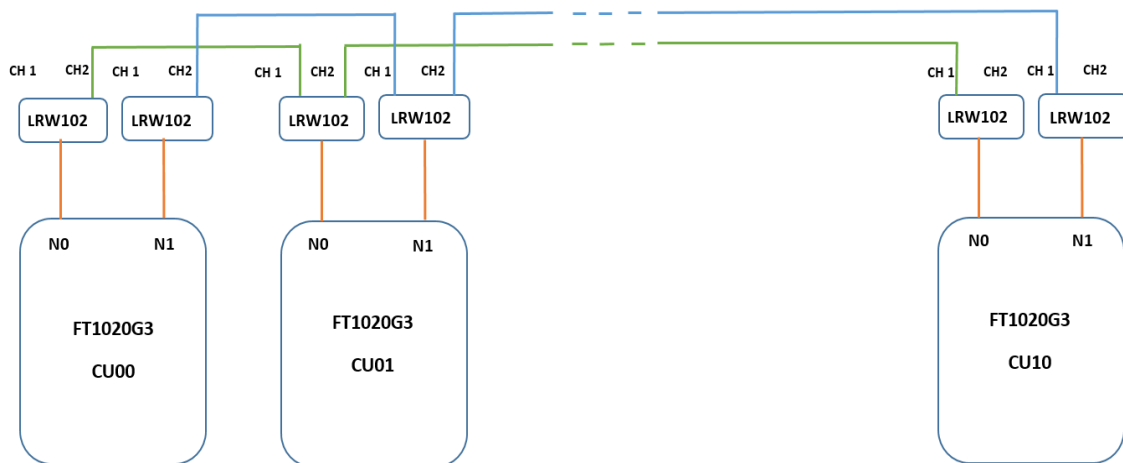


Figure 3 Redundant fibre optic network for up to 10 control panels

The type of fibre optic repeater is dependent on the cable type e.g. single or multi-mode, distance between C.U.'s, etc. Care must be taken when selecting the repeater type.

Note: A TLON network of FT1020G3 control panels may consist of fibre optic segments and twisted pair segments.

3.4.3 TCP/IP TLON network

LonWorks Internet server such as iLon 600, can be used as an internet (or any IP-based LAN or WAN) pathway for TLON.

The transition from TP/FT10 to IP network opens the opportunity to use a large range of infrastructure products e.g. fibre optic converters.

Note: a network of fire alarm system is always connected via a dedicated network wiring, great attention must be taken when choosing an IP network as a pathway for TLON should be used for autonomous Control Units only. The efficiency of the IP based communication is dependent on the efficiency of the infrastructure of the IP network.

4 Control & Indicating Equipment

4.1 FT1020G3 Specifications

The specifications of FT1020G3 Control Panel are shown in Table 1 below and the system limitations are shown in Table 2 next page.

Table 1 Control Panel Specifications

Item	Specifications
Mains Voltage	230VAC (176-264), 1.6A
System Voltage	24VDC @ 6.5A
Current Consumption	Quiescent / alarm current is dependent on other equipment fitted in FT1020G3, type and number of expansion boards, connected external equipment, etc. ² .
Ambient Temperature (°C)	Operating 0 to + 40, Storage -40 to +70
Ambient humidity (%RH)	Maximum 90, non-condensing
Size (mm)	Standard cabinet 920H x 450W x 210D (with metal door closed) ³
Enclosure Material	1.5 Zinc anneal steel
Enclosure Colour	Oyster, powder coated, ripple finish
Approvals	AS7240.2, AS7240.4, AS4428.3:2010 and NZS4512:2010
Standard Inputs / Outputs ⁴	Four COM loops (0-3), each loop can connect up to 255 devices
	Four non-supervised inputs
	Four programmable Supervised voltage outputs, 0.75 Amp each
	Two programmable relay outputs, contact rating 2 Amp
	Four programmable clean contact (N/O or N/C) inputs (I0-I3) ⁵
	Two non-programmable relay outputs for ASE (fire & fault)
	Six x 24V outputs for Web server, ASE, remote display units, external applications 2-4 Amp.
Expansion Boards	Max. 6 of 4580, 4581 or 4583 ⁶
I/O Matrix 4582 board	Max. 24, 6 per COM loop if no expansion boards on Loop 0 ⁷ fitted. Up to 6 modules can be used as zone or generic + 18 Fan control modules (4 fans per module) ⁸

² Refer to chapter "Current consumption" page 173 and the current calculation spread sheet.

³ Medium size enclosure 630H x 450W x 210D can be used to fit limited number of options. A combination of large and medium size enclosures can be used if more options required. In 19" rack cabinets, a series of 19" face plates are also available.

⁴ Refer to G3 block wiring diagram, drawing no. F765

⁵ First input I0 cannot be used in NZ convention, only 3 programmable inputs are available.

⁶ Expansion boards are internally connected to COM loop 0, ensure total number of expansion boards and I/O matrix boards connected to COM loop 0 does not exceed 6. Software 2.1.1 allows to use 6 x 4583.

⁷ Reduce the number of 4582 connected to COM loop 0 by one for every expansion board used.

⁸ If no expansion boards fitted, up to 24 fan control modules can be used i.e. 96 individual fans

Table 2 Control Panel Limitation

Item	C.I.E.	Network System
General fire alarm via programmable input	100	
External fault via programmable input	50	30 x 50
Programmable inputs	512	
Programmable outputs (= control expressions) ⁹	512	
Technical warnings	100	30 x 100
Addressable 2 voltage outputs unit 3364	40	
External display units	16	30 x 16
Interlocking Combinations	400	4000 ¹⁰
Presentation numbers / alarm points ¹¹ that can be presented in the display(s) in case of fire alarm	512	512
Presentation numbers ⁸ that can be programmed	512	30 x 512 = 15 360
Zones that can be programmed	512 ¹²	999
Faults		300
Disabled zones		512
Disabled alarm points (zone/address) + Disabled COM loops		200 ¹³
Disabled outputs		200 ¹⁴
Disabled interlocking outputs		200 ¹⁵
Sensors activating SERVICE signal		200
AAF zones (Max. 5 detectors per AAF zone.) ¹⁶	100	30 x 100
Total number of expansion boards 4580, 4581 and 4583 ¹⁷	6	30 x 6
Number of I/O matrix boards 4582 ¹⁸	24	30 x 24
Total number of 4582 for zone control and generic applications	6	30 x 6
Number of user definable text message programmed per 1728 and 1736	617	

⁹ Approx. 4000 trigger conditions can be used in these control expressions, more outputs can be used without control expression (V2.1.1 and higher).

¹⁰ Max. 100 user definable texts can be displayed "at the same time".

¹¹ Presentation number is a ZONE only or ZONE – ADDRESS.

¹² Any zone number between 001 and 999 can be used for the 512 zones.

¹³ Zone/address disabled via time channel not included.

¹⁴ Control outputs disabled via menu H2/B3 and Alarm devices disabled via menu H2/B4 are not included.

¹⁵ Interlocking outputs disabled via menu H2/B3 are not included.

¹⁶ Used in conjunction with the Alarm Acknowledgement Module (AAM).

¹⁷ Expansion boards 4580, 4581 and 4583 are physical connected to COM loop 0

¹⁸ Reduce no. of 4582 boards by one for every expansion board used (4580, 4581 or 4583).

4.2 FT1020G3 CIE Layout

The FT1020G3 available in many configurations depending on the number of options fitted in the CIE.



Figure 4 The FT1020G3 Control Unit, with printer

The FT1020G3 control and indicating equipment (CIE) shown in Figure 4 is housed in a powder coated metal cabinet, colour is oyster. The cabinet has an inner and outer door. The outer door is fitted with 003 keys to provide access level 1 and is made of tinted high impact plastic and allows easy viewing of all indicators and controls.

Access to the inner door is gained by opening the outer door which then provides access to the inner door fixing screws. Opening the inner door allows access to the Control Unit hardware for the purpose of maintenance or servicing

The fire brigade panel (**FBP**) forms integral part of the control panel (**CP**) as shown in Figure 5 below, it is used by the fire brigade or fire services personnel to see which alarm point(s) / zone(s) having activated fire alarm and to take required operational control of the system. In the graphical display, the information displayed in the upper part is dependent on how many alarm points / zones having activated fire alarm. In the middle part, the fire alarms will be shown, i.e. one alarm point or one zone together with a user definable alarm text (if programmed) plus some other information.

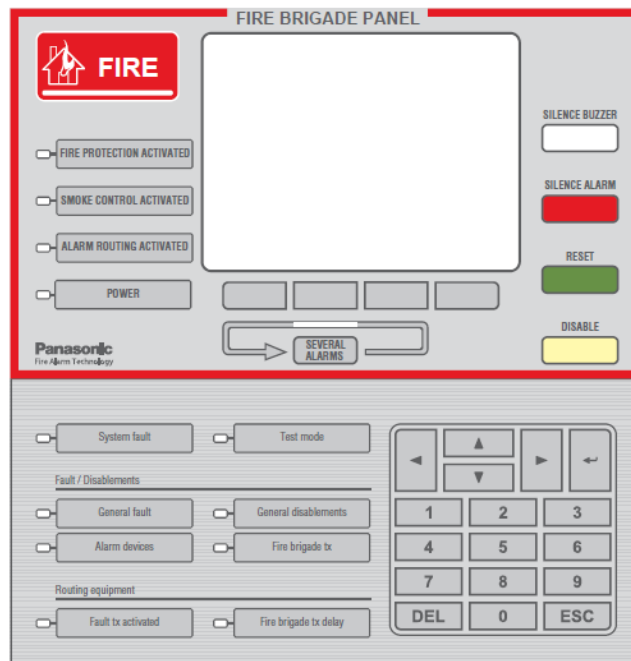


Figure 5 FT1020G3 front display

The **CP** is used to "communicate" with the system, i.e. for commissioning, routine tests, maintenance, etc. Access codes for different access levels are required. A keypad is used to get access to the system (a menu tree with main and sub menus) and for operational control of the system. Up to ten **User names** can be used for three different **User level types**. A **Password** (six digits) for each User name is required¹⁹.

The CP has several system status LEDs and a keypad.

Note: Regarding LED indicators, keypad / push buttons / soft keys, user level types and for more information, see FT1020G3 Operation Manual.

Each FT1020G3 Control Unit has the following basic configuration:

- Oyster metal cabinet with acrylic door
- MMI board (5011), see drawing F727
 - ☞ FT1020G3 front with display
- Main board (5010), see drawing F726
 - ☞ Four COM loops (0-3) to which the loop units are connected, for connections and more information, see drawing F784-01, F784-02 and F733.
 - ☞ Four programmable supervised voltage outputs (S0-S3), for connections and more information, see drawing F732-02.
 - ☞ Two programmable relay outputs (R0-R1), for connections and more information, see drawing F732-02.
 - ☞ Four programmable inputs (I0-I3)²⁰, for connections and more information, see drawing F732-02.

¹⁹ The same User names and Passwords (for the different user levels) can be used for logon to the Web-server.

²⁰ In NZ convention, only I1, I2 and I3 are available i.e. Input I0 cannot be used

- ☞ Six x 24 V_{DC} power supply outputs for Web-server II (1598), routing equipment and external equipment requiring battery backed supply. Connections and more information, see Drawing F732-01.
- ☞ Two non-programmable relay outputs for routing equipment (Fire alarm output for Fire Brigade TX and Fault output for Fault TX). For connections and more information, see drawing F732-02.
- ☞ Space and connectors for two TLON connection boards 5090, See drawing F726 and F732-03.
- ☞ RS485 and 24V_{DC} outputs for Display Units (1728 & 1736), for connections and more information, see drawing F765.
- ☞ Connector for expansion boards (4580, 4581 & 4583), for connections and more information, see drawing F728, F729 and F731.
- ☞ Connectors for Web-server (1598), for connections and more information, see drawing F734.
- ☞ Connectors for Battery charger DC in and battery termination.
- Power supply, see chapter "Power supply", page 177. Connections and more information, see drawing 765.
 - ☞ Switched mode supply, 230V_{AC} / 24V_{DC} (150 Watt).
 - ☞ Space and connection cables for two Sealed Lead-Acid backup batteries.
 - ☞ Battery temperature sensor.
- Space for up to six **optional** expansion boards (458x) mounted on two expansion boards mounting kits.
- Space for different brigade (ASE) interface brackets e.g. Romtec, Tyco ASE, etc.
- Depending on the system requirements and the space available, the following options can be added to FT1020G3:
 - ☞ Occupant Warning System, 60W, 120W or 250W
 - ☞ AS1668 Fire Fan Control Card
 - ☞ Zone status indications and control card
 - ☞ Gaseous Extinguishing System
 - ☞ NZ Fire Brigade mimic display
 - ☞ MDH control

See following chapters for more and detailed information.

4.2.1 Mounting plates

The FT1020G3 control panels are equipped with different front and rear mounting plates to suit mounting of compatible equipment, optional application boards and the optional printer.

4.2.2 Mounting plate for 19" mounting rack

When FT1020G3 units are required to be mounted in a 19" mounting rack or cabinets, the standard mounting plates can be replaced with 19" rack mounting plates.

4.3 COM loops

Each FT1020G3 has four COM loops (0-3) to which the loop units are connected. Connections according to drawing F733.

On each COM loop, up to 255 COM loop units can be connected (COM loop address 001 – 255). The exact number of loop units and the cable length are dependent on the cable type (cable resistance) and the total COM loop unit current consumption (i.e. the type and number of loop units). Regarding type and number of COM loop units in relation to the cable length / type, see drawing F733 and chapters "FT1020G3 cable length", page 170 and "Current consumption", page 174.

NOTE: In total, up to 1020 (4 x 255) COM loop units can be used.

Each COM loop unit has a COM loop address (e.g. 123) and depending on the loop number (e.g. 0) and the Control Unit number (e.g. 04), each COM loop unit has a technical number (040123). Each alarm point and zone line input has a fire alarm presentation number (Zone-Address), e.g. 001-01. See FT1020G3 Operation Manual for more information.

Normally the communication (and power supply) direction alternates every 22 second. When the communication is in the COM loop A-direction, the COM loop voltage is checked when the COM loop cable returns to the Control Unit. The voltage has to be > 12 V DC. If not, a fault will be generated.

4.4 Programmable voltage outputs (S0-S3)

The 24Vdc outputs S0-S3 are supervised (monitored)²¹. One to five 33K resistors can be connected, for connection diagram, refer to drawing F732-02. When all connections are completed, a calibration has to be performed, see chapter "Calibration of supervised outputs" (menu H5/A1)", page 122 and the FT1020G3 Operation Manual. The calibration value should be 1K-50K.

Each output has to be programmed via EBLWin for the following:

- Type of output (Control, Alarm devices, etc).
- Output signal period (steady, pulse, delay, etc.).
- Supervised / non-supervised.
- Logic, i.e. normally low (default) or normally high (24Vdc).
- Control expression (contains one or more trigger conditions).

See also chapter "Programmable outputs", page 79.

4.5 Programmable relay outputs (R0-R1)

Connections according to drawing F732-02. Each output has to be programmed (via EBLWin) for the following:

- Type (Control, Alarm devices, etc.).
- Output signal period (steady, intermittent, pulse, delay, etc.)
- Logic, i.e. normally open (NO) **or** normally closed (NC) contacts²².
- Control expression (one or more trigger conditions).

²¹ The outputs in EBLWin are set by default as supervised however, it is possible to change the setting of S0-S3 individually to be not supervised.

²² A normally high output cannot be supervised. The supervision voltage is 1.5 – 3.6 V_{DC} (depending on the number of supervision resistors) and the polarity is reversed compared to activated output.

See also chapter "Programmable outputs", page 79.

4.6 Programmable inputs (I0-I3)

Connections according to drawing F732-02. Each input has to be programmed (via EBLWin) for the following:

- Type (trigger condition).
- Logic, i.e. normally open (NO) or normally closed (NC) contacts.
- Additional information when required, depending on the selected trigger condition (Fault no., Zone, Address, Fault message (Error text), etc.)

Open = $R > 20K$. Closed = $R < 500\Omega$.

An input has to be activated ≥ 0.5 sec.

See also chapter "Programmable inputs", page 72.

4.7 Relay outputs for routing equipment (TX)

Two dedicated non-programmable relay outputs are used for routing equipment. The outputs can be tested via menu H1. For more information refer to the FT1020G3 Operation Manual. Connections according to drawing F732-02.

4.7.1 Fire alarm output

This output is normally used for fire alarm routing equipment (Fire brigade TX). It is a change-over relay contact that is activated when a fire alarm is generated in the system ²³. De-activated output is (normally) indicated by the LED "Fire brigade TX" ²⁴.

When a specific zones or alarm points required to call the brigade, any programmable relay can be used and type should be "Fire Brigade TX".

4.7.2 Fault condition output

This output is normally used for fault warning routing equipment (Fault TX). It is a change-over relay contact that is normally activated and will be de-activated in case of a fault ²⁵ in the Control Unit (CIE) ²⁶. De-activated output (i.e. fault condition) is indicated by the LED Routing equipment "Fault TX activated".

²³ The output can be disabled via "door open" (not recommended) or via menu H2/B5. See also chapter "Alert Annunciation", page 115.

²⁴ This output and programmable outputs with type of output = Fire brigade TX, will normally turn on the LED but a programmable input with trigger condition = Activated routing equipment, can turn on the LED instead.

²⁵ Also when the control unit is powered down (i.e. power supply and batteries are disconnected) or Watch-dog fault.

²⁶ The output can be disabled via "door open" or via menu H2/B5.

5 Expansion boards 458x

FT1020G3 cabinet provides space for expansion boards holder, up to 4 boards can be mounted on one holder. Another holder can be mounted inside the cabinet for the additional 2 expansion boards. The maximum number of the expansion boards of types **4580**, **4581** and **4583** used in each **FT1020G3** is six. An expansion board connection cable is to be used to connect expansion boards (connector "J12") to the main board 5010 (connector "J9"). See drawing F728, F729 & F730.

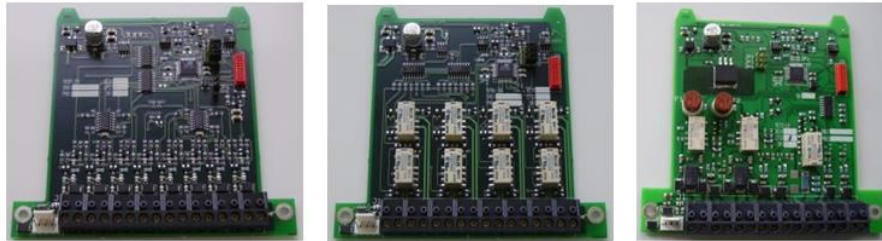


Figure 6 Expansion boards 4580, 4581 and 4583.

I/O Matrix board 4582 is a special type of expansion boards that plugs (piggy back) onto an Application board (Fan, Generic or Zone). The Application board is connected to the COM loop and to 24 V_{DC}. On each COM loop 0-3, up to six 4582 boards can be used (i.e. up to 24 boards in total per FT1020G3 control panel). Refer to drawing F730 for more details.

Note: COM loop 0 is however a special loop, since the expansion boards 4580, 4581 and 4583 are internally connected on this loop. On COM loop 0, up to a total of six 4580, 4581, 4583 and 4582 boards can be used. This means that for each expansion board 4580, 4581 or 4583 used, the number of 4582 boards is reduced by one.



Figure 7 I/O Matrix board 4582.

Maximum six of the I/O Matrix boards 4582 can be programmed as type Generic and/or Zone control.

Note: Maximum 512 programmable outputs per CIE can be used.

Each expansion board 4580-4583 must have an expansion board address (0-5) set via jumpers on the expansion board. The jumpers "JP2-JP4" are used on boards type 4580, 4581 and 4583, and jumpers "JP1-JP3" are used on board type 4582, see Table 3 page 25. Refer to drawings F728, F729, F730 and F731.

EBLWin is used for all expansion board programming.

The expansion board address is set via jumpers on the expansion board as shown in Table 3 below.

Table 3 Expansion boards address (jumpers) setting

Board no. (address)	4580, 4581 and 4583			4582		
	JP2	JP3	JP4	JP1	JP2	JP3
0						
1	X			X		
2		X			X	
3	X	X		X	X	
4			X			X
5	X		X	X		X
6						
7						

X=Shunted, Blank = Open

Address 6 & 7 are not currently used

5.1 8 zones expansion board 4580

Each board has to be programmed via EBLWin with an address (Board no.) which is set via the jumpers "JP2-JP4", see Table 3 above.

The 4580 board has eight conventional zone line inputs (0-7) intended for conventional detectors, MCP, flow switch input or any N/O clean contact. The end-of line device must be connected in the last alarm point on each zone, depending on the selected "Type of zone line input", see below.

Connections to "J1:1-16" and "J2" according to drawing F728.

Each zone line input has to be programmed via EBLWin for the following:

- Type of zone line input (see below), depending on detectors / end-of-line device (capacitor or resistor), i.e. different threshold levels etc.
- Alarm at short circuit i.e. whether a short- circuit on the zone line input generates a fault or a fire alarm.
- Zone number (address optional)
- AVF (Alarm Verification Facility), if required
- Text (Alarm / fault text when required)
- Alert annunciation time channel
- Disable time channel
- Two-unit dependency time channel
- Type of detectors connected to the zone line input (see "Fire alarm type A and Fire alarm type B" page 118 for an explanation of A and B)

The terminals support a wire size up to 1.13 mm² (1.2 mm).

5.1.1 Type of zone line input

Each input must be selected either as "**Not used**" or as one of the following types / modes.

5.1.1.1 Zone line input (EOL capacitor)

This mode should normally be used. It has the lowest zone line current consumption since the End-Of-Line device is a capacitor, 470 nF ($\pm 10\%$).

- Maximum allowed cable resistance is 50 ohm.
- Maximum allowed cable capacitance is 50 nF.
- Maximum allowed zone line current consumption is 1.5 mA.

5.1.1.2 EX zone line input (EOL resistor)

This mode must be used when the zone line input is intended to be connected to intrinsically safe devices e.g. intrinsically safe detectors or manual call points via the Galvanic isolator MTL5061 (2820). The end-of-line device is a resistor, 10K ($\pm 5\%$) with a body surface area $> 230 \text{ mm}^2$ (supplied with the Galvanic isolator).

- Maximum allowed cable resistance is 40 ohm.
- Maximum allowed cable capacitance is 70 nF.
- Total zone line current consumption is $\leq 1.0 \text{ mA}$.

5.1.1.3 Zone line input (EOL resistor)

This mode is typically used in New Zealand where only EOL resistors are allowed. It has to be used when any of the other types cannot be used (e.g. for some older type of detectors and not Panasonic detectors). The EOL resistor has the highest zone line current consumption since the end-of-line device is a resistor, 4K7 ($\pm 5\%$).

- Maximum allowed cable resistance is 50 ohm.
- Total zone line current consumption is 2.0 mA.

Note: Older version of 4580 boards PCB9287-2B requires 10K end-of-line resistor while the newer version PCB9287-3A requires 4K7. Table 4 and Figure 8 illustrate the two distinctive differences between the two PCB versions in both hardware and software.

Table 4 4580 Versions with EOL Values to Use

4580	PCB No.	SW Version	EOL Resistor to Use
Version 1	9287-2B	1.0.x	10K Ω
Version 2	9287-3A	2.0.x	4K7 Ω

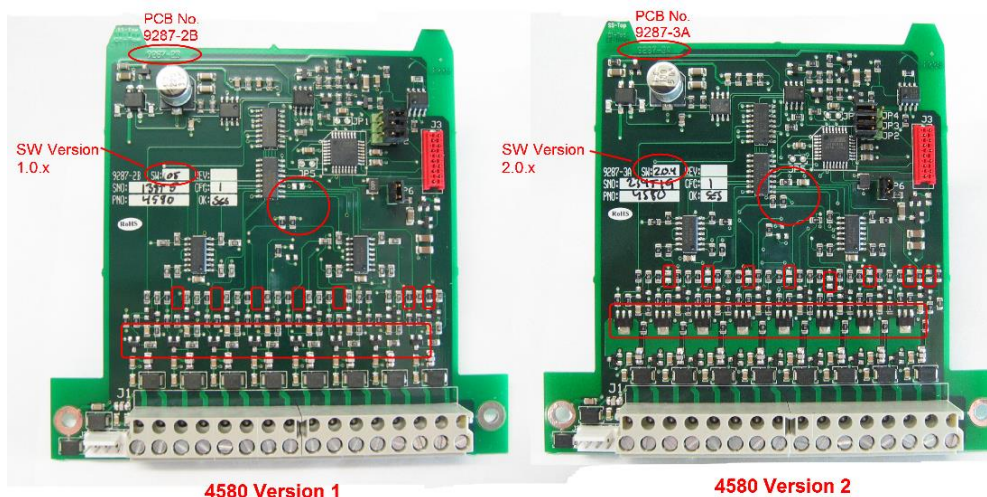


Figure 8 Expansion board top side differences

5.1.2 Input states

Each input will be in one of six different states.

5.1.2.1 Normal state

The normal zone line input state, i.e. no alarm, no fault, etc. and the nominal voltage is 24V_{DC}²⁷. From this state any other state can be reached / activated.

5.1.2.2 High current state

The maximum current consumption limit²⁸ for the zone line input is exceeded, which is indicating that e.g. too many alarm points are connected. This state generates a fault condition in FT1020G3. From this state any other state can be reached / activated except the open circuit state.

5.1.2.3 Alarm state

One alarm point (or more) on the zone line is in alarm state and the alarm limit²⁸ for the zone line is exceeded which activates a fire alarm in FT1020G3. In this state short-circuit, open circuit, high current and low voltage states cannot be reached / activated. After alarm reset, the zone line input will return to the normal state.

5.1.2.4 Short-circuit state

The short circuit current limit²⁸ is exceeded, indicating short-circuit on the zone line which normally generates a fault condition in FT1020G3 **but** instead, a fire alarm can be activated, if this option is selected via EBLWin.

5.1.2.5 Open circuit state

The open circuit current limit²⁸ is passed, indicating very low zone line current consumption or no current, i.e. the End-Of-Line device is not detected which generates a fault condition in FT1020G3. From this state any other state can be reached / activated.

5.1.2.6 Disconnected state

Via menu H8/S1 (Disconnect loop / zone line input) the zone line input can be disconnected²⁹, i.e. there is no voltage on the zone line. From this state no other state can be reached / activated.

5.2 8 relays expansion board 4581

Each board has to be programmed via EBLWin for Address (Board no.), set via jumpers "JP2-JP4" as shown in Table 3 page 25.

The 4581 board has eight programmable relay outputs (Output 0-7).

Connections to "J1:1-16" and "J2" according to drawing F729.

Each output has to be programmed via EBLWin for the following:

- Type, i.e. output for Control, Alarm devices, etc.
- Output signal period (steady, pulse, delay, etc.)
- Logic, i.e. normally open (NO) **or** normally closed (NC) contacts³⁰
- Control expression (contains one or more trigger conditions)

²⁷ Voltage range 15-28 V DC.

²⁸ This limit is dependent on the selected input mode.

²⁹ This is indicated in FT1020G3 by the LED **Fault / Disablements** "General disablements".

³⁰ Relay contact ratings: Max. 2A @ 30 V DC.

For more information, see chapter "Programmable outputs", page 79. The terminals support a wire size up to 1.13 mm² (1.2 mm).

5.3 Inputs and outputs expansion board 4583

Since the maximum current consumption for this type of boards can be up to 400 mA, only **two** 4583 boards should be used however up to six boards can be configured (EBLWin V2.1.1 or higher) with a warning if more than two are used when the SSD is validated in EBLWin. Care must be taken to avoid overloading the fuse (F13) on the main board when more than two boards are used.

Each board has to be programmed via EBLWin for Address (Board no.) set via the jumpers "JP2-JP4", see Table 3, page 25.

The I/O expansion board 4583 has two programmable supervised / non-supervised voltage outputs (Output 0-1), one special programmable output (Output 2) intended for German extinguishing system and five programmable supervised / non-supervised inputs (Input 0-4).

Connections to "J1:1-16" and "J2" according to drawing F731.

Output 0-1 has to be programmed via EBLWin for the following:

- Type, i.e. output for Control, Alarm devices, etc.
- Output signal period (steady, pulse, delay, etc.)
- Supervised / Non-supervised ³¹
- Logic, i.e. normally low (default) **or** normally high (24VDC) ²².
- Control expression (contains one or more trigger conditions)

One to five 33K resistors can be connected. When all connections are completed, perform a "calibration of supervised output" via menu H5/A1. Calibration value has to be in the range 4K7-50K. See also the FT1020G3 Operation Manual chapter "Calibration of supervised outputs (menu H5/A1)".

Voltage **Output 0** (J1:1-2): Max. 200 mA (Fuse F1).

Voltage **Output 1** (J1:5-6): Max. 200 mA (Fuse F2).

See chapter "Programmable outputs", page 79.

Output 2 has to be programmed via EBLWin for the following:

- Type of output, i.e. output for Control, Alarm devices, etc.
- Output signal period (steady, pulse, delay, etc.)
- Logic, i.e. normally open (default) **or** normally closed.
- Control expression (one or more trigger conditions)

Output 2 (J1:11-12): Normally Open (high resistance, 3K3) or Normally Closed (low resistance, 680R). See drawing F731.

See also chapter "Programmable outputs", page 79.

Input 0-4 have to be programmed via EBLWin for the following:

- Trigger condition (Triggered by)

³¹ A normally high output cannot be supervised. The supervision voltage is 1.5 – 3.6 V_{DC} (depending on the number of supervision resistors) and the polarity is reversed compared to activated output.

- Supervised / Non-supervised
- Logic, i.e. Normally open (high resistance, 3K3, when supervised) **or** Normally closed (low resistance, 680R, when supervised)
- Additional information depending on the selected type

See chapter "Programmable inputs", page 72.

5.4 I/O Matrix board 4582

The I/O matrix is a special type of expansion boards, it can only be used in conjunction with an **Application board**. Three types of application boards are available; AS1668 Fan control, Zone control and NZ Generic mimic for index panels, see Figure 9.

The I/O Matrix board (80 x 63 mm) is plugged to the application board ("piggy back" connection) and has 16 switch inputs and 48 LED outputs which can be individually programmed (generic application only).. The COM loop and 24 VDC is connected to the Application board.

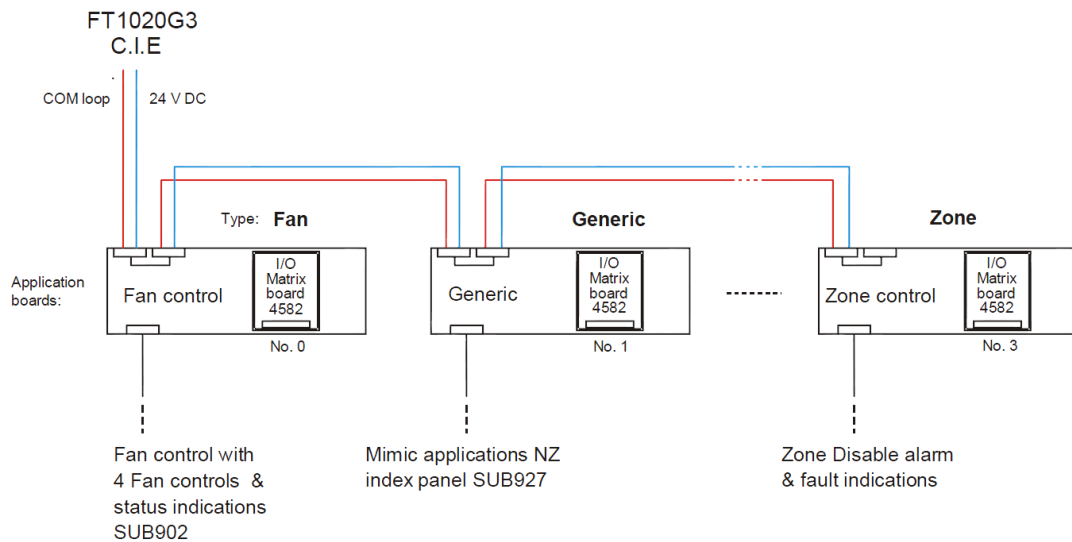


Figure 9 I/O Matrix board application overview SUB900

5.4.1 I/O Matrix jumper link setting

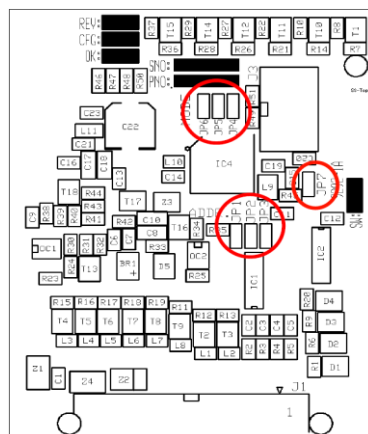


Figure 10 I/O Matrix PCB layout

The PCB layout of the I/O matrix board is shown in Figure 10, jumper links are shown in red circle. Ensure that JP7 is not fitted, this is used for production purposes only. Three different options for **application board types** can be selected via jumpers (JP4 & JP5) on the I/O Matrix board as shown in Figure 10 and Table 5

The three configuration options for the I/O matrix board are:

- **Generic**, normally used for any special applications e.g. NZ index panel, mimic or relay boards, pump status indications, etc. Maximum of six generic options can be used, if no zone control is not used.
- **Fan Control**, up to 6 fan modules can be used for each loop if no other applications or expansion boards used. Four fans are the maximum number allowed per module.
- **Zone Control**, only six zone control options can be selected to provide a maximum of 64 zones³² for each FT1020G3 system, if no generic options are used.

There is no COM loop address to be set. Instead, the **expansion board no. / address** (0-5) is set with jumpers (**JP1-JP3**) on the I/O Matrix board. See Table 3, page 25.

A total of up to 512 outputs can be used in FT1020G3, including all types of outputs.

The application board type can be selected via jumpers JP4-JP5 as shown in Table 5.

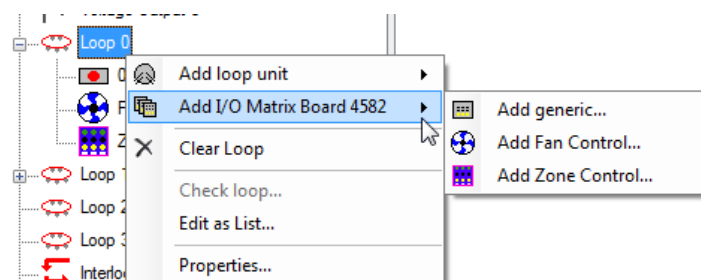
Table 5 I/O Matrix board 4582 type setting

Type (mode) Application Board	JP4	JP5	JP6	Brooks Application Board Part No.
Fan Control				SUB902
Zone Control	X			SUB900
Generic ³³		X		SUB985-SUB988 ³⁴

Note: Jumper "JP6" is for future use

Each I/O Matrix board 4582 has to be programmed via EBLWin according to its application.

- Set the address on the 4582 via jumpers "JP1-JP3", see Table 3, page 25.
- Right click on the respective Loop and select "Add I/O Matrix Board 4582" to bring up the context menu to select the type of Application Board to be added as shown below:



....and **programmed** for the following:

- **Address** (must be the same board no. as set via jumpers "JP1-JP3").
- **Name** (I/O Matrix Board # - normally not changed)
- **LED test on Input 15** (selected or not selected)

³² Due to the space limitation, only 12 zones are available in every zone control module

³³ When SUB900 or SUB902 is used as a Generic application board, the Type of Inputs and Outputs can be customised by programming in the EBLWin configuration software.

³⁴ The new versions of NZ mimic boards SUB985, SUB986, SUB987 & SUB988 replace the discontinued SUB927 and SUB927R, for more details refer to chapter "New mimic options" page 39

6 Optional Modules

6.1 AS1668 Fan control

Used for Application board type **Fan control (SUB902)** which has a front decal label to indicate and control up to 4 fans. Typical fan control front is shown in Figure 13 page 37.

Each fan control module consists of a universal I/O matrix 4582 specifically configured for fan control applications and application board SUB902. Different Programming options are simplified through the EBLWin configuration software.

Each fan control module has controls and fan status indicators for 4 fans, each fan status is indicated by six LEDs (On / Auto / Off / Running / Stopped / Fault) and controlled via three push buttons (On / Auto / Off). One "Fan Reset" button is provided in every AS1668 fan module. A LED test button is also provided to test LED's for each fan module (if programmed).

In EBLWin, the functionality of the fan control relays Re0 & Re1 in "3361 for fan" module has been improved³⁵. New "Enhanced mode" is added to 3361 configuration to enable the programmer to configure Re0 and Re1 independently i.e. start relay and stop relay are now configured separately. The monitored input In0 is in use when the fan is only controlled from the CIE. External control from Mechanical Services Switch Board (MSSB or via time clock will indicate the fan status without generating a fan fault.

6.1.1 Mode Control

The buttons / LEDs On, Auto and Off are used to manually override the fan mode of operation. The switches are non-latching and the mode of operation will be indicated by the corresponding LEDs.

On Fan is running in manual override mode independent of fire mode in the CIE or any external control e.g. MSSB. "On" and "Fan Running" LED's are lit. "On" control has higher priority over alarm and external control.

Auto Fan either be running or stopped depending on the CIE alarm condition. The fan may also be controlled externally (less priority than alarm) from mechanical services e.g. time clock. LED "Auto" is lit and either "Fan Running" LED or "Fan Stopped" LED is also lit. The "Auto" LED flashes during the time that the fan is changing status (running to stopped or stopped to running) then becomes steady.

Off Fan is stopped in manual override mode independent of any alarm condition in the CIE. "Off" and "Fan Stopped" LED's are lit. "Off" control has the highest priority over fire mode or external control.

6.1.2 Fan Status

Running Indicates fan running, red

Stopped Indicates fan stopped, green

Fault Indicates fan fault, yellow

The fan fault LED is lit if the control from the CIE to change the fan status (via 3361 relay contacts) is not verified via input In0. The request to change the fan status from the CIE can be due to one of the following:

³⁵ In the older PC configuration software WinG3, the two relays Re0 and Re1 have toggle action i.e. cannot be controlled independently, both activated at the same time but with different contacts (Re0 is normally open & Re1 is normally closed).

1. Manual operation of the manual override switch (On or Off) for a fan or
2. In Auto mode, a fire alarm that controls the fan is activated.

In both cases, if the feedback signal confirming the change of state has not been received by input In0 in 3361 within 30 seconds (default), the fan fault LED will be lit.

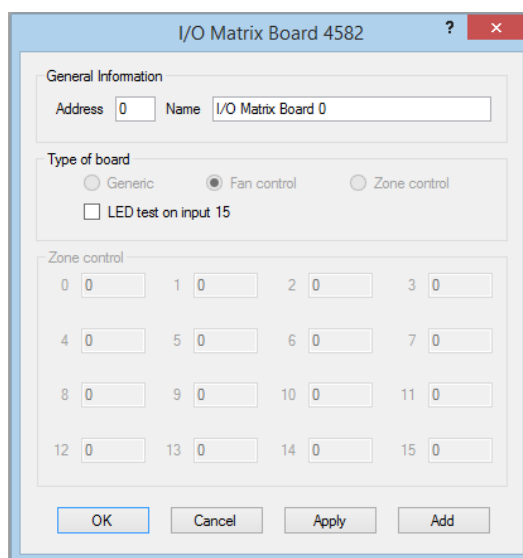
If also In0 is configured to be supervised and there is an open circuit fault in the input wiring, the fan fault LED will also lit.

6.1.3 Configuration and Programming

For each fan, a field module (3361) is required and has to be configured in EBLWin as “3361 I/O unit for fan control”. The AS1668 fans can be configured as follow:

Each Fan (0-3) (i.e. each Fan control) has to be added and programmed via EBLWin.

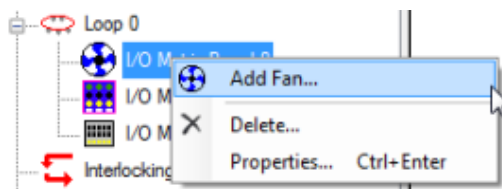
1. Right click on a COM loop and “Add I/O matrix board 4582”, the following dialog box appears:



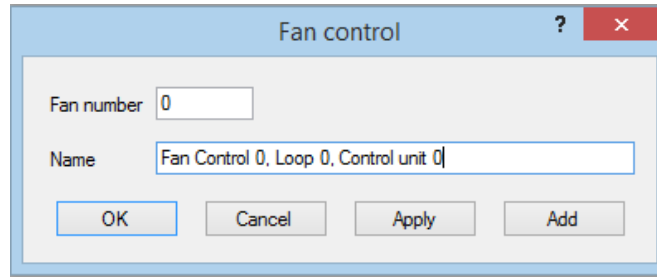
Select the I/O matrix board address (0-5) and change the name to “AS1668 Fan Control”. If the LED test function is required, mark the check box “LED test on input 15”.

Note: The address selected in EBLWin (0-5) must match the address of the I/O matrix board which is set by jumpers JP1-JP3 as per Table 3 page 25. The type of board is automatically selected.

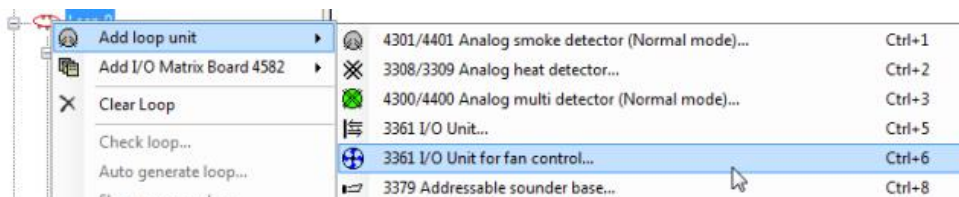
2. Right click on the configured “I/O Matrix Board” and select “Add Fan” as shown below



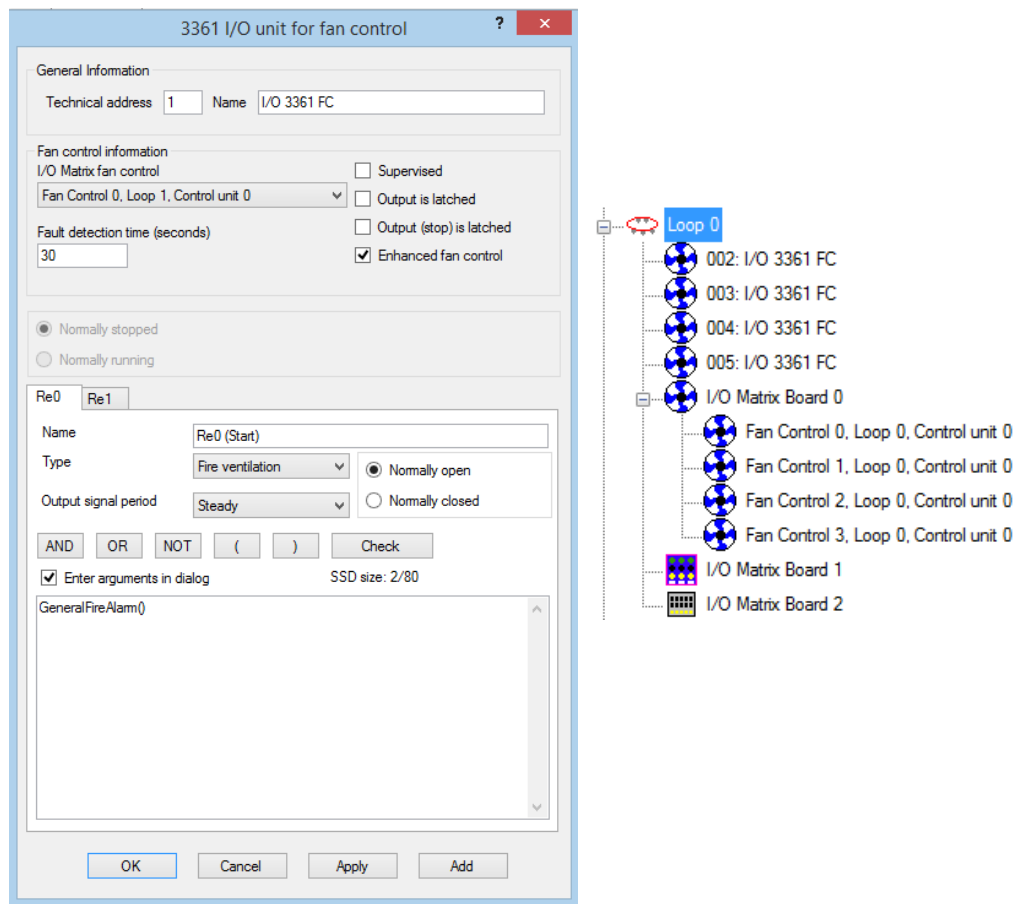
3. The Fan control dialog box appears for the 1st fan to be added. Repeat adding the fans as required, maximum 4 (0-3).



4. For each added fan, a “3361 I/O Unit for fan control...” must also be added. To do this, right click on a COM Loop to Add loop unit and select “3361 I/O Unit for fan control..”

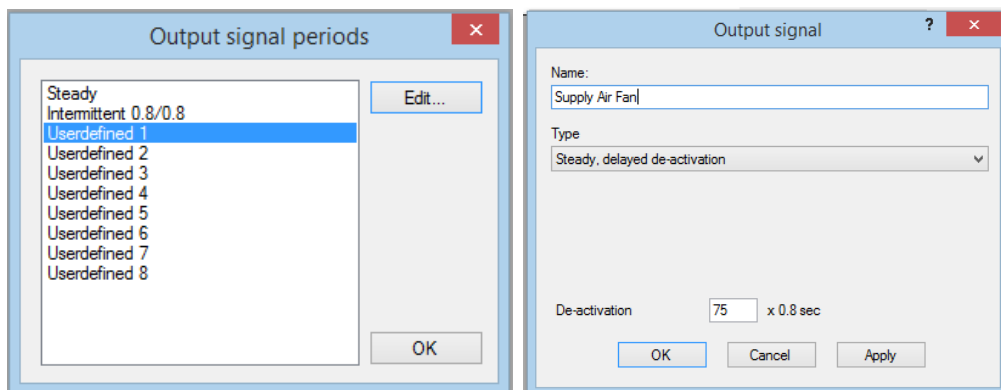


5. When the 3361 dialog box appears, select from the pull down menu under the Fan control information area, one of the fans that was added in the previous steps as shown below. The final tree view should look like the right side as shown below.



6. On the 3361 properties shown above, select the required configuration as follow:
- Select whether In0 required to be supervised or non-supervised.
 - Relay output Re0 and Re1 output to be latched or non-latched.

- Enhanced mode for independent configuration of Re0 and Re1³⁶.
 - Enhanced mode for independent configuration of Re0 and Re1³⁷.
 - Write the logical expression for Re0 and Re1 (enhanced mode only³⁸).
 - Fault detection time is set to 30 seconds by default, change time if required.
 - Select Re0 and/or Re1 type “Fire ventilation” (default).
 - If a supply air fan is to be configured, on the “Output signal period” on Re0 and/or Re1 dropdown menu select “Supply Air Fan” as shown in step 7.
7. For supply air fan applications, set the post timing required to reset the duct detector as follow:
- On the “System” tab, select “Output signal period”.
 - In the displayed dialog box shown below, select one of the “Undefined” options
 - Re-name the “Undefined” to Supply Air Fan or any other name then click edit as shown below.
 - On the drop down menu, select “Steady, delayed de-activation”
 - In the de-activation box, enter 75, this will set the post timing of the duct smoke detector to 60 seconds i.e. the duct detector will reset after 60 seconds of clearing up the smoke.
 - Click ok.



6.1.4 Fan Reset

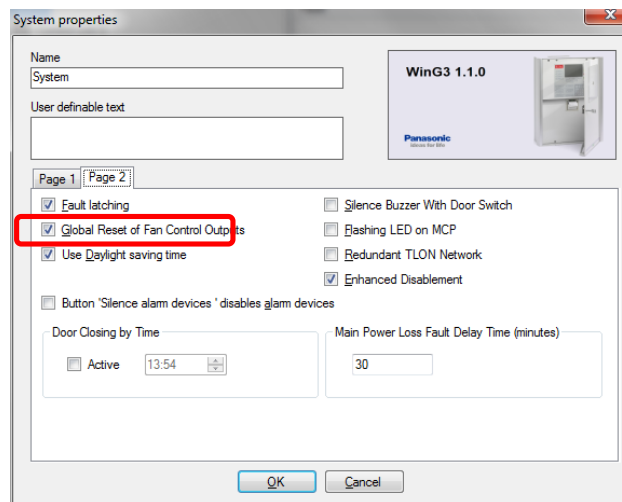
A fan reset button is added to the front display of the fan control module to comply with the requirements of AS1668.2 and used to independently reset 3361 relays Re0 and Re1 in fire mode conditions. The two relays should be programmed in EBLWin to be “Latched” i.e. resetting the alarm in the CIE will not bring the fans to the non-fire mode condition until the reset button is pressed. If the alarm remains active in the CIE, the fan reset button will not function. The fan reset function can be selected in EBLWin to be either local reset or global (Default) reset.

To change this setting in EBLWin select, System I Properties which will bring up the System Properties dialog box then select the “Page 2” tab. Check/uncheck the box against “Global Reset of Fan Control Outputs” accordingly

³⁶ In non-enhanced mode, if Re0 is normally open, Re1 will automatically be normally closed and vice versa. If "Enhanced fan control" function is selected, Re0 and Re1 tabs will be available for individual programming.

³⁷ In non-enhanced mode, if Re0 is normally open, Re1 will automatically be normally closed and vice versa. If "Enhanced fan control" function is selected, Re0 and Re1 tabs will be available for individual programming.

³⁸ In non-enhanced mode, only Re0 requires logical expression hence Re1 will follow same logical expression.



By unchecking this box option, **local** reset will be selected. This means that the reset control will reset only fans connected to the same fan module. If more than one fan control module is used within the CIE and the “Global Reset...” is selected, pressing any reset button on any fan control module will reset all fans controlled by any CIE in a network system.

CAUTION: Global reset should only be selected where the management in use plan considers the network control as a whole.

6.1.5 Fan Front Display

The fan control and display module is normally mounted in the CIE but it is also possible to remotely install the module and connect it to a COM loop and 24Vdc supply. The fan operation is controlled by Re0 and Re1 relay outputs on the 3361 unit. The feedback signal from the fan pressure switch is connected to the supervised input of 3361 to provide the required indications of the fan status.

The typical front display of AS1668 module and connection diagram are shown in Figure 13, page 37.

Two typical fan application examples are shown in the following sections.

6.1.6 Supply Air Fan

A supply air fan is normally running in the non-fire mode condition and stops when smoke is detected in the air supply duct. Timing sequence is shown in Figure 11 below.

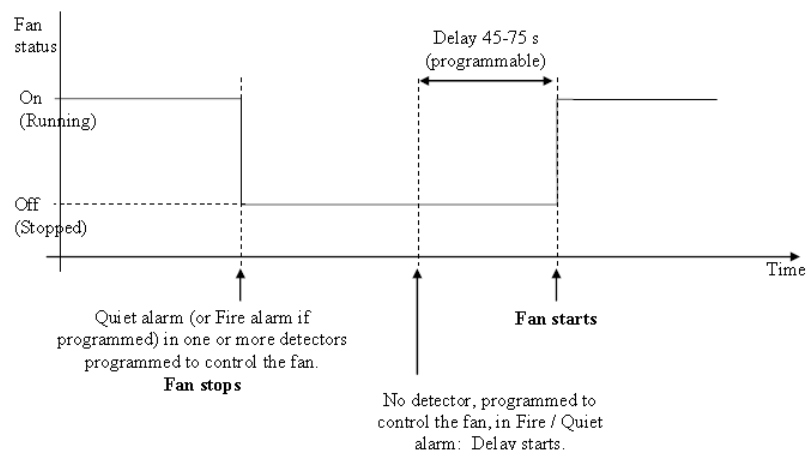


Figure 11 Supply air time delay setting

When the smoke is no longer present in the supply air duct, a time delay (45-75 Sseconds) starts, the fan remains in the shutdown mode until the time delay is elapsed, then the duct detector resets and causes the fan to restart. The presence of smoke in the supply air does not initiate a Fire Brigade TX signal or any other alarm output (type, quiet alarm). The Occupant Warning System does not sound. Only the "FIRE" and general alarm indicators will be flashing and a quiet alarm message displayed.

Notes related to supply air fan applications:

1. Only analogue smoke detectors can be used in supply air fan applications.
2. The detector used in supply air fan applications must be selected as a "Quiet Alarm" i.e. check box in EBLWin program is ticked.
3. One detector, several detectors or a zone can be programmed to control the supply air fan.
4. A time signal period output must be configured in EBLWin as shown in section 6.1.3, step 7 to set up time delay (post timing) which is normally 60 seconds

6.1.7 Smoke Exhaust Fan

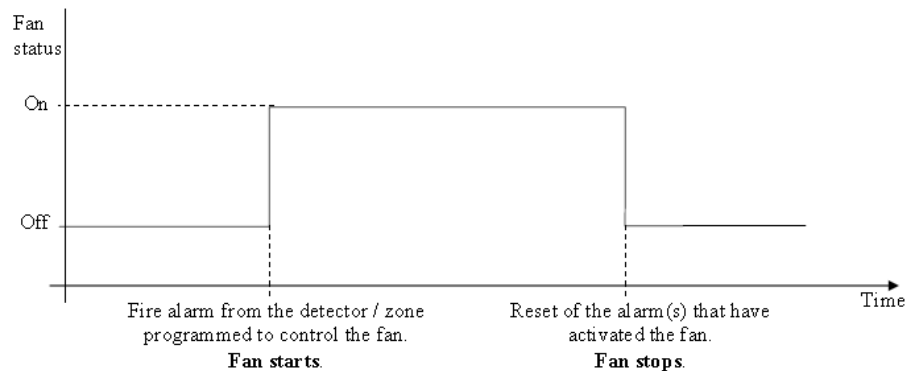


Figure 12 Smoke exhaust or spill fan timing

The smoke exhaust fan is normally controlled by general fire alarm, single device or a zone. Both analogue detectors and conventional zones can be configured to control the fan. Standard time signal period output can be used.

Typical AS1668 fan example is shown in Figure 13

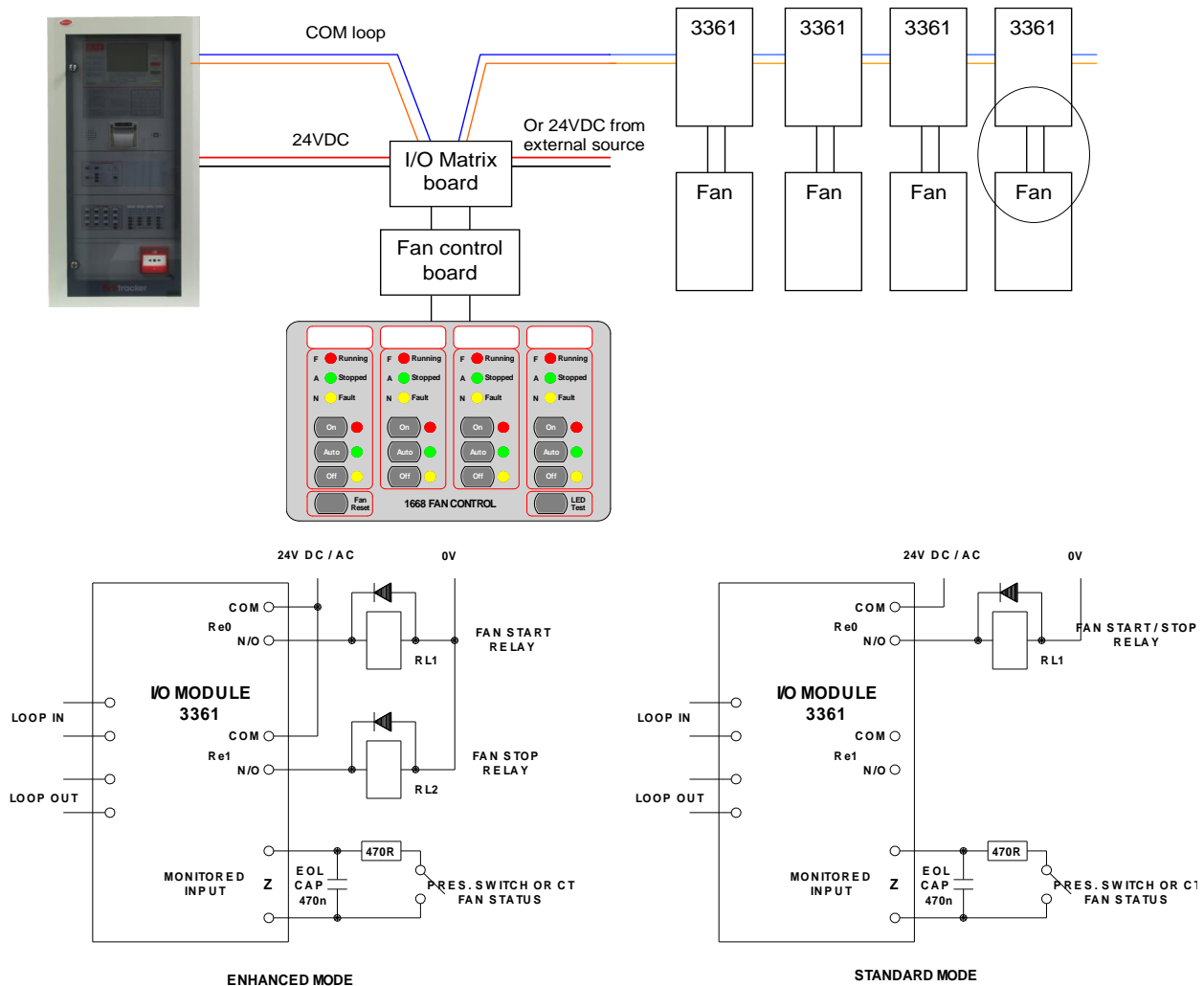


Figure 13 AS1668 Fan Control Example

6.2 Zone control

The Zone Control Module provides a simplified indication of zone status without the need for a liquid crystal display. The disable control allows a specific zone to be temporarily disabled without the need to access the CIE menu. This is typically used where building works or maintenance procedures are being carried out in a localised area of a building. The front display layout is shown as part of Figure 14 below.

Each zone control module consists of a universal I/O matrix 4582 plugged in a display board SUB900 specifically configured to provide up to 12 individual zone indicators and controls. The module is normally mounted in the CIE, but it is also possible to connect the module externally via a COM loop and 24Vdc supply.

6.2.1 Controls & Indications

Alarm LED (Red) – Illuminates when an alarm from a conventional zone, an addressable device or group of addressable devices designated as a zone enters into an alarm state.

Fault LED (Amber) – Illuminates when either a short circuit or open circuit fault on a conventional zone line input or any fault that prevents an addressable alarm point in a designated zone to operate properly.

Disabled LED (Amber) – Illuminates when a zone is disabled either by the disable switch on the zone control card or where the zone is disabled via menu H2/B1.

Disable Switch –Pressing the disable switch will disable the specific zone selected. Pressing the switch a second time will re-enable the zone. Functions are the same as menu H2/B1.

LED Test Switch – Pressing the LED test switch illuminates all indicators, if Input 15” is selected when programming the zone control function.

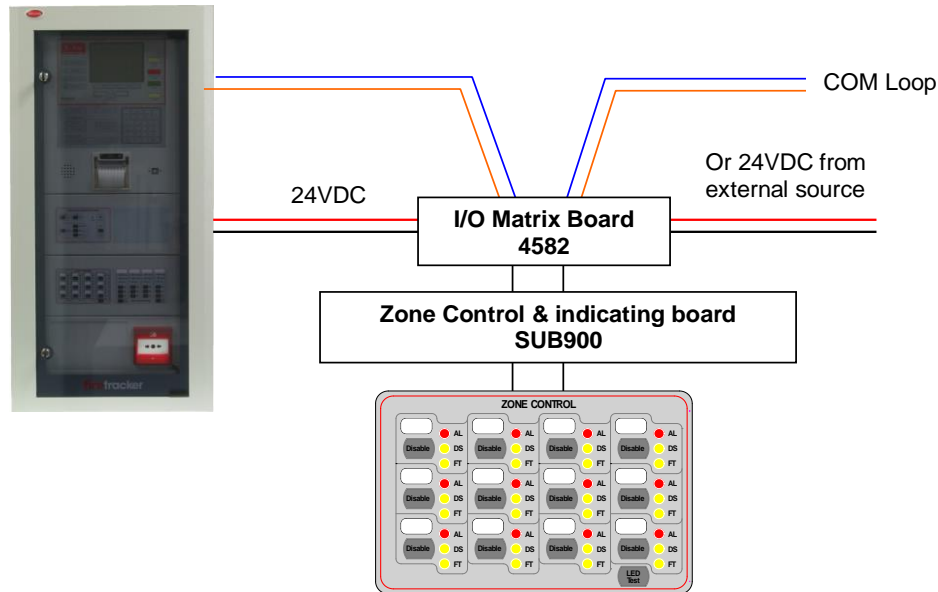
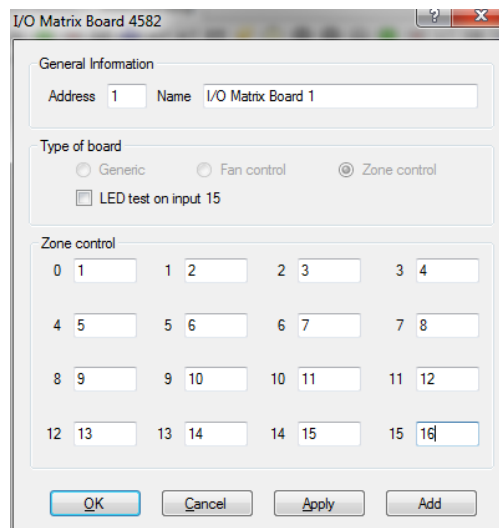


Figure 14 Zone Control Connection

6.2.2 Zone Control Configuration

When the I/O Matrix board is selected in EBLWin to “Zone Control” type, up to 16 zones [0-15] can be configured. The display Board is limited to only 12 zones and one additional switch for LED test. The following procedures are used to configure the zone control module:

1. Right click on a COM loop and “Add I/O matrix board 4582” then select “Add zone control”. The following dialog box will be showing.



The dialog box titled **I/O Matrix Board 4582** is shown. It has the following sections:

- General Information:** Address Name
- Type of board:**
 - ☐ Generic
 - ☐ Fan control
 - ☒ Zone control
- ☐ LED test on input 15
- Zone control:** A grid of 16 zone indicators (0-15) arranged in a 4x4 layout. Each indicator has a label (AL, DS, FT) and a status icon (red, yellow, green).

At the bottom are buttons: **OK**, **Cancel**, **Apply**, and **Add**.

2. Select the zone control module address (0-5) and zone control name (if required). If the LED test function is required on input 15, tick the check box.

Note: The address selected in EBLWin (0-5) must match the address of the I/O matrix board which is set by the jumpers JP1-JP3 as per Table 3 page 25. The type of board is automatically selected.

3. Select the check box "LED test on Input 15" if this button is to be used for LED tests or uncheck the box if LED test facility is not required.
4. Assign the zone number in the corresponding Zone control boxes.
5. Click OK.

6.3 Generic Applications

6.3.1 Overview

The generic feature in the FT1020G3 software supports the remote mimic applications of the I/O matrix board 4582. Currently, this feature is used in the New Zealand Fire Brigade mimic and index panels as well as other products e.g. remote generic inputs / outputs termination 2212, remote inputs / outputs and relay output, and ASE interface for the NZ applications. This section describes one of the main applications of the generic option, the popular NZ index panel. Refer to Brooks technical datasheet TDS019 for other applications.

Each master NZ mimic board provides 12 LED indications and screw terminals for 4 inputs (switches). The first 3 LEDs used for Common Alarm (red). Normal (green) and Defect (yellow). The remainder 9 LEDs (red) used to indicate separate zone indications or sprinkler flow switch indication. Two of the four inputs are used to interface the NZ Fire Brigade bulgin keys to the CIE. Additional slave mimic boards can be added to provide up to 36 additional red LED indicators.

Up to 4 mimic boards can be used to indicate maximum of 48 individual zone indications, only one I/O matrix is required for every 4 mimic boards, up to six I/O matrix boards can be used in the NZ mimic applications if no zone control modules are used. Refer to drawing F781 for connection diagram. A typical NZ mimic application is shown in Figure 16 page 41.

6.3.2 New mimic options

The new design of the mimic boards allows for either LED indicators or screw terminals for graphic or remote LED's. Four new boards are now available as shown in Figure 15 below:

1. **Master LED mimic Board SUB985:** This must be the first board and to be fitted with the I/O matrix board 4582. The board contains the first 3 common indicators and additional 9 red indicators. It also contain terminals to connect the Bulgin keys. All outputs / inputs are fully programmable.
2. **Slave LED mimic board SUB986:** contains 12 fully programmable red indicators, no provision for terminals or connectors for the I/O matrix. Up to 3 slave boards can be connected to the master board via plug-in connectors.
3. **Master terminals mimic board:** In addition to the connector for the I/O matrix board and Bulgin keys terminals, it also contain terminals to connect 12 remotely located LED's (on-board LED's are not fitted). The I/O matrix board is to be fitted to this master board. The board can be utilised to connect existing LED mimics to new FT1020G3 in retrofit applications.
4. **Slave terminals mimic board:** Up to 3 slave boards can be connected to the master board via the plug-in connectors to provide terminals for additional 36 LEDs.

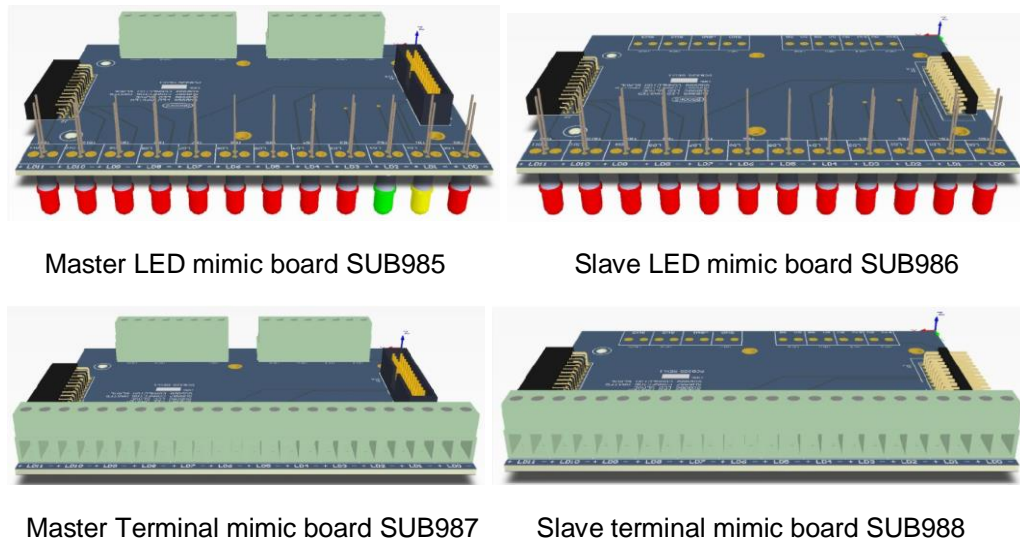


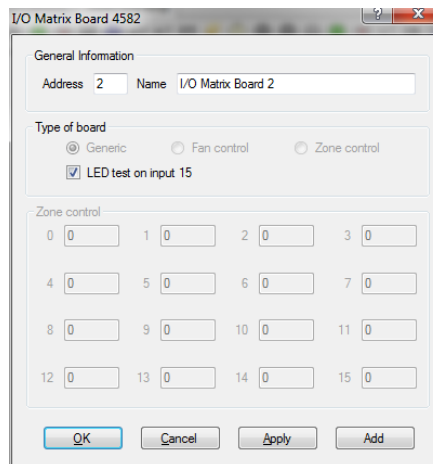
Figure 15 Mimic Board Options

Note: Mounting holes of the new series of mimic boards are slightly different to the mounting holes of the previous version (SUB927) i.e. new mimic LED boards must be used in the new index cabinets.

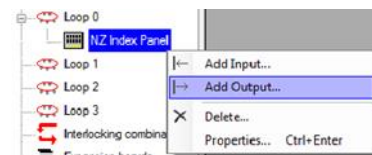
6.3.3 Configuration and programming

The following procedures are used to configure the NZ mimic or index panel:

1. Select a COM loop then “Add I/O matrix board 4582” and select “Add generic”. The following dialog box will appear:



2. Enter the generic address (0-5) (usually automatically assigned) in the general information area and give it an application name e.g. NZ Index panel.
3. Select the check box “LED test on Input 15” if this button is to be used for LED test or uncheck the box if not required.
4. Right click on the Generic Board (i.e. NZ Index Panel as a given example) that was added in step 1 and choose **Add Output...** from the context menu as required (0-47) and enter the fields in the



properties dialog box with its logical expression (similar to programmable relay output).

5. Add input 0 and input 1 to program the Bulgin keys. Select type “NZ Silence switch” for input 0 and assign the name to “Silence Alarms”. Select type “Evacuate” for input 1 and assign the name to “Evacuate”.

A typical NZ mimic application is shown in Figure 16 below.

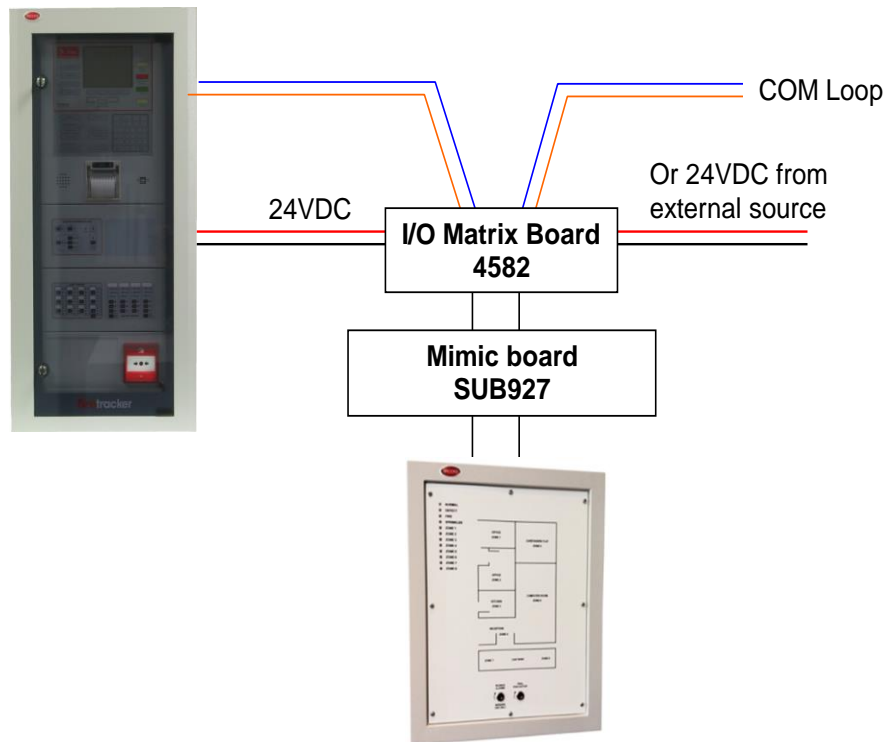


Figure 16 Generic application, NZ Index panel

6.4 Occupant Warning System (OWS)

6.4.1 Overview

Brooks OWS is an intelligent occupant warning system that can be incorporated in FT1020G3 with number of options depending on the available space in the cabinet, larger enclosures can be used to allow for more options.

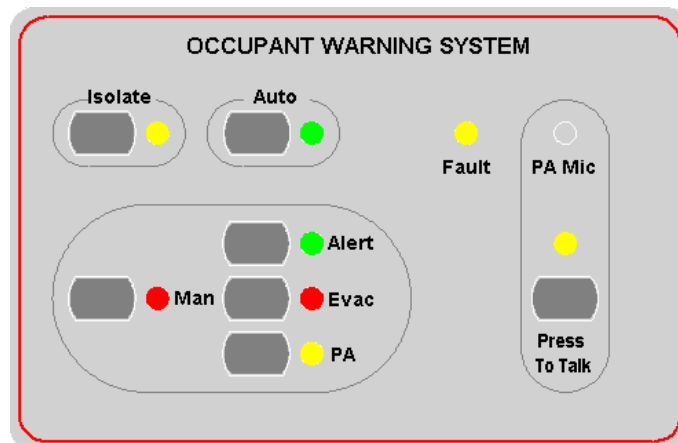


Figure 17 Occupant Warning Display Module

The OWS is supplied with a wide range of high efficiency class-D audio amplifiers: 60, 120 or 250 Watts. A basic OWS system fitted in FT1020G3 supports the following standard Features:

- Digital voice messages for alert and T3 (or AS2220 evacuation tone)³⁹.
- Supervised trigger Input (short/open circuit fault)
- Supervised dual Strobe 24Vdc output for alert and evacuation strobes.
- Supervised 100V speaker line output (open/short circuit fault).
- Fault Relay output (changeover contacts)⁴⁰
- Fault indicators for strobe output, trigger input and speaker circuit on OWS main board. Only one common fault indicator on the front display.
- Built in electret microphone.
- Auxiliary input to connect to Brooks single or multiple zone remote microphones
- Auxiliary audio enable/disable switch input.

An optional expansion 4 zone splitter board can be fitted with the standard OWS, maximum of 4 boards can be used to provide up to 16 fully supervised speaker zone circuits.

The four zone splitter boards can be used to individually select one of the four zones (or all zones) for PA announcement purposes only⁴¹. The PA front display can select up to 8 PA zones and requires 2 x 4 zone splitter board.

6.4.2 Audio Amplifiers

- 60 Watt audio amplifier SUB865
- 120 Watt audio amplifier SUB866
- 250 Watt audio amplifier SUB867

Standard 60W OWS can be powered from the FT1020G3 power supply (battery backup must be upgraded). When larger OWS is required e.g. 120W or 250W, separate power supply and power supply supervision must be used. Larger amplifiers may require larger cabinets depending on the space available.

6.4.2.1 60/120 Watt Amplifier Module

Features:

- High energy efficiency class D amplifier design.
- Available in 60W and 120W configuration.
- Standby function to reduce power consumption.
- Designed to mount on top of the main control OWS module to save space

³⁹ In NZ applications, the OWS has to be configured to provide AS2220 tones and voice messages.

⁴⁰ OWS faults are hardwired via this common fault relay to input I0 - I3 in FT1020G3 to display OWS fault on the LCD. In NZ convention, I0 cannot be used, it has to be I1 - I3.

⁴¹ The tone / message is common for all zones, only PA can select one or multiple zones for announcement.

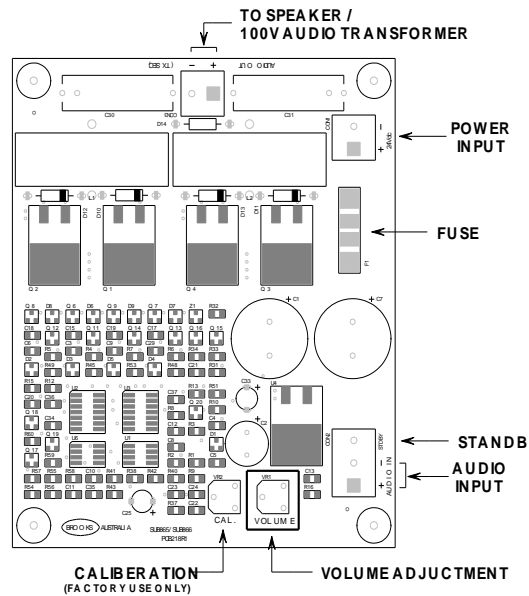
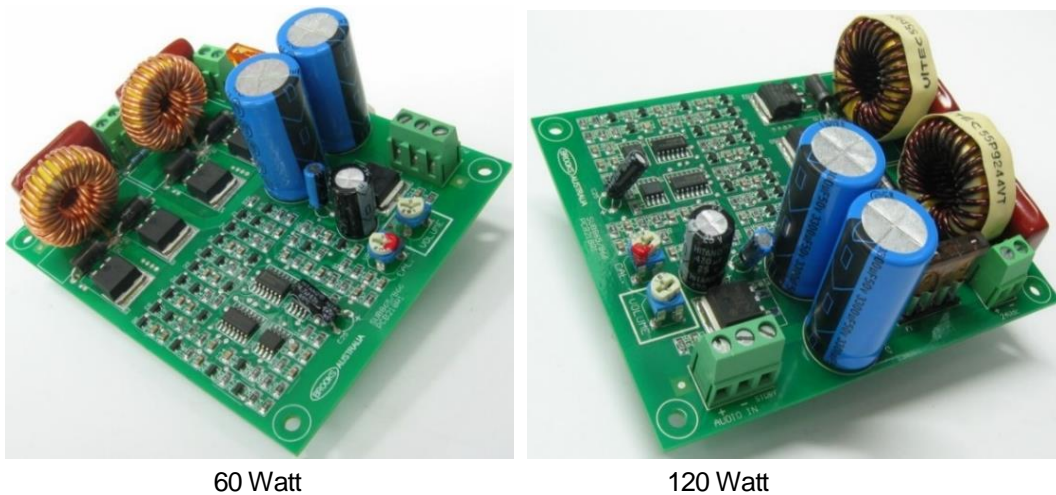


Figure 18 Class-D 60W / 120W Audio Amplifier Board Layout



60 Watt

120 Watt

Figure 19 60W / 120W Audio amplifier photos

Table 6 OWS 60/120W amplifier specifications

Function	60W version	120W version
Voltage input range	20 to 32Vdc	
Fuse rating	5 A (blade fuse)	7.5 A (blade fuse)
Low voltage shutdown	15 V (approx)	
Audio input impedance	10 k Ω	
Output load	4 Ω	2 Ω
Amplifier quiescent Current ⁴²	40 mA	
Total OWS quiescent current) ⁴²	118 mA	119 mA
Total OWS active current – full load ⁴²	2.8 A	5.17 A

⁴² Current measured at 27V supply

6.4.2.2 250 Watt Amplifier Module

- High energy efficiency class D amplifier design.
- Low voltage protection.
- Over current protection
- Standby function to reduce power consumption.

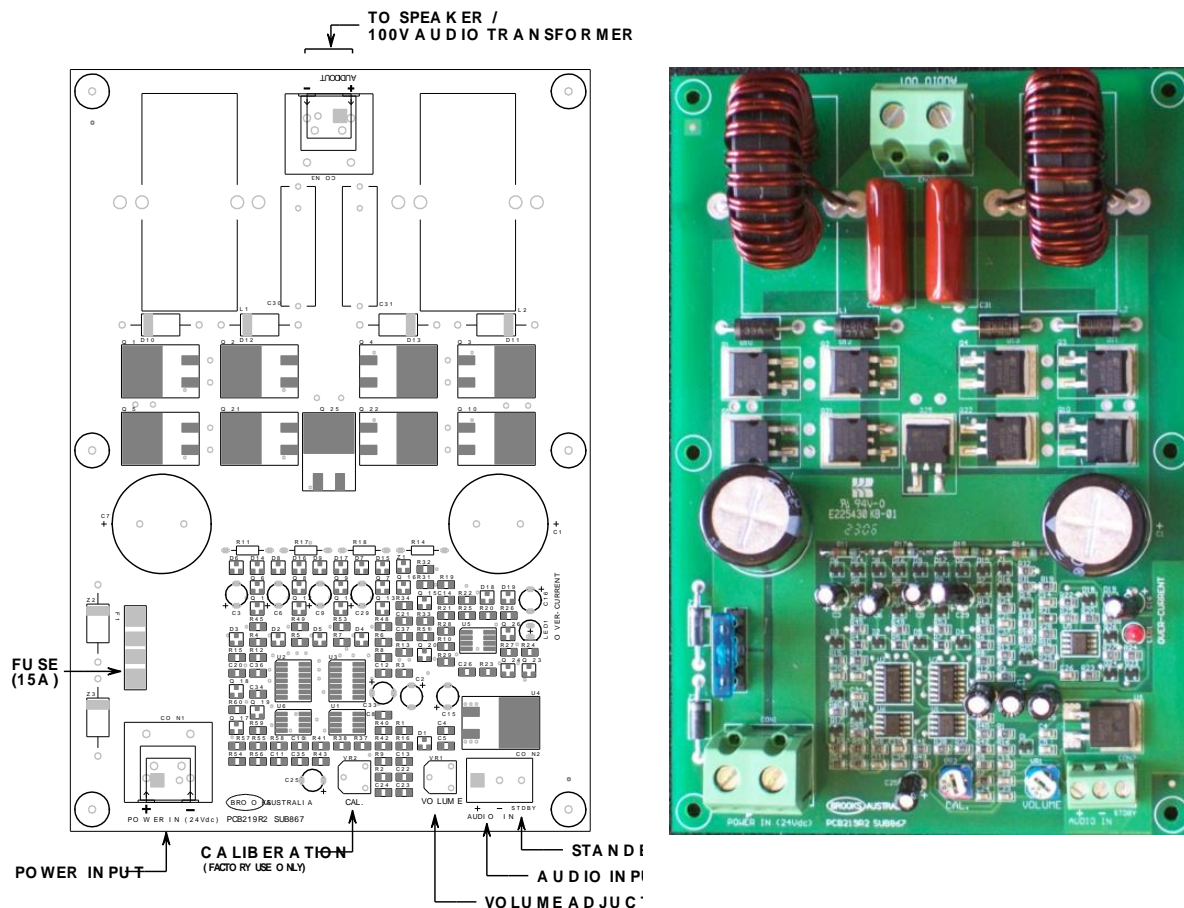


Figure 20 Class-D 250W Audio Amplifier Board Layout

Table 7 OWS 250W amplifier specifications

Function	Rating
Voltage input range	20 – 32 Vdc
Fuse rating	15 A (automotive blade fuse)
Low voltage shutdown	19 V (approx.)
Audio input impedance	10 kΩ
Output load	1 Ω
Amplifier Quiescent Current ⁴²	40 mA
Total OWS quiescent current ⁴²	119 mA
Total OWS active current – full load ⁴²	10 A

Table 8 Connection of the Audio Amplifier 60W, 120W and 250W

Designator	Type	No.	Label	Pin	Description	
CON1	Screw terminal	1	24Vdc	+	Power input. 19V - 32V, 2.8A (60W), 5.2A (120W), 10A (250W) ⁴²	
		2		-		
CON2	Screw terminal	1	AUDIO IN	+	Audio input <=1 V _{RMS} . Input impedance: 10K.	
		2		-		
		3		STDBY	Audio amplifier enable/disable input, logic 5V, <= 5mA. It is to minimize the unit power consumption. The amplifier output will be disabled when the input is high.	
CON3	Screw terminal	1	AUDIO OUTPUT	+	Audio output to the transformer secondary side on the main control board. 16V _{RMS} to the associated different transformer.	
		2		-		

6.4.3 OWS Volume Adjustment

All volume adjustments are made on the Audio Amplifier Module via the trimpot VR1 only. This volume adjustment is given a reference designator, VR1 and named "VOLUME" on all amplifier boards. This trimpot, VR1, is shown in both Figure 18 page 43 and Figure 20 page 44. **Do not use VR2 for adjusting the volume at any time, VR2 is only used for factory calibration purposes.**

The following procedures describe how to adjust the volume.

1. Manually turn on the evacuation tone.
2. Adjust the trimpot clockwise a little at a time to increase the volume on the audio amplifier.
3. Then test or measure if the required audio level is met. Specious
4. Repeat 1 to 3 as necessary.

6.4.4 Auxiliary Audio inputs

The OWS provides an auxiliary audio input controlled by a supervised auxiliary enable input. The auxiliary audio input can be connected to a background music source and enabled via the auxiliary input. The auxiliary inputs are also used to connect the Brooks remote desktop microphones. When the CIE is in quiescent conditions and the auxiliary enable input is activated, the auxiliary audio is activated and remote PA announcement or background music will be broadcasted across the speakers.

Note: Shielded cables must be used for Audio signals and its shielding should be connected to the CIE EARTH terminal, this is to reduce disturbances.

6.4.5 OWS Dual Strobe Output

The OWS Dual Strobe output circuit is shown in Figure 21. A small current flows through one of the two strobes constantly, which is normally too small to activate the strobes in normal conditions. The EOL resistor of the output is 47K, however, the EOL resistance may vary based on the strobe model connected. Multiple dual strobes can be used.

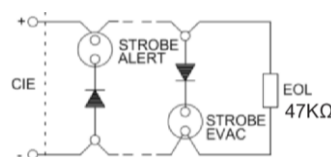


Figure 21 Typical OWS Dual Strobe Control Circuit

6.5 Gaseous extinguishing system control module

6.5.1 Overview

The gaseous extinguishing system control module is provided for use as an option in FT1020G3. The module comprises the following:

- Control Board (SUB928) with software for CIE interface.
- Display Board (SUB929)
- CIE interface board (SUB943).
- Front panel decal with interconnection cable

The gaseous extinguishing system provides outputs to the following Brooks gas ancillary equipment:

- A series of Brooks Warning Signs
- Brooks Local Control Station (LCS)
- Voice / Tone Electronic Sounder
- Dual Strobe Module

The control module combined with other Brooks system components is designed to provide the monitoring and control functions of a complete gaseous extinguishing system that meets the requirements of the relevant clauses 7.1 to 7.6 of the Australian Standard AS4214-2002 (including amendment 1). For more details, refer to FT2GAS Operation / technical manual MA400.

The control module provides the following inputs / outputs:

- Fully supervised gas release 24VDC output rated @ 5A maximum.
- Fully supervised input circuits e.g. gas lock-off valve input, manual release input and gas discharged sensor input.
- Fully supervised system warning sign 24VDC output rated @ 0.5A maximum.
- Fully supervised 2 wire system output 24VDC for level 1 and level 2 alarm to Brooks warning signs (alarm 1 [+/-] & alarm 2 [-/+]) rated @ 3A maximum.
- Gas release clean-contact relay output rated @ 2A maximum.
- Gas Fault clean-contact relay output rated @ 2A maximum.
- Gas Isolate clean-contact relay output rated @ 2A maximum.
- Four-wire interface for Local Control Station (LCS). Both the local gas isolate control and the local gas release control are fully supervised for open and short circuit faults.
- Adjustable gas release timer, set via a built-in DIP switch.

Note: the current rating above is the maximum current capacity of the outputs, a power supply and battery calculations must be performed to ensure that the power supply capacity is sufficient to run the system in full alarm condition without exceeding the maximum current rating of the power supply. The gas module might need a separate power supply with PSU supervision board and backup batteries

6.5.2 Display board (SUB929) & decal

The front decal of the gaseous extinguishing system is shown in Figure 22 below. The display board SUB929 is mounted on the inner door behind the front decal.

All LED indicators on the front display are covered by a polycarbonate decal clearly labelled with their functions.

When the system sets in the normal condition, all LED indicators will be extinguished.

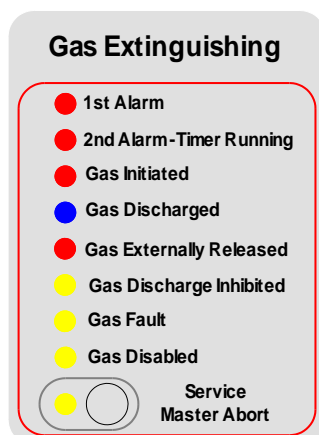











Figure 22 Gas Extinguishing Display Layout

The gaseous extinguishing system status indicating LEDs and flash patterns are described in Table 9 below. The default state of the LED indicators is OFF, if it is not defined below.

Table 9 Gas Front Status LED Indication and flash Pattern

Type	LED Name	Module Conditions	LED Pattern
Alarm	1st Alarm 	One zone or zone address in alarm	Fast Flash
	2nd Alarm – Timer Running 	Both zones or zone addresses in alarm	
	Gas Initiated 	Gas release output activated	
	Gas Externally Released 	External gas release control activated	
	Gas Discharged 	Gas discharged sensor input activated	
Fault	Gas Fault 	Fault in any of the supervised inputs or outputs	Steady ON
Disable	Gas Discharge Inhibited 	Gas discharge inhibited via LCS isolate switch	Steady ON
	Gas Discharge Disabled 	Gas discharge disabled by the service master abort switch or the gas lock-off valve controls	
	Service Switch Active 	Illuminates when the master abort switch is activated	
	Service, Master Abort	Gas service master abort switch	

6.5.3 Control board (SUB928)

The control board (SUB928) is mounted on top of the CIE interface board (SUB943), as shown in Figure 23 below.

The gas control board SUB928 provides all the gaseous extinguishing control functions. It provides the termination and supervision of all the field equipment.

6.5.4 CIE interface board (SUB943)

The CIE interface board (SUB943) is mounted at a suitable location inside FT1020G3 cabinet. It provides the required terminations to interface the gas control board SUB928 to FT1020G3. This includes zone alarm, Zone fault, zone isolate and gas release conditions.



Figure 23 Assembled Control & Interface Boards

6.5.4.1 Inputs from FT1020G3 to CIE interface board (SUB943)

The following inputs are provided in the gas interface board:

1. **24Vdc supply** (22-30V), 200mA to 3A based on system power calculation
2. **Zone 1 & Zone 2 alarm input** from FT1020G3, normally open clean alarm contact for each zone or zone address required to activate the gas system.
3. **Fault input⁴³**, zone 1 fault, zone 2 fault or power supply fault in the CIE will activate the system inoperative sign. Fault input from FT1020G3 should be normally closed clean contact.
4. **Zone Isolate input**, if any of the two zone inputs or zone addresses used to release the gas is disabled (open contact), the system inoperative sign will activate.

6.5.4.2 Outputs from CIE interface board (SUB943) to FT1020G3

The following outputs from SUB943 are provided to indicate the gaseous extinguishing system status in FT102G3 display via programmable inputs:

1. **Gas isolate**, relay output to indicate in FT1020G3 if the gas has been isolated.
2. **Gas fault** relay output to indicate in FT1020G3 if a fault exists in the gaseous extinguishing system.
3. **Gas release** relay output to indicate in FT1020G3 if the gas has been released.

⁴³ Individual zone fault output can be configured only in software ≥ V2.0.x.

7 Printer

The FT1020G3 control panel can be fitted with an optional printer. It is mounted on the front face plate behind the lockable door and is connected to the MMI board 5011. Refer to drawing F725-01

When the printer is mounted, the checkbox "Printer" has to be ticked in the EBLWin "Control Unit properties" dialog box.

The following can be printed:

- Alarms (Fire alarms – including test mode alarms & Heavy smoke / heat alarms, etc.)
- Disablements, etc. via menus H4/U1 – U2
- Detectors activating service signal via menu H4/U5
- The event log via menu H4/U7
- The Control Unit information / configuration via menu H4/U8
- Activated Interlocking inputs via menu H9/C1

The printer only – not the mounting frame - is available as a spare part, type number 5058.

8 TLON connection board 5090

The main control board 5010 in FT1020G3 CIE. provides space and connectors for two TLON connection boards type 5090⁴⁴. In a single (standalone) Control Unit there is **no** TLON connection boards mounted.

A system, with two or more Control Units, uses a **single TLON Network** or a **redundant TLON Network** (i.e. two TLON Networks), see below.

Note: As per AS1670.1, redundant TLON network **must** be used. Single TLON Network is not permitted unless the networking is inside the same enclosure e.g. network 2 x 5010 boards to increase the system capacity.

The TLON connection boards 5090 are mounted on the main board (5010) in the allocated space as shown in drawing F726 and the networks are connected to the terminal block "J4" on main board as shown in drawing F732-03. Typical examples of a redundant TLON network connections are shown in drawing F738-01, F738-02 and F738-03.

8.1 Single TLON Network (not recommended)

In a single TLON Network (Network no. 0), the TLON connection board 5090 must be mounted in position no. 0 on the main board. A single TLON Network is a violation to the Australian standard AS1670.1 and can only be used to network two main control boards 5010 inside the same enclosure.

8.2 Redundant TLON network

In a redundant TLON Network (Network no. 0 and no. 1), the TLON connection boards 5090 are to be mounted in position no. 0 and position no. 1 on the main board.

Normally only Network no. 0 will be in use and in case of a network failure (i.e. open circuit or short circuit), Network no. 1 will be automatically used until there is no fault on Network no. 0.

See also chapter "TLON Network", page 14.

8.3 Network programming

The PC program **TLON Manager** is used for the TLON Network programming. **TLON Manager V1.X** is replaced by **TLON Manager V2.0.x**.

Note: When the TLON Network is programmed, some unique data will be stored in the TLON connection board 5090 memory and some unique data will be stored in the main board 5010 memory.

When a TLON connection board is to be replaced (or replacing both a TLON connection board 5090 and a main board 5010), do **"Replace" and "Update"** in TLON Manager.

When the main board 5010 is to be replaced (not the TLON connection board), do **"Update"** only in TLON Manager.

⁴⁴ TLON connection board type 5090 is a replacement of the older version 1590.

9 Peripheral devices

Alarm points, **analogue** alarm points (detectors, MCP's, etc.) are connected directly to a COM loop. **Conventional** alarm points (detectors, MCP's, etc.) are connected to a zone line input in an 8 zones expansion board 4580 or in a COM loop unit e.g. 3361 zone line input. Programmable inputs can also be used for flow switch inputs, etc.

Short circuit isolators **must** be used on the COM loops if more than 40 alarm points are connected to a COM loop.

I/O Matrix boards are plugged "piggy back" to an Application board (Zone, Fan, Generic, etc.), which is connected to a COM loop, refer to chapter Expansion boards 458x", page 24.

Sounders, strobes, door holders, etc. are connected to COM loop output units e.g. 3361 / 3364 and/or to Control Unit outputs (S0-S3, R0-R1) and/or 8 relays expansion board (4581) outputs. Addressable sounders (4477 / 3379) are connected directly to a COM loop.

Input devices e.g. timers, external faults, etc. are connected to programmable inputs i.e. to COM loop unit (e.g. 3361) inputs and/or to the Control Unit inputs (I0-I3).

Routing equipment is normally connected to the Control Unit outputs "Fire alarm" (for Fire brigade TX) and "Fault condition" (for Fault TX). Also, any programmable output can be used.

Remote Display Units are connected directly to the RS485 channel.

For more information, see the following Sections and the Product Leaflets on our web site: <http://www.brooks.com.au>

9.1 COM loop units






















Each COM loop (0-3) supports up to 255 addressable COM loop units⁴⁵, i.e. in total up to 1020 COM loop units. The total current consumption will vary depending on the type and number of units, which will affect the cable length. See chapters "FT1020G3 cable length", page 170, "Current consumption", page 174 and drawing F784-01.

Note: The Control Unit is normally factory set for 512 alarm points. However, the FT1020G3 can be changed on site or in the factory to 1024 alarm point (via EBLWin)⁴⁶. The current configuration is shown in menu H4/U8. **The units should be distributed as evenly as possible on each COM loop and between the COM loops (0, 1, 2 and 3).**

⁴⁵ Conventional detectors can be connected to an 8 zones expansion board 4580 or to the zone line input (Z) on an addressable I/O unit 3361.

⁴⁶ This action require a special download password.

The following units can be connected to the COM loops in **NORMAL** mode (some units can be used in different modes):

	4301/4401 Analog smoke detector (Normal mode)...	Ctrl+1
	3308/3309 Analog heat detector...	Ctrl+2
	4300/4400 Analog multi detector (Normal mode)...	Ctrl+3
	3361 I/O Unit...	Ctrl+5
	3361 I/O Unit for fan control...	Ctrl+6
	3379 Addressable sounder base...	Ctrl+8
	3364 Addressable two voltage outputs unit...	Ctrl+9
	3366 External power supply...	Ctrl+0
	4313 Short Circuit Isolator...	Ctrl+E
	4383 Light indicator...	Ctrl+H
	4401 Analog smoke detector (Advanced mode)...	Ctrl+I
	4400 Analog multi detector (Advanced mode)...	Ctrl+M
	4433/4439 Addressable manual call point with short circuit isolator...	Ctrl+Q
	4620 Addressable base station for wireless units...	Ctrl+J
	4611 Wireless photoelectric smoke detector...	Ctrl+K
	4477 Addressable siren with short circuit isolator...	Ctrl+R
	4445 LAAU Local alarm acknowledgement unit...	Ctrl+T
	AE2010 L-P Aspect Lazeer...	
	AE2010 N/G-P Aspect Nitro/Grizzle...	
	4402 Multi detector with CO...	
	Customized units	▶
	Obsolete loop units	▶

Notes:






The following loop units are not available in Australia or New Zealand:

1. Customized units: Customised I/O 1 (1=Exit Light),
2. Multi Detector with CO: 4402
3. Wireless Units: 4611, 4620
4. Aspiration Detectors: AE2010 L-P Aspect Lazeer, & AE2010N/G-P Aspect Nitro/Grizzle

Notes:

1. The I/O 3361 Unit for Fan control is used only in the Fan control applications.
2. The Alarm Acknowledge Facility Control AAFC is used in conjunction with AAM.

Obsolete loop units (listed below) may be found in old installations and can be used in FT1020G3 systems as well.

	4380 Addressable beacon...	Ctrl+G
	3333/3339 Addressable manual call point...	Ctrl+4
	3377 Addressable siren...	Ctrl+7
	3378 Addressable sounder base...	
	AAFC Alarm acknowledge facility control...	

Notes:

3333/3339 can be used instead of 4433/4439 when the built-in short circuit isolator is not to be used.

3377 can also be used instead of 4477 when the built-in short circuit isolator is not to be used

Address setting

Each COM loop unit must have a unique COM loop address (001-255). This address and the mode are set with an Address Setting Tool 3314 / **4414**. Except otherwise stated, the **NORMAL** mode is used in FT1020G3 (default). To set the detectors 440x in **Advanced Mode**, the Address Setting Tool **4414** must be used.

9.1.1 Input units

Each COM loop input unit is added and programmed via EBLWin. Depending on type of unit, the following to be programmed:

- Technical address (COM loop address) 001-255
- Name (normally not changed)
- Zone number and Address within the zone
- Alarm text (user definable)
- Regular Alarm algorithm (some units only)
- Options:
 - ☞ Alternative Alarm algorithm & Time Channel (some units only)
 - ☞ Alert annunciation & Time Channel (some units only)
 - ☞ Disablement & Time Channel (some units only)
 - ☞ Two-units-dependent fire alarm, i.e. co-incidence alarm & Time Channel (some units only)
 - ☞ Delayed (fire alarm)
 - ☞ Quiet alarm

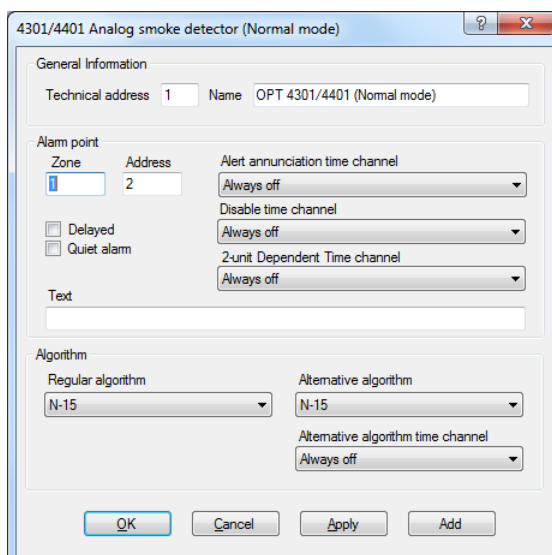


Figure 24 EBLWin properties dialog box for 4301 / 4401(Normal Mode)

9.1.1.1 Analogue Sensor Bases (ASB)

An Analogue detector (Sensor) to be plugged in an Analogue base. The COM loop address is set in the detector, see below.



- 3312** Analogue Base 3312 has screw terminals for the COM loop and an RIL. Prepared for mechanical lock of the detector - if required. Recess for label holder (3391). The base has an address label on which the plugged-in detector's COM loop address can be written.



- 4313** Analogue Base with isolator. An Analogue detector (Sensor) is to be plugged in 4313. Terminals are provided for remote indicators (RIL). Prepared for mechanical lock of the detector - if required. Recess for label holder (3391). It has also a built-in short circuit isolator (see page 64). The isolator's COM loop address is set with the Address setting tool 3314 / 4414. The base has an address label on which both the plugged-in detector's COM loop address and the isolator's COM loop address can be written.

The Address setting tool 3314 / 4414 is also used for mode setting:

NORMAL mode: Used for 4313 in system FT1020G3.

9.1.1.2 Addressable Manual Call Points



- 4433** Addressable Manual Call Point⁴⁷ with isolator. Conforms to EN54-11, replaces 3333. This MCP is similar to 3333 but it also has a built-in short circuit isolator. A built-in LED will indicate that a fire alarm is generated, i.e. the glass is broken. Routine testing can be performed with a supplied test key, without breaking the glass. A hinged polycarbonate flap protects the glass from accidental triggering. The COM loop address is set with the Address setting tool 3314 / 4414.

The isolator does not use any COM loop address

4433 is to be surface mounted in the supplied red back box or flush mounted as it is mounted in the FT1020G3 cabinet.

For indoor use and in dry premises.

The Address setting tool 3314 / 4414 are also used for mode setting:

⁴⁷ The manual call points have a response time ≤ 5 s

NORMAL mode: The built-in short circuit isolator is **in use**. Programmed in EBLWin as MCP type 4433 Flashing or non-flashing LED is set via EBLWin.

2330 mode: The built-in short circuit isolator is **not in use**. Programmed in EBLWin as MCP type **3333**⁴⁸. Flashing or non-flashing LED is set via EBLWin.



4439 Enclosed Addressable Manual Call Point ⁴⁷ with isolator. Replaces 3339. 4439 is same as 3339 unit but it has built-in short circuit isolator. The isolator does **not** use any COM loop address. The Address setting tool 3314 / 4414 is also used for mode setting same as 4433.

For indoor use in premises where IP56 rating is required. Operating temp. -10 to +55°C.

Addressing and programming 4433/4439 with SCI

1. Connect the address setting tool to the MCP terminals SA and SB (without loop connection).
2. Turn on the address setting tool then hold down both Write and Read buttons simultaneously until "MODE: 0-3" appears.
3. Press "0" to select "M0 NORMAL" mode.
4. Enter the required technical address then press "write".

In EBLWin, select 4433/4439 from the "Obsolete units" and add to the desired Loop.

Addressing and programming 4433/4439 without SCI

1. Connect the address setting tool to the MCP terminals SA and SB (without loop connection).
2. Turn on the address setting tool then hold down both Write and Read buttons simultaneously until "MODE: 0-3" appears.
3. Press "1" to select "M1 2330" mode.
4. Enter the desired technical address then press "write".

In EBLWin, select 3333/3339 from add loop unit and add to the desired Loop.

Notes:

1. Incorrect addressing mode or programming will cause the unit to report a "No reply" fault in the Control Unit.
2. When 4433 or 4439 is used in FT512 system, the MCP must be addressed in 2330 mode and programmed as 3333 / 3339.
3. The short circuit isolator feature in 4433 or 4439 can be used only in FT1020G3 or FT128

9.1.1.3 Analogue Detectors



3308 Analogue heat detector. To be plugged in an Analogue base (3312 / 4313 / 3379). Built-in LED is lit to indicate that the detector has activated a fire alarm. Prepared for mechanical lock (screw attached) if required. The COM loop address is set with the Address setting tool 3314 / 4414. The detector has an address label on which the programmed COM loop address can be written.

The Address setting tool is also used for mode setting:

NORMAL mode: 3308 is set in this mode in EBLWin to one of three algorithms (static response temp. range) for class:

⁴⁸ When 4433/4439 is used as a replacement for 3333/3339, in EBLWin, 3333/3339 must be selected (not 4433 or 4439).

- ☞ A1 (54-65°C), min./typical/max. ambient temp. -20/+25/+50°C
- ☞ A2 S (54-70°C), min./typical/max. ambient temp. -20/+25/+50°C
- ☞ B S (69-85°C), min./typical/max. ambient temp. -20/+40/+65°C

3309 Analogue heat detector. Enclosed (IP67)⁴⁹. Built-in LED is lit to indicate that the detector has generated fire alarm. Terminals for remote indicator (RIL). Recess for label holder (3391). The COM loop address is set with the Address setting tool 3314 / 4414. The Address setting tool 3314 is also used for mode setting:



NORMAL mode: 3309 is set in this mode in EBLWin to one of three algorithms (static response temp. range) for class:

- ☞ A1 (54-65°C), min./typical/max. ambient temp. -20/+25/+50°C
- ☞ A2 S (54-70°C), min./typical/max. ambient temp. -20/+25/+50°C
- ☞ B S (69-85°C), min./typical/max. ambient temp. -20/+40/+65°C

4300 Analogue multi detector. Discontinued and replaced by 4400 in normal mode, see below. 4300 is a smoke detector and a heat detector within the same housing. Scattered light (i.e. reflection of infrared light) is used to detect smoke and the heat sensing element is a thermistor. The detector unit (actually the heat detector) can detect a methylated spirits (alcohol) fire (EN54-9, test fire TF6; liquid fire), which normally is impossible for a photo electric smoke detector to detect.



The detector has unleaded soldering.

To be plugged in an Analogue base (3312 / 4313 / 3379).

Built-in LEDs are lit to indicate that the detector ⁵⁰ has activated a fire alarm. Prepared for mechanical lock (screw attached) – if required.

Via EBLWin, the mode of operation can be selected as follow:

Zone-Addr.
001-01 (smoke)
001-02 (heat)
COM loop address
e.g. 123

- a) **Two presentation numbers (addresses):** The detector unit works as two separate detectors. The smoke detector is programmed for one zone-address and the heat detector for another zone-address⁵¹. (Can be used to disable e.g. the smoke detector during working hours and/or in control expressions for programmable outputs).
- b) **One presentation number (address):** The detector unit works as one detector and is programmed for one zone-address.

Zone-Addr.
001-01(smoke or
heat)
COM loop address
e.g. 123

If alternative b) is to work with "OR-functionality" or with a "Decision algorithm", program this via EBLWin using either of these functionality options:

b1) OR-functionality: Either the heat detector or the smoke detector will activate fire alarm. This alternative is recommended in most cases.

b2) Decision algorithm:

Fire alarm will be activated if:

Temperature (°C) + adjusted smoke value ⁵² ≥ 58.

Pre-warning will be activated if:

⁴⁹ This detector holds the ATEX classification: Ex II 3GD EEx nA II T5 (T 70°C), -20°C < Ta < 65°C.

⁵⁰ i.e. the heat detector and/or the smoke detector.

⁵¹ The zone number has to be the same for both detectors. **NOTE!** When counting alarm points these "two detectors" are regarded as two alarm points.

⁵² Adjusted smoke value = obscuration (%/m) x 10. Default heat alarm levels (50°C / 58°C) and smoke alarm offsets (50 / 58) can be changed via EBLWin. The temperature cannot be lower than 0°C in the algorithm / graph.

$58 > \text{temperature } (^{\circ}\text{C}) + \text{adjusted smoke value}^{52} \geq 50.$

20°C	=>	3.8 %/m
↓		↓
40°C	=>	1.8 %/m

The "Decision algorithm", see Figure 25, can be used to reduce false alarms (nuisance alarms), because at a normal room temperature, more smoke is required to activate fire alarm than when the room temperature is high (or is rising). In a real fire condition, the room temperature will rise rather fast and less smoke is required to activate fire alarm. Very little smoke requires a "high" temperature to activate fire alarm and a lot of smoke will activate fire alarm also at a "low" temperature.

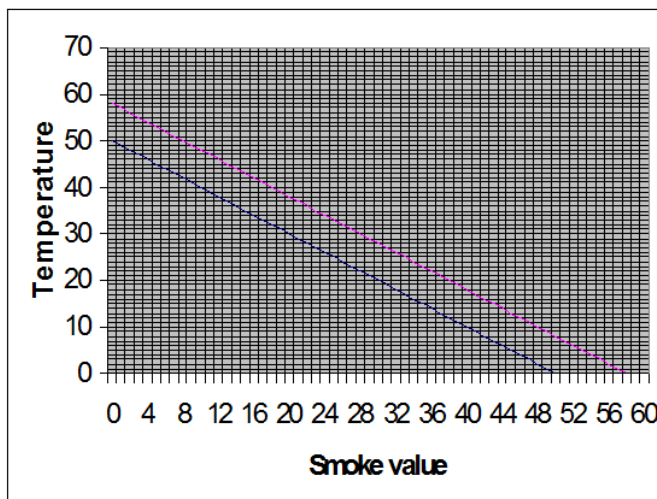


Figure 25 Decision algorithm

When the calculated value in the decision algorithm exceeds the lower graph, pre-warning will be activated. When it exceeds the upper graph, fire alarm will be activated.

Temperature = °C. *Smoke value* = obscuration (%/m) x 10.

The Analogue multi detector's COM loop address (Technical address) is set with the Address setting tool 3314 / 4414. The detector has an address label on which the programmed technical address can be written.

Note: The multi detector 4300 in system FT1020G3 takes two COM loop (technical) addresses of the available 255 addresses. One address that is set with the 3314 / 4414 tool but also the following address will be "occupied" for the heat part of the detector and cannot be used by any other unit on the COM loop.

The Address setting tool 3314 / 4414 is also used for mode setting:

NORMAL mode: 4300 is set to this mode in EBLWin. For the smoke detector, set to one of six algorithms H-15, H-35, L-15, L-35, **N-15** or N-35 and for the heat detector set to one of three algorithms for class **A1** (static response temp. 54-65°C), A2 S (54-70°C) or B S (69-85°C).

4301 Analogue photo electric smoke detector. Discontinued and replaced with 4401 in **Normal** mode, see below. Scattered light (i.e. reflection of infrared light) is used to detect smoke. To be plugged in an Analogue base (3312 / 4313 / 3379). Built-in LEDs are lit to indicate that the detector has activated fire alarm. Prepared for mechanical lock (screw attached) if required.



The COM loop address is set with the Address setting tool 3314 / 4414. The detector has an address label on which the programmed COM loop address can be written. The Address setting tool 3314 / 4414 is also used for mode setting:

NORMAL mode: 4301 is set in EBLWin to this mode to one of the six algorithms H-15, H-35, L-15, L-35, **N-15** or N-35.

4400



Analogue multi detector. Replaces 4300 in **Normal** mode, see above. 4400 is a smoke detector and a heat detector in one housing. Scattered light (i.e. reflection of infrared light) is used to detect smoke and the heat sensing element is a thermistor. To be plugged in an Analogue base (3312 / 4313 / 3379). Built-in LEDs are blinking to indicate that the detector ⁵³ has activated fire alarm. Prepared for mechanical lock (screw attached), if required. 4400 has slightly different design to the 4300 detector and the smoke chamber net has even made with smaller holes, this will keep insects and particles ⁵⁴ larger than smoke particles out of the chamber.

The COM loop address (Technical address) is set with the Address setting tool 3314 / **4414**. The detector has an address label on which the programmed technical address can be written.

The Address setting tool is also used for **mode setting**:

Advanced mode: Only the new Address setting tool 4414 can be used to set 4400 to “Advanced” mode. **Note**, the Address setting tool 3314 cannot be used to set “Advanced” mode!

In Advanced mode, 4400 will use an algorithms in the detector for fire alarm evaluation. It can be set to a Learning function or via EBLWin to one of five area alarm algorithms (Normal, Clean, Smoke/Steam, Cooking/Welding or Heater area), see chapter “Advanced mode” page 131.

An alternative smoke and/or heat algorithm can be used via one or two time channels. 4400 has a green polling LED. Via EBLWin, the green polling LED can be set to blink when the detector is polled or never blink. Note, the LED will not be blinking if the detector is in Test mode.

In “Advanced” mode, only one COM loop address will be occupied for the multi detector.

NORMAL mode: 4400 in this mode has to be programmed in EBLWin as a **4300** detector, i.e. the 4400 detector will work as a replacement for the Analogue multi detector 4300 and two COM loop addresses will be occupied, see 4300 above.

The smoke detector part has to be set to one of six alarm algorithms H-15, H-35, L-15, L-35, **N-15** or N-35 and the heat detector part has to be set to one of three alarm algorithms for class **A1** (static response temp. 54-65°C), A2 S (54-70°C) or B S (69-85°C). An alternative smoke and/or heat algorithm can be used via one or two time channels.

4401



Analogue photo electric smoke detector. Replaces 4301 in **Normal** mode, see above. Scattered light (i.e. reflection of infrared light) is used to detect smoke. To be plugged in an Analogue base (3312 / 4313 / 3379). Built-in LEDs are blinking to indicate that the detector has activated fire alarm. Prepared for mechanical lock (screw attached) if required.

4401 has slightly different design to the 4301 detector and the smoke chamber net has even made smaller with holes that will keep insects and particles ⁵⁴ larger than smoke particles out of the chamber. The technical address is set with Address setting tool 3314 / **4414**. The detector has an address label on which the programmed technical address can be written.

The Address setting tool is also used for **mode setting**:

Advanced mode: 4401 has to be set to Advanced mode via only the Address setting tool **4414**. *Note, the Address setting tool 3314 cannot be used to set Advanced mode!* In Advanced mode, this detector will use algorithms in the

⁵³ I.e. the heat detector and/or the smoke detector.

⁵⁴ For example dust, steam, etc.

detector for fire alarm evaluation. It can be set to a Learning function or via EBLWin to one of three area alarm algorithms (Normal, Clean or Smoke/Steam area), see chapter “Advanced mode” page 131.

An alternative area alarm algorithm can be used via a time channel. 4401 has a green polling LED. Via EBLWin, the green polling LED can be set to either blink when the detector is polled or never blink. **Note**, the LED will not be blinking if the detector is in Test mode.

NORMAL mode: In this mode 4401 has to be programmed in EBLWin as a **4301** detector, i.e. the 4401 detector will work as a replacement of the Analogue photoelectric smoke detector 4301 (see 4301 above) and has to be set to one of six alarm algorithms H-15, H-35, L-15, L-35, **N-15** or N-35. An alternative alarm algorithm can be used via a time channel.

9.1.1.4 Conventional Detector Bases (CDB)

- 2324** Base. A conventional detector is to be plugged in a conventional detector base 2324. Built-in LED is lit to indicate that the detector plugged in the base has activated fire alarm. Terminals for remote indicator (RIL) are provided.



9.1.1.5 Conventional Detectors

- 4318** Combination heat detector. Rate-of-rise **and** fixed temperature, 59°C, heat detector class **A1R**. Static response temperature range 54-65°C, ambient temperature min./typical/max. -10/+25/+50°C.



Shall be plugged in a conventional detector base (2324).

- 4350** Multi detector. This detector is **discontinued** and will not be replaced. 4350 is a smoke detector and a heat detector within one housing. Scattered light (i.e. reflection of infrared light) is used to detect **smoke** and the **heat** sensing element is a thermistor. In order to secure the fire detection and to reduce false alarms, an AI function is used, i.e.



- Combined heat and smoke sensing
- Variable delay function
- Adaptive learning function

- 4352** Photoelectric smoke detector. **Discontinued** and replaced with 4452. Scattered light (i.e. reflection of infrared light) is used to detect smoke. An advanced alarm algorithm is used to secure the smoke detection and to reduce false alarms, e.g. a minimum of nine consecutive readings over the fire alarm level are required before the detector goes into alarm. (One reading per sec.). To be plugged in a conventional detector base (2324).



- 4452** Photoelectric smoke detector. Replaces 4352, see above. Similar to 4352 but 4452 has a little different design compared to 4352 detector (see 4401 above) and the smoke chamber net has smaller holes. This will keep insects and particles⁵⁴ larger than smoke particles out of the chamber.



- 4375** Heat detector. Fixed temperature heat detector, 60°C, class **A2S** (static response temp. range 54-70°C), latching, minimum/**typical**/maximum ambient temperature -10/**+25**/+40°C.



To be plugged in a conventional detector base 2324.

- 4376** Heat detector. Fixed temperature heat detector similar to 4375 but 80°C, class **BS** (static response temp. range 69-85°C), latching, minimum/**typical**/maximum ambient temperature -10/**+40**/+60°C. To be plugged in a conventional detector base 2324.



- 6295** Heat detector: Enclosed (IP67) ⁵⁵. Fixed temperature heat detector, 57°C, class **A2S** (static response temperature range 54-70°C), latching. minimum./**typical**/maximum ambient temperature -40/+25/+50°C. Built-in LED is lit to indicate that the detector has activated a fire alarm. Terminals for a remote indicator (RIL) are provided.
- 6296** Heat detector: Enclosed (IP67) ⁵⁵. Same as 6295 but 72°C, class **BS** (static response temperature range 69-85°C), latching. Minimum/**typical**/maximum ambient temperature -40/+40/+65°C. Built-in LED is lit to indicate that the detector has activated a fire alarm. Terminals for a remote indicator (RIL) are provided.
- 6297** Heat detector: Enclosed (IP67) ⁵⁵. Same as 6295 but 87°C, class **CS** (static response temperature range 84-100°C), latching. inimum./**typical**/maximum ambient temperature -40/+55/+80°C. Built-in LED is lit to indicate that the detector has activated a fire alarm. Terminals for a remote indicator (RIL) are provided.
- 6298** Heat detector: Enclosed (IP67) ⁵⁵. Same as 6295 but 117°C, class **ES** (static response temperature, range 114-130°C), latching. Minimum/**typical**/maximum ambient temperature -40/+85/+110°C. **No** built-in LED but terminals for a remote indicator (RIL) are provided to indicate that the detector has activated a fire alarm.

9.1.1.6 Accessories



- 3314** Address setting tool. Discontinued, replaced by 4414, is used to write or read the COM loop units' **technical address** (001-255). It is also used to write or read the mode, **NORMAL** or **2330** (see the unit respectively). A connection cable with crocodile clips and tab terminals is supplied with the tool and can be used when required.

Slide the ON/OFF switch to the ON position and wait for a beep. Plug the detector's SA & SB terminals onto the tool's SA & SB terminals or, when required, use the connection cable.⁵⁶

How to read: Press "READ", wait for a beep and read the address and mode.

How to write: To select the mode, press "WRITE" and "READ" simultaneously **and/or** write the address. Press "WRITE" and wait for a beep. ("READ" again as a check).



- 4414** Address setting tool. Replaces 3314. Is used to write or read the units' **COM loop address** (Technical address 001-255). It is also used to write or read the mode (Advanced⁵⁷, NORMAL and 2330), see the COM loop unit respectively for mode information.

A connection cable with crocodile clips and tab terminals is supplied with the tool and can be used when required.

4414 replaces 3314 but 4414 is only required when the 4400 and 4401 detectors are configured for the Advanced mode.

Turn on the tool (On/Off/CLR button). A blinking cursor and mode **MO** will be shown in the display. Plug the detector's SA & SB terminals onto the tool's SA & SB terminals or, when required, use the connection cable ⁵⁶

How to read: Press "Read", wait for OK, address and mode info and a beep.

How to write: To change the mode (if required) press "Write" and "Read"

⁵⁵ This detector holds the ATEX classification: Ex II 3GD EEx nA II T5 (T 100°C), -40°C < Ta < 50°C.

⁵⁶ Some units have flying leads for easier connection. After use they should be disconnected and thrown away.

⁵⁷ Address setting tool 4414 has to be used to set the detectors 4400 and 4401 in Advanced mode. (Address setting tool 3314 cannot be used for the Advanced mode).

simultaneously, then press 0, 1, 2 or 3 for the mode respectively. Type the address (1-255) and press "Write". Wait for OK, address, mode info and a beep (Press "Read" again to confirm). More info. on the backside of the tool.



3390 Label holder. To be mounted on the Analogue base (3312 / 4313 / 3379)⁵⁸. Intended for a label with "zone-address", "technical address", etc. to be read also when the detector is plugged in its base. 100 label holders per packet. Excel labels.

3391 Labels for 3390. A packet with self-adhesive white labels for label holder 3390. 10 A4-sheets, 132 labels for laser printer usage. The print-out is done via EBLWin.

9.1.2 Addressable I/O units

3361 Addressable multipurpose I/O unit.⁵⁹ COM loop powered unit.

The unit has two programmable inputs:

Monitored input



....**used as zone line input (Z)** (terminals 6 & 7): End-of-line capacitor 10uF⁶⁰ mounted in the last unit on the zone line. A short circuit on the input can generate a fault or a fire alarm (set via EBLWin). This input is intended for conventional detectors.⁶¹ Max. 1.5 mA, cable characteristic is max. 50 and max. 50nf.

....**used as general input (In0)** (terminals 5 & 7): An input for NC or NO contacts (set via EBLWin).

Isolated input (In1) (terminals 8 & 9): An optocoupler input (external 24 VDC / 8 mA is required). Normally low or high (set via EBLWin).

The unit has two **programmable** relay⁶² outputs:

Relay output (Re0): NC or NO contacts (set via EBLWin).

Relay output (Re1): NC or NO contacts (set via EBLWin).

Connections and examples, see drawings F733 & F735. Unit dimensions: (L x W x H) 90 x 70 x 32 mm. A plastic protection cover is attached. The cover dimensions: (L x W x H) 129 x 73 x 45 mm.

3361 is intended to be surface mounted and for indoor use in dry premises. When required, the unit can be mounted in a Waterproof (IP66 / 67) box. 3361 has an LED to indicate communication to the unit or alarm condition. For more information, see the Product Leaflet. The COM loop address is set with the Address setting tool 3314 / 4414. The unit has an address label on which the unit's COM loop address can be written.

The Address setting tool is also used for mode setting:

NORMAL mode: Used for 3361 in system FT1020G3.

3364 Addressable 2 voltage outputs unit. The unit is connected to a COM loop. External 24VDC supply is required (via a 3366AU unit or FT1020G3).

⁵⁸ Also in an enclosed analogue heat detector (3309).

⁵⁹ The same physical unit (3361) is also used in AS1668 Fan control applications and has a separate dialog box in EBLWin

⁶⁰ 470nF is revised to 10uF.

⁶¹ It is via EBLWin possible to define this input function to be a manual call point ("Used as MCP"), i.e. it cannot be disabled via a time channel, cannot be included in two-unit dependence or cannot use the "AVF" function.

⁶² Relay contacts: max. 2 A @ 30 VDC / 125 VAC.

The unit has two programmable and supervised voltage outputs (VO0-VO1), intended for alarm devices (e.g. sirens, strobes, etc.). An End-Of-Line capacitor (470nF) is to be mounted in the last device, alternatively, a capacitor (470nF) in up to five alarm devices (T-off).



The unit also has a special voltage output (VO2) intended for fire door closing only. The trigger condition "Fire Door Closing" and the controlling detectors have to be programmed. The "fire door closing function" is described on page 101 and besides that function, the output VO2 will also not be powered for approx. 30 sec. after:



- The "/Mains OK input" (terminal 8) goes high, see below.
- The COM loop communication is interrupted i.e. 3364 has no connection / communication with the CIE

The unit has two inputs, i.e. one for power supply (24VDC) and one for "/Mains OK".

- **VO0:** Normally low or high (set via EBLWin), 24VDC, 1 A⁶³.
- **VO1:** Normally low or high (set via EBLWin), 24VDC, 1 A⁶³.
- **VO2:** Normally high, 24VDC, 1 A⁶³ (Fire door closing function.)
- **24V DC:** From an external power supply (unit 3366AU or FT1020G3)
- **/Mains OK:** From an external power supply unit (3366AU). Normally low = the main power source (230VAC) in the External power supply unit is okay⁶⁴.

For connections and examples, see drawings F733 & F737. Unit dimensions: (90L x 70W x 32H mm. A plastic protection cover is attached. The cover's dimensions: 129L x 73W x 45H mm. The unit is intended to be surface mounted and for indoor use in dry premises. When required, the unit can be mounted in a Waterproof box (IP66 / 67).

The COM loop address is set with the Address setting tool 3314 / 4414 while the unit is powered. The unit has an address label on which the programmed technical address is to be written.

The Address setting tool 3314 / 4414 is also used for mode setting:

NORMAL mode: Used for 3364 in system FT1020G3.

9.1.3 Alarm devices (addressable sounders)

4477 Addressable siren. Replaces 3377, the new 4477 is similar to 3377 unit but it has a built-in short circuit isolator, refer to section 9.1.4 Short circuit isolators (addressable) page 64. The isolator does **not** use any COM loop address.



The power to the siren is supplied via the COM loop, i.e. the number of sirens is dependent on the type and number of other units connected to the COM loop.⁶⁵

Three sound types (tones) and three priority levels are available.

- **Steady** (continuous) 990 Hz
- **Intermittent** (pulsed) 990 Hz, 0.5s / 0.5s (1 Hz)

⁶³ Cont. 1 A, during 10 ms 1.4 A.

⁶⁴ When the 24Vdc power to 3364 is supplied from FT128, this terminal must be connected to negative. To simulate "Mains Ok" for 3364.

⁶⁵ The number of 4477 + 3379 units must be < 50 per COM loop.

- **Alternating** (two-tone) 990 / 650 Hz, 0.25s / 0.25s (2 Hz)

For each level, an output control expression and a sound type is programmed (via EBLWin). For more technical data, see the product datasheet.

The COM loop address is set with the Address setting tool 3314 / 4414 which is also used for mode setting.

NORMAL mode: 4477 with the built-in isolator **in use**.

2330 mode: 4477 with the built-in isolator **not in use**. 4477 replaces a 3377 unit.

Note: See also Table 2 "Control Panel Limitation", page 18.



3379 Addressable sounder base.⁶⁶ 3379 consists of an Analogue base (3312) mounted together with a sounder. 3379 is mounted in the ceiling. An Analogue detector can be plugged in the base, which has screw terminals for the COM loop and a remote indicator (RIL). Prepared for mechanical lock of the detector - if required. Recess for label holder (3391). 3379 is COM loop powered, i.e. the number of sounder bases is dependent on the type and number of other units connected to the COM loop⁶⁵.

Three sound types (tones)⁶⁷ and three priority levels are available:

- Steady (continuous) 3650 Hz
- Intermittent (pulsed) 3650 Hz, 0.5s / 0.5s (1 Hz)
- Intermittent (pulsed) 3650 Hz, 0.167s / 0.167s (3 Hz)

For each level, an output control expression and a sound type is programmed (via EBLWin). High sound output (approx. 4.5 dB higher) can be selected via EBLWin (more current will be required). For more technical data, see the Product datasheet.

The COM loop address is set with the Address setting tool 3314 / 4414. The unit has an address label on which the programmed COM loop address can be written. (The detector has its own COM loop address set via the Address setting tool).

The Address setting tool 3314 / 4414 is also used for mode setting:

NORMAL mode: Used for 3379 in system FT1020G3.

Note: See also Table 2 "Control Panel Limitation", page 18.



4380 Addressable beacon.⁶⁸ The LED beacon is connected to a COM loop. It is powered via the COM loop, i.e. the number of beacons is dependent on the type and number of other units connected to the COM loop but max. 10 per COM loop. Red ABS plastic housing and PC lens. The light output is 1 Cd and the flash rate is 1 Hz. An output control expression is programmed (via EBLWin). For more technical data, see the Product Leaflet.

The COM loop address is set with the Address setting tool 3314/4414. The beacon has an address label on which the programmed address can be written.

The Address setting tool 3314 / 4414 is also used for mode setting:

NORMAL mode: Used for 4380 in system FT1020G3.

⁶⁶ This unit has replaced the Sounder base 3378.

⁶⁷ High tone can be selected via EBLWin V2.1.x and higher, more current will be required.

⁶⁸ The addressable beacon is discontinued and will be replaced by new VAD's



4383 Light indicator. The light indicator 4383 is used as a complement to audible alarm devices. It is of type A for indoor use. All electronics and the eight red LEDs (visible 360°) are mounted in a transparent ABS housing. Flash rate is 1 Hz. 4383 is COM loop powered, i.e. the number of indicators is dependent on the type and number of other units connected to the COM loop. The light indicator is plugged in an analogue detector base 3312, 3379 or 4313 and an analogue detector is plugged in the light indicator.

A control expression for activation has to be programmed, similar to a programmable output or alarm device. It takes one COM loop address. For more technical data, see the Product Datasheet.

The COM loop address is set with the Address setting tool 3314 / 4414. The unit has a label for the COM loop address and another label for the detector's COM loop address.

The Address setting tool is also used for mode setting:

NORMAL mode: Used for 4383 in system FT1020G3.

9.1.4 Short circuit isolators (addressable)

According to the Australian standard **AS1670.1, at least one short circuit isolator must be used every 40 alarm points on the COM loop.** Up to 64 isolators can be used per COM loop.

Each COM loop short circuit isolator 4313 is to be programmed (via EBLWin) for the following:

- COM loop address ⁶⁹
- Name (Normally not changed)
- Sequence Number (Serial Number in the COM loop's A-direction), 0-63 ⁶⁹

For connections, see drawing F733.



4313 Analogue base with isolator. 4313 is an Analogue base with a built-in short circuit isolator. In case of short circuit on the COM loop, the number of disabled units will be minimised. 4313 is a COM loop powered unit. For more information, see the Product Datasheet. The COM loop address is set with the Address setting tool 3314 / 4414. The unit has an address label on which the programmed COM loop address is to be written.

The Address setting tool 3314 / 4414 is also used for mode setting:

NORMAL mode: Used for 4313 in system FT1020G3.

Up to 64 isolators can be used, which give 65 loop segments. Each isolator has to be given a **Sequence Number**, 00-63. The isolators have to be connected **consecutively** (Sequence Number 00-01-02-03-04-05-06-07-08-09-10-11-12-13-14-15 ... up to 63) in the COM loop's **A-direction**.

Note: FT1020G3 has one built-in isolator in the-A direction (no. "A") and one in the B-direction (no. "B").

Short circuit / cut-off (break) on the COM loop

See chapter "Short circuit isolators", page 94. See also FT1020G3 Operation Manual, chapter "Fault messages".

⁶⁹ The units 4433, 4439 and 4477 have a built-in isolator that doesn't occupy any COM loop address and the isolator's Sequence Number is set in the dialog box for the 4433, 4439 and 4477 unit respectively.

9.1.5 Built-in Isolators

The units 4433, 4439 and 4477 have a built-in isolators that do not require any separate COM loop addresses, only the Sequence Number, 00-63. As an option, these units can be used without the isolator in function. If so, they have to be programmed in EBLWin as if they were 3333, 3339 and 3377 units and via the Address setting tool 4413 set to 2330 mode instead of NORMAL mode.

9.1.6 Units for Hazardous (Ex) areas

In hazardous (Ex) areas, Intrinsically Safe (IS) and approved products are required. The IS alarm points are connected to an interface outside the hazardous area.

Normally the Analogue addressable units, IS smoke (2840) and heat 2841 detectors are to be used. They are connected to an IS barrier unit (2842), which is connected to a CIE via a COM loop.

Conventional units are connected via a Galvanic isolator MTL 5061 (2820) to an expansion board 4580 Ex zone line input. See also drawings F728 & F736.

9.1.6.1 Galvanic isolators / IS barrier units



MTL5061 Galvanic isolator (2820). The isolator is used to connect conventional intrinsically safe detectors and manual call points to an expansion board 4580 zone line input (programmed in "Resistor-Ex" mode). The isolator has two zone line inputs and two outputs (Channel 1 & 2) and is mounted in a Waterproof box (IP66/67) which has to be mounted outside the hazardous (Ex) area. Four compression glands for the cable entries and an End-Of-Line resistor (10K) with an area >230 mm² are supplied. Box dimensions (L x W x H): 175 x 125 x 150 mm. BASEEFA classification: EEx ia IIC T_{amb}=60°C.



2822 Isolated zone interface. The Isolated zone interface (2822) contains a waterproof box (IP66/67) that is supplied with four compression glands for the cable entries, an Isolated zone interface board (2823) mounted on a DIN rail, a DIN rail interface intended for an I/O unit 3361 and one 8K2 EOL resistor. The box has to be mounted outside the hazardous (Ex) area

A Galvanic isolator 2820 is to be connected to the Isolated zone interface 2822 (i.e. to the Isolated zone interface board 2823), which is connected to a COM loop via an Addressable multipurpose I/O unit 3361 that can be mounted inside the waterproof box. (2820 and 3361 have to be ordered separately.) External power supply 24 V_{DC} (30 mA) is required. Box dimensions (L x W x H): 175 x 175 x 75 mm.



2842 Intrinsically safe (IS) barrier unit. The barrier unit is used to connect analogue addressable IS detectors to a COM loop. The unit has connectors for COM loop in / out, external power supply (24 V_{DC}, 60 mA) and one IS COM line for connection of up to 20 IS detectors 2840 and 2841. It is mounted in a Waterproof box (IP66/67). Five compression glands for the cable entries are supplied. Box dimensions (L x W x H): 280 x 280 x 133 mm. DEKRA: II (1) G [Ex ia Ga] IIC.

9.1.6.2 Intrinsically Safe mounting bases



YBN-R / 4 IS Intrinsically Safe mounting base (2812). In the base, an intrinsically safe conventional smoke or heat detector can be plugged. The base has terminals for the zone line (in/out) and for an RIL.

9.1.6.3 Intrinsically Safe photoelectric smoke detectors

SLR-E-IS Intrinsically Safe photoelectric smoke detector (2810).



A conventional photoelectric (optical) smoke detector, to be plugged in the intrinsically safe mounting base. The detector has two built-in LEDs that are lit to indicate that the detector has generated fire alarm. Zone classification: Cat. 1, 2 or 3. BASEEFA classification: II 1G EEx ia IIC T5 (-20°C < 55°C). Max 20 per zone.

2840 Analogue IS smoke detector. An analogue / addressable photo- electric smoke detector. The detector can be used with higher IP rating back- box. Three cable glands are supplied with the back-box. The detector has one built-in LED to indicate that the detector has generated fire alarm. The detector is programmed in EBLWin as an analogue photoelectric smoke detector 4401 (in NORMAL mode) but it has to be connected to a COM loop via an IS barrier unit 2842. ATEX class: Ex ia IIC T5.



9.1.6.4 Intrinsically Safe heat detectors

DCD-1E-IS Intrinsically Safe heat detector. A conventional Rate of Rise heat detector, fixed temperature 60°C (class A1), shall be plugged in the intrinsically safe mounting base. Two built-in LEDs that are lit to indicate that the detector has generated fire alarm. Zone classification: Cat. 1, 2 or 3. BASEEFA classification: II 1G EEx ia IIC T5, T_{amb}=55°C. Max 20 per zone.



2841 Analogue IS heat detector. An analogue / addressable heat detector. The detector can be used with a back-box for higher IP rating. Three cable glands are supplied with the back-box. The detector has one built-in LED to indicate that the detector has generated fire alarm. The detector is programmed in EBLWin as an analogue heat detector 3308 (in NORMAL mode) but it has to be connected to a COM loop via an IS barrier unit 2842. ATEX class: Ex ia IIC T5.



9.1.7 Intrinsically Safe Manual Call Points

MCP 1A-R470SGIS Intrinsically Safe manual call point (2814). A conventional outdoor manual call point (NO contact and alarm resistor 470 ohms). The call point is connected to Galvanic isolator 2820. The call point is surface mounted with the supplied back-box (IP67) and has two compression glands for the cable entries. BASEEFA / ATEX classification: II 1G EEx ia IIC T4, T_a = -30 to +70°C. Max 20 per zone.



9.1.8 Other COM loop units

3366AU External power supply. Conforms to AS7240.4. 3366AU is connected to a COM loop, i.e. it is monitored from FT1020G3 and e.g. loss of the main power source will generate a fault in FT1020G3. It can be used as power supply for external equipment requiring 24 VDC with battery backup, e.g. the 3364 unit (see page 61). It also has a "/Mains OK" output (normally low), intended to be connected to the corresponding input on the 3364 unit.



An oyster metal enclosure 320W x 330H x 125D mm is used for 3366. There is **space** for two maintenance-free sealed Lead-Acid backup batteries, 2 x 12V, 7Ah or 12Ah as the second power source. Batteries with higher capacity (up to 65 Ah) have to be placed outside the housing. There are cable inlets on the top, and back sides of the housing.

The unit has one 24VDC power supply output for external equipment with up to 2.1 A or 0.85 A continuous current consumption, at the same time as battery charging is in progress. In case of no battery charging e.g. fire alarm in the system, the continuous current consumption can be up to 4 A.

The unit has one **24Vdc**⁷⁰ **power supply output** for external equipment with up to **2.1 A** or **0.85 A** continuous current consumption, at the same time as battery charging is in progress.⁷¹ In case of no battery charging e.g. fire alarm in the system, the continuous current consumption can be up to **4 A**.

It has a number of battery protection functions, e.g. monitoring high current output and low battery voltage etc. For more information, see the Technical Description and the Product Datasheet. See also drawings F737 & F733.

The COM loop address is set with the Address setting tool 3314 / 4414. The unit has an address label on which the programmed technical address can be written.

The Address setting tool is also used for the mode setting:

NORMAL mode: Used for 3366 in system FT1020G3.

AAM Brooks Alarm Acknowledgement Module (AAM)⁷². The **AAM** is a box with an alarm indication LED and a non-latching switch "Press to acknowledge & investigate alarm".



One AAM per Alarm Acknowledgement Facility Control (AAFC) zone and up to 100 AAFC's zones can be used. The COM loop address is set with the Address setting tool 3314 / 4414. See also chapter "Alert Annunciation Applications" page 115.

The address setting tool 3314/4414 is used for address and mode settings:

NORMAL mode: Used for AAFC in system FT1020G3 version < V2.2.x

2330 mode: Used for AAFC in system FT1020G3 version ≥ 2.2.x

Note: The new local alarm acknowledgement unit (LAAU) 4445 is developed by Panasonic, it is equivalent to Brooks Alarm Acknowledgement Module (AAM).

4445 Local Alarm Acknowledgement Unit (LAAU). The LAAU consists of a PCB with an alarm indication LED and green non-latching switch for acknowledgement of an alarm. The PCB is mounted on the rear of a white ABS lid. It can be wall mounted in a 65mm circular mounting box. One LAAU per LAA zone and up to 100 LAA zones per control panel can be used. The COM loop address is set with the address setting tool 3314/4414. See also chapter "Alert Annunciation Applications" page 115.



The address setting tool 3314/4414 is used for address and mode settings:

NORMAL mode: Used for 4445 in system FT1020G3 version ≥ V2.2.x

2330 mode: Used to program Brooks AAM.

Note: The programming in EBLWin and the operation of the Panasonic 4445 are typically the same as for Brooks AAM but using different terminology i.e.

LAAU = AAM

LAA zone = AAFC zone

The mode setting is also different in software version ≥ V2.2.x

⁷⁰ The rated output voltage for the main power supply is 24Vdc ± 1%. Max. ripple 500 mVp-p. The rated output voltage for the second power source (the backup battery) is 18 – 28Vdc. **NOTE!** The voltage will, however, be decreased to approx. 15 V while the output will be switched off in order to avoid damaging the batteries.

⁷¹ A current consumption of **0.85-2.1 A** allows only the "**low current charging mode**", i.e. the battery capacity can be **up to 26 Ah**. A current consumption ≤ **0.85 A** allows the "**high current charging mode**", i.e. the battery capacity can be **up to 65 Ah**. However, batteries larger than 12AH require different enclosure to suit.

⁷² The AAFC function in EBLWin V2.2.0 has been moved from "Add loop unit" menu tree to the "Obsolete loop unit" submenu.

9.2 Units connected to the RS485 interface

Up to sixteen Display Units type Alert Annunciation Units 1736 and/or External Presentation Units (1728) can be connected to the built-in RS485 interface (J4:37-38) in FT1020G3. Connections, see drawing F732-03.

Note: Display Unit software version > 1.4.1 is required.

Address and S/W mode settings

The display and the push buttons (in the unit) are used to set the address, which also can be changed via FT1020G3. The S/W mode must be set to **xxxx – 1587** (xxxx = type number). See the Technical Manual of 1728 and 1736.

The first unit is to have the address 00, the second unit address 01 and so on⁷³. Follow the Address setting instructions in the Technical Manual for each unit.

"Selective alarm presentation" can be programmed Via EBLWin, i.e. you can select which alarms to be presented in each unit, see the Technical Manual for the unit respectively.

9.2.1 Alert Annunciation Units

When the **Alert Annunciation (AA)** function is to be used in system FT1020G3, a unit is required for the related manoeuvres, i.e. to acknowledge / reset the **AA** alarms. For a detailed description of the Alert Annunciation function, see chapter "Alert Annunciation", page 114.

1736 Alert Annunciation Unit (AAU). A compact size enclosure 145H x 220W x 50D mm made of grey high impact ABS. Fitted with a supplementary "O" ring gasket, it complies with IP61, in respect of dust and moisture. The unit has no door, i.e. the front is accessed directly but the push buttons are disabled until an alarm is received. The unit should be wall mounted. Two compression glands are included.



All or selected fire alarms will be presented in a display (alphanumeric LCD, 2x40 characters), with back-light. An alarm text will also be presented together with each alarm, if programmed in FT1020G3. Furthermore, at least 617 texts can be stored for selected fire alarms in the unit and will in such a case be shown, instead of the texts sent out from FT1020G3 for these alarms. These text messages will be downloaded to the unit via FT1020G3. A built-in buzzer will sound to indicate a non-acknowledged **AA** alarm.

New software versions can be downloaded directly in the unit. The unit is powered from FT1020G3 or an external power supply.

The unit has the following LEDs:

Fire and Alarms queued, indicating fire / **AA** alarm.

Operation, indicating that the unit is in operation, i.e. the **AA** function is enabled in the system. A time channel can be used to enable the **AA** function.

Fire brigade alerted, indicating that the "Fire brigade TX" output is activated in FT1020G3 due to:

- the activated fire alarm is not an **AA** alarm
- the **AA** function has been terminated, e.g. the acknowledge or investigation time respectively has run out, etc.

Acknowledge, indicating that the **AA** alarm has been acknowledged.

⁷³ The connection order on the line is not dependent on the unit address.

The unit has the following push buttons:

Alarms queued, used to scroll amongst the alarms.

Acknowledge, to acknowledge an **AA** alarm and also silence the buzzer.

Silence alarm devices, used to silence OWS or sounders.

Reset, used to reset an **AA** alarm.

The unit must run in **S/W mode 1736 – 1587**, which has the highest performance in regards to functionality, response time, ability to store alarms, etc.

Up to 1200 m cable can be used for RS485, the 24V supply cable length is mainly dependent on the cable size. Refer to section "Remote Display Units cables" page 168. For more information, see 1736 Technical Manual.

9.2.2 External Presentation Units



1728 External Presentation unit (EPU). Same enclosure as 1736 except that there are 2 more buttons on the 1736 not exist in 1728, namely the Silence Alarm Devices and Reset buttons also the Acknowledge button is renamed in 1728 to Silence buzzer. The push buttons are disabled until an alarm is received. The unit is to be wall mounted. Two compression glands are included.

This unit is intended for pre-warning, co-incidence⁷⁴, fire (and heavy smoke / heat) alarm presentation. If there are two or more alarms in the system, you can scroll amongst them but the **fire alarms cannot be reset via this unit**.

All or selected alarms will be presented in a display (alphanumeric LCD, 2x40 characters), with back-light. An alarm text will be presented together with each alarm, if programmed in FT1020G3. Furthermore, at least 617 texts can be stored in the unit for selected fire alarms and will be shown in such a case, instead of the texts sent out from FT1020G3 for these alarms. These text messages will be downloaded to the unit via FT1020G3.

Any fault in the system will be presented as "General fault in system", a built-in buzzer will sound similar to FT1020G3 buzzer and can be silenced. Any disablement in the system will be presented as "General disablement in system".

The buzzer can be silenced but the alarm devices in the system e.g. OWS, sounders, etc. cannot be silenced via this unit. New software versions can be downloaded directly in to the unit. The unit is powered from FT1020G3 or an external power supply. The unit must run in **S/W mode 1728 – 1587** which has the highest performance in regards to functionality, response time, ability to store fire alarms, etc.

The number of units that can be powered via FT1020G3 (or an external power supply) is dependent on all other units connected to the same CIE / external power supply.

Up to 1200 m cable length can be used for RS485. The 24Vdc supply cable length is mainly dependent on the cable size. Refer to chapter "Remote Display Units cables" page 168. For more information, see External Presentation Unit 1728 Technical Manual.

⁷⁴ Two zone / address dependence.

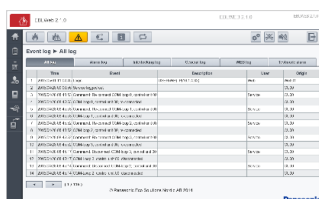
9.3 Units connected to the RS232 interface J7

9.3.1 Web-servers

1598 Web-server II. This unit can be used in the following applications:



- For presentation of the actual CIE status on a PC using a web browser such as Microsoft Internet Explorer. It can also send e-mails in case of pre-warning, fire alarm, fault, disablement and test mode alarm and/or service signal.
 - For remote control via two-way communication. Up to 10 User names with an individual Password ⁷⁵ and three different access levels.
 - As a gateway to other PC systems etc.:
- EBL Talk (RS232 or TCP/IP) is an open protocol, used to transmit and present fire alarm information in a separate PC / system.
 - Tateco (RS232) used to transmit and present fire alarm information in an Ascom Tateco paging system.
 - SIA (RS232) used to transmit and present fire alarm information in a separate PC application.
 - MODBUS (RS232) used to transmit and present fire alarm information in a separate PC application.
- As a gateway to a security management system via EBLnet. (TCP/IP) EBLnet licence required.



The Web-Server has to be preconfigured with proper TCP/IP protocols using @CHIPTOOL before setting up the Web-Server SSD configuration in the PC program EBLWin. The Web-Server SSD configuration is downloaded to the Web-Server via TCP/IP using an Ethernet cable. The Web-Server software is also downloaded via the PC program EBLWin.

The Web-server II consists of a light grey plastic enclosure (90x25x69.5 mm), which can be mounted on a 35 mm DIN rail inside the FT1020G3 CIE

Web-server II has the following interfaces:

RS232 (PLC COM) to connect the web-server to J7 in the FT1020G3 CIE

RS232 (MODEM COM) to connect the web-server to other PC / system

RJ45 (10 BASE-T) to connect the web-server to Internet / an intranet (LAN)

Molex 3.5 to connect the web-server to J3 (24 Vdc) in the FT1020G3 CIE

Details for setting up the Web-Server is found in MA440 Web Server II Manual Rev 1.0 for FT1020G3 and FT128.

9.4 Other units

9.4.1 External LEDs

BARIL Remote Indicator RIL. Used when a detector is placed out of view or hidden e.g. roof space detectors. The LED is lit at the same time as the LED in the detector / base that is connected to. It has a "Burning house" symbol instead of any text. BARIL can be connected to all types of Panasonic detectors / bases. The input is polarised.



J2:1 (+5 to +35 V_{DC}) for **Conventional** detectors / bases

J2:2 (< 25 mA) for **Analogue** detectors / bases

J2:3 (0 V)

To be wall mounted (87 x 87 x 39 mm)

⁷⁵ Consists of 6 digits.

9.4.2 Alarm Devices (sounders, etc.)

Regarding addressable alarm devices, see page 62.

The alarm devices used in FT1020G3 can be one or two of the following equipment:

1. Occupant Warning System (OWS) with different power output built in FT1020G3 and provides a supervised 100V speaker circuits and 24VDC dual strobe output.
2. 24VDC strobes or alarm bells connected to S0 – S3.
3. Full EWIS system interfaced to FT1020G3.

Connections of alarm devices according to drawings F732-02 and F737.

9.4.3 Magnetic Door Holders

Different magnetic door holders to suit the applications are required. A separate 24V non-battery backed power supply is recommended. Door holders must be provided with a "suppression diode" (e.g. 1N4004) in parallel with the coil, similar to the alarm devices, see drawing F732-02. Typical example is shown in Figure 26.

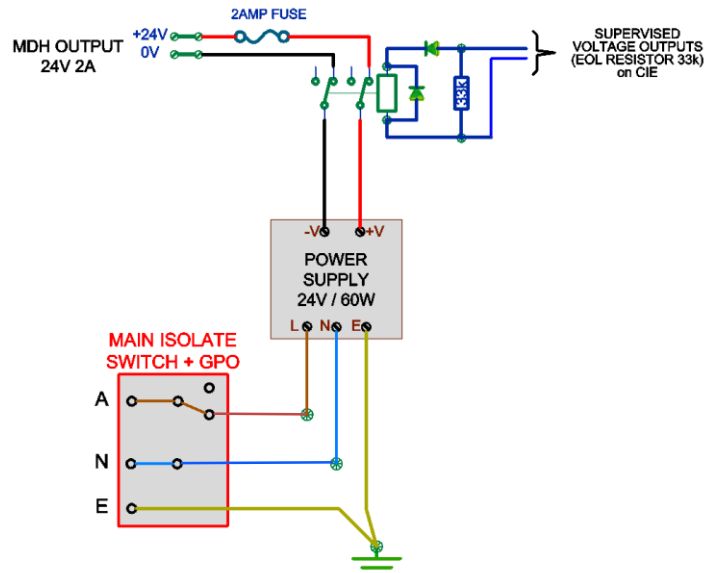


Figure 26 Connection example of 2A MDH power supply

9.4.4 Duct Detector Chambers



- 6377** Duct Detector Chamber UG-4. The housing is made of grey ABS and the venturi pipe is made of aluminium. It is supplied with four IP65 glands for cable entry. 6377 can be used in conventional as well as Analogue fire alarm systems, depending on the base and detector mounted inside the housing (base 2324 + 4452 or base 3312 + 4401). The venturi pipe is available with or without a built-in fan and in three lengths (0.6, 1.5 & 2.8 m). The pipe can easily be shortened to suit the ventilation duct. Mounting bracket and filters are also available. For more information see Duct Detector Chamber Datasheet.

10 Programmable inputs

Four non-supervised programmable inputs are available in FT1020G3 (I0-I3).

In FT1020G3 the Inputs and Outputs expansion board 4583 can also be mounted, five programmable inputs (Input 0-4) are available which can be configured to be supervised or non-supervised. See chapter "Expansion boards 458x", page 24.

On the COM loops, the addressable multipurpose I/O unit 3361 with two programmable inputs can be connected. Each 3361 unit has two programmable inputs (In0/Z and In1), supervision is not configurable.

Each input is programmed via EBLWin as per the dialog boxes shown in Figure 27 below.

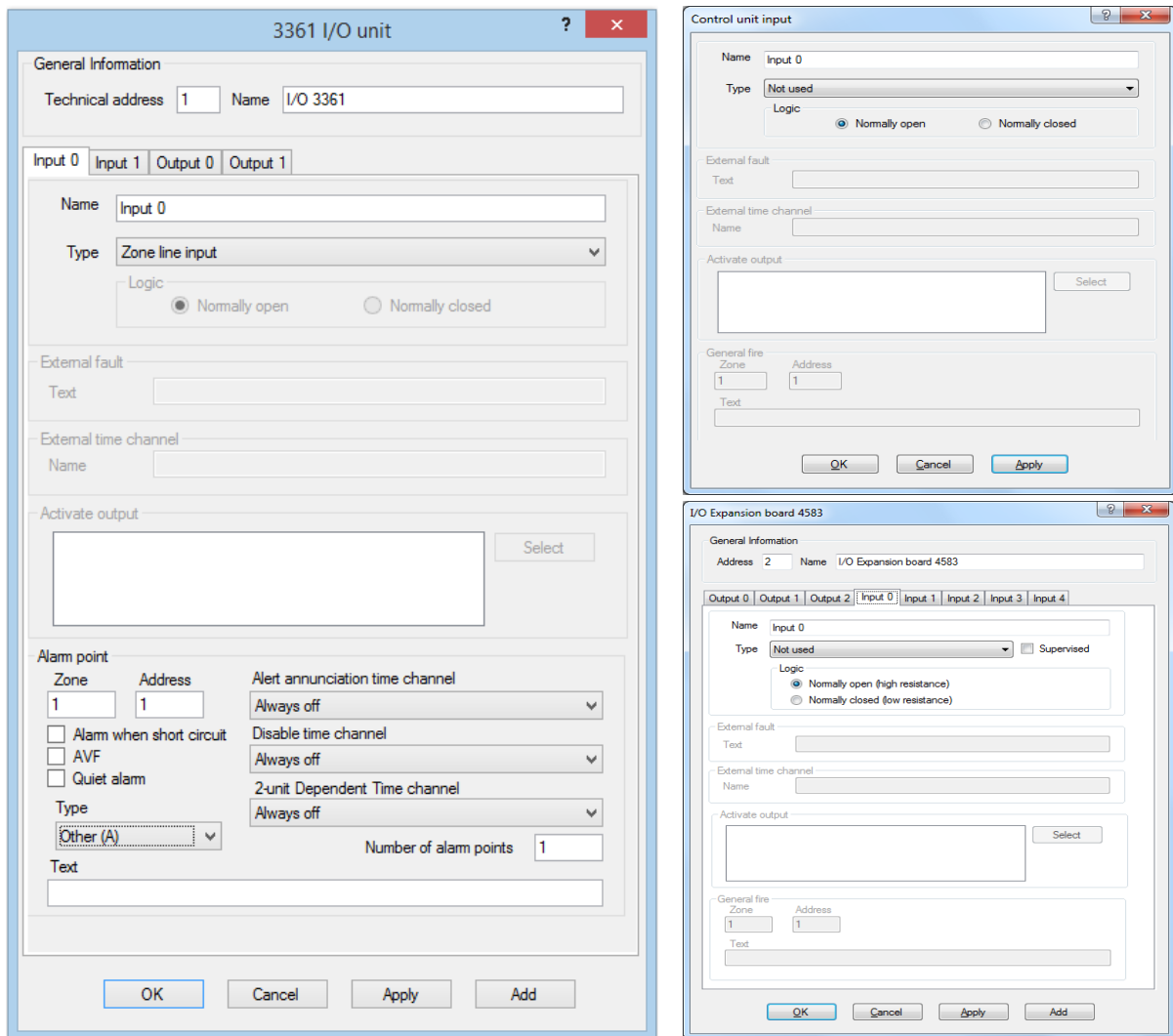


Figure 27 EBLWin "Input" dialog boxes

Different trigger conditions require different additional information, i.e. only the enabled fields can be filled in.

Note: The 3361 unit, Input 0, has a special input dialog box.

10.1 Control Unit Inputs I⁷⁶₀-I₃

Normally Open ($R > 20K$) or Normally Closed ($R < 500\Omega$)

Activation time: > 1 sec.

Connections, see drawings F732-02.

10.2 Inputs 0-4 on expansion board 4583

For connections, see drawings F731.

10.2.1 Not supervised

Normally Open ($R > 20K$) or Normally Closed ($R < 500\Omega$)

Activation time: > 10 sec.

10.2.2 Supervised

Each supervised input can be in one of four different states shown in Table 10:

- Open circuit (cut-off)
- Not activated (quiescent)
- Activated
- Short-circuit

Depending on the selected logic, Normally Open (high resistance) **or** Normally Closed (low resistance), the four conditions in the table are valid.

Table 10 State of the Supervised Inputs 0-4

Line resistance R	Normally Open (high resistance)	Normally Closed (low resistance)
$R > 6K8$	Open circuit (cut-off)	Open circuit (cut-off)
$6K8 \geq R > 2K$ (nom. 3K3)	Not activated	Activated
$2K \geq R > 70$ (nom. 680)	Activated	Not activated
$R \leq 70$	Short-circuit	Short-circuit

Input line fault

If open circuit (cut-off) or short-circuit is detected on a supervised input, a fault will be generated in FT1020G3 and the following fault message will be displayed:

FAULT: Input x expansion board x,
Control Unit xx

10.3 The 3361 unit Inputs I₀ / Z & I₁

Connections, see drawings F733 and F735.

⁷⁶ Input I₀ in the New Zealand convention cannot be programmed, it is used to restart the software when the processor freezes as required by NZS4512.

10.3.1 Input In0

Input 0 can be used as a general input (In0) – same as the CIE inputs I0-I3 **or** used as a zone line input (Z) requiring an End-Of-Line capacitor (10 uF).

10.3.2 Input In1

Input 1 is an isolated optocoupler input requiring a NO / NC contact and external 24V_{DC} (8 mA).

11 Input programming

Input programming is performed in EBLWin. Each input must have an individual Trigger condition "Type" and Logic. It is not allowed to let two or more inputs have the same trigger condition for some inputs.

11.1 Trigger conditions

The following trigger conditions are available (numbering only for the comments below):

0. **Activated output** (specified COM loop unit output)
1. **Activated fault** routing equipment (one input per C.U.)
2. **Activated Fire Ventilation** (one input per C.U.)
3. **Activated key cabinet** (one input per C.U.)
4. **Activated Routing Equipment** (one input per C.U.)
5. **Alarm Key Cabinet** (one input per Control Unit)
6. **Alert Annunciation Acknowledge**
7. **Alert Annunciation Reset**
8. **Door Closing Test Input**
9. **Evacuate** (one input per C.U.)
10. **External Fault** (max. 50 inputs per system)
11. **External Time Channel** (one input per time channel. 49 external time channels e.g. 1049 are available per system)
12. **Extinguishing alarm**
13. **Extinguishing start** ⁷⁷
14. **Extinguishing stop** ⁷⁷
15. **Extinguishing system fault** (one input per C.U.)
16. **Extinguishing system released** (one input per C.U.)
17. **Fault Signal External Fuses** (one input per Control Unit)
18. **Fault Signal External Power Supply** (one input per Control Unit)
19. **Fault warning routing equipment fault** (one input per C.U.)
20. **General Fire** (max. 127 per C.U.)
21. **Interlocking** (400 inputs per C.U. / 4000 per system)
22. **Loss of battery charger to external power supply** (one input per C.U.)
23. **Loss of main power source to external power supply** (one input per C.U.)
24. **Not used**
25. **NZ Silence switch**⁷⁸ (one input per system)
26. **Pre-warning** (input and corresponding fire alarm input have to be "connected" to the same C.U.)
27. **Technical warning** (max. 100 per C.U.)

⁷⁷ All inputs and outputs involved have to be connected to the same C.I.E.

⁷⁸ Only valid for the New Zealand convention.

28. Zone Line Input⁷⁹

Comments to the trigger conditions (above):

0. This trigger condition should be used in conjunction with a programmable **COM loop unit output** in order to test / activate the output via this input. The output is active as long as the input is active. This is valid even if the output is disabled.
1. "Activated Fault routing equipment" signal (feed-back) to FT1020G3 will light the LED "Fault TX activated" on the front membrane. Output with trigger condition "Indication Fault TX Activated" will be activated.⁸⁰
2. Activated Ventilation equipment feedback to the FT1020G3 Control Unit to light up the LED "Ventilation".⁸¹
3. Output with trigger condition "Activated Key cabinet" will be activated.
4. Activated Fire brigade TX feedback to the FT1020G3 Control Unit to light up the LED "Fire brigade TX".⁸¹
5. Key cabinet (for fire brigade) will activate a Key cabinet alarm. This feature is not used in Australia or NZ due to different fire brigade requirements.
6. Alert annunciation, see chapter "Alert Annunciation", page 114 and FT1020G3 Operation Manual for more information.
7. Same as 6.
8. "Fire door closing" outputs will be activated for 20 seconds by this trigger condition.
NOTE: Only valid for inputs and outputs connected to the same CIE
9. Normally used for the New Zealand fire brigade Bulgin key switch "Evacuate". When the switch is set to the evacuate position, the OWS or sounders will be active until the switch restores to the normal position.
10. External fault will activate a fault in FT1020G3. A user definable fault message ("Error text") up to 40 characters will be shown.
11. External clock, timer, key switch, etc. can disable / re-enable alarm points. The function Alert Annunciation can be set on / off by a time channel. Control outputs can be turned on (activated) / off (de-activated) by a time channel.
12. Activated input will activate a fire alarm (Zone), e.g. a sprinkler zone alarm. This trigger condition is normally used for a 3361 unit monitored Input 0 used as a Zone line input (End-Of-Line capacitor) and as the type "Extinguishing".
13. Used to start a new "countdown", see 14 below.
Push button: NO, momentary action. One or more push buttons can be used.
14. Output for Extinguishing equipment (type of output = 2) has to have a delayed activation programmed (a "countdown"). This "countdown" will be stopped when an input with trigger condition 14 is activated. To start a new "countdown", see 13 above.
Push button info: NO, latching action. One or more push buttons can be used. Manual reset of push button(s).
15. Activated input will generate a fault in FT1020G3. Output with trigger condition "Extinguishing system fault" will be activated. The following fault message will be shown:

FAULT: Extinguishing system,
Control Unit xx

⁷⁹ Only valid for the Addressable multipurpose I/O unit 3361 input "In0", used as zone line input (Z).

⁸⁰ One input activated in any control unit, will light up the LED in all control units.

⁸¹ One input activated in a control unit, will light up the LED in that control unit.

-
16. Activated Extinguishing equipment feedback to the FT1020G3 Control Unit to light up the LED "Extinguishing".⁸¹
17. External fuses (for external. power supply equipment) fault output will activate a fault in the FT1020G3 system. The following fault message will be shown:

FAULT: External fuses,
Control Unit xx

18. External power supply equipment fault output will activate a fault in the FT1020G3 system. The following fault message will be shown:

FAULT: External power supply,
Control Unit xx

19. Activated input (i.e. fault on the fault routing equipment) will generate a fault in FT1020G3:

FAULT: Fault warning routing equipment,
Control Unit xx

20. A special detector, push button, etc. can activate a fire alarm in FT1020G3. Zone no. and Address (+ user definable alarm text).
21. A feed-back from the equipment activated by the corresponding interlocking output. Activated input is shown in menu H9/C1. See also chapter "Interlocking function", page 96.
22. "Loss of the battery charger to external power supply equipment" fault output will activate a fault in the FT1020G3 system. It will have the same time delay, as set for the Loss of main power source fault for the CIE. The following fault message will be shown:

FAULT: Charging external power supply,
Control Unit xx

23. "Loss of main power source to external power supply equipment" fault output will activate a fault in the FT1020G3 system. It will have the same time delay, as set for the Loss of main power source fault for the CIE. The following fault message will be shown:


FAULT: Mains, external power supply,
Control Unit xx

24. Default. Indicating that an input trigger condition is not selected, i.e. the input will not "activate" anything.
25. Used for the "outside switch" (Bulgin key) (i.e. the New Zealand FB silence switch).

Turned on: Alarm devices and the CIE buzzer will be disabled. The following fault message will be shown:

FAULT: FB Silence switch,
Control Unit xx

From Turned on to Turned off: All fire alarms will be isolated, all zones in alarm will be disabled, alarm devices and the CIE buzzer will be re-enabled and the fault will be serviced.

26. Pre-warning, e.g. from a High Sensitive Smoke Detector's pre-warning output. Zone no. and Address set to the same as the corresponding fire alarm (from the same detector).
27. A technical warning is neither an alarm nor a fault. It is activated as long as the input is activated, which is indicated by a blinking symbol  in the display. Identified via menu H4/U6. Output with trigger condition "Technical warning (+name)" will be activated.
28. The Addressable multipurpose I/O unit 3361 monitored Input "In0" used as zone line input (Z) for conventional detectors. Use End-of-Line capacitor with value 470nF.

11.2 Logic

The logic has to be set (in EBLWin dialog box "properties").

11.2.1 Non-Supervised (Default)

(•) **Normally open / Normally low**, normally open contact or normally low opto-coupler input (3361).

() **Normally closed / Normally high**, normally closed contact or normally high opto-coupler input (3361).

11.2.2 Supervised

Valid for the Inputs and Outputs of the expansion board 4583 programmable inputs (Input 0-4) only.

(•) **Normally open (high resistance)**

() **Normally closed (low resistance)**

Depending on the selected logic, Normally Open (high resistance, 3K3) **or** Normally Closed (low resistance, 680R), the function will be according to the Table 10 on page 73.

12 Programmable outputs

FT1020G3 has four programmable voltage outputs S0-S3 and two programmable relay outputs R0-R1. 8 relays expansion boards 4581 and Input / Output expansion board 4583 with three programmable outputs (Output 0-2) can be mounted in FT1020G3. See chapter "Expansion boards 458x", page 24.

On the COM loops, Addressable Multipurpose I/O units 3361 with two programmable relay outputs (Re0-Re1) per unit and Addressable 2 voltage outputs units 3364 can be connected. Addressable siren 4477, Addressable sounder base 3379, Addressable beacon 4380 and light indicator 4383 can also be connected on the COM loops, i.e. the units have no physical outputs, only siren, sounder and light respectively.

Notes: Units type 3379 + 4477 (or old type 3377) = maximum 50 per loop.
Units type 4380 = maximum 10

Each output is programmed via EBLWin, when applicable for the following

- Name (Normally not changed)
- Type
- Signal period (continuous, pulse, delay, etc.)
- Logic (NO / normally low or NC / normally high)
- Supervised / Non-Supervised (The voltage outputs in FT1020G3 and in the Addressable 2 voltage outputs unit 3364)
- Control expression (with one or more trigger conditions)

If "Enter arguments in dialog" is selected, a separate dialog box is opened for easier entering of the required data (e.g. zone, address, etc.). **SSD size** indicates how big the control expression is. It must be ≤ 80 .

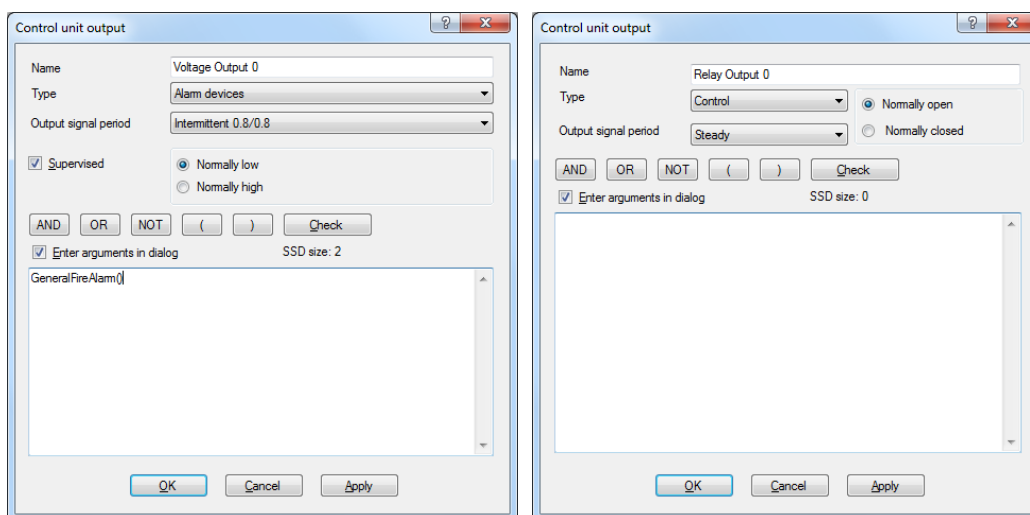


Figure 28 EBLWin Voltage & Relay Output dialog boxes

Each 3379, 4477, 3378 and 3379 unit is programmed via EBLWin for the following:

- Technical address
- Name (Normally not changed)
- Priority level (High / Medium / Low)

For each priority level:

- ☞ Sound type (different for each priority level)
- ☞ Name
- ☞ Type (Normally "Alarm device")
- ☞ Output signal period (Normally "Steady")
- ☞ Control expression (with one or more trigger conditions)

If “**Enter arguments in dialog**” is selected, a separate dialog box is opened for easier entering of the required data (e.g. zone, address, etc.).

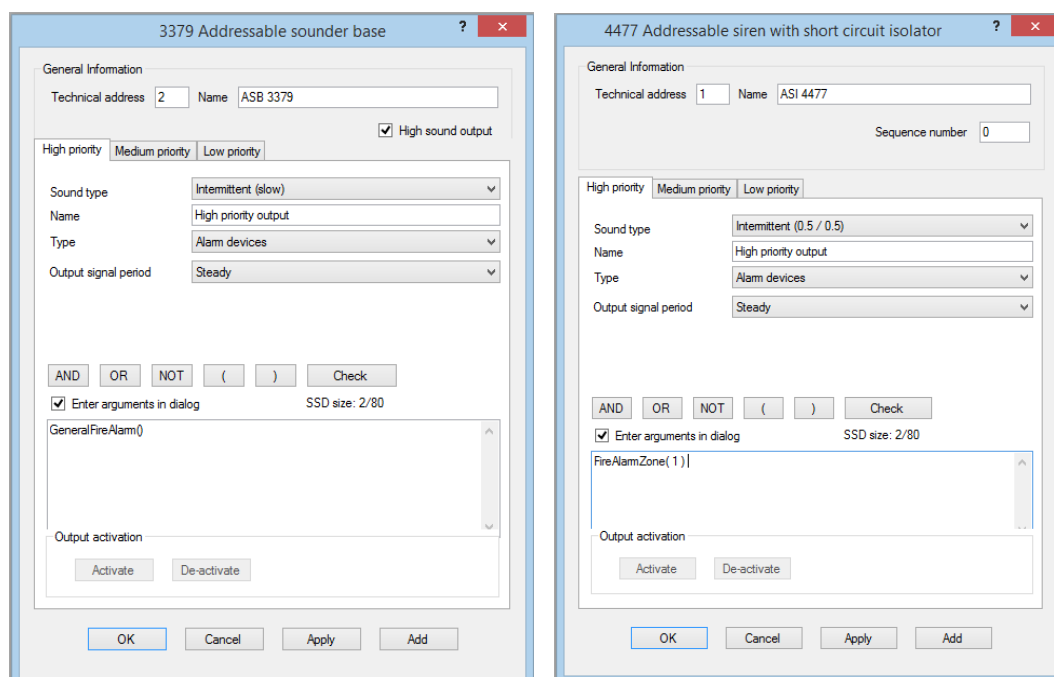


Figure 29 EBLWin 3379 and 4477 dialog boxes

Output test

When a PC is connected to a Control Unit, EBLWin open and you are logged on, each output can be tested for activation / de-activation.

12.1 Control Unit outputs S0 – S3

FT1020G3 Control Unit has four programmable, supervised (monitored)⁸² voltage outputs:

- S0** Supervised voltage output, 24VDC, max. 500 mA (Fuse F4)
- S1** Supervised voltage output, 24VDC, max. 500 mA (Fuse F5)
- S2** Supervised voltage output, 24VDC, max. 500 mA (Fuse F6)
- S3⁸³** Supervised voltage output, 24VDC, max. 500 mA (Fuse F7)

Connections and more information, see drawing F732-02.

⁸² This is default, but via EBLWin it is possible to set each output individually as not supervised (not monitored). A normally high output is non supervised. See also chapter "Calibration of supervised outputs", page 122.

⁸³ Note! This output will be low in case of system fault (via the watch dog reset circuit). May be used as a supervised voltage output for fault warning routing equipment (Fault TX).

12.2 Control Unit outputs R0 & R1

FT1020G3 Control Unit has 2 programmable relay outputs, contact ratings: 1A @ 30 V

R0 Relay output, NO or NC contacts programmable

R1 Relay output, NO or NC contacts programmable

Connections and more information, see drawing F732-02.

12.3 8 relays expansion board 4581 Output 0 – Output 7

Each 4581 board has eight programmable relay outputs:

Output 0 Relay output, NO or NC contacts programmable

Output 1 Relay output, NO or NC contacts programmable

Output 2 Relay output, NO or NC contacts programmable

Output 3 Relay output, NO or NC contacts programmable

Output 4 Relay output, NO or NC contacts programmable

Output 5 Relay output, NO or NC contacts programmable

Output 6 Relay output, NO or NC contacts programmable

Output 7 Relay output, NO or NC contacts programmable

Relay contact ratings: Max. 2A @ 30 V DC.

Connections and more information, see drawing F729.

12.4 Inputs and Outputs expansion board 4583 Output 0 - 1

Expansion board 4583 has two programmable, supervised (monitored)⁸⁴ voltage outputs:

Output 0 Supervised voltage output, 24VDC, max. 200 mA (Fuse F1).

Output 1 Supervised voltage output, 24VDC, max. 200 mA (Fuse F2).

Connections and more information, see drawing F731.

See also chapter "Inputs and outputs expansion board 4583", page 28.

12.5 The 3361 unit's Outputs Re0 & Re1

Each 3361 unit has two programmable relay outputs. Contact ratings: 2A @ 30 Vdc / 125 VAC).

Re0 Relay output, NO or NC contacts programmable

Re1 Relay output, NO or NC contacts programmable

Connections and more information, see drawing F735.

12.6 The 3364 unit's VO0 – VO2

Each 3364 unit has two programmable, supervised (monitored)⁸² voltage outputs:

Output VO0 Supervised voltage output, 24VDC⁸⁵

Output VO1 Supervised voltage output, 24VDC⁸⁵

⁸⁴ This is default, but via EBLWin, it is possible to set each output individually as not supervised (not monitored). A normally high output is not supervised. See also chapter "Calibration of supervised outputs", page 120

⁸⁵ Cont. 1 A, during 10 ms 1.4 A.

Each 3364 unit also has one programmable special output, intended for fire door closing (release magnets) only:

Output VO2 Voltage output, 24Vdc, max. 1A⁸⁵. Normally high. For more information see the Addressable 2 voltage outputs unit Technical Description.

24Vdc is required from an external power supply unit (e.g. 3366AU).

Connections and more information, see drawing F733 & F737.

12.7 The 4477 unit's Output (siren)

Each 4477 unit has one programmable output:

Output Siren, with three priority levels and three types of tones.

Connections and more information, see drawing F733.

12.8 The 3379 unit's Output (sounder)

Each 3379 unit has one programmable output:

Output Sounder, Three priority levels and three types of tones.

Also "High sound output" can be selected (4.5 dB).

Connections and more information, see drawing F733

12.9 The 4380 unit's Output (beacon)⁸⁶

Each 4380 unit (under obsolete loop units) has one programmable output:

Output Beacon (Light output 1 Cd. Flash rate 1 Hz.)

Connections and more information, see drawing F733.

Note: This unit is no longer to be found in Panasonic's product range.

12.10 The 4383 unit's Output (light indicator)⁸⁷

Each 4383 unit has one programmable output:

Output Light indicator (Flash rate 1 Hz.)

⁸⁶ The unit is discontinued and will be replaced with a new approved strobe to EN54.23.

⁸⁷ 4383 is discontinued, it is not complying with the new standard EN54.23 however the unit still can be used in the AU or NZ markets until a compliant unit is released.

13 Output programming

Output programming is done in EBLWin. See the EBLWin dialog box.

13.1 Type of output

Some output types can be collectively disabled, some others can be indicated by an LED when activated. The following types are available (numbering only for the comments below):

1. **Control**
2. **Fire Ventilation**
3. **Extinguishing**
4. **Alarm Device**
5. **Routing equipment** (Fire brigade TX)
6. **Control, neutral**
7. **Interlocking**

Comments to the output types:

1. Default. General (normal) control output ⁸⁸
2. Used to activate fire ventilation equipment 88⁸⁹
3. Used to activate extinguishing equipment 88⁹⁰
4. Used for sounders or OWS, etc.⁹¹
5. Used for **fire brigade TX** outputs only ⁹²
6. General (normal) control output. No collective disablement and no LED indication.
7. This output 88 can be used together with a corresponding Interlocking input. See chapter "Interlocking function", page 96. Activated output is shown in menu H9/C1.

13.2 Logic

(•) Normally open / low, Normally Open relay contact or normally low voltage output.⁹³

() Normally closed / high, Normally Closed relay contact or normally high voltage output (24V DC).⁹⁴

⁸⁸ Controlled by menu H2/B3 Disable / Re-enable output type.

⁸⁹ Activated output is indicated by the LED "Ventilation". (Feedback from the fire ventilation equipment to a programmable input can instead light up the LED).

⁹⁰ Activated output is indicated by the LED "Extinguishing". (Feedback from the fire extinguishing equipment to a programmable input can instead light up the LED).

⁹¹ Controlled by menu H2/B4 Disable / Re-enable Alarm devices and by push button "Silence alarm devices" on the control unit front. Output fault / disabled is indicated by LED **Fault / Disablements** "Alarm devices" blinking / continuous on.

⁹² Activated according to its control expression (trigger condition 43 *Indication Fire brigade TX activated* must **not** be used). Disabled similar to the standard control unit "Fire brigade TX" relay output. Activated output is indicated by the LED "Fire brigade TX". (Feedback from the Fire brigade TX to a programmable input can instead light up the LED). Output fault / disabled is indicated by LED **Fault / Disablements** "Fire brigade TX" blinking / continuous on.

NOTE! When the Alert Annunciation function is to be used, the following trigger condition has to be added to the control expression: **& !Alert Annunciation activated**. ("&!" is the same as "and not").

⁹³ The logic is set in the EBLWin dialog box "Voltage / Relayed Output".

⁹⁴ The logic is set in the EBLWin dialog box "Voltage / Relayed Output".

NOTE! A normally high output cannot be supervised and it will be low for a few seconds during restart of the C.I.E.

13.3 Supervised / Non-supervised

A voltage output is normally supervised (default). By unmarking the "Supervised" checkbox the voltage output will be non-supervised.

A normally high output cannot be supervised.

13.4 Output signal period

Each output uses an "Output signal period", which controls the output's activation. The following are available:

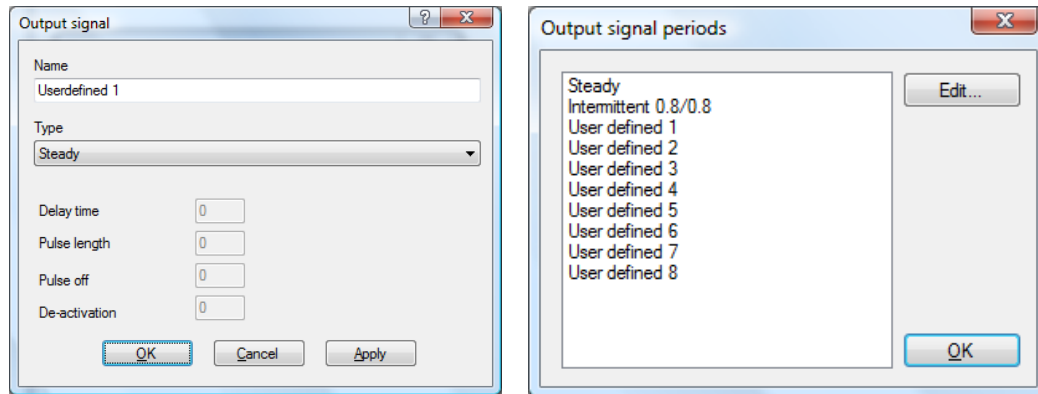


Figure 30 EBLWin output signal period dialog box.

User defined 1-8 can be configured with type and time.

Types:

1. Steady (continuous)
2. Intermittent
3. Pulse
4. Steady, Delayed Activation
5. Intermittent, Delayed Activation
6. Pulse, Delayed Activation
7. Steady, Delayed De-Activation

Times:

- Delay time (when required)
- Pulse length time (when required)
- Pulse off time (when required)
- De-activation time (when required)

See also Figure 31 below

Regarding the programming, see chapter "Output Signal Periods", page 156.

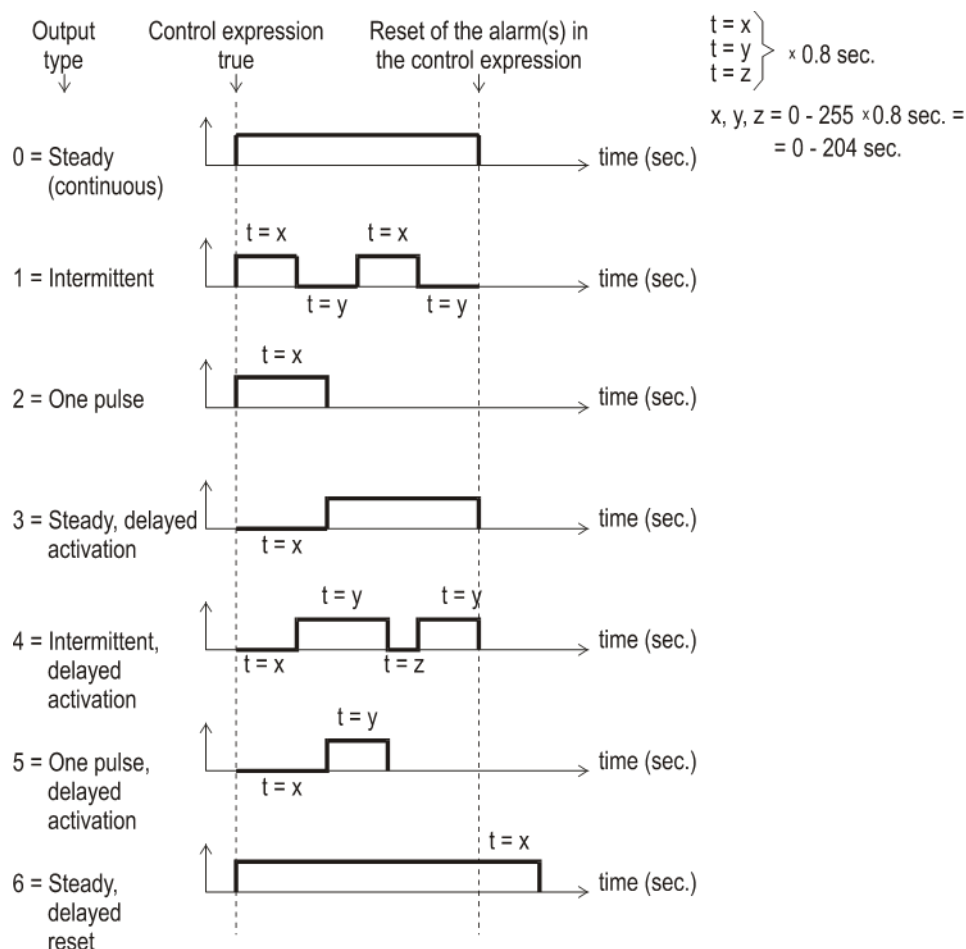


Figure 31 Signal period set up options

Delay time, Pulse length, Pulse off and/or De-Activation, have to be set for the "Signal period" respectively. For types 2 & 5 the x and y times must be equal and maximum 5.6s. For types 3 & 6 the x time must be maximum 5.6s.

Note: The different types can be used together with the different outputs according to the following Table 11 below

Table 11 Output signal period for programmable output

Output Type	In FT1020G3				COM loop units				
	S0-S3	R0, R1	4581 board	4583 board	I/O unit 3361	Unit 3364	Siren, S/B & Beacon 4477, 3379, 4383 & 4380	4582 board	
1 Steady (continuous)	X	X	X	X	X	X	X	X	X
2 Intermittent	X	X	XXX	--	--	XX	--	--	--
3 One pulse	X	X	XXX	--	--	--	--	--	--
4 Steady (continuous), delayed activation	X	X	X	X	X	X	X	X	X
5 Intermittent, delayed activation	X	X	XXX	--	--	XX	--	--	--
6 One pulse, delayed activation	X	X	XXX	--	--	--	--	--	--
7 Steady (continuous), delayed de-activation	X	X	X	X	X	X	X	X	--

The types that can be used in the "Output signal period" for the programmable output respectively are:

X = Output type that can be used.

XX = Output type that can be used but only 0.8s/0.8s.

XXX = Output type that can be used but max. 5.6s/5.6s and the pulse max. 5.6s respectively.

13.5 Control expression

Each programmable output has to be given a control expression⁹⁵. It is created using Boolean algebra.

If an output is to be used for manual control only e.g. an AS1668 fan control output or an output controlled by input trigger condition "Activate output", a "never true" control expression must be programmed. In such a case, control expression "TimeChannelActivated" (Always off) can be used.

Trigger conditions (see "Available functions"), logical "Operators" (**AND**, **OR**, **NOT**) and parentheses are used to build up a "control expression" containing up to 40 trigger conditions. See also chapter "Control expression examples" page 92.

A programmable output will be activated as long as its control expression is true.

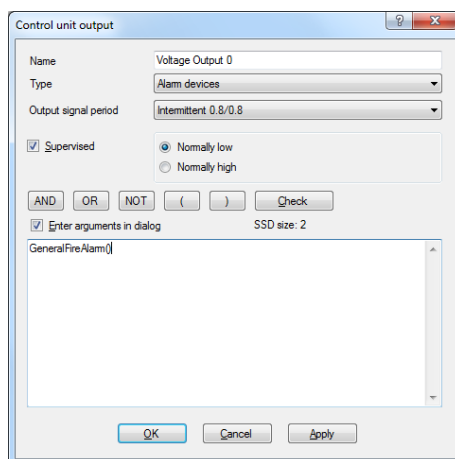


Figure 32 EBLWin control expression

In any output dialog box, click the right mouse button in the large white field. Select Alarm, Interlocking, Disablement or Other to open a "Trigger condition list". Depending on the selected trigger condition, different arguments / data have to be entered. In Figure 32, the trigger condition "General Fire Alarm" is selected.

13.5.1 Trigger conditions

Some trigger conditions require additional information, see below information within parentheses (+nnnnn) after the trigger condition respectively.

The trigger conditions are divided into four groups as follows:

- Alarm
- Interlocking

⁹⁵ A programmable output with no control expression will be interpreted by the CIE. as if it does not exist.

- Disablement
- Other

The numbering of the trigger conditions is only for "the comments to the trigger conditions" below:

13.5.1.1 Alarm

1. **Fire Alarm Zone** (+Zone no.)
2. **Fire Alarm Zone Address** (+Zone no.+Address)
3. **General Fire Alarm**
4. **Consecutive Fire Alarm** (sequence) (+start Zone no. and address +stop Zone no. and address + Quantity)
5. **Pre Warning Zone** (+Zone no.)
6. **Pre Warning Zone Address** (+Zone no.+Address)
7. **General Pre Warning**
8. **Consecutive Pre Warning** (+start Zone no. and address +stop Zone no. and address + Quantity)
9. **Heavy Smoke Alarm Zone** (+Zone no.)
10. **Heavy Smoke Alarm Zone Address** (+Zone no. + Address)
11. **General Heavy Smoke Alarm**
12. **Consecutive Heavy Smoke Alarm** (sequence) (+start Zone no. and address +stop Zone no. and address +Quantity)
13. **Two Address Dependent Fire Alarm** (+Zone no. +Address)
14. **Two Zone Dependent Fire Alarm** (+Zone no.)
15. **Multiple Detector Alarm**
16. **One Detector Alarm**
17. **Key Cabinet Alarm**
18. **AAF Zone Alarm** (+AAF Zone no.) or **LAA Zone Alarm** (+LAA Zone no.)
19. **Quiet Alarm Zone** (+Zone no.)
20. **Quiet Alarm Zone Address** (+Zone no. +Address)
21. **General Fire Alarm Reset**
22. **Delayed Alarm Zone Address** (+Zone no. +Address)
23. **Delayed Alarm Zone** (+Zone no.)
24. **General Delayed Alarm**
25. **First Zone In Alarm Control Unit** (+Zone no. +Control Unit no.)
26. **First Zone In Alarm Zone Group** (+Zone no. +Zone Group name)
27. **Pre Warning Zone Group** (+Zone Group name +Quantity)
28. **Fire Alarm Zone Group** (+Zone Group name +Quantity)
29. **Heavy Smoke Alarm Zone Group** (+Zone Group name +Quantity)

13.5.1.2 Interlocking

30. **Interlocking Input Area Activated** (+Area no.)
31. **Interlocking Input Area Point Activated** (+Area no. +Point)
32. **General Interlocking Input Activated**

-
- 33. Consecutive Interlocking Input Activated** (sequence) (+start Area no. and point +stop Area no. and point +Quantity)

13.5.1.3 Disablement

- 34. Fire Brigade Tx Disabled**
- 35. Zone Disabled** (+Zone no.)
- 36. Zone Address Disabled** (+Zone no. +Address)
- 37. General Zone Address Disabled**
- 38. All Control Disabled**
- 39. All Alarm Devices Disabled**
- 40. Control Disabled Control Unit** (+Control Unit)
- 41. Alarm Device Disabled Control Unit** (+Control Unit)
- 42. General Disablement**

13.5.1.4 Other

- 43. Indication Fire Brigade TX Activated**
- 44. Indication Fault TX Activated**
- 45. General Fault**
- 46. General Mains Fault**
- 47. Reset Pulse Zone Address** (+Zone no. +Address)
- 48. Time Channel Activated** (+Time channel name / no.)
- 49. Alert Annunciation Activated**
- 50. Alert Annunciation Acknowledged**
- 51. Door Open**
- 52. Fire Door Closing** (+Zone no. +Address)
- 53. General Service Signal**
- 54. Fire brigade TX**
- 55. Door Open Control Unit** (+Control Unit)
- 56. Extinguishing System Fault**
- 57. Extinguishing System Released**
- 58. Activated Key Cabinet**
- 59. Fault Control Unit** (+Control Unit)
- 60. Consecutive Fault Control Unit** (+start Control Unit and stop Control Unit)
- 61. Zone Fault** (+Zone no.)
- 62. External Fault** (+ext. fault)
- 63. Technical Warning** (+techn. warning)
- 64. General Technical Warning**

13.5.1.5 Comments to the trigger conditions (functions):

Alarm

- 1. Fire alarm. For more information regarding fire alarm, see FT1020G3 Operation Manual. Output is activated when the specified Zone is in alarm.
- 2. See 1. Output is activated when the specified alarm point is in alarm.

3. See 1. Output is activated when the specified alarm point or Zone is in alarm.
4. See 1. Quantity (1-9): "1" means one unit in alarm is required, "2" means two units in alarm are required to activate the output and so on.
5. Pre-warning.⁹⁶ Output is activated when the specified alarm point exceeds the pre-warning level. For more information regarding pre-warning, see FT1020G3 Operation Manual.
6. See 5. Output is activated when the specified alarm point exceeds the pre-warning level
7. See 5. Output is activated when the specified alarm point or zone exceeds the pre-warning level
8. See 5. See also 4 above regarding "Quantity".
9. Heavy smoke / heat alarm. Output is activated when the specified Zone exceeds the heavy smoke / heat level. For more information regarding heavy smoke / heat alarm, see FT1020G3 Operation Manual.
10. See 9. Output is activated when the specified alarm point exceeds the heavy smoke / heat level.
11. See 9. Output is activated when any alarm point exceeds the heavy smoke / heat level.
12. See 9. See also 4 above regarding "Quantity".
13. Output is activated when only one address (in two- address dependence) is in fire alarm state. For more information, see FT1020G3 Operation Manual.
14. Output is activated when only one zone (in two-zone dependence) is in fire alarm state. For more information, see FT1020G3 Operation Manual.
15. Output activated when "Multiple detector alarm" is true, i.e. fire alarm type A.⁹⁷
16. Output activated when "One detector alarm" is true, i.e. fire alarm type B ⁹⁷.
17. General Key cabinet alarm activated. For more information, see FT1020G3 Operation Manual.
18. Alarm Acknowledgement Facility, requires Alarm Acknowledgement Module **AAM**. "Alarm" is activated in the specified AAFC zone. Panasonic new Local Alarm Acknowledgment (LAA) is typically Brooks AAM.
19. Output activated for any "Quiet alarm" in the specified zone. Normally used in AS1668 fire fan applications or as a non-latching / non-brigade call alarm.
20. Output activated for one specified "Quiet alarm" in the specified zone-address. Used in AS1668 fire fan control applications.
21. This control expression is true (i.e. output activated) for 15 seconds after the last alarm is reset.
22. Output of specified Zone-Address is activated for predetermined time (set in EBLWin system properties). Typical application when a smoke detector is programmed to activate 3379. If the smoke is cleared during the delay time, the sounder base will de-activate otherwise, a general alarm in FT1020G3 will be activated.
23. Same as 22 but for a specified zone.
24. Same as 22 but for any Zone or Zone-Address in the system..)
25. Output is activated only if the first alarm is an alarm in the specified Zone in the specified Control Unit. **NOTE:** This is not valid for manual call points.

⁹⁶ The trigger condition is true as long as the pre-warning level is exceeded. It is also true as long as the fire alarm level is exceeded even if the option pre-warning detection is disabled (via EBLWin).

⁹⁷ See chapter "Fire alarm type A and Fire alarm type B", page 119.

26. Output is activated only if the first alarm is an alarm in the specified Zone in the specified Zone Group.
27. Pre-warning, Output is activated when any of the alarm points in the specified Zone Group exceeds the pre-warning level. See also 4 above regarding the quantity. For information refer to the FT128 Operation Manual.
28. Fire alarm, Output is activated when any of the alarm points in the specified Zone Group is in alarm. See also 4 above regarding the quantity. For information refer to the FT128 Operation Manual.
29. Heavy smoke / heat alarm, Output is activated when any of the alarm points in the specified Zone Group exceeds the heavy smoke / heat alarm level. See also 4. Above regarding the quantity. For information refer to the FT128 Operation Manual.

Interlocking

30. Output activated when one or more interlocking inputs, in the specified interlocking area, are activated.
31. Output activated when the interlocking input, in the specified interlocking area/point, is activated.
32. Output activated when any interlocking inputs is activated.
33. Output activated when interlocking inputs, in the specified range, are activated (from interlocking area no./point to interlocking area no./point). See also 4. above regarding "Quantity".

Disablement

34. Output activated when any Routing equipment output (Fire brigade TX) is disabled⁹⁸.
35. Output activated when the specified zone is disabled⁹⁹.
36. Output activated when the specified alarm point (zone- address) is disabled⁹⁹.
37. Output activated when any alarm point (zone/address) or zone is disabled⁹⁹.
38. The control expression is true (output activated) when all control outputs of the types **Control**, **Fire ventilation** and **Extinguishing** are disabled via menu H2/B3⁹⁹. This output has to be type Control – neutral.
39. The control expression is true (output activated) when all control outputs of type **Alarm device** in all control units are disabled via menu H2/B4¹⁰⁰. This output must be type Alarm devices
40. The control expression is true (output activated) when all control outputs of the types **Control**, **Fire ventilation** and **Extinguishing** in the specified control unit are disabled via menu H2/B3⁹⁹. This output has to be type Control – neutral.
41. The control expression is true (output activated) when all control outputs of type **Alarm device** in the specified control unit are disabled via menu H2/B4). This output has to be type Alarm devices.
42. The control expression is true (output activated) when any disablement exists in the system⁹⁹.

⁹⁸ Indicated by LED **Fault / Disablements** "Fire brigade TX".

⁹⁹ Indicated by LED **Fault /Disablements** "General Disablements".

¹⁰⁰ Indicated by LED **Fault / Disablements** "Alarm devices".

Other

43. The control expression is true (output activated) when LED "Fire brigade TX" is lit, i.e. when any "Fire brigade TX" output is activated (default) or when a programmable input with trigger condition "Activated Routing Equipment" is activated¹⁰¹.
44. The control expression is true (output activated) when LED "Fault TX activated" is lit, i.e. when the routing equipment output (Fault TX) is activated¹⁰².
45. Output activated when one or more faults are generated in the system¹⁰³.
46. Output activated for loss of mains (in the CIE or external power supply 3366AU)¹⁰⁴.
NOTE: The output(s) will be activated immediately but the corresponding fault is normally delayed (set via EBLWin).
47. The control expression is true (Output activated) for 5 seconds whenever a reset pulse is sent to the specified Zone-Address. The control expression can only be used in the CIE as the specified Zone-Address
48. Output activated when the specified time channel is activated.
49. Output activated when Alert annunciation alarm is activated (by any alarm point set to activate this function).¹⁰⁵ For more information, see FT1020G3 Operation Manual.
50. Output activated when Alert annunciation alarm is activated (by any alarm point set to activate this function)¹⁰⁵ and acknowledged. For more information, see FT1020G3 Operation Manual.
51. Output activated when door open in any Control Unit in the system.¹⁰⁶
52. This trigger condition plus the OR operator has to be used for each detector (zone-address) controlling a fire door (normally \geq two detectors). Type of output is normally "Control, neutral". See also chapter "Fire Door Closing", page 101.
53. Output activated when service signal is activated (by any sensor).¹⁰⁷
54. The control expression is true (output activated) when the Control Unit standard output "Fire brigade TX" is activated. Used for example when a standard "Fire brigade tx" voltage output is required. Used with output type *Routing equipment* (*Fire brigade tx*).
NOTE: If the Control Unit has "selective fire alarm presentation", the standard output(s) will also be selectively activated.
55. Output activated for door open in the specific Control Unit.¹⁰⁸
56. Output activated when input trigger condition "Extinguishing system fault" is true.
57. Output activated when input trigger condition "Extinguishing system released" is true.

¹⁰¹ This output will also be activated when the routing equipment test is performed via menu H1. This trigger condition **must not** be used for type of output "Routing equipment (Fire brigade TX)".

¹⁰² Indicated by LED **Routing equipment** "Fault TX activated". This output will also be activated when the routing equipment test is performed via menu H1.


¹⁰³ Indicated by LED **Fault / Disablements** "General fault" and/or LED **Routing equipment** "Fault TX activated".

¹⁰⁴ Indicated by the symbol  in the CIE display.

¹⁰⁵ Valid until the AA alarm is reset or becomes a normal fire alarm.

¹⁰⁶ Or external FBPs connected to the control unit(s).

¹⁰⁷ Indicated by a "Service" symbol  in the display symbol area.

¹⁰⁸ Indicated by the "Door open" symbol  in the display symbol area.

58. Output activated when input trigger condition "Activated key cabinet" is true
59. Output activated when one or more faults are generated in the specified Control Unit ¹⁰³
60. Output activated when one or more faults, in the specified range (from Control Unit to Control Unit) are generated ¹⁰³.
61. Output activated when one or more faults are generated in the specified Zone¹⁰³.
62. Output activate when the specified external fault is generated¹⁰³.
63. Output activated when the specified technical warning is generated¹⁰⁹.
64. Output activated when one or more technical warnings are generated.

13.5.2 Logical operators

The logical operators available in EBLWin are in the following priority order:

- () **parentheses**, changes priority order
- NOT** **not**-function (inverts), is written NOT in EBLWin
- AND** **and**-function, is written AND in EBLWin
- OR** **or**-function, is written OR in EBLWin

13.5.3 Control expression examples

In order to understand the possibilities to create control expressions, here follow some AND, OR, NOT and () examples and also some control expression examples.

13.5.3.1 AND

a **AND** b **AND** c=y

y is true (=1) when all the conditions **a**, **b**, **c** are true, i.e. a=1 and b=1 and c=1 makes y=1. All other combinations makes y=0.

This is shown in the truth table

a	b	c	y
0	0	0	0
0	0	1	0
0	1	0	0
0	1	1	0
1	0	0	0
1	0	1	0
1	1	0	0
1	1	1	1

13.5.3.2 OR

a **OR** b **OR** c=y

y is true if at least one of the conditions a, b, c is true, i.e. a=1 or b=1 or c=1 makes y=1.

This is shown in the truth table

a	b	c	y
0	0	0	0
0	0	1	1
0	1	0	1
0	1	1	1
1	0	0	1
1	0	1	1
1	1	0	1
1	1	1	1

13.5.3.3 NOT

Inverts a condition, e.g. **NOT** b = **NOT** 0=1.

a **OR NOT** b **AND** c = y

This is shown in the truth table

a	b	c	y
0	0	0	0
0	0	1	1
0	1	0	0
0	1	1	0
1	0	0	1
1	0	1	1
1	1	0	1
1	1	1	1

¹⁰⁹ Indicated by the symbol  in the CIE display.

13.5.3.4 Parentheses

Changes priority order.

a **OR NOT** (b **AND** c) = y (This is same as the previous but completed with parentheses.)

This is shown in the truth table

a	b	c	y
0	0	0	1
0	0	1	1
0	1	0	1
0	1	1	0
1	0	0	1
1	0	1	1
1	1	0	1
1	1	1	1

13.5.3.5 Control expressions

The **AND** operator has priority, i.e. a **AND** b **OR** c = (a **AND** b) **OR** c. This is perhaps more obvious if you write it: a • b + c.

This means that: a **AND** b **OR** c ≠ a **AND** (b **OR** c).

Here follows some examples (and explanations) to show the principles how to build a control expression with "conditions" and logical operators.):

Example 1

Output: Voltage output **S0**

Control expression: Pre Alarm Zone (90)

Explanation: Pre-warning activated in zone no. 90 will activate output S0.

Example 2

Output: Relay output **R1**

Control expression: General Control Off () **AND NOT** Door Open (01)

Explanation: Controls OFF (via menu H2/B8) will activate the output R1 when the door in Control Unit 01 is not open (i.e. closed).

Example 3

Output: Relay output **R0**

Control expression: Fire Alarm Zone (145) **AND** Fire Alarm Zone (045) **AND** General Fault ()

Explanation: Fire alarm activated in zone 145 and zone 45 will activate the output R0 when there are one or more faults in the system at the same time.

Example 4

Output: Voltage output **S1**

Control expression: Consecutive Fire Alarm (100,10,100,19,1)

OR

Consecutive Fire Alarm (100,21,100,40,1)

Explanation: Fire alarm activated by one of the alarm points in zone 100 address 10-19 or activated by one of the alarm points in zone 100 address 21-40 will activate the output S1 (i.e. alarm point address 20 in zone 100 will not activate the output S1).

14 Short circuit isolators

4313 Analogue base with isolator has built-in short circuit isolator that requires a separate COM loop address and a Sequence Number, 00-63.

The units 4433, 4439 and 4477 have built-in isolator that do not require any separate COM loop address, only a Sequence Number, 00-63. As an option, these units can be used without the isolator in function. If so, they have to be programmed in EBLWin as if they were 3333, 3339 and 3377 units and via the address setting tool 4313/4413 set to 2330 mode instead of NORMAL mode.

An open circuit (break) or short circuit on a COM loop has to generate a fault in the Control Unit within 60-100 seconds.

If one or more short circuit isolators are used ¹¹⁰, the loop will be divided into "segments" (i.e. the part between two short circuit isolators or between the Control Unit and one short circuit isolator). Only the affected segment will be isolated, which will minimise the number of units disabled by a short circuit.

The fault messages will also show between which isolators the short circuit is situated.

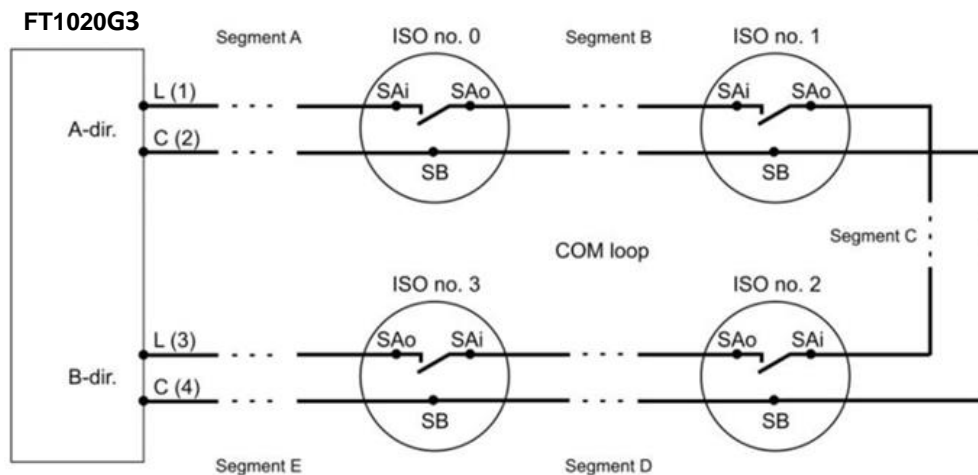


Figure 33 Short circuit isolators example in FT1020G3

The first isolator (ISO) in the A-direction must have the sequence no. 0 (ISO no. 0), the next sequence is no. 1 (ISO no. 1) and so on. The sequence number is programmed via EBLWin.

If no short circuit isolators are used, the whole COM loop will be disabled in case of short circuit on the loop.

As from version 2.1.x, the communication (and power supply) direction will alternate every 22 seconds.

COM loop end-point voltage ¹¹¹ <12 V DC or COM loop short circuit or COM loop break(s):

This will start a "cycle" as follows.

- The whole loop will be disabled, i.e. no voltage on the loop which means that all isolator relays will be powered down (= all isolators disabled), i.e. there will be a "break" on the L (SA) wire in each isolator.
- A Control Unit algorithm will now try to re-enable the first isolator in the A-direction (ISO no. 0 / sequence no. 0). If this is possible, the next isolator in the A-direction

¹¹⁰ At least one short circuit isolator **must** be install every 40 alarm points as required by AS1670.1.

¹¹¹ When communicating in the A-direction.

(ISO no. 1 / sequence no. 1) will be re-enabled, if this is possible, and so on. The isolator just before a short circuit cannot be re-enabled.

- The Control Unit algorithm will now try to re-enable the first isolator in the B-direction (ISO no. 3 / sequence no. 3 in Figure 33). If this is possible, the next isolator in the B-direction, and so on.
- Finally all isolators will be re-enabled except the isolator on each side of a short circuit and any isolator(s) between two or more breaks on the loop.
- Communication will be in both directions for 10 minutes. Then a new “cycle” starts.
- If the “fault(s)” are not corrected, the communication will be in both directions for another 10 minutes when a new “cycle” starts, and so on.
- If the “fault(s)” are corrected, the communication will return to be in the A-direction only.

Depending on if it is too low voltage on the loop, short circuit, one break or two or more breaks, the fault messages will be different.

FAULT: Cut-off loop x, Control Unit xx
SCI nn <-> SCI nn

NOTE: nn = A, 00, 01, 02, 03, 04, 05 - - up to 63 or B.

FAULT: Short circuit loop x, Control Unit xx
SCI nn <-> SCI nn

NOTE: nn = A, 00, 01, 02, 03, 04, 05 - - up to 63 or B.

If there are multiple loop faults, i.e. one or more short circuits and/or one or more Cut-offs, there will be a “multiple COM loop fault” message.

FAULT: Multiple faults, COM loop x,
Control Unit xx

The first fault message will show the first fault in the A-direction.

There will always be a “no reply” message for all units not found in spite of communication in both directions.

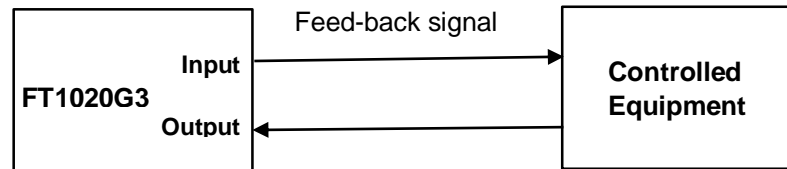
FAULT: No reply zone: xxx address xx
Technical number xxxxxx
Alarm text for xxx-xx

Regarding Fault acknowledge, see the FT1020G3 Operation Manual.

Note: After the faults are acknowledged it can take up to 10 minutes before the faults can disappear from the fault list, since the check (“cycle”) starts every 10th minute.

15 Interlocking function

The interlocking function is used to verify that an output is truly activated, i.e. by "combining" an output with an input (feed-back from the equipment controlled by the corresponding interlocking output).



15.1 Programming of interlocking function

Up to 400 Interlocking Combinations per CIE and up to 4000 in a system, can be programmed using EBLWin.

Note: One Interlocking Combination (input, output and area) must be included in / connected to one CIE. An input and an output can only be used in one combination.

Area and **Point** fields are unique identifiers for each paired interlocking combination synonymous to Zone-Address. They are presented in this format NNN-NN with the first 3 digits representing the Area and the last 2 digits representing the Point. The Area numbers range from 1-999 and the Point numbers range from 1-99

It is advantageous to have a numbering system planned correlating to the location ("Area") when assigning a **Name** to the interlocking combination. Having some form of structure to the numbering will greatly help organise the SSD file and make it easier to understand and assist with troubleshooting later. One should also consider including all I/O devices into this numbering structure so that it will be easier to select from the list of interlocking combinations.

A **Filter Function Box** as shown in Figure 34 below, is available to assist with listing only those interlocking combinations of interests. This will become more powerful when some sort of numbering structure is in place. Figure 34 was from a list of 100 interlocking combinations, typing in "1"¹¹² in the filter function box quickly narrows down the lists with anything containing "1". One can see the usefulness of having a planned numbering structure in place from this example should all interlocking combinations on containing 1 were called for.

Deviations	Selected loop	Validate results	Interlocking combinations (filt...	Filters the lists of interlocking with anything containing "1"					
			1						
Interlocking Combination	Control Unit	Fault	Fault detection time	Buzzer	Latched output	Input	Output	Text	
001-02 Interlocking Combination	Control unit 0	●	5	●	●	Interlocking Input 4	Interlocking Output 4		
001-01 Interlocking Combination	Control unit 0	●	5	●	●	Interlocking Input 1	Interlocking Output 1	Flow Switch Activated	
001-03 Interlocking Combination	Control unit 0	●	5	●	●	Interlocking Input 3	Interlocking Output 3		
001-04 Interlocking Combination	Control unit 0	●	5	●	●	Interlocking Input 2	Interlocking Output 2		

Figure 34 Filter function

Available interlocking inputs and/or outputs will appear in the EBLWin dialog box shown in Figure 34 page 96, only when each input and output have been configured with Type = Interlocking.

¹¹² Filtering search texts are case sensitive. For this reason, ensure that naming convention is consistent throughout.

15.1.1 Interlocking output

The "Voltage Output" / "Relay Output" dialog boxes are used to configure the interlocking output.

- **Type:** "Interlocking" is to be selected.
- **Output signal period:** Type Steady (continuous) or Type Steady delayed activation is to be selected (checked by the "Validate" function in EBLWin).
- **Control Expression** is to be programmed for the output, i.e. for the equipment to be controlled.

Activated output will be indicated in menu H9/C1.

- **Name:** It is recommended to add information, e.g. interlocking combination's presentation number (Area-Point) could be added.

15.1.2 Interlocking input

The "Input" dialog box is used to configure the interlocking input.

- **Type** "Interlocking" is to be selected.
- **Name:** It is recommended to add information, e.g. interlocking combination's presentation number (Area-Point) could be added.

Activated input will be indicated in menu H9/C1.

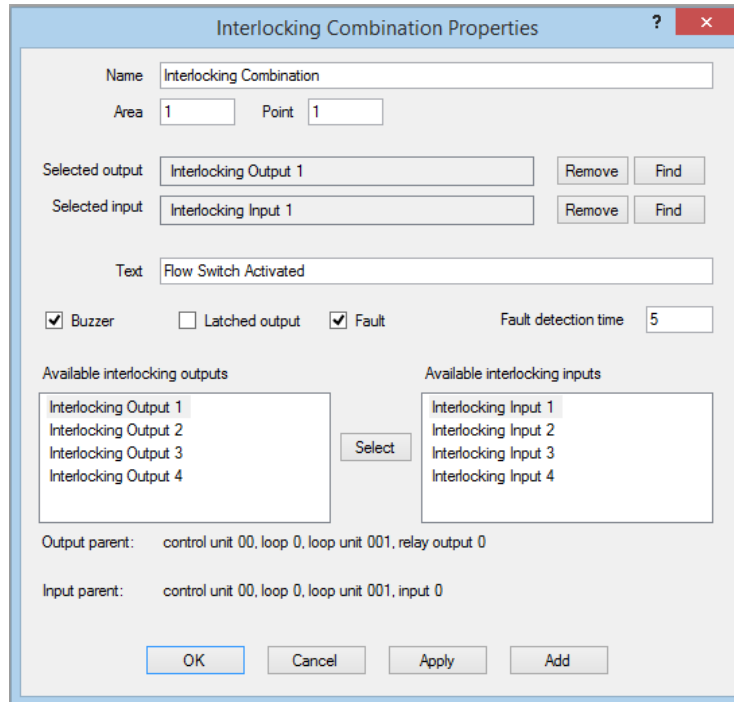
15.1.3 Interlocking combination

The interlocking function requires one interlocking output and one interlocking input to be programmed in one interlocking combination.

Note: The interlocking outputs and inputs have to be programmed first before programming the interlocking combination¹¹³.

An interlocking combination can have only an output or only an input programmed, e.g. when a user definable text message is required to indicate an activated output or input and alerted from the buzzer.

¹¹³ In the "Interlocking Combination" dialog box, all the outputs and inputs that have been programmed for interlocking are listed, see Figure 35 next page.







The dialog box is titled "Interlocking Combination Properties". It contains the following fields and controls:

- Name:** A text field containing "Interlocking Combination".
- Area:** A text field containing "1".
- Point:** A text field containing "1".
- Selected output:** A text field containing "Interlocking Output 1". To its right are "Remove" and "Find" buttons.
- Selected input:** A text field containing "Interlocking Input 1". To its right are "Remove" and "Find" buttons.
- Text:** A text field containing "Flow Switch Activated".
- Options:**
 - ☒ Buzzer
 - ☐ Latched output
 - ☒ Fault
 - Fault detection time:** A text field containing "5".
- Available interlocking outputs:** A list box containing "Interlocking Output 1", "Interlocking Output 2", "Interlocking Output 3", and "Interlocking Output 4".
- Available interlocking inputs:** A list box containing "Interlocking Input 1", "Interlocking Input 2", "Interlocking Input 3", and "Interlocking Input 4".
- Select:** A button located between the two list boxes.
- Output parent:** A text field containing "control unit 00, loop 0, loop unit 001, relay output 0".
- Input parent:** A text field containing "control unit 00, loop 0, loop unit 001, input 0".
- Buttons:** "OK", "Cancel", "Apply", and "Add" at the bottom.

Figure 35 EBLWin "Interlocking Combination" dialog box.

To configure an interlocking combination, the following procedures can be used:

- 1 Select from each side of the interlocking inputs and/or outputs lists, click the  button, this puts the selection into the selected output/input fields.
- 2 Click the  button, the selections will disappear from the lists and cannot be reused elsewhere.
- 3 Click on the  button beside the respective input/output to delete selections.
- 4 To locate the device from which each input/output has been used, click on the adjacent  button. The device dialog box will appear. This is a time saving feature when you have close to hundred interlocks specified.

The configured interlocking combination should display the following:

- **Name:** Displayed in the EBLWin Tree and List views. Default is "Interlocking Combination" that can be edited when required. "Area-Point" will be added in the tree view and shown in the list view.
- **Area and Point:** Each "Interlocking Combination" is presented as Area-Point (compare with Zone-Address). Area numbers 1-999 are possible to use and within each area, Point numbers 1-99 can be used.

Note: An Area can only be used in one CIE.

- **Available interlocking outputs** list displays all the previous programmed outputs, Type = "Interlocking".
- **Available interlocking inputs** list displays all the previous programmed inputs, Type "Interlocking". Select one **output** and one **input**. Press Select and the selected output and input will be shown in the **Selected output** and **Selected input** field respectively.

It is possible to **Remove** an output / input (from the field).

It is possible to **Find** (open the dialog box) an output / input.

- **Output parent:** Shows where the selected output is situated, e.g. Control unit 0.
- **Input parent:** Shows where the selected input is situated, e.g. Control unit 0.

- **Text** = User definable interlocking text to be shown in menu H9/C1. Can be written in this field or in the "Texts" dialog box, see chapter "Creating the alarm texts via EBLWin", page 123.
- **Buzzer** checked = activated interlocking input will turn on the FT1020G3 buzzer (0.8 / 0.8 sec.)¹¹⁴. The buzzer can be silenced. It will be automatically turned on again, if a new interlocking input is activated.
- **Latched output** checked = Output reset has to be performed via menu H9/C3. (Automatically output reset will not take place when the control expression becomes false.).
- **Fault** checked = Fault detection ON.
- **Fault Detection Time**: If the input is not activated within 5-255 seconds after the output is activated¹¹⁵, a fault will be generated:

FAULT: Interlocking input AAA/PP

15.2 Interlocking indications

One or more activated Interlocking Combinations (interlocking output and/or input) are listed in the CIE display¹¹⁶:

Disabled interlocking output is indicated by the LED "Disablements".

15.3 Interlocking outputs and inputs (H9)

Menu H9 has the following sub menus.

15.3.1 Activated interlocking outputs / inputs (H9/C1)

The following information will be shown in menu H9/C1:

Interlocking area AAA point PP output active
User definable text message..
dd-mm-yyyy hh:mm

or

Interlocking area AAA point PP input/output active
User definable text message..
dd-mm-yyyy hh:mm

or

Interlocking area AAA point PP input active
User definable text message..
dd-mm-yyyy hh:mm

AAA = Interlocking combination Area

¹¹⁴ Priority order: Fire alarm – Pre-warning - Interlocking - Fault.

¹¹⁵ After the end of the delay time (if used).

¹¹⁶ This indication has the lowest priority and will only be shown if the display was empty.

PP = Interlocking combination Point within the Area

Date (**dd-mm-yyyy**) and time (**hh:mm**).

Use "↑" "↓" to scroll between several interlocking combinations.

15.3.2 **Activate / deactivate interlocking output (H9/C2)**

Activate

Even if the control expression for an interlocking output is not fulfilled (true), the output can be manually activated via this menu.

The "Interlocking Combination" (Area / Point) is to be entered to activate the output. The corresponding interlocking input will be "monitored" in the same way as if the output was activated by its control expression.

Deactivate

Activated interlocking outputs are listed here. Use "↑" "↓" to scroll between the "Interlocking Combinations" (Area / Point).

Interlocking output activated via its control expression and latched output selected: The output has to be reset via this menu.

Interlocking output activated via its control expression and latched output not selected: The output can be reset via this menu.

Interlocking output activated via this menu: The output has to be reset via this menu.

15.3.3 **Disable / re-enable interlocking output (H9/C3)**

Disable

Interlocking outputs (i.e. Output Type = Interlocking) can be individually disabled via this menu (Not via menu H2/B2). A disabled output will stay in (or return to) the normal condition for the output respectively. The "Interlocking Combination" (i.e. Area / Point) is to be entered to disable the output.

All the interlocking outputs in the system can be disabled / re-enabled collectively via menu H2/B3.

Re-enable

Interlocking outputs (i.e. Output Type = Interlocking) can be re-enabled via this menu (Not via menu H2/B2).

Disabled interlocking outputs are listed in this menu. Use "↑" "↓" to scroll between the "Interlocking Combinations" (i.e. Area / Point) or type it via the key-pad.

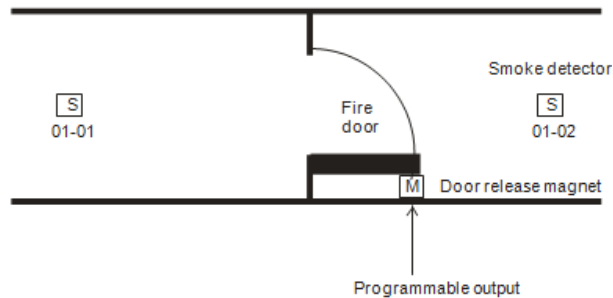
15.4 **Interlocking control expressions**

A programmable output control expression can contain "interlocking" trigger conditions ("Functions") numbers 22-25 (see chapter "Control expression", page 86), i.e. one or more outputs can be activated when one or more interlocking inputs are activated.

16 Fire Door Closing (MDH)

Programmable outputs can be used for fire door closing. A special trigger condition is available (Fire Door Closing.). Type of output is normally "Control, neutral".

One or more alarm points can control the output, i.e. the detectors on both sides of the fire door as shown in the figure below.



Note: The alarm points and the output triggered by these alarm points must be connected to the same CIE

In case of one of the following "events", the output will be activated, i.e. the fire door will close:

- Fire alarm (from any of the detectors controlling the fire door)
- Fire alarm in "Test mode" (from any of the detectors controlling the fire door)
- Fault (i.e. "no answer" from any of the detectors controlling the fire door¹¹⁷)
- Disablement (any of the detectors controlling the fire door, the zone(s) involved or the COM loop involved)¹¹⁸
- A definite time every day, if programmed via EBLWin. The output will be activated for 20 seconds.
- Via a programmable input (trigger condition "Door Closing Test Input"). The output will be activated for 20 seconds.

The input has to be in / connected to the same CIE as the alarm points and their "belonging" output.

Note: Zone line inputs (via 4580 or 3361) cannot be used for this type of Fire Door Closing.

If a magnet contact is available, it is possible to get a "closed fire door verification" via the Interlocking function. In this case, Type of output has to be "Interlocking output". See also chapter "Interlocking function" page 96.

¹¹⁷ E.g. if the detector is faulty, if there are two breaks or short-circuit on the COM loop.

¹¹⁸ If an I/O unit 3361 output is used, it is recommended, for safety reasons, **not** to connect it to the same COM loop as the detectors controlling the fire door.

17 Functions / Services / Features

Some Functions / Services / Features require programming via EBLWin, see chapter "PC software (S/W)", page 12. For more information see also FT1020G3 Operation Manual.

How to connect the PC and for more information, see chapter "Download SSD" page 162, "A Fault message for an alarm point, zone or zone line input will also show the text message.

Download software (System Firmware)" page 164.

Notes: The information in the following chapters 17.1 - 17.7 is valid for the **analogue smoke detectors 430x / 440x in NORMAL mode**.

Chapter 17.15 is valid for the **analogue heat detectors 3308 / 3309 in NORMAL mode**.

For the analogue detectors 440x in Advanced mode, see chapter "Advanced mode" page 131

17.1 Sensor value

An Analogue smoke detector is like a "sensor". It detects its environment at all times. Each detected Analogue value is converted in the detector to a digital "**sensor value**", which is continuously picked up and evaluated by FT1020G3 for each individual detector. In Figure 36, the (digital) sensor values (during a certain time) are represented by the graph "**Working level**".

17.2 Week average sensor value

Each hour, one sensor value is stored in a special memory (in FT1020G3) and each week, these stored sensor values are used to calculate a "**week average sensor value**".¹¹⁹ This is done for each Analogue smoke detector individually. In Figure 36, the (digital) week average sensor values (during a certain time) are represented by the graph "**Week average sensor value**" (B).

Each Analogue smoke detector has a default sensor value = 0.1%/m and a week average sensor value = 0.1%/m (i.e. at Time = 0).

A "**fire alarm offset**" (value) is added to the week average sensor value to get each detector's "**Fire alarm level**", i.e. the fire alarm level will be adjusted in relation to each new week average sensor value in order to keep the detector's fire alarm sensitivity constant. The fire alarm level is in Figure 36 represented by the graph "**Fire alarm level**" (C) - parallel with the graph "**Week average sensor value**" (B).

In Figure 36 (at Time = 0):

The week average sensor value (B) is 0.1 %/m and the fire alarm offset is 3 %/m, i.e. the fire alarm level (C) is 0.1+3=3.1 %/m.

Service signal will be given when the week average sensor value for a detector has reached the service signal level (1.8 %/m), i.e. the detector is "dirty" and has to be replaced. See "**Service level**" (D) in Figure 36. The week average sensor value will now stay on 1.8 %/m, i.e. the detector will be more sensitive until it is replaced with a new one.

"Sensor Information" is available via menu H4/U4. Via EBLWin and a PC connected to FT1020G3 you can also get "Sensor Information" for all Analogue detectors on a COM loop or an individual detector. For an individual detector you can also get continuous information.

¹¹⁹ The week average sensor value will be calculated within 2½ minutes after any restart, i.e. also after SSD download. During these "2½ min." all analogue smoke detector fire alarms are suppressed.

Also via the Web-server II 1598 you can get "Sensor Information" for all Analogue detectors on a COM loop.

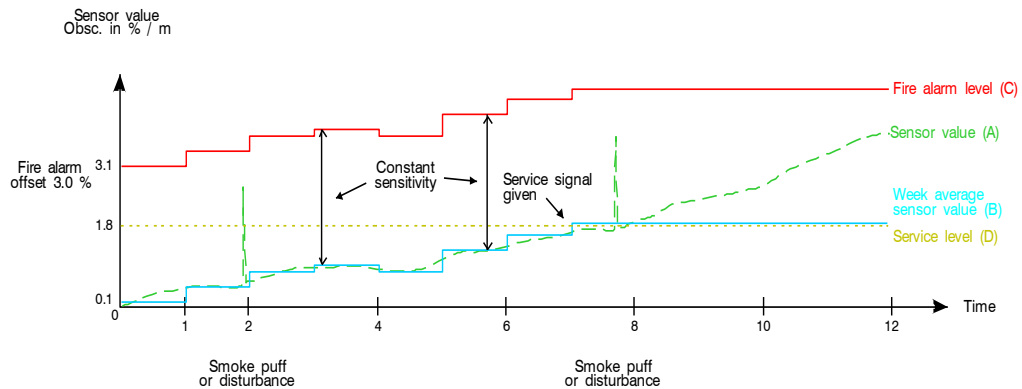


Figure 36 Basic working principle for Analogue smoke sensor

The smoke detector sensor values are presented as obscuration in % per meter (%/m). (Heat detector values as °C.)

17.3 Decision value

In order to secure real fire alarms and reduce the nuisance alarms, a decision value is calculated. The decision value is used to decide if it is normal state, pre-warning, fire alarm or heavy smoke alarm and also in the smouldering smoke algorithm (see page 106). The decision value is calculated, see chapter "Filtering algorithm", page 104.

17.4 Alarm algorithms for smoke detectors / Detection levels / Offsets

Each alarm algorithm has three detection levels:

1. **Fire Alarm** (fire alarm level = the week average sensor value + the fire alarm offset)
2. **Pre-Warning** will be activated (if selected in EBLWin – Control Unit Properties) at a lower level (smaller offset) than for fire alarm, i.e. pre-warning will be activated before the fire alarm from the same alarm point.
3. **Heavy Smoke Alarm** will be activated at a higher level (bigger offset) than for fire alarm, i.e. heavy smoke alarm will be activated later than the fire alarm from the same alarm point.

The pre-warning offset and the heavy smoke alarm level can be set in EBLWin for the whole system, see chapter "Alarm algorithms", page 153.

The fire alarm offset can be set in EBLWin for the whole system, see chapter "Alarm algorithms", page 153.

Note: Changing the alarm algorithm will affect the sensitivity and detection time and should not be done, a special password is required to change the fire alarm parameters.

"Pre-warning", "Fire Alarm" and "Heavy Smoke Alarm" can activate programmable outputs. See chapter "Control expression", page 86 and FT1020G3 Operation Manual.

17.4.1 Alarm algorithm / Alternative alarm algorithm

In order to secure real fire alarms and reduce nuisance alarms, six different alarm algorithms are available. See Table 12, page 104. The alarm algorithms are based on:

- Normal (N), High (H) or Low (L) sensitivity

- Normal (15 sec.) or slow (35 sec.) detection time

Normal sensitivity (Default) Fire alarm offset is **3.0 %** smoke obscuration per meter.

High sensitivity Fire alarm offset is **2.4%** smoke obscuration per meter, i.e. less than for normal sensitivity. This can be used when an "early" fire alarm is required.

Low sensitivity Fire alarm offset is **3.6 %** smoke obscuration per meter, i.e. more than for normal sensitivity. Can be used to reduce nuisance alarms but might not fulfil the AS7240.7 requirements.

Normal detection time - 15 sec. (Default) There will always be minimum 15 seconds alarm delay¹²⁰. This is a "normal filter" to reduce nuisance alarms.

Slow detection time - 35 sec. There will always be minimum 35 seconds alarm delay¹²⁰. This is an "extra filter" to reduce nuisance alarms but might not fulfil the AS7240.7 requirements.

Each Analogue smoke detector can have two alarm algorithms programmed (via EBLWin). One **Regular alarm algorithm** that is normally used (**N-15** is default) and one **Alternative alarm algorithm** that is turned on/off via a time channel (internal or external) e.g. normal sensitivity can be used during night-time and low sensitivity during daytime (i.e. the alternative alarm algorithm is used to reduce nuisance alarms during working hours).

The alarm algorithm in use can be read in menu H4/U3.

17.4.2 Filtering algorithm

In order to secure a fast detection of real fire alarms and to reduce nuisance (false) alarms to a minimum, a filtering algorithm is used.

The filtering algorithm uses the sensor values to calculate a decision value depending on which alarm algorithm that is in use. The decision value starts at zero. Each time a new sensor value is picked up (sampled) from an Analogue smoke detector 430x/440x, this new sensor value is compared with the actual decision value which will be adjusted if required, see below:

If the difference, between the new sensor value and the actual decision value is \leq "X", the decision value is set equal to the new sensor value.

If the difference is $>$ "X", the decision value is increased or reduced by "X".

"X" = the Step Value. It is different depending on the sensitivity and detection time, i.e. it is dependent on the selected alarm algorithm, see Table 12 below.

The decision value will consequently not be increased / decreased with a value exceeding the "X" value even if the sensor values are much higher / lower.

Table 12 Smoke Detector Alarm Algorithms

Analogue detector	Normal detection time (15sec.)			Slow detection time (35sec.)		
	H-15 2.4%, High sensitivity	N-15 3.0%, Normal sensitivity	L-15 3.6%, Low sensitivity	H-35 2.4%, High sensitivity	N-35 3.0%, Normal sensitivity	L-35 3.6%, Low sensitivity
4300 ¹²¹ / 4301 ¹²² 4400 / 4401	X=8	X=10	X=12	X=4	X=5	X=6

¹²⁰ After the fire alarm level is reached / passed, it will take min. 15 alt. 35 seconds until fire alarm will be activated in the C.I.E.

¹²¹ 4300 is replaced by 4400.

¹²² 4301 is replaced by 4401.

The six alarm algorithms for the detectors 430x and 440x in NORMAL mode. Default is alarm algorithm **N-15**, i.e. normal detection time (15 sec.) and normal sensitivity (3%).
X=The step value.

X refers to the step value.

Note: the L-15, H35, N-35 and L-35 algorithms may not comply with the AS7240.7 requirements.

Sensor/Decision values

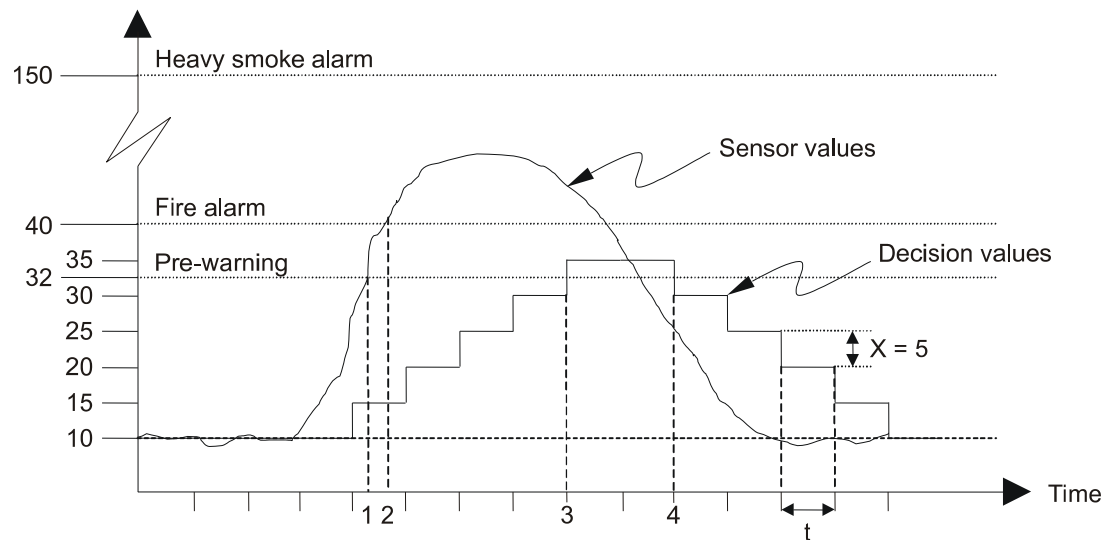


Figure 37 Filtering algorithm example for analogue smoke detector

Figure 37 shows an example of the filtering algorithm for an Analogue smoke detector with the step value $X = 5$. The polling time (t) in this example is approx. 2.56 seconds.

Explanations to the Figure 37:

In this example, the week average sensor value is "10" ($=1.0\%/m$) at the "starting point", i.e. due to contamination, the pre-warning level has been adjusted to "32" ($10+22$) and the fire alarm level to "40" ($10+30$). The sensor value is accordingly "10".

In this example, alarm algorithm "N-15" is selected, i.e. normal detection time 15 sec. and normal sensitivity 3% (30). $X = 5$. The detector polling time $t \approx 2.56$ sec. (**In system FT1020G3** the detector polling time $t \approx 7$ seconds and the step value "X" is according to Figure 37– but the **principle** is the same.)

The sensor values and decision values at start are approx. equal ("10"). When smoke enters the detector, the sensor values are increasing and by the fourth polling approx. "27". Since $27-10 > X=5$, the decision value ("10") is increased by $X=5$ to "15". Next polling the sensor value is approx. "45", i.e. the decision value ("15") is increased by $X=5$ to "20", and so on. In this example the decision value never reach to the fire alarm level. When the sensor value is reduced to approx. "25" the decision value is set to "30", because $35-25=10 > X=5$, i.e. the decision value ("35") is reduced by $X=5$ to "30", and so on.

Refer to Figure 37, these comments refer to the numbered points on the graph:

1. The sensor value has here reached the pre-warning level but nothing will happen since the decision value has not reached the pre-warning level.
2. The sensor value has here reached the fire alarm level but nothing will happen since the decision value has not reached the fire alarm level.

3. The decision value has here reached the pre-warning level and pre-warning is activated.
4. The decision value is here below the pre-warning level and the pre-warning is automatically reset.

17.4.3 Smouldering smoke algorithm

The smoke from a smouldering fire causes the sensor value to rise very slowly but not reach the fire alarm level. A smouldering fire can last for hours and sometimes days. The smouldering smoke algorithm will detect such a fire at an "early" stage.

The smouldering smoke algorithm is dependent on and works in parallel with the selected alarm algorithm, i.e. the smouldering smoke algorithm can affect the pre-warning and fire alarm levels, see below.

If the decision value has been over the smouldering level for **7 minutes** (1-2 in the figure), the pre-warning and fire alarm levels will be lowered:

- The pre-warning level will be lowered to a level right between the original pre-warning level and the smouldering level.
- The fire alarm level will be lowered to a level right between the original fire alarm level and the pre-warning level.

If the decision value has reached the pre-warning level, but not the fire alarm level, after **additional 90 minutes** (2-4 in the figure), the pre-warning and fire alarm levels will be lowered again:

- The pre-warning level will be lowered to the original smouldering level.
- The fire alarm level will be lowered to the original pre-warning level.

If the decision value continues to rise, fire alarm will be activated (5 in the figure).

The smouldering smoke algorithm will be aborted and the pre-warning and fire alarm levels restored to their original values if:

- The decision value becomes lower than the smouldering level.
- The decision value, after the **90 minutes**, has not reached the pre-warning level.
- The decision value, after the **90 minutes** and **additional 120 minutes**, has not reached the fire alarm level.

The smouldering offset can be set in EBLWin for all detectors collectively, see chapter "Alarm algorithms", page 153.

Sensor/Decision values

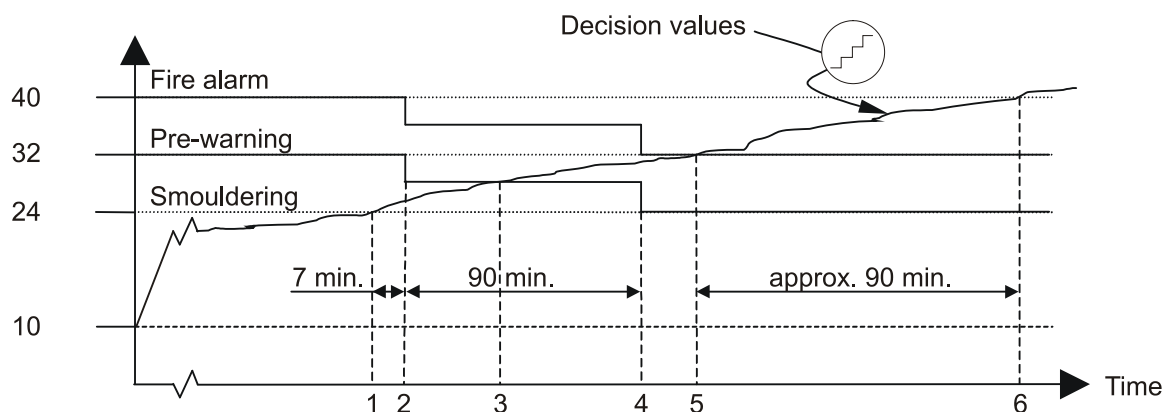


Figure 38 Smouldering smoke algorithm example for 4301.

Figure 38 explanation:

In this example, the week average sensor value and the decision value are "10" (=1%/m) at the "starting point", i.e. due to contamination the smouldering level has been adjusted to "24" (10+14), the pre-warning level to "32" (10+22) and the fire alarm level to "40" (10+30).

When a smouldering fire starts, the sensor values and the decision values will increase slowly from "10" and upwards.

1. The decision value has reached the smouldering level. A 7 minutes timer is started.
2. After the 7 minutes, the decision value is still over the smouldering level and the pre-warning level and the fire alarm level are lowered. A 90 minutes timer is started.
3. The decision value has reached the pre-warning level and pre-warning is activated.
4. After the 90 minutes the decision value is still over the pre-warning level but has not reached the fire alarm level. The pre-warning level and the fire alarm level are lowered again. A 120 minutes timer is started.
5. The decision value has here reached the fire alarm level and fire alarm is activated.
6. The decision value has reached the original fire alarm level "40", i.e. the fire alarm would have been activated approx. 90 minutes after the fire alarm is activated by the smouldering algorithm!

17.4.4 Performance factor

To find out the environment conditions where an analogue smoke detector 430x/440x in NORMAL mode is mounted, the **performance factor (PF)** can be studied. The performance factor is shown in menu H4/U4 together with the minimum and maximum sensor values. All three values should be studied together. Example, one or two high sensor values will not result in a high performance factor. The performance factor is calculated for each detector individually.

Each sensor value is compared with the week average sensor value. The absolute difference is saved and each twenty-four hour (at midnight) is an "average value" is calculated, i.e. the performance factor. (12343 = samples per 24 hours)

Where,

X_m = momentary sensor values for 24 hours.

X_{wa} = week average sensor value

If the detector is mounted in a very "stable" environment, the performance factor will be low (min. 0 %/m).

If the detector is mounted in a very "unstable" environment, the performance factor will be high (max. 2.55 %/m).

An "unstable" environment can cause nuisance alarms (unnecessary alarms). Perhaps should another type of detector or alarm algorithm be used or other functions, e.g. alert annunciation or two-address dependence.

$$\frac{\sum_{m=0}^{12343} |X_m - X_{wa}|}{12343} = Pf$$

17.5 Algorithms for Analogue heat detectors

The heat detectors conform to a class according to the requirements of the tests specified in AS7240.5.

Each Analogue heat detector can have two alarm algorithms programmed (via EBLWin). One **Regular alarm algorithm** that is normally used and one **Alternative alarm algorithm** that is turned on/off via a time channel (internal or external) e.g. class A1 can be used during night-time and class B can be used during daytime (the alternative alarm algorithm

is used to reduce nuisance alarms during working hours). The actual algorithm can be read in menu H4/U4 or EBLWin.

When the CIE has picked up a sensor value above the **fire alarm** level (xx° C) for a detector, the next two values from the same detector also have to be above the fire alarm level to activate fire alarm in the CIE (This results in an approx. 5 seconds alarm delay).

The same is valid for **pre-warning** except it is a lower level (xx° C) value compared to fire alarm. The Pre-warning option under EBLWin –System Properties can be either be enabled or disabled.

The same is valid for **heavy heat alarm** except it is a higher level than for fire alarm.

The fire alarm, pre-warning and heavy heat alarm levels can be set in EBLWin collectively for all detectors, see chapter "Alarm algorithms", page 153.

See FT1020G3 Operation Manual for more information.

17.5.1 Class A1 algorithm

Conforms to Class **A1**.

Typical / max application temperature 25 / 50° C.

Max. / min static response temperature 54 / 65° C.

The algorithm is as follows:

For a rate-of-rise $\leq 4^{\circ}$ C per minute:

- Fire alarm level is 56° C.
- Pre-warning level is 46° C.
- Heavy heat alarm level is 90° C.

Rate-of-rise $> 4^{\circ}$ C per minute:

- Fire alarm level is 46° C.
- Pre-warning level is 36° C.
- Heavy heat alarm level is 90° C.

The "Class A1 algorithm" will detect a fast temperature rise (rate-of-rise $> 4^{\circ}$ C per minute) some minutes earlier than the "Class A2 algorithm".

17.5.2 Class A2 S algorithm

Conforms to Class **A2 S**.

Typical / max. application temperature 25 / 50° C.

Max. / min. static response temperature 54 / 70° C.

The algorithm is as follows:

- Fire alarm level is 60° C).
- Pre-warning level is 50° C.
- Heavy heat alarm level is 90° C.

17.5.3 Class B S algorithm

Conforms to Class **B S**.

Typical / max. application temperature 40 / 50° C.

Max. / min. static response temperature 69 / 85° C.

The algorithm is as follows:

- Fire alarm level is 74° C.
- Pre-warning level is 64° C.
- Heavy heat alarm level is 90° C.

The "Class B S algorithm" can be used when the application temperature is "high" (compare with the "Class A1 and A2 S algorithms).

17.6 Self verification

The Analogue Detectors 430x / 440x in **NORMAL mode** have a built-in Self Verification function. The detector's HW is always supervised by the detector's S/W and CPU. Every minute, each detector will be polled from the CIE to detect faults. Any faults will be notified on the CIE with the following fault messages:

FAULT: Detector xxx-xx Technical number xxxxxx

17.7 Minimum / Maximum sensor values

To find out how the environment is, where an Analogue detector 33xx / 430x / 440x in NORMAL mode is mounted, the **minimum and maximum sensor values** can be studied. The sensor values are continuously picked up and evaluated by the Control Unit (CIE) for each detector individually. Every value is checked if it is a new minimum or maximum value for that detector. At midnight every day, a memory will be updated and the new minimum and maximum sensor values can be read in menu H4/U4¹²³.

For Analogue smoke detectors the minimum and maximum sensor values are shown as XX.X % (obscuration) per meter.

For Analogue heat detectors the values are shown as XX°C.

To access the minimum and maximum sensor values in EBLWin, right click on the sensor and choose "Show Sensor Values..." in the context menu and it would bring up its sensor log displaying in graphical or tabulated form, Figure 39 and Figure 40.

Note: In order to see the graphs, you must install Microsoft MSChart.exe in your computer or notebook. The software is to be installed only once in your computer. The link to install Microsoft MSChart as follow:

<http://www.microsoft.com/en-gb/download/details.aspx?id=14422>

¹²³ I.e. the min. / max. sensor values shown, are from the previous day.

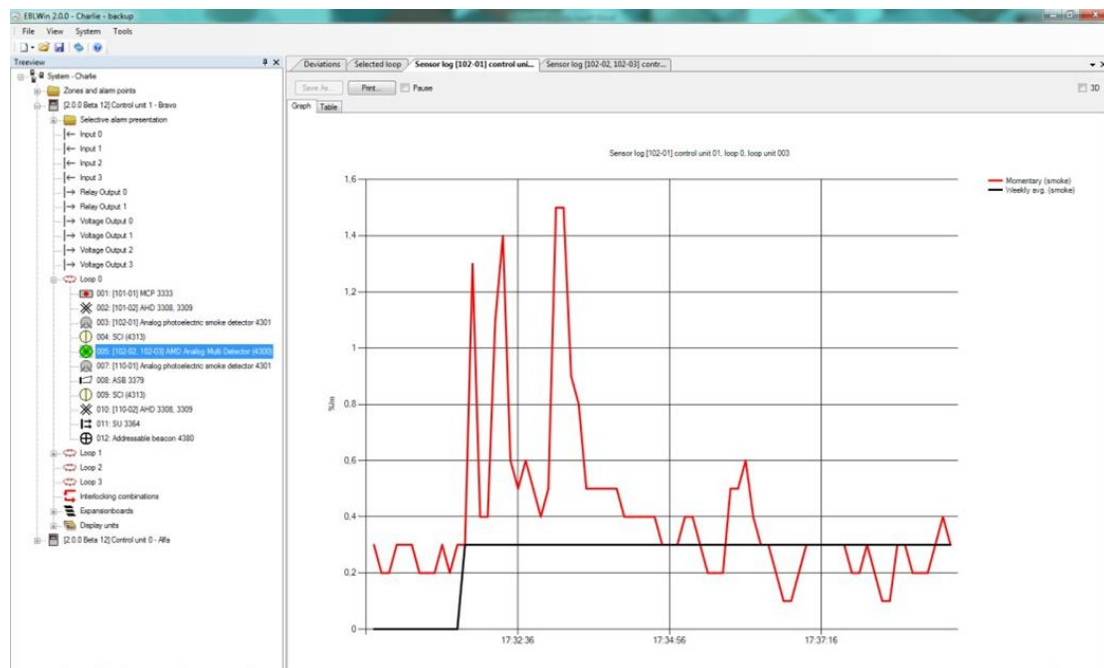


Figure 39 Sensor log in graphical form

Time	Technical number	Momentary (smoke)	Weekly avg. (smoke)	Performance factor (smoke)	Min (smoke)	Max (smoke)
2012-12-21 17:30:25	010003	0.3	0	0	0	0
2012-12-21 17:30:30	010003	0.2	0	0	0	0
2012-12-21 17:30:36	010003	0.2	0	0	0	0
2012-12-21 17:30:44	010003	0.3	0	0	0	0
2012-12-21 17:30:50	010003	0.3	0	0	0	0
2012-12-21 17:30:58	010003	0.3	0	0	0	0
2012-12-21 17:31:05	010003	0.2	0	0	0	0
2012-12-21 17:31:12	010003	0.2	0	0	0	0
2012-12-21 17:31:19	010003	0.2	0	0	0	0
2012-12-21 17:31:26	010003	0.3	0	0	0	0
2012-12-21 17:31:33	010003	0.2	0	0	0	0
2012-12-21 17:31:39	010003	0.3	0	0	0	0
2012-12-21 17:31:47	010003	0.3	0	0	0	0
2012-12-21 17:31:54	010003	1.3	0.3	0	0	0
2012-12-21 17:32:01	010003	0.4	0.3	0	0	0
2012-12-21 17:32:08	010003	0.4	0.3	0	0	0
2012-12-21 17:32:15	010003	1.1	0.3	0	0	0
2012-12-21 17:32:22	010003	1.4	0.3	0	0	0
2012-12-21 17:32:28	010003	0.6	0.3	0	0	0
2012-12-21 17:32:36	010003	0.5	0.3	0	0	0
2012-12-21 17:32:43	010003	0.6	0.3	0	0	0
2012-12-21 17:32:50	010003	0.5	0.3	0	0	0
2012-12-21 17:32:57	010003	0.4	0.3	0	0	0
2012-12-21 17:33:04	010003	0.5	0.3	0	0	0
2012-12-21 17:33:11	010003	1.5	0.3	0	0	0
2012-12-21 17:33:17	010003	1.5	0.3	0	0	0
2012-12-21 17:33:25	010003	0.9	0.3	0	0	0
2012-12-21 17:33:32	010003	0.8	0.3	0	0	0
2012-12-21 17:33:39	010003	0.5	0.3	0	0	0
2012-12-21 17:33:46	010003	0.5	0.3	0	0	0
2012-12-21 17:33:53	010003	0.5	0.3	0	0	0
2012-12-21 17:34:00	010003	0.5	0.3	0	0	0
2012-12-21 17:34:07	010003	0.5	0.3	0	0	0
2012-12-21 17:34:14	010003	0.4	0.3	0	0	0
2012-12-21 17:34:20	010003	0.4	0.3	0	0	0
2012-12-21 17:34:28	010003	0.4	0.3	0	0	0
2012-12-21 17:34:36	010003	0.4	0.3	0	0	0

Figure 40 Sensor Log in Tabulated Form

17.8 2-zone / 2-address dependence (Co-incidence alarm)

In some premises 2-zone or 2-address dependent fire alarm ("Two unit dependent" in EBLWin) can be used to avoid false alarms (nuisance alarms). A time channel can turn on/off this function.

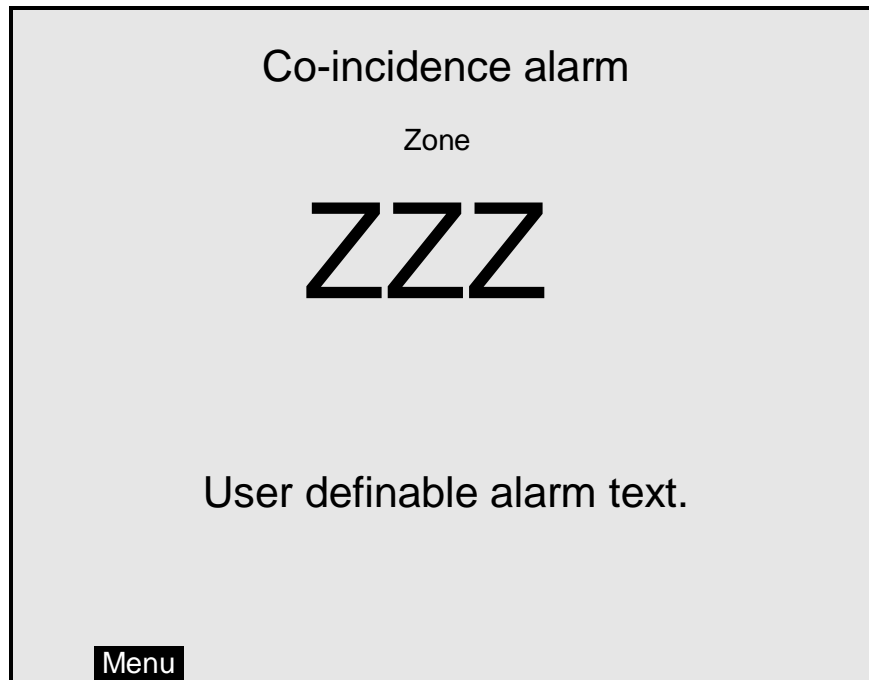
17.8.1 2-zone dependence

Each zone in the system can be programmed to be "Two zone dependent" for fire alarm activation. The zone has to belong to one of ten "Two zone dependent" groups (1-10).¹²⁴

Function:

Two or more zones in the same group have to be in "fire alarm state"¹²⁵ at the same time to activate fire alarm in the Control Unit. When only one of the zones is in "fire alarm state" it is indicated in the Control Unit (CIE) as follows:

- The buzzer sounds similar to pre-warning (0.8 / 5 sec.).
- In the CIE LCD the following information is shown:



Programmable outputs can be activated by trigger condition "Two Zone Dependent Fire Alarm" but no other outputs will be activated.

17.8.2 2-address (-unit) dependence

Each Analogue detector, addressable multipurpose I/O unit (3361) monitored Input 0 (Z) and 8 zones expansion board (4580) input, can be programmed for 2-unit dependent fire alarm activation. (Heat detectors should not and manual call points must not be 2-unit dependent).

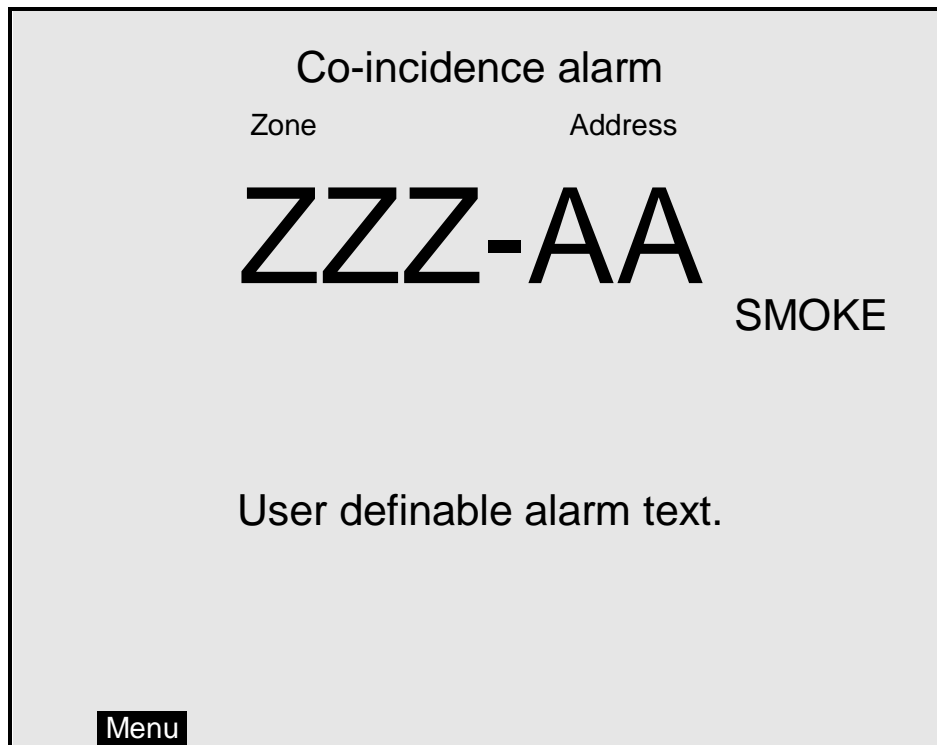
Function: Two or more units in the same zone have to be in "fire alarm state"¹²⁵ at the same time to activate a fire alarm in the Control Unit. When only one unit is in "fire alarm state" it is indicated in the Control Unit (CIE) as follows:

- The buzzer sounds similar to pre-warning (0.8 / 5 sec.).
- The following information is shown on the CIE LCD:

Programmable outputs can be activated by trigger condition "Two Address Dependent Fire Alarm" but no other outputs will be activated.

¹²⁴ See also chapter "Two zone dependence", page 156.

¹²⁵ Fire alarm state is when a fire alarm normally would have been activated in the C.I.E.



17.8.3 Reset of 2-zone / 2-address dependence (co-incidence alarm)

The unit / zone having activated a Co-incidence alarm will be latched in this status for at least 5 minutes and then automatically reset. During these 5 minutes the push button "Reset", on the CIE front, can be used to manually reset the Co-incidence alarm.

If, during these 5 minutes, at least one more unit (in the zone) or at least one more zone (in the group) comes into "fire alarm state", the Co-incidence alarm ends and normal fire alarms will be activated in the CIE

17.9 Delayed alarm

17.9.1 General time delay application

On some premises delayed fire alarm activation can be used to avoid nuisance alarms. The delay time will be added at the end when a fire alarm normally would have been activated in the CIE. This function is a violation to AS7240.2 standard

The delayed alarm function in the properties of analogue smoke detectors is called "**Delayed**" while in conventional zone line input properties called "**AVF**". The functionality of the delayed alarm in both types are different as explained below.

Each analogue detector in the system can be programmed (in EBLWin) to delayed fire alarm activation, "Delayed" alarm check box in the detector properties must be ticked

☒ Delayed . (Heat detectors should not and manual call points must not have delayed fire alarm activation). The delay time can be set (in EBLWin, System Properties) to 0-255 seconds. In general applications, it is not recommended to use this function however if it is necessary to be used, it has to be less than 30 seconds.

Function for an Analogue smoke detector:

An alarm point has to be in "fire alarm state"¹²⁵ for the duration of the delay time, in order to activate a fire alarm in the CIE. If an alarm point restores back to "normal state" during the delay time, the delay time will reset and restarts when the alarm point activates "fire alarm" again.

Programmable output can be activated using specific trigger type during the delay of a specific alarm point e.g. 3379 sounder base.

Function for conventional zone line inputs:

The “Delayed” check box for addressable multipurpose I/O unit (3361) zone line Input 0 (Z) and 8 zones expansion board (4580) input is called Alarm Verification Facility “**AVF**”, when required, check box ☒ **AVF** must be ticked. The AVF function is explained in chapter 17.11 below.

17.9.2 Specific time delay application

In this specific application of the “Delayed” alarm function, the alarm activation type for an output unit (3379) must be set (in EBLWin) to “DelayedAlarmZoneAddress” (or zone). In this case, when the alarm point activates an alarm, the output unit 3379 will sound during the time delay period without signalling alarm to the CIE. If the alarm point still in alarm after the time delay elapsed, the CIE will be in full alarm condition. The delay for this application can be selected for up to 255 seconds.

The function is the same as the “AAF” without the wall mounted module “AAM”.

Application Example:

A typical application for the delayed alarm function would be a residential accommodation where false alarms may cause a brigade call. Sounder base(s) 3379 mounted inside the unit will activate upon receiving a delayed alarm from a smoke detector for the delay period configured in the system properties (0-255 sec). If the smoke is not cleared from the smoke detector during the time delay, the control panel will go to full alarm condition. If the smoke clears up within the delay time, the alarm will reset, 3379 will be silenced and the system restores to the normal condition.

Several control expressions are available to cover any possible configuration:

- DelayedAlarmZoneAddress (Zone, Address), true when a specific zone / address is in delayed alarm state.
- DelayedAlarmZone (Zone), true when a specific zone or any detector in a certain zone is in delayed alarm state.
- GeneralDelayedAlarm, true when any zone or zone/address is in delayed alarm state.

17.10 Selective Alarm Presentation

Instead of having all fire alarms presented in all Control Units (default) it is possible to have Selective Alarm Presentation, i.e. only fire alarms from selected Control Units will be presented in the Control Unit respectively. This selection is done in EBLWin for the Control Unit respectively.

17.11 Alarm Verification Facility (AVF)

In some premises AVF can be used to reduce false alarms. The function is valid for any conventional zone line input.

When the AVF is used, the function "Delayed alarm" (see above) is not valid. The function "AVF" is selected in the dialog box for the zone line input.

Function: A zone in "fire alarm state"¹²⁶ will be registered in FT1020G3 but a fire alarm will not be activated. Within the first 15-20 seconds, the zone will automatically reset the conventional detectors sensing smoke. If the smoke still exist in the smoke chamber within the following 110 seconds, the zone will latch in "fire alarm state" and a fire alarm will be

¹²⁶ A zone with the AVF not selected would in this state activate a normal fire alarm in FT1020G3.

activated in FT1020G3, otherwise nothing will happen until the next time the zone is in "fire alarm state" and so on.

17.12 Alert Annunciation

In some installations the **Alert Annunciation** function can be used to avoid false alarms to the fire brigade. A time channel can turn on/off this function.

Trained personnel on site are required to locate the fire and take the correct actions depending on whether a real fire exists.

Normally Analogue smoke detectors and zones with smoke detectors only, can be programmed (via EBLWin) for alert annunciation. Heat detectors and manual call points should not be programmed for Alert Annunciation. A manual call point can only activate the **AA** function if there are no other fire alarms activated in the system i.e. the second fire alarm will turn off the **AA** function and the "Fire brigade TX" output will be activated ¹²⁷

The **AA** function is normally turned on (enabled) during daytime working hours only. A time channel is used to turn on/off (enable / disable) the **AA** function. When the **AA** function is turned on (enabled), it is indicated by the LED **Routing equipment** "Fire brigade TX delay" on the CIE front. Normally only one time channel is used for this function but two or more channels can be used. The **AA** function can, as an alternative, be continuously "on".

Note: The **AA** function can be de-activated (turned off) manually via menu H2/B6 and will remain off until turned on (normal) again via menu H2/B6.

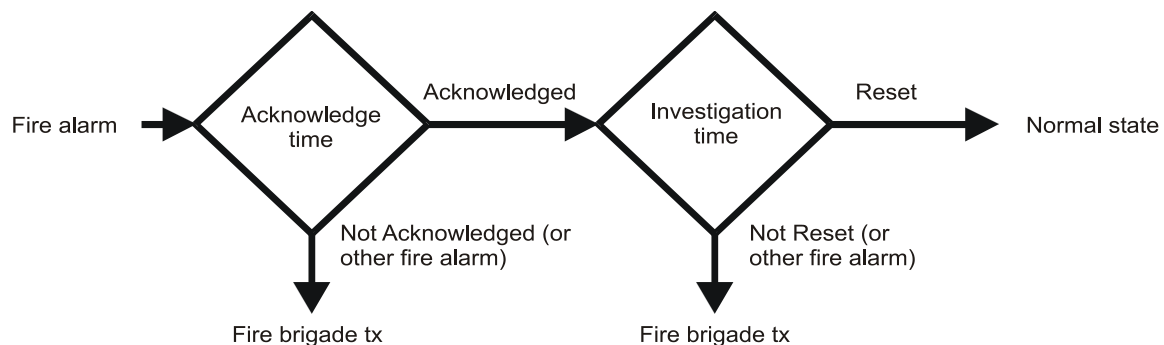


Figure 41 Alert Annunciation function flow chart.

Alert Annunciation function:

Indications, print-outs, actions, etc. for an AA alarm are the same as for a normal fire alarm except the output "Fire alarm" for routing equipment (fire brigade TX) in each CIE that will not be activated directly. ¹²⁸

The AA alarm has to be acknowledged within an acknowledgement time and the AA alarm has to be reset within an investigation time, otherwise the output(s) for routing equipment (fire brigade TX) will be activated.

During the acknowledgement and investigation times:

- If a fire alarm is activated by a detector / zone not programmed for Alert Annunciation or if fire alarm is activated by a manual call point, the output(s) for routing equipment (fire brigade TX) will be activated.

¹²⁷ This is valid even if "Multiple alarms within same zone" is selected (via EBLWin).

¹²⁸ **Note:** Programmable outputs type "Fire brigade TX" will however be activated if not the following is added to the control expression: **AND NOT Alert Annunciation Activated**.

- If "Multiple alarms allowed within same zone" is set via EBLWin, more than one AA alarm is allowed within that zone.
- "Number of zones" can be set via EBLWin. Normally, only one zone with **AA** alarm is allowed but up to four zones can be used.

Acknowledgement and Reset is done on the Alert annunciation unit 1736. A programmable output "Alert Annunciation Activated" for indication and programmable inputs "Alert Annunciation Acknowledge" and "Alert Annunciation Reset" can also be used.

The Acknowledgement time can be set to **0-120** seconds.

The Investigation time can be set to **0-9** minutes.

17.13 Alert Annunciation Applications

17.13.1 Alarm Acknowledgement Facility (AAF)

The **AAF** function is similar to the "Alert Annunciation function" as explained in chapter 17.12 above. The COM loop module used to achieve the AAF function is called Alarm Acknowledgement Module (AAM).

The AAM can be either surface mounted in the supplied white box or recess mounted in a single gang box. It enables the occupant to control the smoke detection inside the sole occupancy unit within a pre-determined time delay. The AAM is used in conjunction with the sounder base 3379. The AAM provides the occupant with a facility to avoid the unwanted alarms within the occupancy e.g. cooking fumes, smoking aerosol spray steams, etc.

Each AAF Zone consists of one or up to five analogue smoke detectors (4400 / 4401), one or up to five sounder bases 3379 and one AAM, all connected to same COM loop.

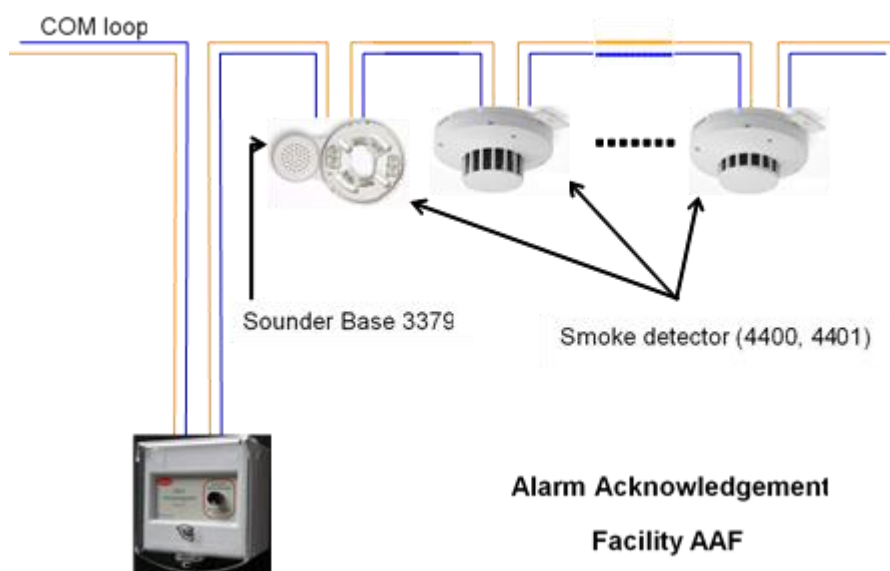


Figure 42 Alarm Acknowledgement Facility units

Each AAM is configured as an AAFC¹²⁹ zone. Each AAF can include up to 5 smoke detectors. If the analogue value of one or more smoke detector in an AAFC zone reaches the alarm level, the alarm acknowledgement process starts and the sounder base will be activated.

¹²⁹ The alarm acknowledgement facility control **AAFC** is the trigger type in EBLWin to activate the **AAM**.

The occupant has 30 seconds to press the button on the AAM (acknowledgement time) which provides the occupant with up to 90 seconds to investigate the alarm and clear up the smoke.

The alarm investigation period of 90 seconds is considered appropriate for protected areas with normal levels of ventilation or accessibility. The investigating period is adjustable 0-9 minutes to satisfy other applications. The acknowledgement period is also adjustable 0-120 seconds.

A red LED on the front cover indicates that the acknowledgement button has been pressed; it remains illuminated until the investigation period expires.

A momentary action switch is provided to acknowledge the alarm and silence the sounder base 3379. Pressing the button during the investigation period (while LED is on) will not extend or re-start the timer. The following flow chart explains the sequence of the AAF process.

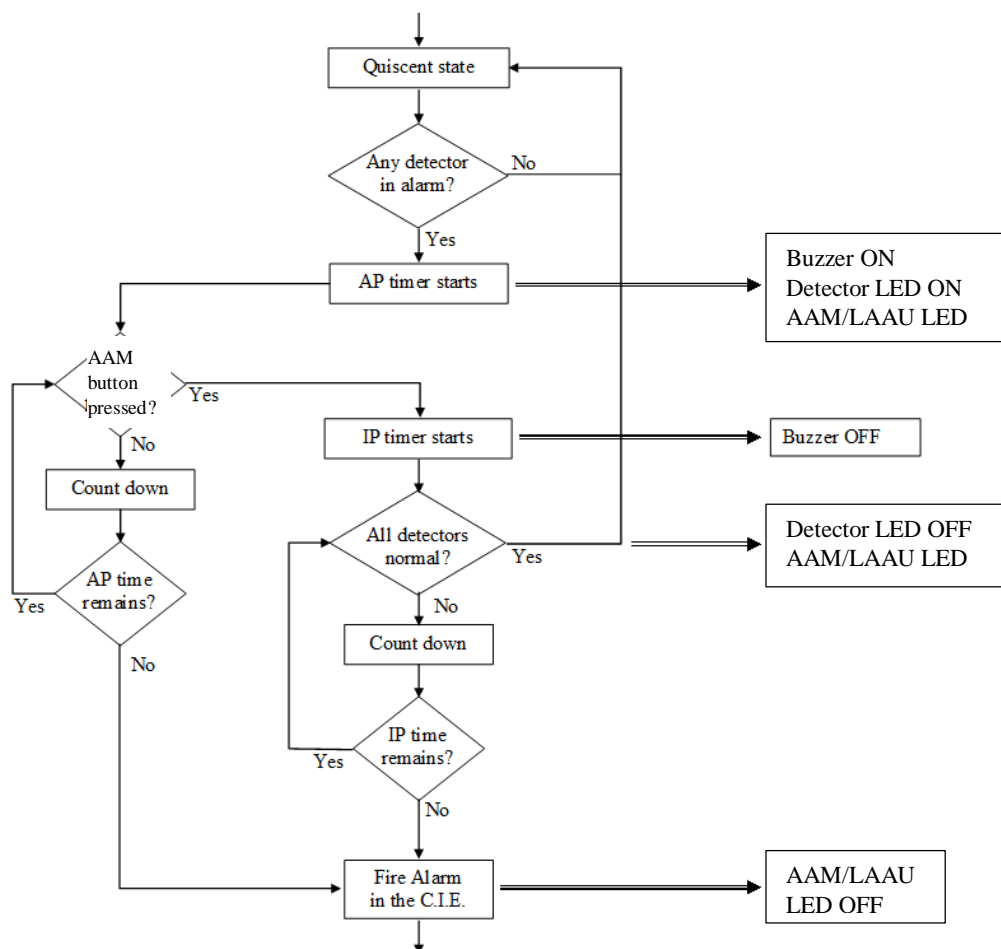


Figure 43 Alarm Acknowledgement Facility (AAF) flow chart

During the AAF Process, an AAF alarm will be indicated in the CIE display

.... during the **Acknowledgement Period (AP)**:

AAF zone xx, activated

.... during the **Investigation Period (IP)**:

AAF zone xx, investigation in progress

If more than one AAF zones are activated, only the first one is shown in the display.

The AAF zone xx (xx=00-99) is only valid for the CIE it is shown in, i.e. not for the whole system.

Notes:

- The AAF alarm indication is only shown in one Control Unit, i.e. in the Control Unit to which the AAF equipment is connected.
- All devices within the same AAF zone must be connected to the same CIE
- Maximum number of smoke detectors in an AAF zone is 5.
- Smoke detectors in an AAF zone cannot be programmed as 2-unit-dependent and not be controlled by the Alert Annunciation function.
- Only Analogue photo electric smoke detector 4401 (4301) and Analogue multi detector 4400 (4300) can be used for AAF. If the Analogue multi detector 4400 is used, it must be programmed as type "Two addresses", so that only the "smoke part" of the detector can be used in AAF function.
- Max. 100 AAF zones (00-99) per CIE
- The sounder base 3379 has to be programmed with the trigger condition "AAF zone alarm" (and other trigger conditions).

17.13.2 Local Alarm Acknowledgement (LAA)

The local alarm acknowledgement is the European's equivalent of the Australian alarm acknowledgement facility. The function is identical to the AAF explained in section 17.13.1 with different terminologies. The functionality of Panasonic's LAAU and Brooks AAM are shown in Table 13 below.

Table 13 Alarm acknowledgement function

	Panasonic LAAU	Brooks AAM
Product code	4445	3340
Module's name	Local Alarm Acknowledgement Unit LAAU	Alarm Acknowledgement Module AAM
Function's name	Local Alarm Acknowledgement LAA	Alarm Acknowledgement Facility AAF
Trigger type in EBLWin	LAA	AAFC
No. of zones	Max. 100 LAA zone	Max. 100 AAFC zone
No. of detectors per zone	5 x 4400/4401 (4300/4301)	5 x 4400/4401 (4300/4301)
Acknowledgement period	10-120 seconds	10-120 seconds
Investigation period	1-9 minutes	1-9 minutes
Sounder unit	3379	3379
Ack. Message on LCD	LAA zone xx, activated	AAF zone xx, activated
Investigation message on LCD	LAA zone xx, investigation in progress	AAF zone xx, investigation in progress

One LAA zone consists of one to five analogue smoke detectors 4400 / 4401 (4300 / 4301), one LAA buzzer (sounder base 3379) and one Local Alarm Acknowledgement Unit (LAAU). All connected on the same COM loop.

Note: All devices included in an LAA zone must be connected to the same CIE.

The local alarm acknowledgement connection diagram is shown in Figure 44 below.

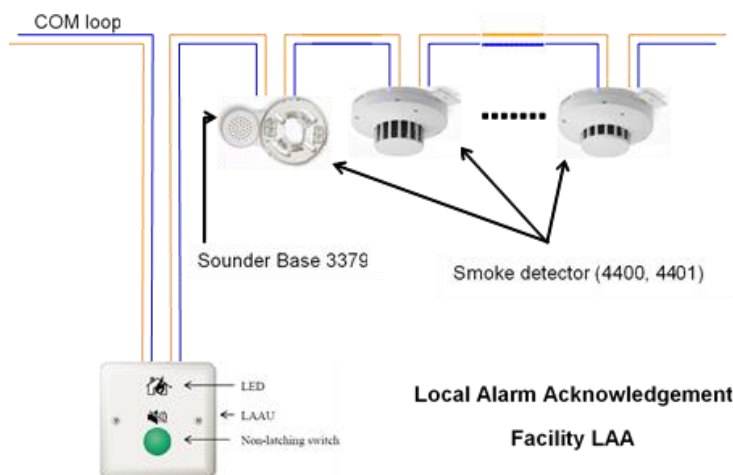


Figure 44 Local Alarm Acknowledgement Facility Connection Diagram

17.14 Quiet alarm

A smoke detector can be set to quiet alarm i.e. non-latching detector / non-brigade call alarm. This feature is used in AS1668 supply air / stair pressurization fan control applications or in residential units as a non-latching smoke alarm.

In AS1668 supply air fan applications, the type "Quiet alarm" is used to set up the duct detector to be non-latching and resets automatically after the time delay that is configured in EBLWin is expired. In residential applications, type "Quiet alarm" is used in conjunction with the sounder base 3379 as a localised warning in a designated area within the unit while the active fire alarms are situated elsewhere within the unit. It can also be activated from general fire alarm in the common areas.

Photo electric smoke detectors, programmed for quiet alarm are used to control AS1668 fans, this requires fan control module in the control panel and an I/O unit 3361 for fan control. See Section 13.5.1 "Trigger conditions" page 86.

Indications and actions:

- Detector LEDs are turned on (also a connected RIL).
- In the CIE display: **Quiet alarm detector ZZZ-AA** and a user definable alarm text, if programmed.
- LEDs "Fire" in the CIE are blinking (0.4 / 0.4 sec.).
- Buzzer in the CIE sounding (0.8 / 5 sec.).
- Programmable outputs for quiet alarm is activated, e.g. 3361 outputs controlling the AS1668 fans i.e. any output with a control expression containing trigger conditions "Quiet Alarm Zone" or "Quiet Alarm Zone Address".

Note: Quiet alarm can also be programmed for a 3361 unit "zone line input". In such a case, only non-latching detectors can be used.

17.15 Fire alarm type A and Fire alarm type B

Normally the CIE relay output "Fire alarm" is used for Fire alarm routing equipment (Fire brigade TX). This output is activated for fire alarm from any alarm point or zone line input (General fire alarm).

If the fire alarm routing equipment has provision for transmission of several fire alarm signals and the alarm receiver has provision for reception of several fire alarm signals, a

fire alarm type B will indicate that only one detector is activated, which could be a nuisance alarm. If a fire alarm type A is received, the probability of a real fire is higher than for a fire alarm type B. The alarm receiver can take different actions depending on if it is a type A or B fire alarm.

17.15.1 Fire alarm type B

The output is to be programmed (via EBLWin) as type "Routing equipment" and have the trigger condition **"One detector alarm"**.

The output will be activated for fire alarm from **one** Analogue addressable smoke, heat or multi detector only.

Note: A multi detector can have one presentation number (Zone-Address) i.e. when programmed as one address with decision algorithm / one address with OR functionality or two independent presentation numbers i.e. one presentation number for smoke and the second number for heat.

17.15.2 Fire alarm type A

The output is to be programmed (via EBLWin) as type "Routing equipment" and have the trigger condition **"Multiple detector alarm"**.

The output will be activated for fire alarm from:

- **Two or more** Analogue addressable smoke, heat or multi detectors.
- **Any** manual call point
- **Any** zone line input
- **Any** programmable input with the trigger condition "General Fire"

17.16 Disable zones, alarm points, outputs, etc.

Temporary disablements are made via the menu H2 sub menus¹³⁰. For more information see FT1020G3 Operation Manual, chapter "Disable or re-enable (H2)". The disablements are re-enabled via menu H2 sub menus.

Regular disablements are made via time channels, see chapter "Time channels", page 151.

When alarm reset method "Single with automatic disablement"¹³¹ is selected via the EBLWin "System Properties", the function will be as follows:

If an alarm point or zone is **in alarm state when being reset** it will not only be reset but also disabled. It has to be re-enabled (via menu H2/B1) the same way as if it was disabled via menu H2/B1.

Disabled alarm points and outputs are indicated by LED **Fault / Disablements** "General disablements" on the CIE front and are listed in menu H4/U1-U2.

Enhanced Disablement (Default) = Fire alarm, pre-warning and fault signal cannot be activated by the disabled alarm point/zone. If only fire alarm and pre-warning required to be disabled, "Enhanced Disablement" must not be selected, see chapter "System properties, Page 2", page 144.

Note: Enhanced Disablement is NOT valid when a time channel is used for disablements, only when menu H2/B1 is used.

¹³⁰ Zones can be temporary disabled via the zone control module (if fitted) on the CIE front.

¹³¹ This reset cannot be used in the Australian or New Zealand conventions.

17.16.1 Disable / Re-enable zone

A whole zone (all addressable alarm points within a zone, including the manual call points) can be disabled via menu H2/B1 or via the zone control front buttons (if fitted). This menu is also used to disable a conventional zone, i.e. a 3361 unit's zone line input (Z) and expansion board 4580 zone line inputs. Re-enable via menu H2/B4 or automatic re-enabling at a specified time.

17.16.2 Disable / Re-enable zone - address

Individual alarm points (zone-address) can be disabled and re-enabled via menu H2/B1.

A time channels can instead be used to disable and re-enable automatically. Disable / Re-enable control output

All outputs (except outputs of type "Alarm Device") can be individually disabled and re-enabled via menu H2/B2. Disabled output will stay in (or return to) the normal condition for the output respectively.

17.16.3 Disable / Re-enable output type

The control outputs can be collectively disabled via menu H2/B3, type:

- "Control (general)"
- "Extinguishing"
- "Ventilation"
- "Interlocking"

It is possible to do this for one or more specific Control Units or for all Control Units (i.e. the whole system). Re-enabled via menu H2/B3. Disabled outputs will stay in (or return to) the normal condition for the output respectively.

17.16.4 Disable / Re-enable alarm devices

The control outputs of type "Alarm device" (OWS) can be collectively disabled via menu H2/B4. It is only possible to do this for all Control Units (i.e. the entire system). Disabled outputs will stay in (or return to) the normal condition for the output respectively.

17.16.5 Disable / Re-enable interlocking output

The type "Interlocking output" can be individually disabled and re-enabled via menu H9/C3. See also chapter "Disable / re-enable interlocking output (H9/C3)", page 100.

17.16.6 Disable / Re-enable outputs for routing equipment

The control outputs of type "Routing equipment (Fire brigade TX and Fault TX)" can be Disabled and Re-enabled via menu H2/B5. For more information see FT1020G3 Operation Manual.

17.16.7 Disable / Re-enable alert annunciation function

The alert annunciation function can be disabled / re-enabled via menu H2/B6. Disabled alert annunciation function will be disabled until Re-enabled. Refer to FT1020G3 Operation Manual.

17.16.8 Disconnect & Re-connect loop / zone line input

The following can be disconnected and re-connected via menu H8/S1:

- COM loop

- Zone line input
- Addressable zone interface (3361 zone line input)

For more information see FT1020G3 Operation Manual.

17.17 External time channels

49 external time channels e.g. 1-49, can be used to:

- disable and re-enable alarm points
- turn the Alert Annunciation function on/off
- activate programmable control outputs
- turn Alternative alarm algorithm for Analogue detector types 430x and 440x on/off
- turn the 2-unit dependence function on/off

The 49 external time channels are allowed for the whole system. One programmable input with trigger condition/type "External Time Channel" is used for each external time channel, which is also given a "Name". The input is controlled by some external equipment, e.g. another time clock, key switch, push button, etc. with a normally open contact (normally low) or a normally closed contact (normally high). When the input is "activated" the time channel is ON.

Note: You must not use more than one input per time channel. (This is checked in the "Validity check" in EBLWin).

17.18 Test mode

Alarm points / zones can be tested during the monthly / annual test via menu H1 or H7. Up to 100 zones can be set in Test mode via menu H7 at the same time but only four zones via menu H1. For more information see FT1020G3 Operation Manual. The LED "Test mode" on the CIE front indicates one or more zones in Test mode. Zones in Test mode are also simultaneously shown in the CIE display.

Disables, faults and fire alarms have higher priority, i.e. the presentation of zones in Test mode will be suppressed during such a condition. In order to shorten the testing time, any time delay for detectors / zones in test mode will be shortened, i.e. fire alarm will be activated faster than normal.¹³²

17.19 Test alarm devices

The programmable outputs type "Alarm device" can be collectively activated via menu H8/S4, which make it possible to test the alarm devices (the test cannot be started if a fire alarm is already activated in the system). One or all Control Units can be selected. When the test starts the alarm devices will be "on" for 1 second ($\pm 1s$)¹³³, "off" for 29 seconds ($\pm 1s$), "on" for 1 second and so on.¹³⁴

Note: Disabled (and silenced) alarm devices will also be tested.

The test will continue for one hour if it is not stopped via menu H8/S4 or if a fire alarm is activated in the system.

¹³² Any 2-zone / -address dependence and the function "delayed alarm" will be ignored.

¹³³ Some COM loop unit outputs might be "on" a little longer.

¹³⁴ The output activation will be continuously (steady). For the alarm devices 4477 and 3379, the tone with the highest priority level (and type "alarm device") will be automatically selected.

17.20 Test of outputs

The programmable outputs (including addressable alarm devices) can be tested i.e. activated via EBLWin but also via menu H8/S8. At the start of the test, the output will be activated even if its control expression is false. At the end of the test, the output will be de-activated but only if its control expression at that time is false.

17.21 Test of routing equipment

Via menu H1, it is possible to test the fault and fire alarm outputs for routing equipment (Fault TX, Fire brigade TX and corresponding programmable outputs). Open door etc. will not affect the test.

In menu H1, select "Yes" and press "←" to start the test. A 60 seconds count-down starts. The "Fault condition" output will be activated¹³⁵, indicated by LED "Fault TX activated" on the CIE front. After 30 seconds, the "Fire alarm" output(s) will also be activated, indicated by LED "Fire brigade TX" on the CIE front. After additional 30 seconds the test will be terminated and the outputs and LEDs will go back to "normal" status.

Note: In the Australian and New Zealand conventions, testing of the routing equipment is conducted via the ASE.

17.22 Calibration of supervised outputs

The supervised (monitored) voltage outputs must be calibrated during commissioning of FT1020G3 system.¹³⁶ This is done via menu H5/A1 in the CIE

Calibration range is **4K7 – 50K** or **470 nF – 5 x 470 nF**. A value outside the calibration range 4K7-50K and 470 nF to 5x470 nF will generate a fault as well as an actual value that differs from the calibrated value \pm a small tolerance.

17.23 Service signal

A smoke detector becomes contaminated no matter what environment it is mounted in. In a harsh environment, contamination is accelerated.

Conventional smoke detector: The sensitivity will normally increase in most environments. This can result in nuisance alarms since conventional smoke detectors have a fixed fire alarm level. Conventional smoke detectors have no service signal output and have to be replaced on a regular basis (i.e. before being fully contaminated).

Analogue smoke detector: The sensitivity will automatically be constant.¹³⁷ **Service signal** will be activated at a fixed **service level**. Service signal will be generated for detectors 4300, 4301, 4400 and 4401 in NORMAL mode when the week average sensor value is ≥ 1.8 %/m. For detectors 4400 and 4401 in Advanced mode, the Service signal will be activated when the sensitivity compensation value is 2 %/m.

One or more detectors having activated SERVICE signal is indicated by the LED "Service" on the CIE front. A programmable output can also be activated.

When a "dirty" detector has been replaced by a new/clean one, its week average sensor value has to be set to default. This is done via menu H8/S3.

¹³⁵ **Note:** Fault condition outputs are normally activated in "normal" state, i.e. they will in this case be de-activated.

¹³⁶ CIE outputs S0-S3: EOL resistor 33K. 1 – 5 resistors (33K) can be used. 3364 outputs VO0-VO1: EOL capacitor 470 nF. 1 – 5 capacitors (470 nF) can be used.

¹³⁷ The detector is supervised at all times and adapts its fire alarm level in relation to the contamination of the detector, see chapter "", page 102.

For more information, see FT1020G3 Operation Manual chapter "Sensors activating Service signal (H4/U5)" and "Acknowledge Service signal (H8/S3)".

17.24 Fault signal (fault condition)

Fault signal, fault messages, fault acknowledge, etc. are described in FT1020G3 Operation Manual, chapter "Fault".

Programmable inputs can be used to activate fault signal in the FT1020G3 CIE. See chapter "Programmable inputs", page 72.

For faults from zones and alarm points also the Alarm text (see below) will be shown. The fault list can be printed via menu H6 if a printer is fitted.

17.25 Alarm texts

The alarm texts are shown in case of a fire alarm.

When a fire alarm is activated, the presentation number (Zone – Address) will be shown in a field in the middle of the CIE display. On the row just below the presentation number, the user definable alarm text for that alarm point will be shown, if programmed.¹³⁸ The alarm text together with the presentation number will be printed when a printer is available in the CIE.

See also FT1020G3 Operation Manual, chapter "Fire alarm".

The alarm texts, up to 40 alphanumeric characters, are created and downloaded via EBLWin. Each addressable alarm point can have the same alarm text displayed in the Alert Annunciation units 1736 and in the External Presentation unit 1728 (or a different alarm text in each unit).

The alarm text will also be shown together with the fault message for an alarm point.

17.25.1 Creating the alarm texts via EBLWin

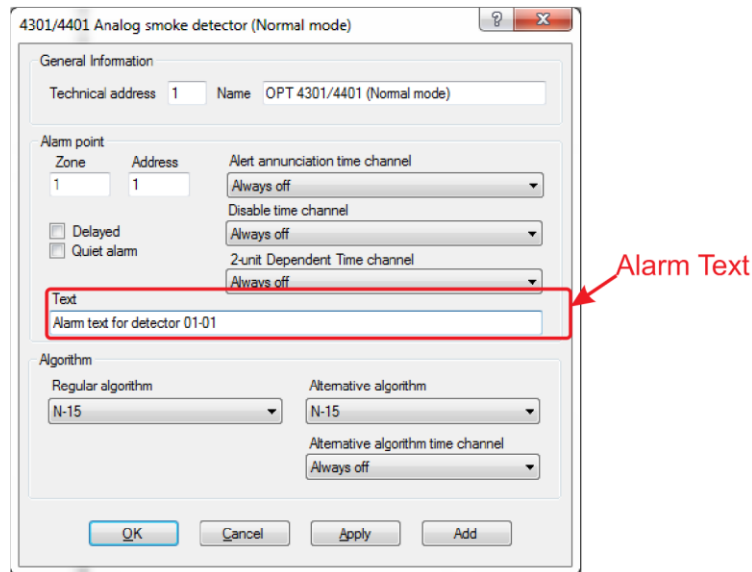
In the dialog box for any alarm point (e.g. a detector/sensor)¹³⁹, there is a "Text" field where the alarm text for that alarm point can be typed (or edited). The alarm text will be shown in the CIE display when this alarm point has activated fire alarm and as from V2.0, it will also be shown in the fault message.

It is recommended that the text reflects general indicating descriptor where the location of this Zone-Address is e.g. "Main Dining Area" is preferred rather than "Fire in the Main Dining Area" because when the text appears in the fault message, the event is not a fire.

The alarm text can, as an alternative, be typed (or edited) in the EBLWin "Text editor" (menu System | Edit Alarm Texts...).

¹³⁸ See also Table 2 Control Panel Limitation page 18.

¹³⁹ In EBLWin.



4301/4401 Analog smoke detector (Normal mode)

General Information

Technical address 1 Name OPT 4301/4401 (Normal mode)

Alarm point

Zone	Address	Alert annunciation time channel
1	1	Always off

☐ Delayed
☐ Quiet alarm

Disable time channel: Always off

2-unit Dependent Time channel: Always off

Text

Alarm text for detector 01-01

Algorithm

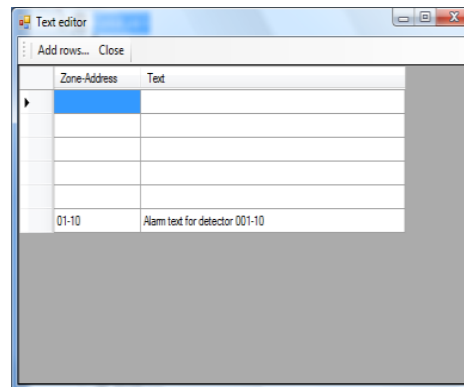
Regular algorithm: N-15

Alternative algorithm: N-15

Alternative algorithm time channel: Always off

OK Cancel Apply Add

These texts can be edited in either the alarm point dialog box or the Text Editor. Both text will be synchronised.



Text editor

Add rows... Close

Zone-Address	Text
01-10	Alarm text for detector 001-10

Explanations:

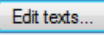
Zone-Address column

Shows the already programmed alarm points (e.g. 001-01, 001-02, 002-01 etc.). Only the texts have to be typed / edited in the "Text" column.

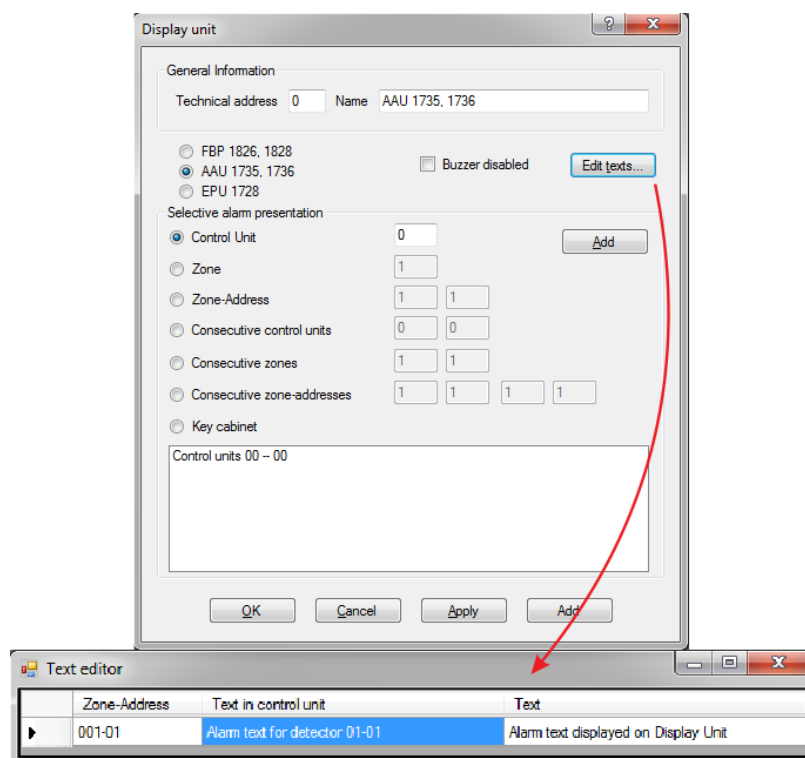
Shows the already programmed zones, i.e. I/O unit 3361 zone line inputs programmed with address "00" (i.e. ZZZ – 00) and 8 zones expansion board 4580 zone line inputs. Only the texts have to be typed / edited in the "Text" column.

Text column

Shows already programmed alarm texts. Texts can be typed / edited here.

Note: If any alarm point is required to have a different alarm text in one or more of the "display units" 1736 or 1728¹⁴⁰, the text has to be typed in the EBLWin "Text editor", for the "display unit" (Click  button in the Display Unit dialog box which will bring up the Text Editor).

¹⁴⁰ Regarding text priority order etc. see the Display Units Technical Description.



Explanation (Text editor for **one** specific "display unit"):

Zone-Address column

Shows the already programmed alarm points (e.g. 001-01, 001-02, 002-01 etc.).

Shows the already programmed zones, i.e. I/O unit 3361 zone line inputs and 8 zones expansion board 4580 zone line inputs programmed with address "00" (i.e. as ZZZ – 00).

Text in Control Unit column (cannot be edited here)

Shows the already programmed texts for each alarm point / zone. This is only information and cannot be edited. These texts will be displayed in the CIE and all "display units" 1736 and 1728 if there are no other texts programmed in the "Text column".

Text column

The text to be shown in **this specific** "display unit" for the alarm point / zone, has to be typed (edited) here. In this "display unit" the text in the "Text" column will now be shown instead of the text in the "Text in Control Unit" column, for the alarm point / zone respectively.

17.25.2 Downloading alarm texts to the Display Units 1728 / 1736

The "display units" have to be connected to FT1020G3 and the address and mode ¹⁴¹ have to be set in the "display units".

The texts will then be downloaded at the same time as the FT1020G3 site specific data (SSD) is downloaded via EBLWin ¹⁴².

The texts can as an alternative be downloaded in one "display unit" at a time but the PC (with EBLWin) has nevertheless to be connected to FT1020G3.

¹⁴¹ S/W mode xxxx – **1587**. (xxxx = e.g. 1728)

¹⁴² In the "Download SSD to Control Unit" dialog box the "Download to FBP / AAU / EPU" check box has to be selected. (As an alternative the "Modified FBP / AAU / EPU only" check box can be selected.)

17.26 Real time clock (RTC)

Each Control Unit has a built-in RTC. It is used for date and time presentation in conjunction with fire alarms, faults, event logging and the time channels 2-14. In a system with two or more Control Units in a TOLON network, the time in all Control Units will be synchronised.¹⁴³ The RTC does not have a backup battery, i.e. the date, time, etc. has to be set (via menu H3) after loss of the power supply (no mains and no battery backup) and after software download.

17.26.1 Daylight saving time

The time is automatically changed when the Daylight saving time period starts and stops respectively, if set so in EBLWin (system properties / page 2). The daylight saving time will be automatically changed in the AU and NZ conventions as follow:

- Australian convention: Forward 1 hour the first Sunday in October, 02:00 → 03:00. Backward 1 hour the first Sunday in April, 03:00 → 02:00.
- New Zealand convention: Forward 1 hour the last Sunday in September, 02:00 → 03:00. Backward 1 hour the first Sunday in April, 03:00 → 02:00.

17.27 Loss of main power source

Regarding the Main power source and standby power source, see chapter "Power supply", page 177.

17.27.1 Fault: Loss of main power source

The delay time for the fault "Loss of main power source" can be set in EBLWin to 0–300 minutes. Default setting is 30 minutes.

17.27.2 LCD backlight

In order to reduce the current consumption, the LCD backlight will be turned off during loss of the main power source.

17.28 Zone Groups

Zones can be grouped together in a zone group. The zone group is given a name e.g. "Level 2" and then can be used in control expressions to activate outputs e.g. FireAlarmZoneGroup ("Level").

Maximum 30 zone groups can be defined. Each zone group can contain unlimited number of zones but a zone can only be a member of one zone group.

See also chapter "Zone groups" page 158

Zone group function is introduced in EBLWin V2.2.0.

¹⁴³ The calendar and clock can be set in any C.I.E. for the whole system. Every day (at midnight) all calendars and clocks will be synchronised.

18 Special New Zealand functions

Note: The functions in this chapter are valid for the New Zealand convention only.

18.1 Alarm devices

In the New Zealand convention only, the **"FIRE"** LEDs will indicate steady instead of blinking when the alarm devices are disabled, see below.

18.1.1 Silence Alarms (inside switch)

On the CIE front, the button **"SILENCE ALARMS"** (P2) is called the **"Inside switch"** and functions are slightly different in the NZ convention as described below.

The switch toggles between two states:

- **Alarm devices disabled**

When the button is pressed, all programmable outputs of type "Alarm devices" are disabled, e.g. OWS or sounders, strobes, etc. and any new alarms will not re-activate the warning devices.

- **Alarm devices not disabled**

All programmable outputs of type "Alarm devices" will be enabled, i.e. any alarm can activate the warning devices.

If the **"SILENCE ALARMS"** switch (inside switch) is left in its disabled state when the CIE door is being closed, the buzzer will beep steady (continuously) and the message **"Silence switch left active"** will be shown in the display. This feature is required in NZS4512 to ensure that the door cannot be closed while the alarm devices are isolated. This message has lower priority than fire alarms but higher than other disablements and faults.

Note: The **"SILENCE ALARMS"** switch on the front display has no function if the **"Silence alarms"** Bulgin key in the FT1020G3 cabinet or in the remote fire brigade panel (see below) is turned to the silence alarms position.

18.1.2 New Zealand FB Bulgin Silence switch (outside switch)

The New Zealand FB **"Silence Alarms"** switch is called the **"outside switch"** since it is placed outside the CIE. The outside switch is a Bulgin key switch, it is connected to a programmable input on NZ mimic display board (via 4582) with the trigger condition **"NZ Silence switch"**. The fire brigade key switch can be in two states:

1. **The Bulgin key switch is turned ON** (i.e. from not activated to activated state).

- All programmable outputs of type "Alarm devices" are disabled¹⁴⁴, i.e. they cannot be activated. The "Silence Alarm" switch (inside switch) has no function (see above).
- LEDs "Fire" (on FT1020G3 front) changes from blinking to steady
- The CIE built-in buzzer is silenced.
- A fault is generated¹⁴⁵

FAULT: FB Silence switch active, Control Unit xx

¹⁴⁴ Indicated by LED "General disablements" on the C.I.E. front.

¹⁴⁵ Always latched, regardless of if faults are programmed to be not latched.

2. The Bulgin key switch is turned OFF (i.e. from activated to not activated state).

- The "FAULT: FB Silence switch active" will be Serviced.¹⁴⁶
- Any fire alarm "**ALARM**" and acknowledged alarm "**ACKNOWLEDGED**" will automatically be disabled / isolated i.e. it has to be re-enabled via menu H2/ B1). Indicated by LED "General disablements" on the CIE front.
- Any fire alarm "**ALARM**" and acknowledged alarm "**ACKNOWLEDGED**" will automatically change the state to "Isolated alarm" (see below) and in the fire alarm list (presented in the display), "**ALARM**" or "**ACKNOWLEDGED**" will be replaced with "**ISOLATED**".

An example:

1234567890123456789012345678901234567890

1.	First alarm: 002-03	Alarm number 1 (of 1)
2.	ISOLATED alarm	
	Zone	Address
3.	002-03	
4.		SMOKE
5.	User definable alarm text for 002-03.	
6.		
7.		
8.		
9.		
10.		
11.		
12.		
13.		
14.	Menu	

18.1.2.1 Isolated alarm

An active fire alarm will automatically change state to "Isolated alarm" when the Bulgin key (outside switch) is turned off, i.e. when it is not activated any more (see above).

The following is valid for an isolated alarm.

- LEDs "Fire" (on the CIE front) not activated.
- The CIE built-in buzzer not activated.
- Presented as isolated alarm, see the example above (**ISOLATED**).
- Programmable outputs will not be activated.
- Output for routing equipment (Fire brigade TX) not activated.

¹⁴⁶ Since this fault is always latched, it has to be acknowledged via menu H6.

18.2 Battery faults

For other conventions, see chapter "Battery protection functions", page 178.

18.2.1 FAULT: Battery

The following battery check is performed:

- The battery charging is turned off every 30 seconds.
- Battery voltage is checked.
- Battery voltage < 24.4 V generates a fault.

FAULT: Battery

18.2.2 FAULT: Low battery capacity (Auto battery test)

The following battery check is performed:

- The battery charging is turned off for 60 minutes every 24 hours.
- Battery voltage is checked during this 60 minutes period.
- Battery voltage < 24.4 V generates a fault.

FAULT: Low battery capacity

If a fault is generated it will be **Serviced** after the 60 minutes period.

18.3 Routing equipment isolate (disable)

If any output for routing equipment (Fire brigade TX or Fault TX) is disabled and the CIE door is being closed, the built-in buzzer will beep for two seconds. In the display will be shown: "**Routing equipment left disabled**". This message has lower priority than fire alarms but higher than other disablements and faults.

18.4 Acknowledged alarm

When a fire alarm is activated in the CIE, it can be acknowledged by first pressing "Alarms Queued" button then on the bottom right of the CIE, "Acknowledge alarm" will be displayed, press the last soft key just under the LCD display to acknowledge the alarm.

An acknowledged alarm has the same functionality as a normal fire alarm except for the indication in the CIE display.

In the fire alarm list (presented in the display), "**ALARM**" will be changed to "**ACKNOWLEDGED**".

An example:

Only the alarm currently shown in the display will be acknowledged, i.e. if there are several alarms it is necessary to scroll and acknowledge each alarm separately. Do this by pushing on the “Alarms Queued” button.

1234567890123456789012345678901234567890

1.	First alarm: 002-03	Alarm number 1 (of 1)
2.	ACKNOWLEDGED alarm	
3.		
4.		
5.	002-03	
6.	SMOKE	
7.		
8.		
9.	User definable alarm text.	
10.		
11.		
12.		
13.		
14.	Menu	

19 Advanced mode

The latest generation of detectors are as follow:

- Conventional photoelectric smoke detector 4452
- Analogue photoelectric smoke detector 4401
- Analogue multi detector 4400

Notes:

The Analogue detectors **4401** and **4400** can be set using the address setting tool **4414** in different modes. In this chapter, only the **Advanced mode** is described.

The detectors are factory set to the **NORMAL mode**, see chapters "COM loop units", page 51 and "Functions / Services / Features" page 102.

The analogue detectors **4401** and **4400** will function in NORMAL mode same as analogue detectors **4301** and **4300** (replace them) in NORMAL mode respectively. (The analogue detectors **4301** and **4300** cannot use the advanced mode)

The **Advanced mode** can be set with the address setting tool **4414** only i.e. address setting tool **3314** cannot be used.

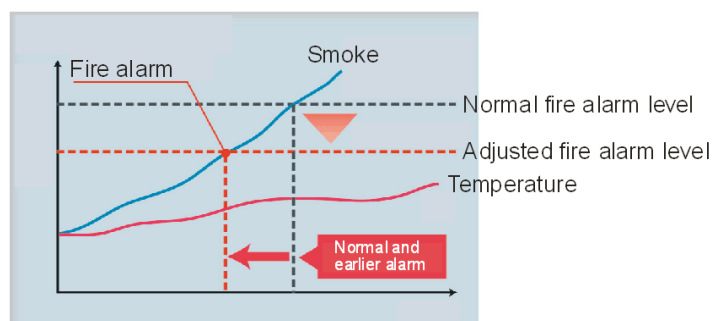
The conventional detector **4452** uses some of the advanced mode functions, see the function respectively below in this chapter.

The **Artificial Intelligence (AI function)** uses combined smoke and heat sensing for the fire judgement, as well as variable sensitivity and time delay based on the smoke and temperature changes just before the alarm level is reached. This will secure the real fire alarms and reduce the nuisance alarms.

The AI function is dependent on if the detector is a photoelectric smoke detector (4452 / 4401) or a multi detector (4400):

Combined heat and smoke sensing will guarantee reliable and accurate fire alarm detection, e.g. by shortening the delay time and/or adjust the sensitivity (lower alarm threshold level).

Fire alarm activation in conjunction with temperature rise.

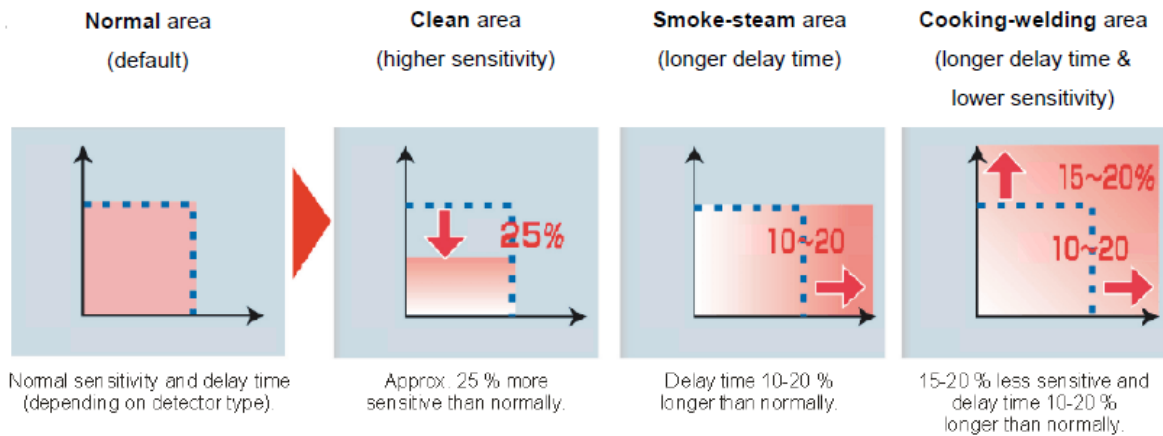


By combined smoke and heat sensing a lower fire alarm level can be used.

Variable delay time: the delay time is influenced by the temporary temperature and/or smoke obscuration changes just before and after the alarm threshold level was passed. The delay time before a fire alarm is activated can be shortened up to 50 % (e.g. from 20 to 10 sec.), or the delay time can be extended in order to reduce nuisance alarms.

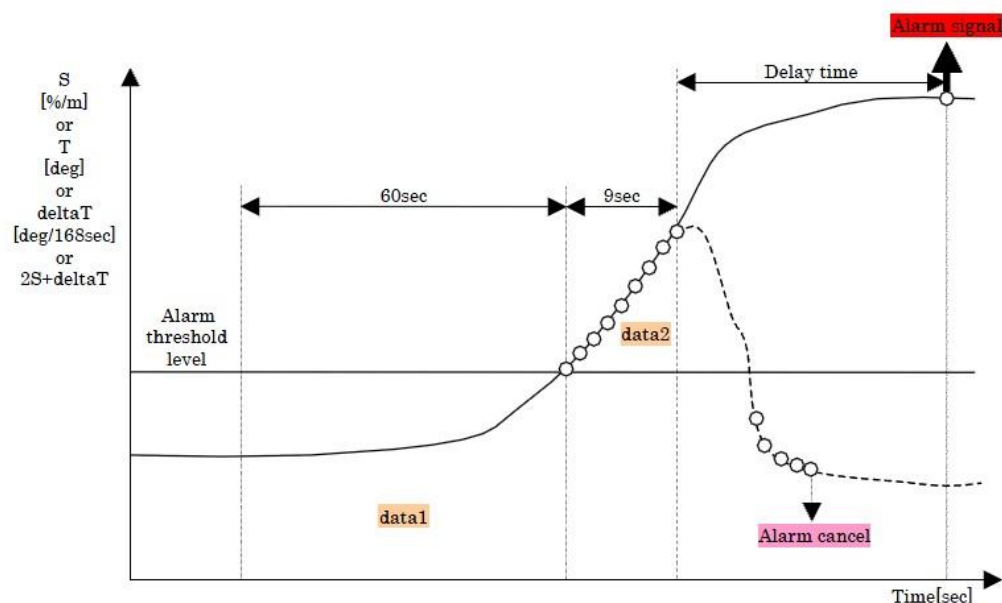
A **learning function** will adapt after a learning period an Alarm algorithm suitable for the smoke and temperature conditions in the area where the detector is located.

Alarm algorithms for the following areas can be adapted:



19.1 Pulse up – down counter

The detector have a "pulse up – down counter", starting at "0" and cannot be negative.



19.1.1 Pulse up – down counter for smoke

When the smoke obscuration S (%/m) \geq the alarm threshold level, "1" is added to the counter every second.

When $S <$ the alarm threshold level, "2" is subtracted from the counter every second.

19.1.2 Pulse up – down counter for temperature

When the temperature T ($^{\circ}\text{C}$) \geq the alarm threshold level, "3" is added to the counter every second)

When the temperature rise ΔT ($^{\circ}\text{C}/168\text{sec.}$) \geq the alarm threshold level, "3" is added to the counter every second.

When T or $\Delta T <$ the alarm threshold level, "2" is subtracted from the counter every second.

19.1.3 Pulse up – down counter for smoke & temperature

When $2S + \Delta T \geq$ the alarm threshold level, "1" is added to the counter every second.

When $2S + \Delta T <$ the alarm threshold level, "2" is subtracted from the counter every second.

19.2 Fire judgement

The fire judgement is dependent on the **alarm threshold level**, which is dependent on the **area alarm algorithm** ("learning mode" in the following tables) and a **delay time**, which is dependent on if the **cause of alarm** is smoke **S**, temperature **T** or **deltaT** or a combination of smoke and temperature $2S + \Delta T$ and also the **area alarm algorithm**.

When the counter shows "9" (i.e. at the earliest after nine seconds in case of S or $2S + \Delta T$ and after three seconds in case of T or ΔT), the delay time starts and has to run out before a fire alarm will be activated in the CIE.

19.3 Alarm threshold levels

Depending on the detector type, mode and learning condition, there are alarm threshold levels (**S**, **T**, **deltaT** and $2S + \Delta T$) for pre-warning, fire alarm and heavy smoke / heat alarm.

The following **fire alarm** threshold levels are valid for the different type of detectors:

4452:

Area alarm algorithm	S [%/m]
	Fire alarm
Normal	4

4401:

Fire alarm threshold level	
Area alarm algorithm \ Cause of alarm	S [%/m]
Normal	3.5
Smoke/Steam	3.5
Clean	2.6

4400:

Fire alarm threshold level				
Area alarm algorithm \ Cause of alarm	S [%/m]	T [deg.]	deltaT [deg./168sec]	$2S + \Delta T$ #4
Normal	5	57	18	12
Smoke/Steam	5	57	18	12
Clean	3.7	57	18	10
Heater	5	57	no use	12
Cooking/Welding	5	57	18	14

#4 : With $S \geq 2.5\%/m$ and $\Delta T \geq 3 \text{ deg}/168 \text{ sec}$

19.4 Alarm Delay Time

The alarm delay time varies for the different types of detectors depending on the cause of alarm, Area alarm algorithm and the values before / after the fire alarm threshold level was exceeded.

4452: Normally 9 seconds.

4401:

Delay time[sec]		
Area alarm algorithm	Cause of alarm	S
		data1[%/m]
Normal Clean		data1 < 0.2
		45
		$0.2 \leq \text{data1} < 0.3$
		39
		$0.3 \leq \text{data1} < 0.4$
Smoke/Steam		30
		$0.4 \leq \text{data1} < 1.3$
		18
		$1.3 \leq \text{data1}$
		9
		data1 < 0.2
		45+data2/2
		$0.2 \leq \text{data1} < 0.3$
		39+data2/2
		$0.3 \leq \text{data1} < 0.4$
		30+data2/2
		$0.4 \leq \text{data1} < 1.3$
		18+data2/2
		$1.3 \leq \text{data1}$
		9+data2/2

4400:

Delay time[sec]						
Area alarm algorithm	Cause of alarm	S		T	deltaT	2S+deltaT
		data1[%/m]				
Normal		data1 < 0.6	45	9	9	data2/2
		0.6 ≤ data1 < 0.8	30			
		0.8 ≤ data1 < 2.5	18			
		2.5 ≤ data1	9			
Smoke/Steam		data1 < 0.6	45+data2/2	9	9	data2/2
		0.6 ≤ data1 < 0.8	30+data2/2			
		0.8 ≤ data1 < 2.5	18+data2/2			
		2.5 ≤ data1	9+data2/2			
Heater		data1 < 0.6	45	9	no use	data2/2
		0.6 ≤ data1 < 0.8	30			
		0.8 ≤ data1 < 2.5	18			
		2.5 ≤ data1	9			
Cooking/Welding		data1 < 0.6	45	9	9	data2'
		0.6 ≤ data1 < 0.8	30			
		0.8 ≤ data1 < 2.5	18			
		2.5 ≤ data1	9			
Clean		data1 < 0.3	45	9	9	data2/2
		0.3 ≤ data1 < 0.4	30			
		0.4 ≤ data1 < 1.3	18			
		1.3 ≤ data1	9			

data1 = The average smoke obscuration value (S) for 60 seconds before the alarm threshold level was passed.

data2 = The sum of the difference between the smoke obscuration value (S) and the alarm threshold level every second for nine seconds after the counter shows "9".

data2' = The sum of the difference between the 2S+deltaT value and alarm threshold level every second for nine seconds after the counter shows "9".

Notes:

Maximum alarm delay time is 60 seconds.

If the cause of alarm is T or deltaT, the alarm delay time will be 9 seconds.

The alarm delay time function will be cancelled after 18 seconds if one of the following conditions is true:

S (%/m) \geq fire threshold level (S) x 2

T (°C) \geq fire threshold level (T)

deltaT (°C/168 sec.) \geq fire threshold level (deltaT)

19.5 Learning function / Learning conditions

Detectors 4400 and 4401 can use a **Learning function**, i.e. Depending on the local temperature changes and the local occurrence of smoke where the detector is situated, each detector can after a **learning period** adapt a more appropriate alarm algorithm than the default (Normal) one, an **Area Alarm algorithm**¹⁴⁷. See also page 132

19.5.1 Area Alarm algorithms

Normal area is the default Area alarm algorithm for each detector. There are four other **Area alarm algorithms** that can be adapted after the learning period:

- Smoke – Steam area, is dependent on the occurrence of smoke, i.e. **level 1 = S** [%/m] \geq half the fire alarm threshold level (S).
- Heater area, is dependent on the rise of temperature, i.e. **level 2 = deltaT** [°C/168 sec.] \geq 12 (approx. 4.3°C/min.).
- Cooking – Welding area, is dependent on the occurrence of smoke in conjunction with the rise of temperature, i.e. **level 3 = 2S+deltaT** \geq 10.

Note: S has to be ≥ 2.5 and deltaT has to be ≥ 3 .

- Clean area, is the most sensitive condition, requiring a very clean and stable environment, i.e. the values for all the other types of areas (level 1, 2 and 3) must not be exceeded.

19.5.1.1 Smoke - Steam area, level 1

A **learning period** contains twenty **36h-periods** (i.e. 20 x 36h = 720h = 30 days = one month).

36h	36h	36h	36h	36h	36h	36h	36h	36h	36h	36h	36h	36h	36h	36h	36h	36h	36h	36h	36h
		✓	✓						✓										
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20

During each **36h-period**, it is recorded if **level 1** is exceeded at least once. If so, the **36h-period** will get a check-mark (see example).

If three or more of the 36h-periods during the **learning period** have a check-mark, the smoke - Steam area alarm algorithm will be adapted. In the example this happens in the **36h-period** no. 10 (i.e. after 10 x 36h = 360h = 15 days).

After the **36h period** no. 20, the next **learning period** starts again in the **36h period** no. 1. The check-marks are inherited from the previous **learning period**. Depending on whether **level 1** was exceeded during the **36h period**, a check-mark or no check-mark will be recorded if it has exceeded and no check mark if it did not exceed.

36h	36h	36h	36h	36h	36h	36h	36h	36h	36h	36h	36h	36h	36h	36h	36h	36h	36h	36h	36h
			✓						✓										
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20

In the example, the Smoke - Steam area algorithm condition will be changed back to the Normal area alarm algorithm after the **36h period** no. 3, since at that time only two **36h periods** are left with check-marks in the **learning period** now. (If later, one or more **36h**

¹⁴⁷ The area alarm algorithm can be set Via EBLWin to be either automatically adapted via the Learning function or manually set. If manually set, also an alternative Area Alarm algorithm can be controlled by a time channel.

periods get a check-mark, the Smoke - Steam area Alarm algorithm will be adapted again as long as three or more of the **36h-periods** during the learning period have a check-mark.)

19.5.1.2 Heating area, level 2

The learning function is the same as for the Smoke - Steam area Alarm algorithm but **level 2** is used instead of level 1.

19.5.1.3 Cooking – Welding Area, level 3

The learning function is the same as for the Smoke - Steam area Alarm algorithm but **level 3** is used instead of level 1.

19.5.1.4 Clean Area, level 1, 2 & 3

For this area Alarm algorithm to be adapted there, must be no check-mark for **level 1**, **level 2** and **level 3** respectively during the **learning period**, i.e. no check-mark whatsoever.

The **Clean area Alarm algorithm** will be changed back to the Normal area Alarm algorithm directly if any **36h period** for **level 1**, **level 2** and **level 3** respectively gets a check-mark, i.e. any check-mark whatsoever.

19.5.1.5 Learning function summary

A detector can adapt the following **area Alarm algorithms**, depending on if and when **level 1**, **level 2** and **level 3** are exceeded or not:

The following is valid for the different type of detectors:

- **4452**: This detector does not use the Learning function.
- **4400**: This detector uses the Learning function (in Advanced mode), i.e. the area Alarm algorithms **Normal**, **Smoke – Steam**, **Clean**, **Heater** and **Cooking - Welding** can be adapted.
- **4401**: This detector uses the Learning function (in Advanced mode), i.e. the area Alarm algorithms **Normal**, **Smoke – Steam** and **Clean** can be adapted.

19.6 Analogue data output

The smoke obscuration value (%/m) and the temperature (°C) can be shown via FT1020G3. A new value is calculated every second (the smoke obscuration value is an average value for the last four seconds.)

The following is valid for the different type of detectors:

- **4452**: This detector has no analogue output.
- **4400**: This detector has a smoke obscuration value output, a temperature value output, actual area alarm algorithm output and a CCF (see below) output to the CIE.
- **4401**: This detector has a smoke obscuration value output, actual area alarm algorithm output and a CCF (see below) output to the CIE.

19.7 Sensitivity compensation

In order to maintain a constant sensitivity regardless of the contamination of the detector, a **Contamination Compensation Factor (CCF)** is subtracted from the momentary smoke obscuration values before evaluated in the alarm algorithms etc. The Contamination Compensation Factor (CCF) is calculated during a 36 hours period as follows:

1. During 13 minutes, all the momentary smoke obscuration values are saved and an average value is calculated. The CCF will be changed directly if the average value is lower than the actual CCF, else no change.
2. This is valid for 18 hours. Then the CCF will be changed also if the average value is higher than the actual CCF. (It will normally be higher because of contamination.)
3. After another 18 hours (i.e. in total 36 hours) the CCF will be changed if the average value is lower or higher than the actual CCF and it will be saved in the detector's EEPROM, i.e. it can be used e.g. after the detector has been without power supply.
4. A new $18 + 18 = 36$ hours period starts with an average value calculation every 13th minute.

Maximum Contamination Compensation Factor (CCF) is 2 %/m. Service signal will then be activated and shown in the CIE.

The following is valid for the different type of detectors:

- **4452:** This detector has sensitivity compensation. No Service signal.
- **4400:** This detector has sensitivity compensation. Service signal.
- **4401:** This detector has sensitivity compensation. Service signal.

19.8 Self-diagnosis of internal devices

The detectors perform an internal check of some vital functions and components (e.g. the IR-LED). In some modes a separate fault message will be shown in the CIE

The following is valid for the different type of detectors:

- **4452:** This detector has no self-diagnosis of internal devices.
- **4400:** This detector has self-diagnosis of internal devices. A fault message will be shown in the CIE.
- **4401:** This detector has self-diagnosis of internal devices. A fault message will be shown in the CIE.

19.9 Address setting check

The red indication LEDs in the detectors **4401** and **4400** will in all modes be blinking every second when the detector is powered and the COM loop address is not set with the Address setting tool 3314 / 4414, i.e. as long as the address is "000". The address should be set in the interval 001-255.

Note: 4414 is required when Advanced mode shall be used.

19.10 Polling LED

The green polling LED in the detectors **4401** and **4400** can in Advanced mode be set (via EBLWin) to be blinking (20 ms / 7 s), indicating that it receives the commands from the CIE correctly.

Note: When the detector is in test mode the green polling LED will be turned off, indicating it is in test mode.

20 Control Unit Properties

In EBLWin, please note:

EBL512 G3 = FT1020G3

EBL128 = FT128

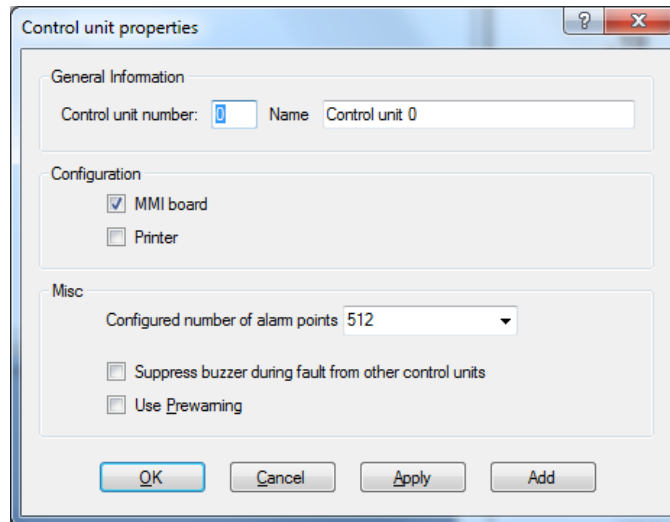


Figure 45 The EBLWin "Control Unit properties" dialog box

Note: Default settings in EBLWin might vary depending on convention.

20.1 Control Unit properties dialog box

Opens when you add a Control Unit or via the "Control Unit" pop-up menu (Properties...)

20.1.1 General Information

Control Unit number: A stand-alone Control Unit must have no. 0. In a system (TLON Network) the Control Units are numbered from 0 to 29.

Name: Normally not changed but can be changed when required.

20.1.2 Peripherals

- ☒ **MMI board** (default): This check box is to be marked when the CIE has a front with display (i.e. standard FT1020G3).

This check box is not to be marked when the CIE. has no front

- ☐ **Printer** (optional): This check box is to be marked when the CIE is fitted with a printer.

20.1.3 Misc.

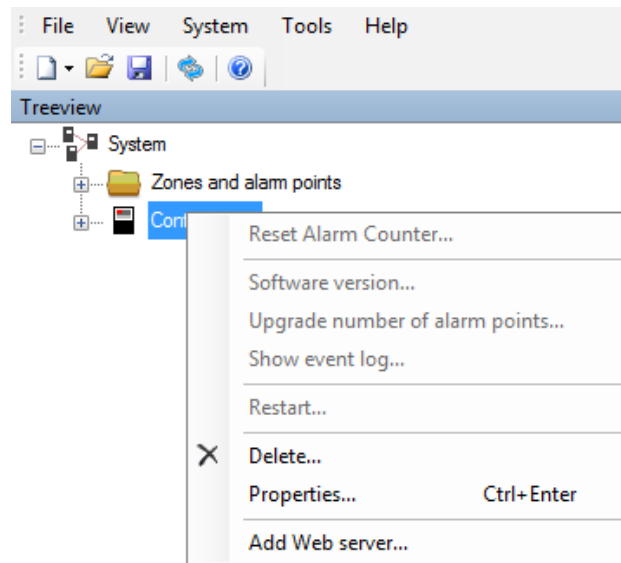
Configured number of alarm points: 512 or 1020.

Set the required number and the validation check in EBLWin can give a "too many alarm points" warning. The validation check is automatically performed when starting a download of SSD to the CIE.

- ☐ **Suppress buzzer during fault from other Control Units:** This check box should be marked if faults generated in other Control Units to be suppressed in this Control Unit, i.e. if the buzzer to be sound for faults generated in this Control Unit only.
- ☐ **Use Pre-warning:** This check box is to be marked if the pre-warning detection is required to be enabled, i.e. pre-warnings will be activated in this Control Unit and presented in all Control Units. All programmable outputs in the system, with trigger condition "Pre-warning", will be activated (if not disabled).

Checkbox not marked = Pre-warnings will not be activated in this Control Unit.

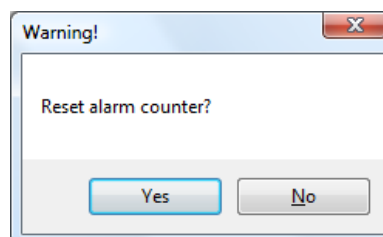
20.2 EBLWin Control Unit pop-up menu



Some commands are disabled since you have to connect and log on to the Control Unit to be able to select / use them.

20.2.1 Reset alarm counter

The Control Unit has an alarm counter that can be reset if required. (Level 2, i.e. a special access code is required).



20.2.2 Software version

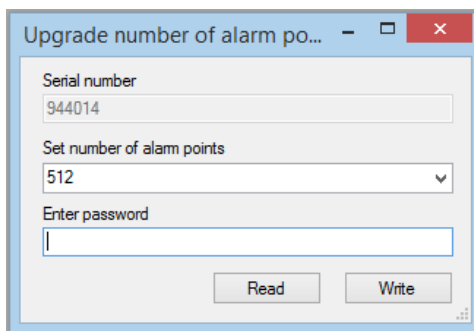
The Control Unit software (S/W) version will be displayed.

20.2.3 Upgrade number of alarm points

The FT1020G3 is delivered with 510 addresses as default, it can be upgraded to 1020 addresses on request. The number of addresses can be upgraded to 1020 addresses either in the factory when the purchase order is received or on site.

If the number of alarm points is required to be upgraded, a PC and **EBLWin** are used. The PC has to be connected to the USB connector in the Control Unit and you have to be logged on.

Select the Control Unit icon, right click, then select "Upgrade number of alarm points" and an "Upgrade" dialog box opens as shown below.



The dialog box titled "Upgrade number of alarm po..." contains the following fields and buttons:

- Serial number: 944014
- Set number of alarm points: 512 (dropdown menu)
- Enter password: (empty text field)
- Buttons: Read, Write

Click "Read" to obtain the current number of alarm points and the serial number for the Control Unit you are connected to.

If you need to upgrade the number of alarm points, report the serial number to Brooks, in order to receive a password.¹⁴⁸

Type the password then click "Write" to configure the Control Unit for the new number of alarm points.

The "Configured number of alarm points" in the "Control Unit properties" dialog box also has to be changed.

20.2.4 Show event log

Three different event log lists, Alarm (999 events), Interlocking (999 events) and General log (999 events) can be shown.

Deviations Selected loop Validate results Event log					
Alarm log Interlocking log General log					
	Id	Origin	User id	Time	Event
▶	1	00		04/01/2000 01:35:22	FAULT: Supervised output 0, control unit 00
	2	00		04/01/2000 01:35:22	FAULT: Supervised output 1, control unit 00
	3	00		04/01/2000 01:35:22	FAULT: Supervised output 2, control unit 00
	4	00		04/01/2000 01:35:22	FAULT: Supervised output 3, control unit 00
	5	EBL...	99	12/02/2015 12:59:11	Synchronization requested by EBLWin
	6	00		04/01/2000 01:35:14	User logged in by EBLWin
	7	00		04/01/2000 01:35:16	FAULT: Read/write site data (SSW), control unit 00 Serviced
	8	00		04/01/2000 01:34:57	FAULT: Earth fault (minus), control unit 00
	9	00		04/01/2000 01:34:52	Door open control unit 00
	10	00		04/01/2000 01:34:52	FAULT: Restart control unit 00, code 59, address 0 Serviced
	11	00		04/01/2000 01:34:52	FAULT: Restart control unit 00, code 59, address 0
	12	00		04/01/2000 01:34:51	FAULT: Read/write site data (SSW), control unit 00
	13	00		04/01/2000 01:34:51	FAULT: Restart control unit 00, code 00, address 0 Serviced
	14	00		04/01/2000 01:34:51	FAULT: Restart control unit 00, code 00, address 0
	15	00		04/01/2000 01:34:51	Control unit 00 restarted

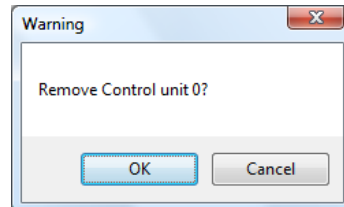
¹⁴⁸ The password will be generated with a special PC program (with a hardware lock) and is unique for every serial number and number of alarm points combination.

20.2.5 Restart

You can restart Control Unit via this menu command.

20.2.6 Delete

The selected Control Unit can be deleted.

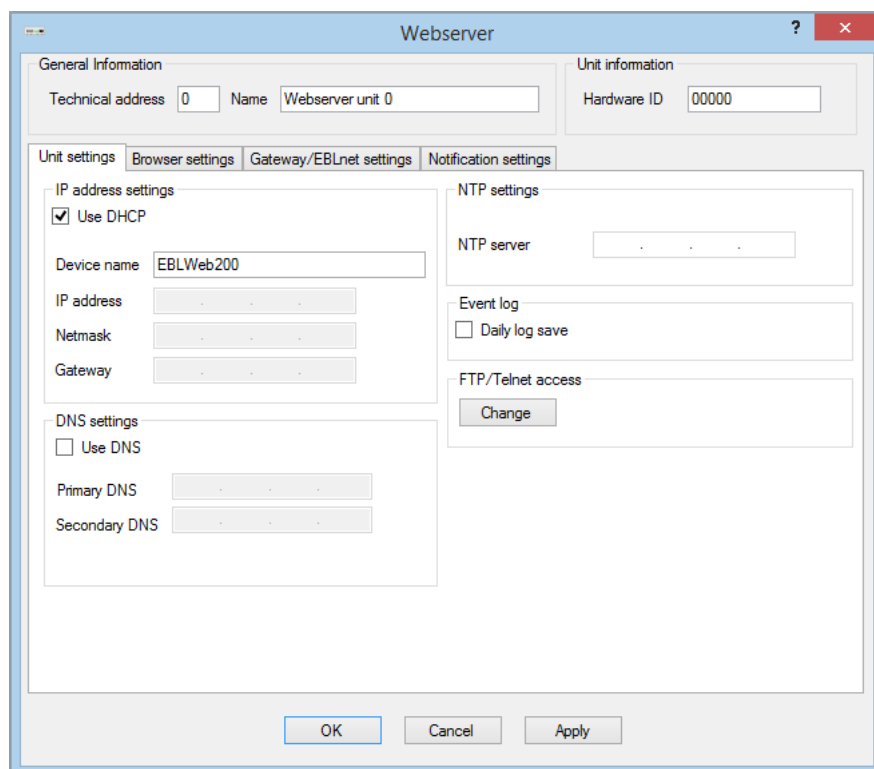


20.2.7 Properties

See beginning of this chapter – Control Unit properties dialog box.

20.2.8 Add Web-server

To add a Web-server to FT1020G3, right click on Control Unit and select “Add Web server”, the Web-server configuration program opens as shown below.



Note: Only one Web-server per Control Unit can be added and maximum 5 Web-servers per system.

Details for setting up the Web-Server is found in the Web Server II manual MA440 Rev 1.0 for FT1020G3 / FT128 EBLWEB V2.1.x.

21 System properties (settings)

21.1 System properties dialog box

To open System properties dialog box as shown in Figure 46, go to the EBLWin menu System | Properties...

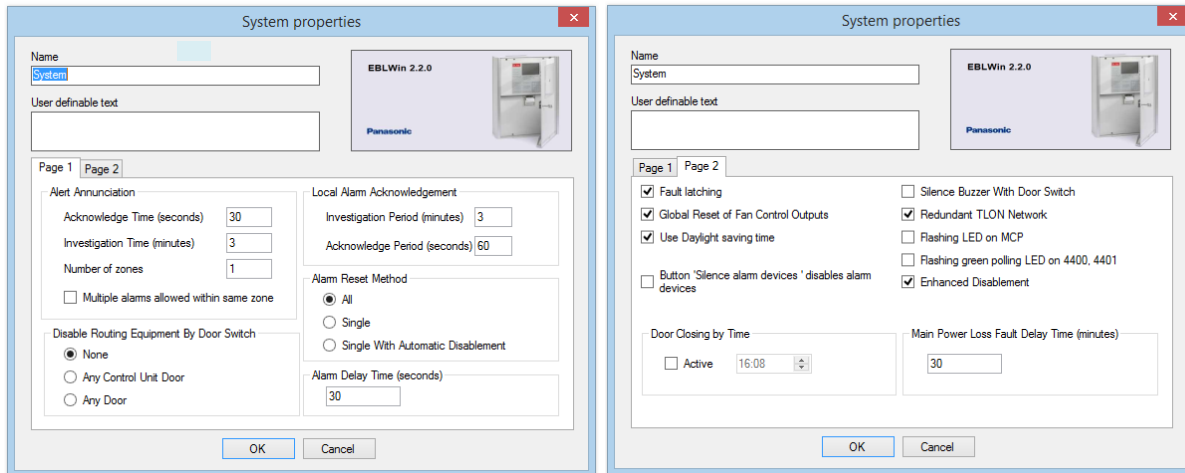


Figure 46 EBLWin "System properties" dialog box, Page 1 and 2

Opens via the "System" pop-up menu or via menu "System" (Properties...).

21.1.1 Name

Normally the installation name (Max. 22 characters).

21.1.2 User definable text

Two rows of 40 characters are available for user definable text messages. The text will be shown in all Control Units. For more information see FT1020G3 Operation Manual.

21.1.3 System properties, Page 1

21.1.3.1 Alert Annunciation

See also chapter "17.12", page 114.

Acknowledgement time: 30 sec.

Default set at 30 seconds, allowable between 0-120 seconds is possible to set.

Investigation time: 3 minutes.

Default set at 3 minutes, allowable between 1-9 minutes.

Number of zones: 1

Default set to 1 zone, allowable between 1-4 zones.

☐ **Multiple alarms allowed within same zone**

Normally only one Alert Annunciation Alarm is allowed within the zone. If more Alert Annunciation alarms within the zone are allowed, this checkbox should be marked.¹⁴⁹

¹⁴⁹ Alarm from two or more alarm points within the same zone will activate normal fire alarm, i.e. the "Fire brigade TX" output will be activated.

21.1.3.2 Alarm Acknowledgement Facility¹⁵⁰

Note: Used in conjunction with the Brooks Alarm Acknowledgement Module AAM.

See also chapter "Alert Annunciation Applications
Alarm Acknowledgement Facility (AAF)", page 115.

Investigation period (IP) time: 3 min.

3 is default. 1-3 is possible.

Acknowledge period (AP) time: 60 sec.

60 is default. 10-60 is possible.

21.1.3.3 Disable routing equipment by door switch¹⁵¹

Valid for the following Control Unit outputs for routing equipment:

Fire alarm (for Fire brigade TX)

Fault condition (for Fault TX)

- ☒ **None** (default): Door open in a C.U. will **not** disable these outputs.
- ☐ **Any Control Unit door:** Door open in any C.U. will disable these outputs in all C.U.'s.
- ☐ **Any door:** Door open in any C.U. will disable these outputs in all C.U.'s.

In the display (or via menu H4/U1) is shown (xx = C.U. number):

Fire alarm routing disabled (by open door in CU xx)

Note: Disable routing equipment via cabinet door must not be used in Australia. The routing equipment can be disabled (isolated) from the ASE.

21.1.3.4 Alarm reset method

One of the following alternatives can be selected.

- ☒ **All** (default): All fire alarms in the system will be reset simultaneously by pressing the "Reset" button once (on the CIE front). **This option must be selected.**

- ☐ **Single:** One fire alarm in the system, i.e. the fire alarm shown in the field in the middle of the Control Unit display will be reset by pressing the "Reset" button once. Any other fire alarm has to be reset individually, one by one.

This function is a violation to the AS7240.2 standard and should not be used.

- ☐ **Single with Automatic Disablement:** Same as "Single" reset but with the Disablement function (see below) as well.

This function is a violation to the AS7240.2 standard and should not be used.

Disablement function: If an alarm point or zone is reset while it is still in alarm state (e.g. smoke in a smoke detector or a manual call point with a broken glass) this unit will be

¹⁵⁰ In software version \geq V2.2.0, the alarm acknowledgement facility is called local alarm acknowledgement and used in conjunction with Panasonic LAU instead of Brooks AAM however, the function is typical in both applications.

¹⁵¹ Disable routing equipment via the door open is not permitted in the AU or NZ conventions. Disabling the routing equipment must be done via the ASE.

automatically disabled in order to not activate a new fire alarm within 20 seconds. It will stay disabled until re-enabled via menu H2/B1.

LED Fault / Disablements "General disablements" on the CIE front is indicating one or more disablement in the system.

Note: According to the fire brigade standard AS4428.3:2010, the "Reset" button is not effective unless the "Silence alarm" button is pressed first.

21.1.3.5 Alarm delay time (seconds)

Valid for the detectors and zone line inputs with this option selected via EBLWin.

30 is default, 0-255 seconds is possible.

Note:

The "Delayed" check box in EBLWin software V2.1.x for conventional zone line inputs has changed to "AVF" in the AU and NZ conventions i.e. when ticked, the Alarm Verification functions will be applied to the smoke detectors within this zone, see page 113.

The delay time for analogue detectors starts when the fire alarm normally should have been activated and must be ≤ 30 seconds.

Or

The analogue smoke detectors activating fire alarm will activate an alarm device e.g. 3379 for the delay time period using the new trigger types, see chapter "Specific time delay application" page 113. If the smoke is not cleared within the delay time, the FT1020G3 will go in full alarm condition, in this case the delay can be extended up to 255 seconds. The function is added in EBLWin software \geq V2.1.2.

21.1.4 System properties, Page 2

- ☐ **Fault Latching** (default): All faults have to be acknowledged as well as corrected faults, this is the default setting in the Australian convention.

Checkbox not marked, fault is non-latching i.e. Not corrected faults have to be acknowledged but corrected faults will automatically be deleted from the fault list. This option **must** be selected in the New Zealand convention.

- ☐ **Global reset of Fan Controls Outputs:** Reset of fan control system is **global**, i.e. all fan control systems in the FT1020G3 network system will be reset. (Regarding Fan control, see page 31).

Checkbox not marked = Reset of fan control systems is **local**, i.e. all fan control systems in the CIE where the switch is located will be reset.

- ☐ **Use Daylight Saving:**

Australian convention: Forward 1 hour the first Sunday in October, 02:00 → 03:00.
Backward 1 hour the first Sunday in April, 03:00 → 02:00.

New Zealand convention: Forward 1 hour the last Sunday in September, 02:00 → 03:00. Backward 1 hour the first Sunday in April, 03:00 → 02:00.

Checkbox not marked = Daylight saving time is not used.

- ☐ **Button "Silence alarm devices disables alarm devices":** The function should not be used in the Australian or New Zealand conventions, see page 127.

- ☐ **Silence Buzzer with Door Switch:** If the buzzer in the CIE is to be silenced when the door is opened, this checkbox should be marked.
- ☐ **Redundant TLON Network:** This checkbox is to be marked when two TLON Networks to be used, i.e. each Control Unit in the system is equipped with two TLON connection boards (5090). See also chapter "TLON connection board 5090", page 50.
- ☒ **Flash LED on MCP:** The manual call point (type 3333 / 3339 / 4433 / 4409) built-in LED will flash to indicate communication with the CIE

Checkbox not marked = This option is disabled, i.e. the LED is switched off until the call point is operated.

☒ **Green polling LED:**

Valid for the detectors 440x in Advanced mode only. The detectors 4400 and 4401 have a green polling LED.

Always off = The green polling LED is not used.

Flash when polled = The green polling LED will be blinking 20ms / 7 sec. indicating the communication with the CIE.

Note: When the detector is in test mode the green polling LED will be turned off until the test mode is turned off

- ☒ **Enhanced disablements:** Disabled alarm point¹⁵² will not activate pre-warning, fire alarm or fault.

Checkbox not marked = Disabled alarm point¹⁵² will not activate pre-warning or fire alarm. Fault can still be activated.

This is a violation to the AS7240.2 standard.

21.1.4.1 Door closing by time

- ☐ **Active:** If all fire doors (trigger condition "Fire Door Closing") required to be closed at a certain time every day, this checkbox is to be marked and the time (*hh:mm*) set, e.g. 23:00.

21.1.4.2 Main power loss fault delay time (minutes)

A fault will be activated *mm* minutes after loss of mains (230VAC). 30 is default. 0-300 minutes can be selected.

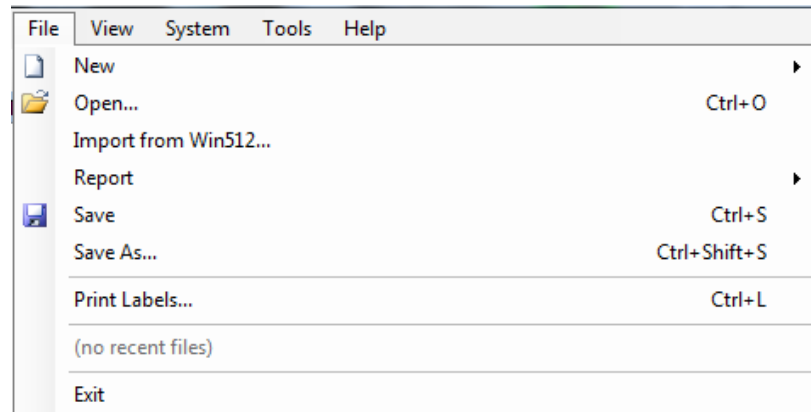
¹⁵² The sensor values for a disabled analogue smoke detector will not be saved.

22 EBLWin menus

When EBLWin is opened, the most recent used / saved (MRU) SSD file will be opened if the checkbox "Open MRU at startup" is selected in the "EBLWin Settings" (Options) dialog box, else a new system will be opened.

Note: If the MRU installation is an FT128 system, a new FT1020G3 system has to be selected via menu "File | New", see below.

22.1 The file menu



22.1.1 New

To open a new installation. The type of system has to be selected.

- ☐ **System EBL512 G3 = FT1020G3** (default)
- ☐ **System EBL128 = FT128**

22.1.2 Open

Used to open an installation via a standard Windows dialog box "Open". The following can be opened:

- EBLWin file (*.ebl)
- WinG3 file (*.WinG3)
- Win128 file (*.Win128)

22.1.3 Import from Win512

To open an SSD file via a standard windows dialog box "Open".

Note: Only valid for version 2.7.x.

File name: Win512 file (*.512).

22.1.4 Report

All reports are exported as a *.htm file that can be saved for later use as a commissioning document. An example of this report is shown in Figure 47 next page.

- **Installation Document**, All System properties, Control Unit properties, etc. will be saved in a file (EBLWin Installation Document.htm), via a standard Windows dialog box "Save As".

- **Alarm points**, A list of all alarm points will be saved in a file (Alarm points report.htm), via a standard Windows dialog box "Save As".
- **Outputs affected by alarm points**, A list of all programmable outputs and which alarm points that will activate them will be saved in a file (Alarm points outputs report.htm), via a standard Windows dialog box "Save As".

Timechannel / alarm points report

Always off

Alarm Point	Technical Number	Control Unit	Loop	Loop Unit	Input	Expansion Board	Text	Delayed	Quiet Alarm	Alert Annunciation Time Channel	Disable Time Channel	Dependent Time Channel
001-02	000001	Control unit 0	Loop 0	001: [001-01, 001-02] AMD 4300/4400 (Normal mode)				No	No	Always off	Always off	Always off
003-03	000003	Control unit 0	Loop 0	003: [003-03] AHD 3308/3309				No	No	Always on	Always on	Always off

Always on

Alarm Point	Technical Number	Control Unit	Loop	Loop Unit	Input	Expansion Board	Text	Delayed	Quiet Alarm	Alert Annunciation Time Channel	Disable Time Channel	Dependent Time Channel
003-03	000003	Control unit 0	Loop 0	003: [003-03] AHD 3308/3309				No	No	Always on	Always on	Always off

Time channel 2

Alarm Point	Technical Number	Control Unit	Loop	Loop Unit	Input	Expansion Board	Text	Delayed	Quiet Alarm	Alert Annunciation Time Channel	Disable Time Channel	Dependent Time Channel
001-01	000001	Control unit 0	Loop 0	001: [001-01, 001-02] AMD 4300/4400 (Normal mode)				No	No	Time channel 2	Time channel 3	Time channel 4

Time channel 3

Alarm Point	Technical Number	Control Unit	Loop	Loop Unit	Input	Expansion Board	Text	Delayed	Quiet Alarm	Alert Annunciation Time Channel	Disable Time Channel	Dependent Time Channel
001-01	000001	Control unit 0	Loop 0	001: [001-01, 001-02] AMD 4300/4400 (Normal mode)				No	No	Time channel 2	Time channel 3	Time channel 4



Time channel 12

Not used

Time channel 13

Not used

Time channel 14

Not used

This report was generated by EBLWin 2.1.2, 18/12/2014 9:27 AM.

Date

Signature

Figure 47 Time Channel Alarm Points Report

22.1.5 Save

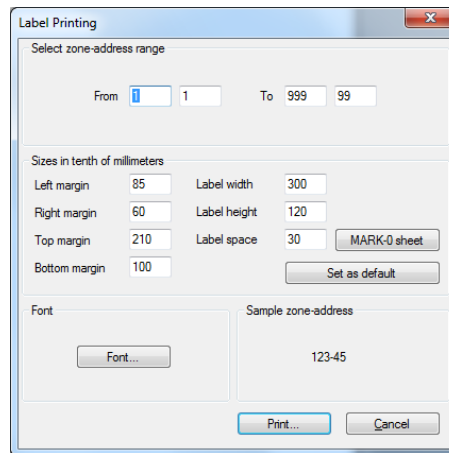
To save an installation (xxxxxx.ebl). The very first time, via a standard Windows dialog box "Save As".

22.1.6 Save As

To save an open installation with another file name (xxxxxx.ebl), via a standard Windows dialog box "Save As".

22.1.7 Print labels

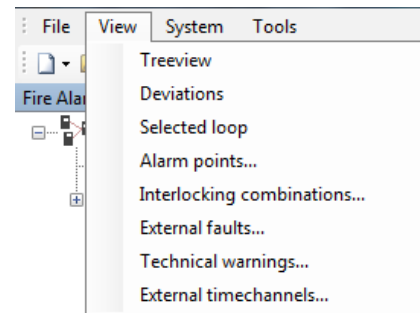
Labels with Zone-Address for the specified range of programmed alarm points will be printed. In order to set the margins etc. change the setting as necessary from the print label dialog box:



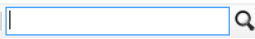

For the Label holder (3390), MARKO sheet can be used, i.e. Labels for **3390** (3391) 10 A4-sheets with 132 labels for laser printer usage.

22.2 The View menu

The first time EBLWin is opened after installation, the tree view will be visible to the left in the window. On the right pane, the tabs "Deviations" and "Selected loop" will be available by default. More taps can be added from the view menu to display information about Alarm points, Interlocking combinations, etc.



22.2.1 Filter Box

The filter box  will appear in all tabs except when the "Selected Loop" tab is selected. Any text typed in this box is case sensitive. Click on  after the key word is entered.

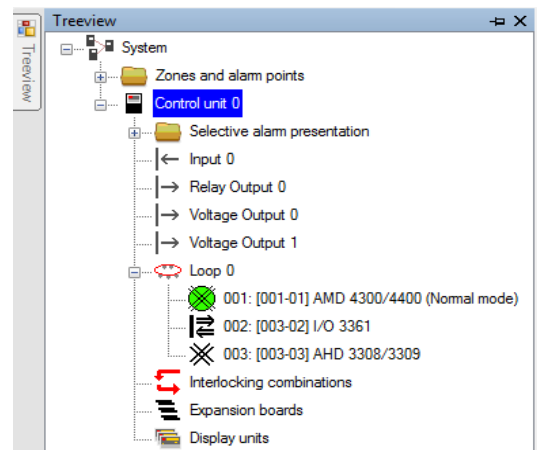
22.2.2 Tree view

This is opened by default at first start up after installation.

If the tree view for some reason has been closed, it can be opened again via menu "View" and "Tree view".

The tree view shows the system and will be updated for every unit added to the system.

The colour of the Control Unit symbol is black in a new system or if its properties have been revised or units have been added or deleted after the latest download of SSD.



22.2.3 Deviations

To the right of the tree view, the "Deviations" tab in Figure 48 is available by default. Any list of faults, fire alarms, disablement, etc, can be either printed or saved.

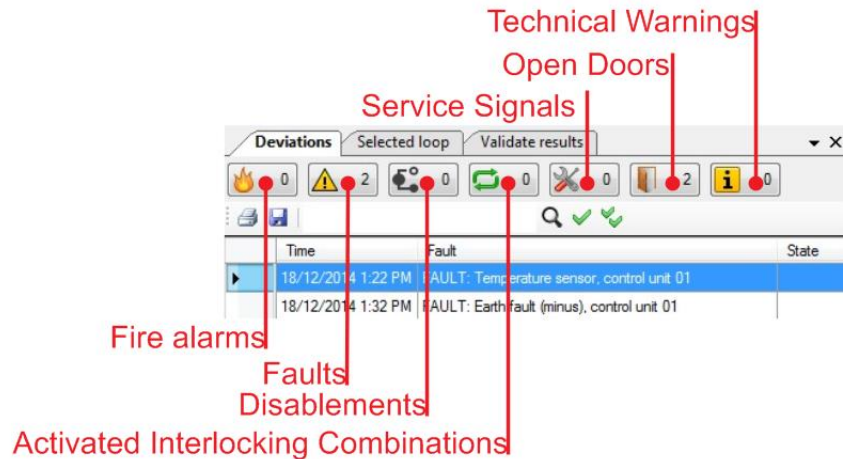


Figure 48 Deviation Tab

Selecting any of the tabs (buttons) shown in Figure 48 above will open a list of the events for this tab.

- ✓ Acknowledges, resets, re-enables individual items in the lists
- ✓ Acknowledges, resets, re-enables all items in the lists.

22.2.4 Selected loop

To the right of the tree view, the "Selected loop" tab lists all configured loop unit devices in that loop as shown in by default.

COM loop units can be added two ways:

- Via the tree view (COM loop pop-up menu) or
- Via the "Selected loop" tab. Click on the COM loop unit symbol just under the tab to add the unit to the list.

To see what the symbols mean, refer to section "COM loop units", page 51. To edit its properties, double-click on the device name, the respective dialog boxes will appear. The "Selected loop" list and the tree view will show the same information.

	Id	Name	Zone	Address	Disable time channel	Alert announcement time channel	Dependent time channel	Quiet alarm	Delayed	Text	Algorithm	Alternative Algorithm	Alternative Algorithm Time channel	Smoke det. disable TC	SCI Seq. No.
1	1	Basement Level 2 in Front of Lift	1	10	Always off	Always off	Always off			Basement Level 2 in Front of Lift	N-15	N-15	Always off		
2	2	Basement Level 2 O/S Fire Stair 2	1	11	Always off	Always off	Always off			Basement Level 2 O/S Fire Stair 2	N-15	N-15	Always off		
3	3	Basement Level 2 Fire Stair 2	1	12	Always off	Always off	Always off			Basement Level 2 Fire Stair 2	N-15	N-15	Always off		
4	4	Basement Level 1 in Front of Lift	2	13	Always off	Always off	Always off			Basement Level 1 in Front of Lift	N-15	N-15	Always off		
5	5	Basement Level 1 O/S Fire Stair 2	2	14	Always off	Always off	Always off			Basement Level 1 O/S Fire Stair 2	N-15	N-15	Always off		
6	6	Basement Level 1 Fire Stair 2	2	15	Always off	Always off	Always off			Basement Level 1 Fire Stair 2	N-15	N-15	Always off		
7	7	North Tower Ground Lobby Entr...	18	7		Always off				North Tower Ground Lobby Entr...					
8	8	North Tower Ground Lobby Entr...	18	8	Always off	Always off	Always off			North Tower Ground Lobby Entr...	N-15	N-15	Always off		
9	9	North Tower Ground Garbage R...	18	9	Always off	Always off	Always off			North Tower Ground Garbage R...	N-15	N-15	Always off		
10	10	North Tower Ground Lift Lobby	18	10	Always off	Always off	Always off			North Tower Ground Lift Lobby	N-15	N-15	Always off		
11	11	North Tower Ground Lobby Entr...	18	11	Always off	Always off	Always off			North Tower Ground Lobby Entr...	N-15	N-15	Always off		
12	12	North Tower Ground Lobby Entr...	18	12		Always off				North Tower Ground Lobby Entr...					
17	17	North Tower Ground Shop South	21	17	Always off	Always off	Always off			North Tower Ground Shop South	N-15	N-15	Always off		

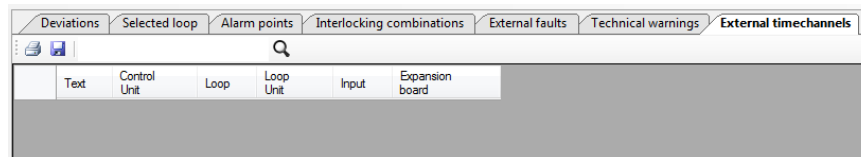
Figure 49 Selected Loop Tab

22.2.5 Alarm points

To the right of the of the tree view the "Alarm points" tab will be available.

22.2.9 External time channels

To the right of the tree view the "External time channels" tab is available.



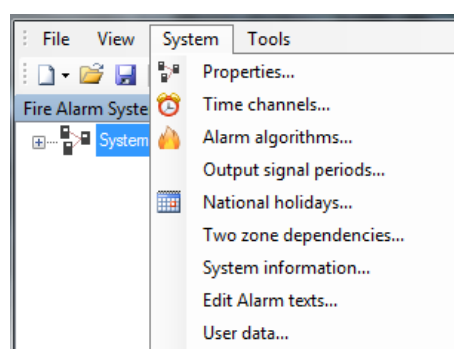
This is a list, for the whole system, showing all external time channels and their properties.

The list can be sorted by clicking the column header respectively.

Double click an external time channel row to open its dialog box.

You can print and save what you see in the list. A filter function is available.

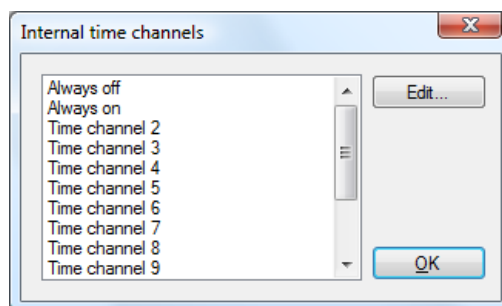
22.3 The System menu



22.3.1 Properties

The same dialog box opens as in Figure 46, page 142.

22.3.2 Time channels



Time channels Always off and Always on cannot be edited.

The time channels **2-14** are Controlled by the built-in RTC (real time clock). Up to five intervals (interval = one time on / one time off) can be set for each day in time channel 2-14.

Time channels 1-14 can be used to:

- disable and re-enable alarm points / zones
- set Alert Annunciation on / off
- disable, re-enable and activate programmable control outputs

- set alternative alarm algorithm for Analogue detector types 430x /440xx on / off
- set 2-unit dependence function on / off

The properties for each **Time channel** (2-14) and each **Day of the week** (Monday – Sunday + National Holiday) have to be set for the channels respectively

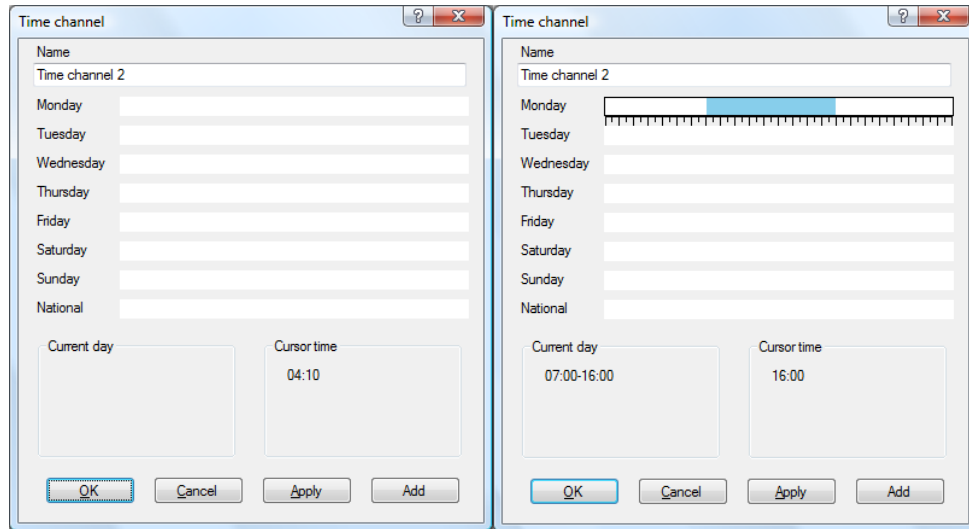


Figure 50 Time channels configuration

Left: The "Time channel 2" dialog box without any programming done.

Right: One time interval is programmed for Monday (time channel 2 is "on" 07:00 – 16:00).

Name: "Time channel n" is default. Normally not changed but an informative text can be added (e.g. office hours).

Monday: To set the time channel for this day, follow these numbered steps in Figure 51.

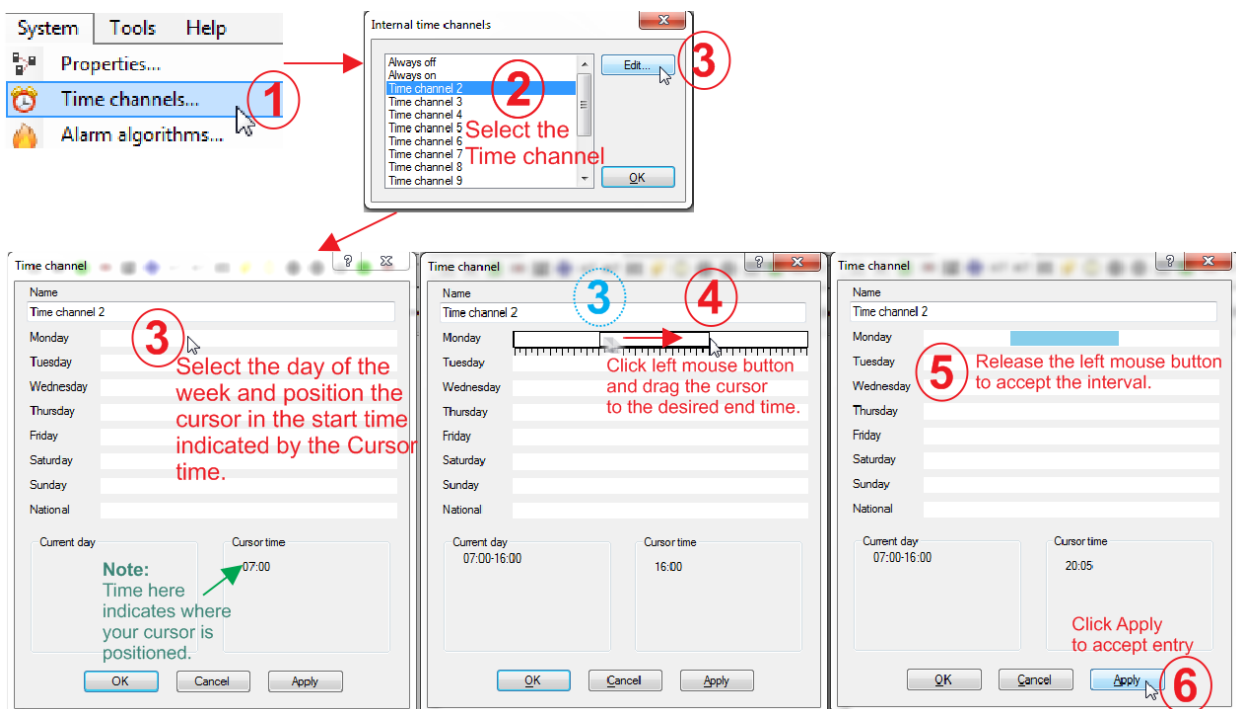


Figure 51 Time Channel Setting

For each day, five time intervals can be programmed. A time interval can be edited by dragging the whole interval (or the left / right side of it) to the left or right in the day field. Alternatively, double click the time interval box in the day field to open a dialog box for easier time editing:

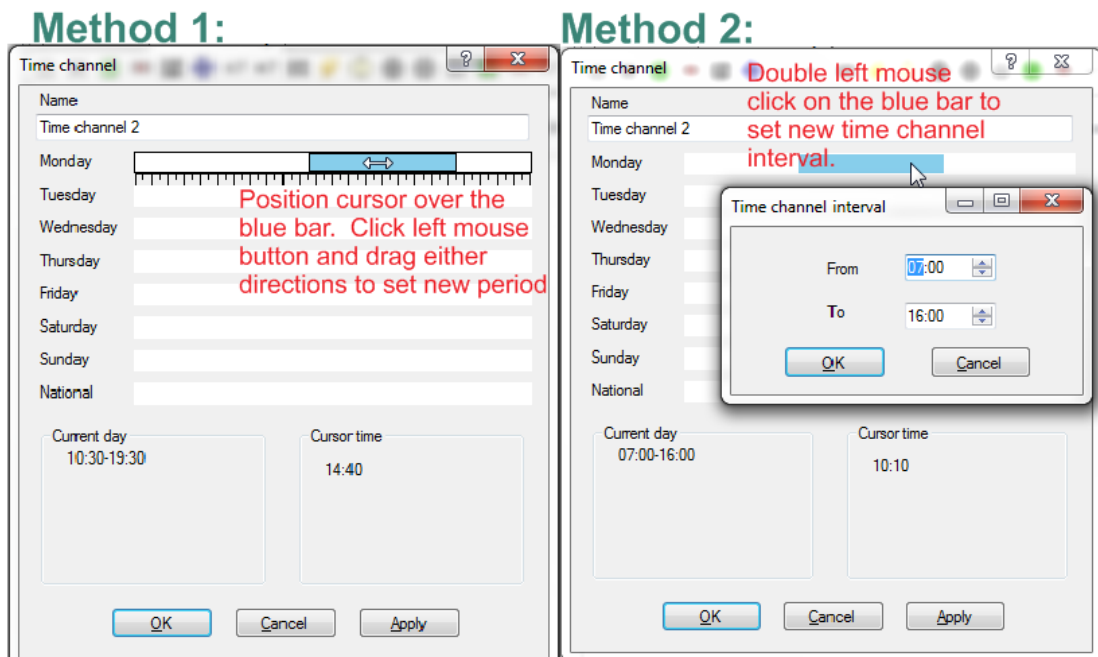


Figure 52 Editing Time Channel Intervals

A time interval can be copied in one day field and pasted into another day field. Click in the blue interval from a selected day, then use Ctrl+C (copy) then Ctrl+V (paste) into another selected day.

All other days are programmed the same way.

National: Programmed the same way as the Monday. See also chapter "National holidays", page 157.

Current day: The programmed time intervals (when the time channel is "on") for the selected day, are shown here.

Cursor time: The cursor position (time) in the day field, is shown here.

Time channels 3 - 14 are programmed the same way as time channel 2.

22.3.3 Alarm algorithms

The following is not valid for the detectors 4400 and 4401 in Advanced mode. (See chapter "Advanced mode", page 131).

In Normal mode $440x = 430x$.

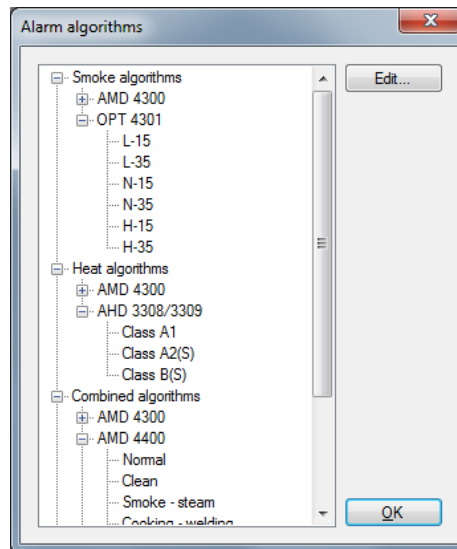


Figure 53 Alarm Algorithms Dialog Box

To open the Alarm Algorithms Dialog Box as in Figure 53, click System | Alarm Algorithms from the EBLWin menu.

All the different algorithms for the different detector types are shown in the tree view to the left. Click "+" to expand and "-" collapse the tree view.

Select one algorithm and click "Edit" and a dialog box displays depending on the selected algorithm:

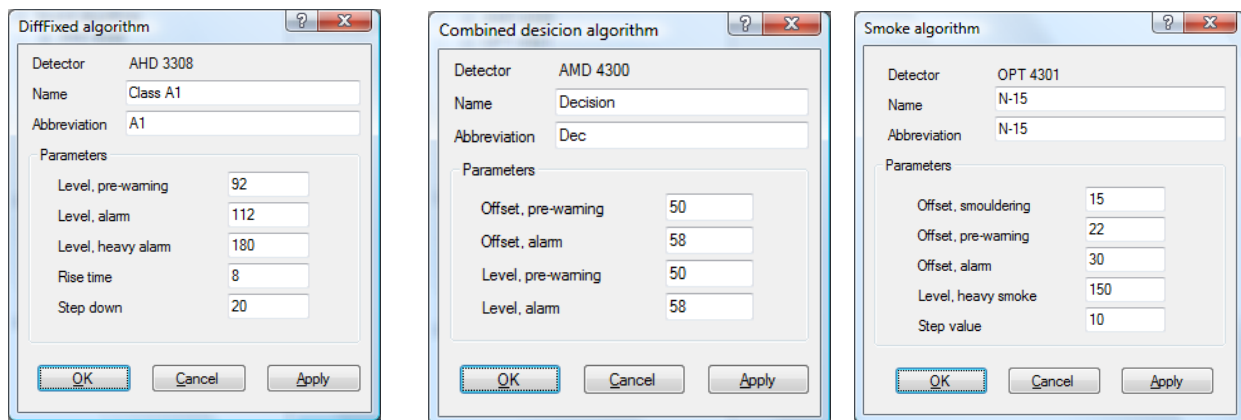


Figure 54 Smoke / heat algorithms example

Figure 54 shows Smoke algorithm **N-15** for 4301 / 4401, Heat algorithm **Class A1** for 3308 and Combined **Decision** algorithm **Dec** for 4300 / 4400 respectively. All in NORMAL mode.

Detector: abbreviations and Type number (e.g. **OPT 4401** = Analogue photoelectric (optical) smoke detector, **AHD 3308** = Analogue heat detector and **AMD 4400** = Analogue Multi Detector).

Name: Name of the algorithm (e.g. N-15, Class A1 & Decision). Normally not changed.

Abbreviation: The algorithm abbreviation (\leq six characters) as shown in the FT1020G3 display, menu H4/U4 (e.g. N-15, A1 & Des). Normally not changed.

22.3.3.1 Parameters for smoke algorithms

Valid for the detectors 4300 / 4400 and 4301 / 4401. All in NORMAL mode.

Offset is a fixed value added to the week average sensor value to get the "alarm" level respectively, e.g. week average sensor value 1 + offset 30 = 31 = the fire alarm level (equivalent to 3.1 % *obscuration per meter*).¹⁵³

The step value gives the alarm delay time to the algorithm respectively, see chapter "Functions / Services / Features", page 102.

The following example is for the *N-15 algorithm* for the 4301 detector. The values for other algorithms and the 4300 detector are different.

- **Offset, smouldering:** Offset value, default 15 (1.5%/m).
- **Offset, pre-warning:** Offset value, default 22 (2.2%/m).
- **Offset, alarm:** Offset value, default 30 (3.0%/m).
- **Level, heavy smoke:** Heavy smoke level, default 150 (15%/m).
- **Step value:** Default 10.

Note: Changing these parameters will affect the sensitivity and detection time and should be done by authorised personnel only! In addition, a special password is required to change the parameters for fire alarm.

22.3.3.2 Parameters for heat algorithms

Valid for detectors 3308/3309 and multi detectors 4300 / 4400. All in NORMAL mode.

The "alarm" levels are fixed, i.e. there are no offset values. The sensor values can be 0-200, which is equivalent to 0-100° C. The rise time and step down gives a rate-of-rise function (used in the A1 algorithm only). See also chapter "Algorithms for Analogue heat detectors", page 107.

The following example is for the *A1 algorithm* for the 3308 detector. The values for other algorithms are different.

- **Level, pre-warning:** Level, default 92 (46° C).
- **Level, alarm:** Level, default 112 (56° C).
- **Level, heavy alarm:** Level, default 180 (90° C).
- **Rise time:** Default 8.
- **Step down:** Default 20

Note: Changing these parameters will affect the sensitivity and detection time and should be done by authorised personnel only! In addition, a special password is required to change the fire alarm parameters.

22.3.3.3 Parameters for combined decision algorithm

Valid for the detectors 4300 / 4400. All in NORMAL mode.

Offset, see "Parameters for smoke algorithms" above. Level, see "Parameters for heat algorithms" above. See also "4300", page 56.

The following example is for the *Dec algorithm* for the 4300 detector.

- **Offset, pre-warning:** Offset value, default 50 (5.0%/m).
- **Offset, alarm:** Offset value, default 58 (5.8%/m).
- **Level, pre-warning:** Level, default 50° C

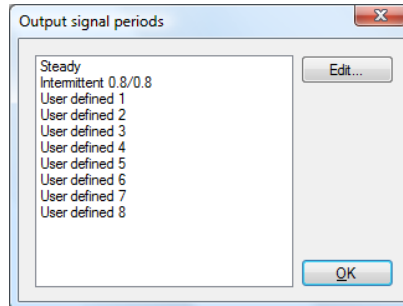
¹⁵³ The week average value starts at "1" for a new (clean) detector. The very first average value will be calculated within two minutes (after SSD download & restart) and thereafter every week. The fire alarm level will be adjusted or not adjusted every week, depending on if the latest calculated week average value is the same as the previous, i.e. if it has increased or if it has decreased. The week average value will normally increase very slowly in a long-time period, due to contamination.

- **Level, alarm:** Level, default 58° C.

Note: Changing these parameters will affect the sensitivity and detection time and should be done by authorised personnel only! In addition, a special password is required to change the fire alarm parameters.

22.3.4 Output Signal Periods

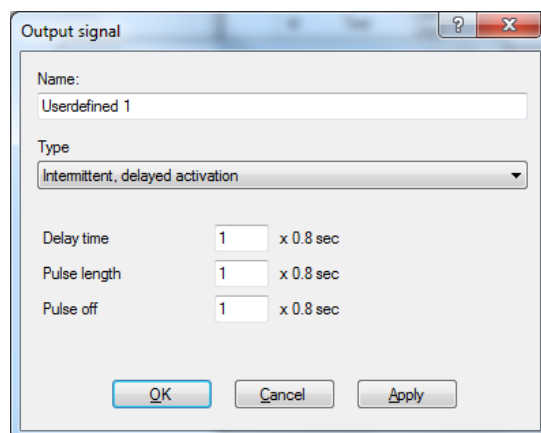
See also chapter "Output signal period", page 84.



To open the output signal period dialog box as shown above, go to the EBLWin menu System | Output Signal Periods...

In the list (above), **Steady** (continuously) and **Intermittent 0.8 / 0.8 s** are already defined since these alternatives are often used. It is however, possible to define them to something else.

User defined 1-8 have to be defined individually:



Name: Normally changed to something that describes the output signal (e.g. "Steady") or what it is meant for (e.g. "Alarm devices").

Type:

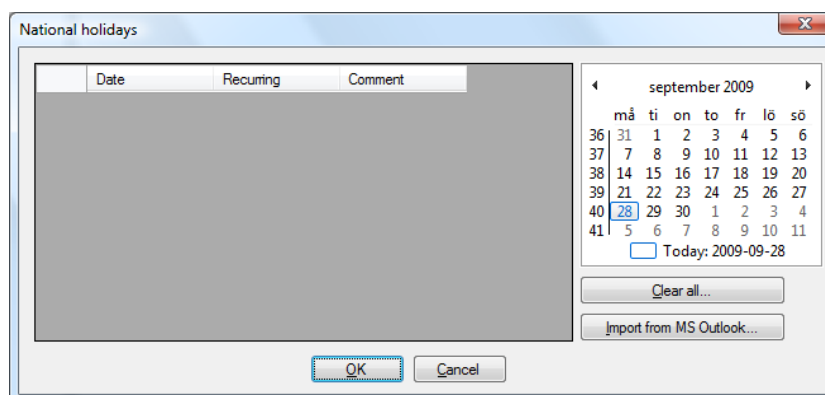
- Steady / continuous (default)
- Intermittent
- Pulse
- Steady, delayed activation
- Intermittent, delayed activation
- Pulse, delayed activation
- Steady, delayed de-activation.

Depending on the selected type, one or more of the following fields might have to be filled-in.

- **Delay time:** Can be set to 0-255 x 0.8 = 0 - 204 sec.
- **Pulse length:** Can be set to 0-255 x 0.8 = 0 - 204 sec.

- **Pulse off:** Can be set to $0-255 \times 0.8 = 0 - 204 \text{ sec.}$
- **De-activation:** Can be set to $0-255 \times 0.8 = 0 - 204 \text{ sec.}$

22.3.5 National holidays¹⁵⁴



To open the National Holidays Dialog Box as shown above, click System | National Holidays from the EBLWin menu.

Up to twenty national holidays can be set for the whole system.¹⁵⁵

Each national holiday can be added one by one, i.e. by selecting a date in the calendar (up to the right) and click "**Add**" to add a row with the date to the list (to the left). To delete a date in the list, click on the date in the calendar with the left mouse button.

If Microsoft® Outlook® is installed on your PC, the national holidays can be automatically added in the list by clicking "**Import holidays from Outlook...**".¹⁵⁶

Mark the checkbox "**Recurring**" if a holiday recur the same date every year, e.g. Christmas Day, Boxing Day, etc.

A comment can be added for every date

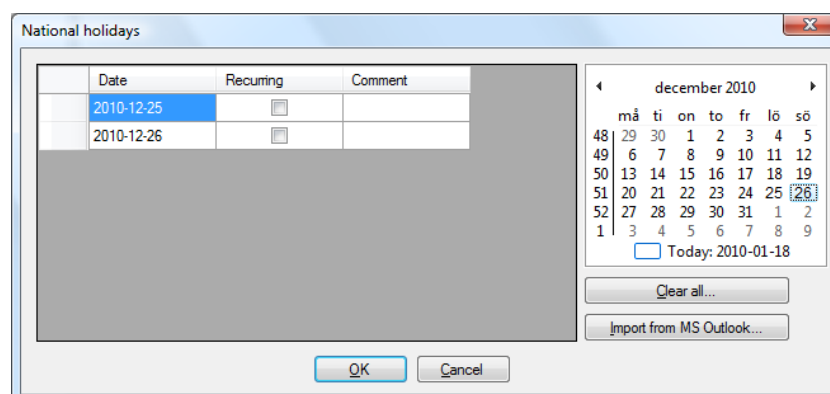


Figure 55 Example setting for national holidays

The example in Figure 55, the first row is selected (blue marked). Two "National Holidays" are marked to recur the same date every year.

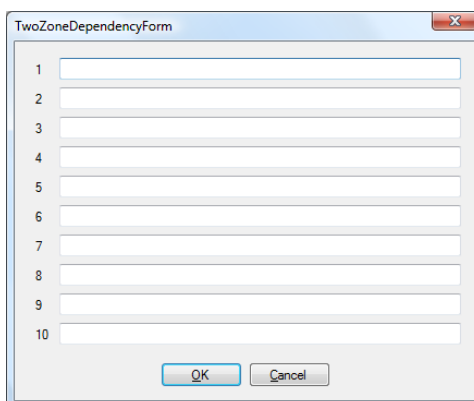
Note: The National Holidays list has to be updated when the last date in the list is passed

¹⁵⁴ Australian government website: <http://www.australia.gov.au/topics/australian-facts-and-figures/public-holidays>

¹⁵⁵ **Note:** ON/OFF times for each time channel (1-14) and every day of the week (incl. national holidays) have to be set.

¹⁵⁶ The National holidays will be imported, starting as from the year when Microsoft® Outlook® was installed and approx. three years ahead. The number and dates of national holidays varies between different states and different countries.

22.3.6 Two zone dependence



The dialog box titled "TwoZoneDependencyForm" contains ten numbered input fields (1-10) for zone numbers. At the bottom are "OK" and "Cancel" buttons.

See also chapter "2-zone dependence", page 111.

Default for all zones is no two zone dependence.

Note: Normally, only conventional zones (i.e. zone line inputs with conventional detectors) should be used for two-zone dependence. For Analogue / addressable detectors the two-address (unit) dependence should be used

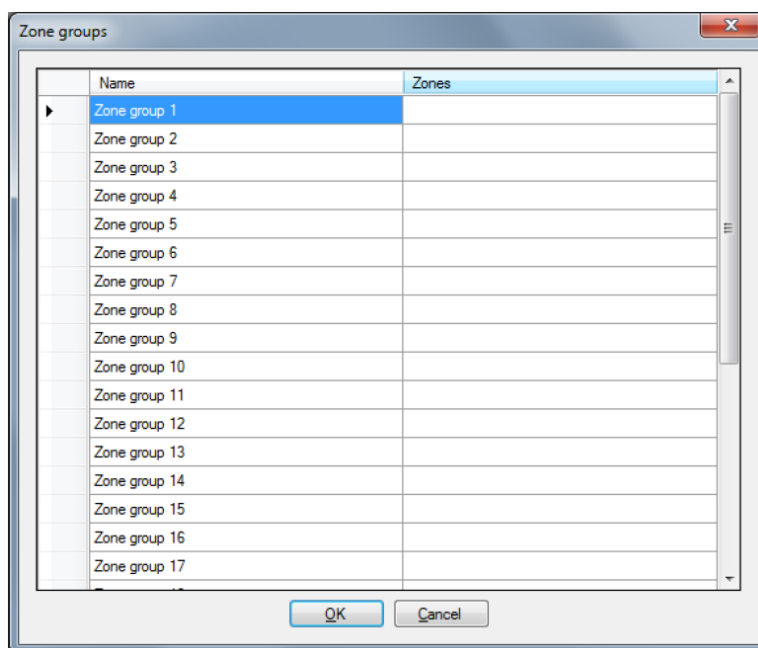
Ten (1-10) groups are available.

For each group, write the zone numbers for the two-zone dependent zones (min. two zones!!!) in the white field/line. Use comma as punctuation mark between the zone numbers or a sequence (e.g. xxx-yyy).

Note: Check so that two or more zones are programmed in each group. (A single zone in a group will never be able to activate any fire alarm!)

22.3.7 Zone groups

Thirty zone groups are available as shown in the figure below. The default name zone group 1 – 30 can be changed to more descriptive name.



The dialog box titled "Zone groups" contains a table with two columns: "Name" and "Zones". The "Name" column lists "Zone group 1" through "Zone group 17". The "Zones" column is empty. At the bottom are "OK" and "Cancel" buttons.

Name	Zones
Zone group 1	
Zone group 2	
Zone group 3	
Zone group 4	
Zone group 5	
Zone group 6	
Zone group 7	
Zone group 8	
Zone group 9	
Zone group 10	
Zone group 11	
Zone group 12	
Zone group 13	
Zone group 14	
Zone group 15	
Zone group 16	
Zone group 17	

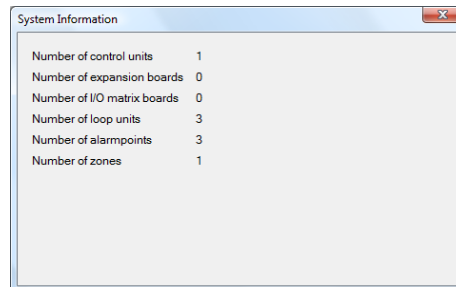
For each zone group, write the zone numbers for the zones that should be included in the zone group in the white field / line. Use comma as a punctuation mark between the zone numbers and a sequence e.g. xxx-yyy.

Default for all zones is that they do not belong to any zone group.

Note: A zone can only be a member of one zone group. A validation error will occur if a zone is programmed to be included in more than one zone group.

22.3.8 System information

In this dialog box you can **read** the following information:



This give all that has been programmed so far in the system. The information will be updated when units etc. are added or deleted.

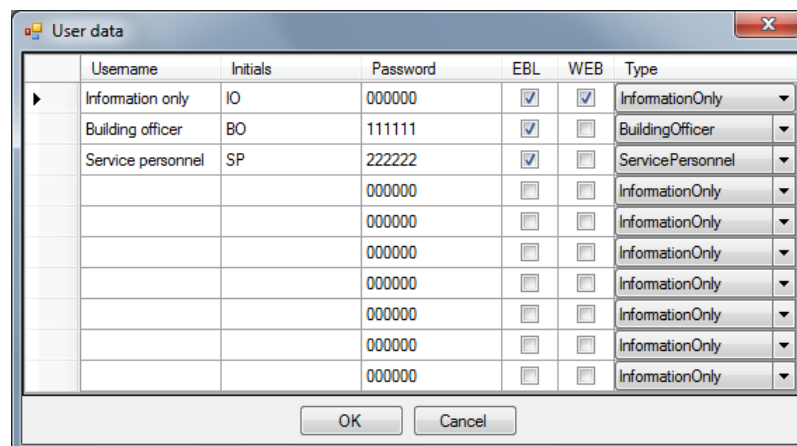
22.3.9 Edit Alarm texts

The user definable text message for each alarm point can be created / edited in the alarm point dialog box respectively or via the menu: Systems | Edit Alarm texts. See **Error! Reference source not found.**, page **Error! Bookmark not defined.**.

22.3.10 User data

To log on to the CIE. and/or the Web-server a User name and a password are required.

Ten different User names and corresponding passwords can be defined for three different User levels (Information only, Building officer & Service personnel).



User level **Information only** gives access to the menus H4, H6 ¹⁵⁷ H9 and H10. (Access Level 2A)

User level **Building officer** gives access to the menus H1 – H4, H6, H7, H9 and H10. (Access Level 2B).

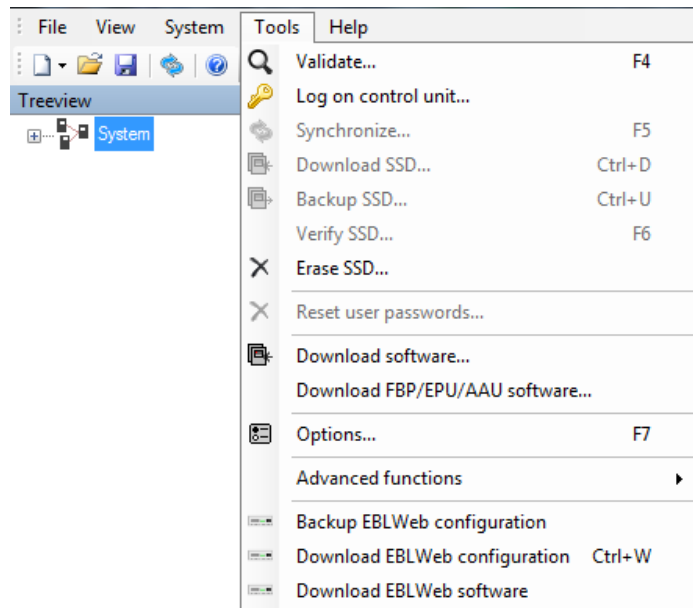
User level **Service personnel** gives access to the menus H1 - H10. (Access Level 3A).

For more information regarding user names, passwords, user levels, logon to a Control Unit, etc. see FT1020G3 Operation Manual.

¹⁵⁷ The faults **cannot** be acknowledged on this level.

22.4 The Tools menu

The EBLWin menu "Tools" is used when the PC is to be connected to FT1020G3 for download / backup etc.



Some commands are disabled (grey) since they require the PC / EBLWin to be connected and logged on to FT1020G3.

Validate...: The SSD can be validated at any time, i.e. checked for System Errors, Warnings and violations. A validation will automatically be done before download of SSD to FT1020G3. System Errors have to be corrected before the download can start.

Log on Control Unit: Log on / Log off to an FT1020G3¹⁵⁸.

Synchronize...: (When connected and logged on to an FT1020G3.) Data (i.e. faults, disablements, etc.) will be synchronized, i.e. the data / information are identical in both the Control Unit and EBLWin. It can also be done via menu H8/S7.

Download SSD...: (When connected and logged on to an FT1020G3) opens a dialog box for download of SSD to one or more of the FT1020G3 Control Units, the Web-server and connected "Display Units" (e.g. 1728).

Backup SSD ...: (When connected and logged on to an FT1020G3) opens a dialog box for backup (upload) of SSD from all the FT1020G3 Control Units and connected Display Units to EBLWin.

Verify SSD...: (When connected and logged on to an FT1020G3.) The SSD shown in EBLWin will be compared with what is actually stored in the FT1020G3 Control Unit. If they are the same the checksums = same SSD.

¹⁵⁸ Log on require the PC to be physically connected to FT1020G3 and an EBLWin key 5094 plugged in the PC.

Erase SSD...: (FT1020G3 must be in **boot mode**.) The SSD stored in an FT1020G3 Control Unit will be erased. Also the SSW (see Operation Manual) will be erased. **NOTE:** An EBLWin key is required.

Reset user passwords...: (When connected and logged on to an FT1020G3.) If any password has been changed via the Control Unit menu (H10) or via a Web-server, it will be reset to the password downloaded via the SSD, i.e. the passwords in the EBLWin dialog box "User data" (found in the menu "System").

Download Software...: (When connected and **not logged on** to an FT1020G3.) **NOTE:** An EBLWin key 5094 is required. Opens a dialog box for download of an EBL512G3 S/W file (xxx.bin) to an FT1020G3 Control Unit. (There is one .bin file for each convention).

Download EPU/AAU software: (When connected to a Display Unit – via RS232.) For download of S/W (xxx.bin file) to one Display unit. **NOTE:** An EBLWin key 5094 is required.

Options...: EBLWin settings. A Convention (one for each country) is selected the very first time EBLWin is opened. Can be changed if Level 2 is selected, see below. Display Unit language can be selected as well as the EBLWin language.

Advanced Functions: Can be one of the following alternatives:

- No "Level" selected (default): Alarm algorithm parameters cannot be changed.
- "Level 1" selected: all Alarm algorithm parameters, except the fire alarm parameters can be changed.
- "Level 2" selected (a special password is required): Also the fire alarm algorithm parameters can be changed. The convention for the opened installation can be changed in "Options...".

Backup EBLWeb configuration: (When connected to the Web-server TCP/IP). Opens a dialog box for backup of the Web-server configuration to EBLWin.

Download EBLWeb configuration: (When connected to the Web-server TCP/IP). Download of the configuration to a Web-server. **NOTE:** An EBLWin key 5094 is required.

Download EBLWeb software: (When connected to a Web-server – TCP/IP). Download of the software to a Web-server. **NOTE:** An EBLWin key 5094 is required.

22.5 Web-server

1. First create the SSD for the installation. In menu "System", select "User data" and check (mark) the user names / passwords that have to be used with the Web-server as well.
2. Add a Web-server to a Control Unit (C.U. menu: Add Web-server)
3. Do the required Web-server configuration.
4. Download the Web-server Software (firmware) V2.2.x to the Web-server.
5. Download the Web-server configuration to the Web-server, "Include SSD Data" must be marked.
6. Do a "power off – power on" Web-server restart.

23 Download SSD

Note: An EBLWin USB key must be used to communicate with the control panel and download the SSD using EBLWin V2.x.x.

The PC program **EBLWin** is used for creating the **Site Specific Data (SSD)** and to download it to the FT1020G3 Control Unit(s), the Web-server and/or the connected Display Units 1728, 1736.

The EBLWin key is a protection USB device required to log on to the Control Unit, it has a unique number. The EBLWin key identification number will be registered in the control panel event log with the date and time stamp for every SSD download performed in the control panel.

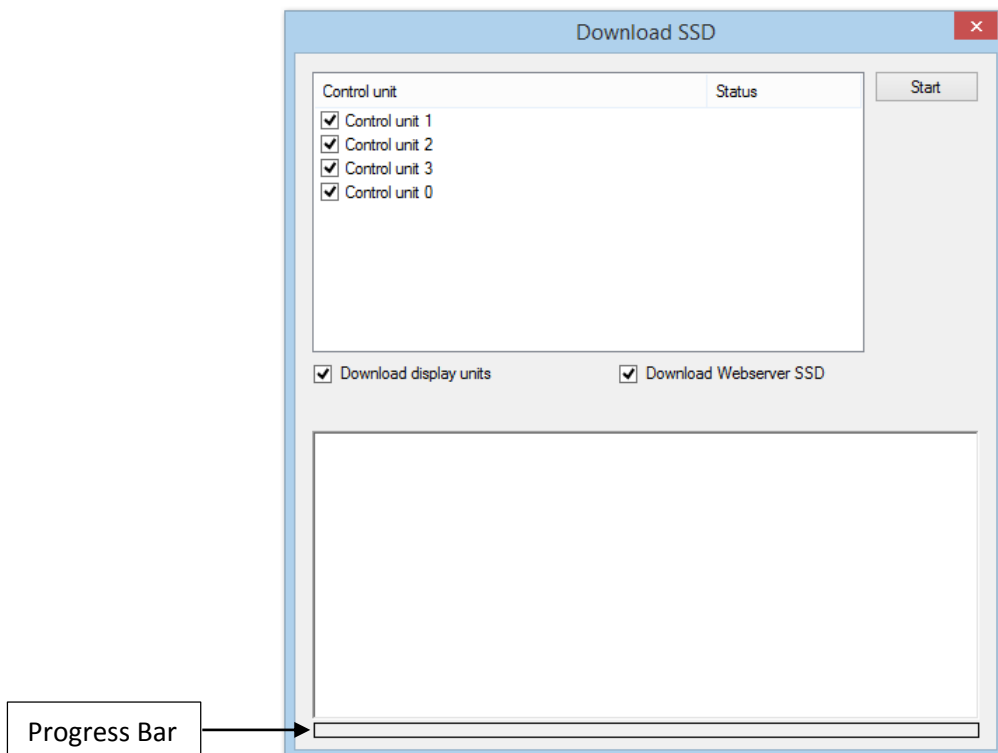
When the installation is ready, i.e. all units connected and the power is turned on, the SSD download can take place. When a number of Control Units are connected in a TLON network, the network has to be running before the SSD download can take place.

The PC has to be connected to the USB port (type "B") in one Control Unit. Start EBLWin and open the required installation. Log on to the Control Unit via the PC (EBLWin).

Note: No password / access code is required to log on to the Control Unit, instead an EBLWin key is required. This key is plugged in a USB-port in your PC.

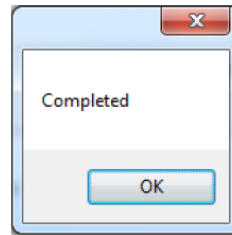
In EBLWin (menu "Tools" | "Download SSD..."), you can select the unit(s), i.e. the Control Units as well as the Display Units and Web-server, to which the SSD is to be downloaded. After the SSD download the Control Unit will restart. A number of faults might then be generated, e.g. due to not connected units. This will cause "heavy traffic" on the network, which might affect (delay) the SSD download to the other units.

In EBLWin (menu "Tools" | "Download SSD..."), select the control unit(s). SSD can also be downloaded to the Web-server and connected Display Units, if the check box "Download display units" and "Download Webserver SSD" respectively is marked.



Click "**Start**" to start the download. The progress bar will indicate the download status for each control unit.

The download is not completed until the following box is shown:

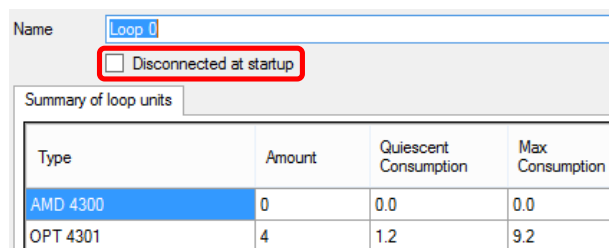


Click **“OK”**

After the SSD download the Control Unit will restart. A number of faults may then be generated, e.g. due to Control Units not connected yet. This will cause "heavy traffic" on the network, which may affect (delay) the SSD download to the other units.

Disconnected at start-up

In the COM loop Properties dialog box it is possible to select the option "Disconnected at start-up". The COM loop will then be disabled directly after the download restart and therefore no faults will be generated.



Type	Amount	Quiescent Consumption	Max Consumption
AMD 4300	0	0.0	0.0
OPT 4301	4	1.2	9.2

Note: A COM loop "Disconnected at start-up" can be re-connected via menu H8/S1 but it will then be disconnected again after next restart. Finally the SSD for that Control Unit has to be downloaded again with the option "Disconnected at start-up" not selected.

23.1 COM loop menu

23.1.1 Check Loop

In the EBLWin COM loop icon pop-up menu, select, **"Check Loop"**. This function can be used after (or before) the download of SSD. The function is as follows:

The Control Unit will find all units connected on the selected COM loop. If there is a break (cut-off) or short circuit on the loop, only the units in the A-direction will be found and shown, i.e. an indication where the break (cut-off) or short circuit is located.

For all units, the address (1-255) and the type of unit will be reported to EBLWin. All differences compared to the installation (SSD) that is open in EBLWin will be listed and can be saved and/or printed out.

"Unknown device" means that the type cannot be identified, e.g. faulty unit.

"Several reply" means that more than one unit have the same address or bad COM loop communication.

Note: During this check, the COM loop will be disconnected (disabled) and no alarms or faults can be activated. Disconnected COM loop is indicated by the LED Fault / Disablements "General disablements" (L10).

23.1.2 Auto generate loop

If you are on site, the **Auto generate** function can be used to create the SSD. Open a new installation in EBLWin, connect the PC to FT1020G3 and log on¹⁵⁹. Select a COM loop,

¹⁵⁹ An EBLWin key 5094 (a hardware key) is required, i.e. plugged in a USB port in the PC.

right click then select "Auto generate...". The selected COM loop units¹⁶⁰ connected on the COM loop will now be identified and listed in EBLWin i.e. the SSD will be auto generated with default settings for all units (01-01, 01-02, 01-03, etc.). The SSD can be edited, saved before the download can take place. Repeat the same procedures for every other Com loop. The SSD can now be downloaded (see below) to FT1020G3 directly.

23.2 SSD Download

23.2.1 SSD Download to Single Control Unit

Start the SSD download from EBLWin. A text message will be shown in the Control Unit display: "Downloading SSD".

When the download is completed the Control Unit will restart. After the restart another text message will be shown in the display:

FAULT: Restart Control Unit nn, code 25
DD-MM-YYYY HH:MM

Code 25 indicates a normal restart after the SSD download. Acknowledge the restart fault.

If the download was unsuccessful, another fault will be generated.

FAULT: Site specific data (SSD), CU nn
DD-MM-YYYY HH:MM

This text message means that the SSD file has **not** been downloaded successfully, i.e. a new download has to be performed.

23.2.2 SSD Download to Control Units in a TLON Network

The SSD for all Control Units can be downloaded via a PC / EBLWin, connected to one Control Unit. The download will be performed to the Control Units, one at a time, according to chapter "Single Control Unit" above. The download is performed in a consecutive order, i.e. 0-1-2-3-4-.....-29 amongst the selected Control Units **but** the Control Unit where the PC is connected will automatically be the last one to get the SSD downloaded.

When the SSD download to a Control Unit is completed, that Control Unit will automatically restart and generate a restart fault.

23.3 User definable text messages download

Each alarm point, zone and zone line input can have a unique user definable alarm text programmed via **EBLWin**. When a fire alarm is activated (e.g. an addressable alarm point), the presentation number (Zone - Address) will be shown in the Control Unit and in 1728/1736 display together with its user definable alarm text.

All alarm texts, up to 40 alphanumeric characters each, are created and downloaded (included in the site specific data – SSD) via **EBLWin**.

When a printer is available the alarm text will be printed with the presentation number.

A Fault message for an alarm point, zone or zone line input will also show the text message.

¹⁶⁰ Each unit have to be running i.e. be connected, power supplied and the address, mode etc. have to be set. **NOTE:** During this check, the COM loop will be disconnected (disabled) and no alarms or faults can be activated. Disconnected COM loop is indicated by the LED "Disablenents" (L8).

24 Download software (System Firmware)

Note: When existing system requires software upgrade, first, logon to the Control Unit using a compatible EBLWin (or WinG3) software version with the existing firmware version in FT1020G3 then perform SSD backup to save the existing Site Specific Data file. This must be performed prior to any software download.

The latest software version of the EBL512 G3 software¹⁶¹ is factory downloaded before delivery. Due to continual development and improvement, different S/W versions may be found.

The valid (current) S/W version for the main board 5010 and the MMI board 5011 is shown in menu H4/U8 (Information) or via EBLWin (Control Unit pop-up menu; Software version...). On site, new S/W can be downloaded via EBLWin.

FT1020G3 can be upgraded with a new S/W version, downloaded on site via EBLWin as well as the display units 1728, 1736. See the 1728 and 1736 manuals respectively.

24.1 Single Control Unit (CIE.)

Note: Before downloading new software in existing system, SSD¹⁶² backup (upload) must be performed using compatible Win and EBL software then saved in the new version of EBLWin.

A standard single CIE should not have a TLON connection board 5090 mounted. (When a CIE has a TLON connection boards 5090 mounted, it is expected to be one CIE. in a TLON network and TLON network programming is required).

To download a new software (system firmware) version, a PC and **EBLWin**¹⁶³ are used. The .BIN file to be downloaded contains the software for the main board 5010, software for the MMI board 5011 and a text file, i.e. there is one BIN file for each convention.

24.1.1 Establish communications between PC and CIE for software download

Note: Brooks strongly recommends using the USB isolator device when you connect your PC to the Control Unit.

The following procedures must be performed to establish the communications between the PC and the control panel:

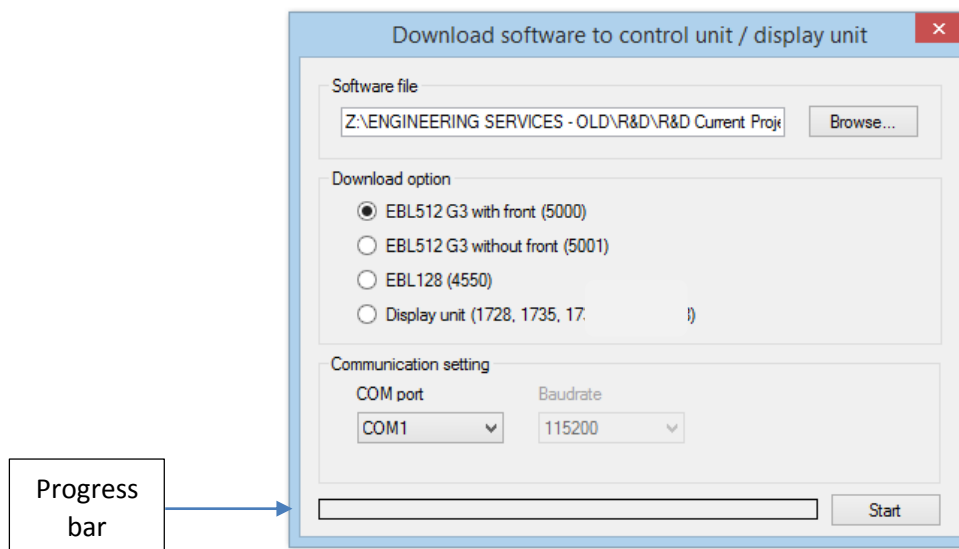
1. Plug in the **USB dongle** into a USB port on the PC.
2. Connect the PC to the CIE using the USB connector.
3. Start EBLWin, (**Do not logon**).
4. In the "Tools" menu, select "Download Software..." to open the dialog box and do the required settings.
5. Select the path and the software file name, e.g. **Australian_EBL512G3_220.BIN** (220 = version 2.2.0).
6. Mark the checkbox "No MMI board" if the control panel is not fitted with front display, i.e. the MMI software and the text file will **not** be downloaded.
7. Select the COM port to be used on your PC¹⁶⁴.

¹⁶¹ The software (firmware) is the system software and always uses "EBL" abbreviation.

¹⁶² It is highly recommended to make a copy of the SSD file in its original version as well.

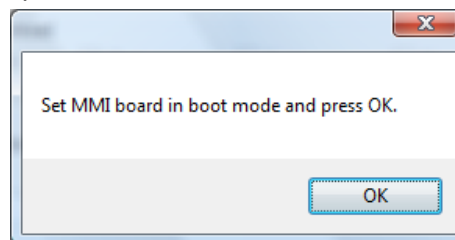
¹⁶³ To logon to the control unit or to download software, an EBLWin key (5094) is required in a PC spare USB port.

¹⁶⁴ If several USB ports are used on your PC, and you want to find which COM port is connected to the panel, go to Device Manager and look for EBL G3 Serial Port (COM#) under Ports (COM & LPT). # will be the COM port number.

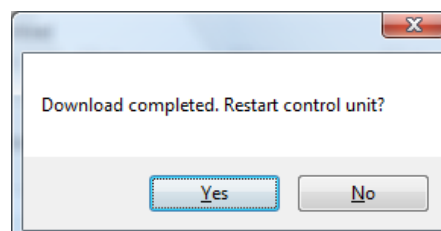


24.1.2 Download the Software

1. Set the Main board 5010 in "boot" mode, i.e. press and hold the "**Boot**" button (SW2) then press the "**RESET**" button (SW1) momentarily. Release the "BOOT" button. The Main board LED "D24" is turned off while the Main board is in "boot" mode.
2. Start the download, i.e. click "Start". Another dialog box opens.



3. Set the MMI board 5011 in "boot" mode, i.e. press and hold the "**BOOT**" button (SW2) and press the "**RESET**" button (SW1) momentarily. Release the "BOOT" button. The MMI board LED "D18" will be turned off and the buzzer is turned on while the MMI board is in "boot" mode.
4. Click "OK", the buzzer is turned off and the download continues. The download status is indicated by the progress bar.
5. When the progress bar goes from "red to green", the download will be completed and the following dialog box opens:



6. Click "Yes" and the Control Unit will restart.

After the restart, the following messages will be shown:

FAULT: Restart control unit nn, code 00
DD-MM-YYYY HH:MM

FAULT: Restrt control unit nn, code 50
DD-MM-YYYY HH:MM

Code 00 / 50 indicates a normal restart of the main board / MMI board after the software download. Acknowledge the restart faults.

7. LED “Operation” (L5) on the FT1020G3 front should now turned on and all other LEDs are normally turned off.

Note: After a new software download, the logon password reverts back to the default setting i.e. “000000”. The user names and passwords will be changed when the SSD is downloaded.

24.2 Control Units in a TLON network

All Control Units connected to a TLON network must have the same software version.

To download new software in each Control Unit, follow the procedure described above.

Since some Control Units do not have contact with other Control Units during the downloading, the following faults might be generated:

FAULT: Control unit xx has no contact with
Control Unit xx, network x
dd-mm-yyyy hh:mm

FAULT: CU xx has wrong information
dd-mm-yyyy hh:mm

The faults have to be acknowledged.

25 Cable types

A fire alarm installation is a safety system and it is important that the cables used are suitable and of the correct types. Fire alarm cables should, when possible, be installed as far as possible from mains power cables or any other cables that may generate noise or have strong EMF in order to avoid disturbances from these cables.

The maximum cable length is dependent on cable type e.g. cross sectional area, units current consumption, etc.

25.1 TLON Network cables

Cable specifications vary and are dependent on cable lengths e.g. 1.50mm² TPS Twisted pair cable unshielded, Brooks stock no. BAC0989/200 (200 metre roll) or equivalent is recommended. Cable specifications are given in drawing F738-01¹⁶⁵, 738-02 and 738-03. See also separate TLON Technical manual.

25.2 COM loop cables

Loop topology is used for highest safety, i.e. the cable connected in FT1020G3, returns back to FT1020G3. In case of a single break on the loop, communication starts in both directions and a fault is generated, a fault message will also be displayed. See drawing F733, F784-01 and F784-02.

The cable length is dependent on the type and number of loop units, etc. See chapter "FT1020G3 cable length calculation" page 170 and drawing number F733.

Note: For applications where the environment is noisy, screened cable is recommended. If screened cable is used, the screen should be connected close to each loop unit and only incoming (or outgoing) screen to the CIE earth point.

In order to maximise the COM Loop cable length, Brooks recommend using 7/0.52mm (1.5mm²) twisted pair (shielded or unshielded) e.g. Brooks BAC0898 1.50mm² TPS 2 Core Twisted cable unshielded or equivalent.

When feeder line is required, use suitable multi core twisted pair cable 1.5mm².

25.3 Remote Display Units cables

For RS-485, CAT5 (twisted) cable can be used, cable length \leq 1200 m to the furthest away situated external EPU / AAU.

For 24V supply, Cable type Brooks BAC0898 1.5 mm² is recommended (or equivalent).

See "Cable Length Calculations for 1728 and 1736" page 172.

25.4 Conventional zone line cables

Zone expansion board 4580 and Multipurpose I/O unit 3361, recommended cable is Brooks BAC0898 1.5 mm² or equivalent. Refer to Table 14 below. See drawing F728 and F735.

25.5 Alarm device cables

Alarm devices (OWS, strobes, external sounders, etc.), recommended cable is Brooks BAC0898 1.5 mm² twin TPS or equivalent unless fire rated cables required.

¹⁶⁵ For longest possible cable length Echelon recommends an unshielded cable type. However shielded cables can be used.

When feeder line is required, use suitable multi core twisted pair cable 1.5mm². Refer to Table 14 below.

Note: Addressable Alarm devices e.g. 3379, 4477, etc. are connected directly on the COM loop.

25.6 Other equipment cables

Intrinsically safe equipment for hazardous areas, RIL, MDH, etc, recommended cable Brooks BAC0898 1.5 mm² twin TPS or equivalent.

The maximum cable length and maximum COM loop current, are dependent on the number and type of loop units and the type of cables used. The cable length for a COM loop is the total cable length from the CIE and returning back to CIE thus completing the loop.

Since the COM loop cable length is dependent on the number of units and their current consumption the figure in the table is for the maximum number of COM loop units i.e. 255 units and 350mA.

Table 14 below summarises the different cable types required and the maximum cable length allowed.

Table 14 Summary of Recommended Cables

Connection type	Cable type	Conductive surface area	Resistance/km	Cable length
Com Loop	Twisted pair	1.5mm ²	11.9 Ω/km	1300m
Conventional Zone	Flat pair	1.5 mm ²	11.9 Ω/km	1000m
		1mm ²	24 Ω/km	650m
Alarm Devices	Flat pair	1.5 mm ²	11.9 Ω/km	1000m
		1mm ²	24 Ω/km	650m
Display Units (RS485)	CAT5 for data	0.5 mm ²	0.5 mm ²	1200m
	Twisted pair for power	1-1.5 mm ²	1-1.5 mm ²	1200m
Other cables	Flat pair	1mm ²	24 Ω/km	650m

26 FT1020G3 cable length calculation

26.1 COM loop Cable length

On each COM loop, up to 255 COM loop units can be connected (i.e. address 1 - 255). The cable length and maximum COM loop current are dependent on the number and type of loop units and cable type, see Figure 56 page 171. Brooks recommends 1.50mm², twisted pair cable or equivalent for the COM loops. Brooks BAC0898 is available in the following size cable reels.

Reel Length (meters)	Brooks Part Number
100	BAC0898
200	BAC0898/200
250	BAC0898/250
500	BAC0898/500

The cable specifications for these 1.5mm² twisted cables are:

- DC Cable Resistance: 11.9 Ω/Km per conductor at 20°C.
- Cable capacitance: 50pF/m at 1MHz.

Generally, the **maximum allowed loop current is 350mA** while the maximum allowable loop resistance is 42.3Ω.

This maximum loop current should be taken into account when calculating the maximum loop cable length. Either use the graph in Figure 56 or use this equation that represents the graph to calculate the cable length.

Calculations of the maximum allowable distance from the Control Unit to the furthest end or the total COM loop distance are based on the above specifications. Note that these calculations do not take into account device loading along the loop.

Excel sheet

An Excel sheet is also available for an easy check of the current consumption, cable length, etc.

EBLWin

In the COM loop pop-up menu select "Properties..." to open a window showing the quiescent and maximum current consumption for the units connected to that COM loop.

Example:

A fire alarm manufacturer (Panasonic) specifies a maximum allowable loop resistance of 42.3Ω. What is the maximum allowable distance from the Control Unit to the last device if Brooks BAC0898 stranded, un-coated copper wire was used? How does this change if the temperature is increased to 80°C?

$$R_{max} = 42.3 \Omega = 2R_W \Omega$$

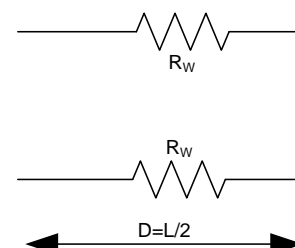
$$R_W = R_u D \Omega$$

$$R_{max} = 42.3 \Omega = 2R_u D \Omega$$

Given that

$$R_u = 11.9 \Omega / 1000m = 0.0119 \Omega / m$$

$$T_{ref} = 20^\circ C$$



Therefore, the maximum allowable distance

$$D = \frac{R_{max}}{2R_u} = \frac{42.3}{2(0.0119)} = 1777 \text{ m}$$

If the temperature was raised to 80°C, we would expect that the resistance will also increase. The relationship between resistance and temperature is given by,

$$R = R_{ref}[1 + \alpha_{cu}(T - T_{ref})]$$

Where,

R = Resistance per unit

R_{ref} = Resistance per unit at a reference temperature

Coefficient of copper $\alpha_{cu} = 0.00323$

T = Actual temperature

T_{ref} = Reference temperature

Hence, calculating for this gives:

$$R = 0.0119[1 + 0.00323(80 - 20)] \Omega/m = 0.0142 \Omega/m$$

Therefore, the new distance would be:

$$D = \frac{42.3}{2(0.0142)} = 1489 \text{ m}$$

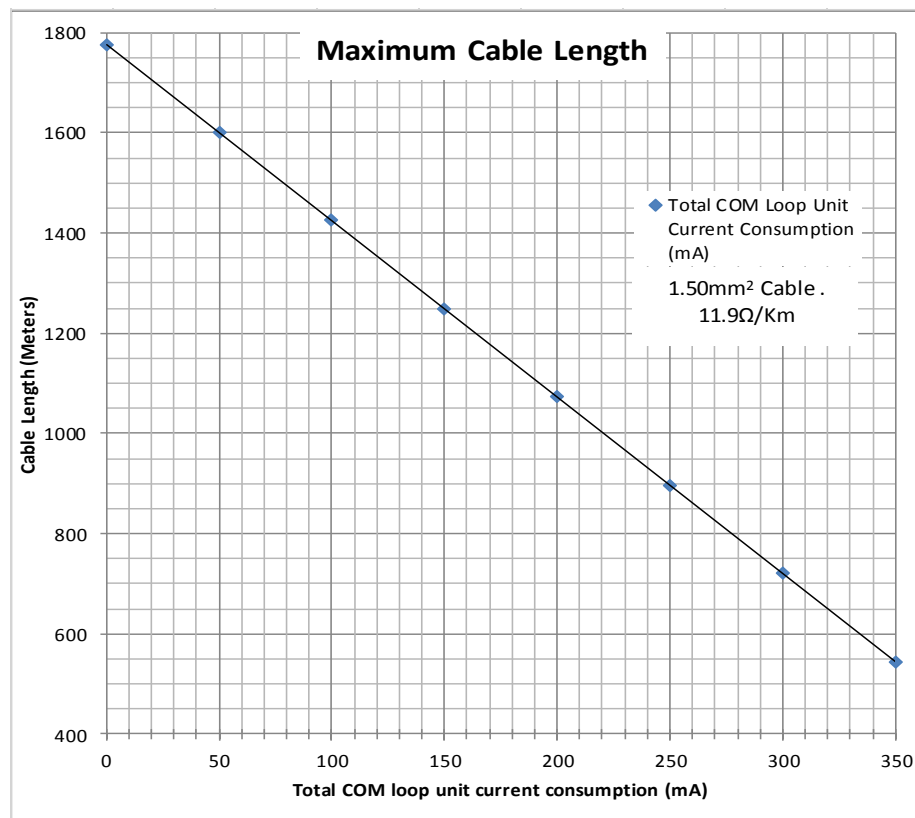


Figure 56 COM Loop Current Consumption vs. Cable Length

The total COM loop unit current consumption is increased as the number of units are added to a loop. Refer to “Current consumption” page 174 as details are given as to how much current is consumed by each unit as they are added to the loop. Use the FT1020G3

current calculation spread sheet to calculate the expected total current consumption before using this graph in Figure 56.

26.2 Cable Length Calculations for 1728 and 1736

Up to 16 display units type 1728 and/or 1736 can be connected depending on the cable (type and length) being used.

Brooks recommendation:

Cable type Brooks BAC0898 1.5 mm² twisted pair for the 24V supply and for RS485. However other twisted pair cables with minimum 0.5 mm² can be used for RS485 e.g. category 5 (CAT5) cables, normal CAT5 cable resistance is 188Ω/Km. RS485 cable length **must not** exceed 1200 metres.

In order to reduce noise immunity due to noisy environment, it is recommended to use CAT5 with shield and terminate the shield in the CIE

Note: End of line resistor on the last unit is 120 Ω, this must be set in the last unit using jumper link in the unit, refer to the Technical Manual for 1728 and 1736.

For ease of calculation, it is recommended to use 2 pairs of Brooks BAC0898 twisted pair cable for 24V supply and RS485.

See

Table 15, this should be the benchmark against other alternative cables if other cables are used.

Wire resistance for this cable (R_u), is approx. 11.9 Ω / Km at 20°C.

The current consumption of these units are given in

Table 15 page 173. Typically, calculations are based on their "Active State". For the External Presentation Unit 1728 to continue working under worst case scenario, i.e. mains failure and system is relying only on the back-up battery. The battery voltage should not drop below 12VDC and should still be able to deliver the active current consumption (88mA). Here is an example to calculate the cable distance from the CIE to the last 1728 unit under these conditions (assuming that only 1728 units are connected and Brooks cable BAC0898 is used):

Current consumption of each 1728, I_{unit}	=	0.088 A
Voltage of 1728 in "Active State", V_{act}	=	12 V
Number of units required	=	16
Nominal battery voltage, V_{batt}	=	24 V
Maximum allowable battery voltage drop, V_{drop}	=	$V_{batt} - V_{act}$
	=	24-12 V
	=	12 V
Total current consumption for 16 units, I_{total}	=	16x0.088 A
	=	1.408 A
Allowed cable resistance, $R_{allowed}$	=	V_{drop}/I_{total} Ω
	=	12/1.408 Ω
	=	8.52 Ω
R_u , for BAC0898 1.5mm ² twisted pair wire resistance was given as	=	11.9 Ω/Km
The maximum cable length for 16 units, L	=	$R_{allowed} (Ω) / R_u (Ω/Km)$ Km
	=	8.52/11.9 Km
	=	0.716 Km

Note: The total length of the cable must be limited to 1200 metres although the calculation result is 1432 metres.

Table 15 Maximum display units cable length

Cable Type	BAC0898				SMA2704			
	Wire Resistance R_u at 20° C		11.9	Ω /Km	Wire Resistance R_u at 20° C		21	Ω /Km
	c.s.a. of cable = 1.5mm ²				c.s.a. of cable = 1mm ²			
Unit	1728		1736		1728		1736	
I _{unit} (A)	0.088		0.079		0.088		0.079	
V _{batt} (V)	12		12		12		12	
No. of units	Allowed cable resistance R _{allowed} (Ω)	Max. distance from CIE, D (metres)	Allowed cable resistance R _{allowed} (Ω)	Max. distance from CIE, D (metres)	Allowed cable resistance R _{allowed} (Ω)	Max. distance from CIE, D (metres)	Allowed cable resistance R _{allowed} (Ω)	Max. distance from CIE, D (metres)
16	8.52	716	9.49	798	9	406	9	452
15	9.09	764	10.13	851	9	433	10	482
14	9.74	819	10.85	912	10	464	11	517
13	10.49	881	11.68	982	10	500	12	556
12	11.36	955	12.66	1064	11	541	13	603
11	12.40	1042	13.81	1160	12	590	14	658
10	13.64	1146	15.19	1200	14	649	15	723
9	15.15	1200	16.88	1200	15	722	17	804
8	17.05	1200	18.99	1200	17	812	19	904
7	19.48	1200	21.70	1200	19	928	22	1033
6	22.73	1200	25.32	1200	23	1082	25	1200
5	27.27	1200	30.38	1200	27	1200	30	1200
4	34.09	1200	37.97	1200	34	1200	38	1200
3	45.45	1200	50.63	1200	45	1200	51	1200
2	68.18	1200	75.95	1200	68	1200	76	1200
1	136.36	1200	151.90	1200	136	1200	152	1200

Table 15 was tabulated based on the calculation example given previously under the same conditions described above. This pre-calculated table serves as a quick estimate for the cable length to the number of Display Units that can be used depending on the selected cables.

If a cable with a reduced conductor area is used the wire resistance (Ω / Km) will be higher and the possible cable length will be shorter. The display units RS485 bus uses RS485 communications standard. Therefore, the maximum distance from the CIE. for any number of Display Unit should not exceed 1200 metre even though calculations show otherwise.

27 Current consumption

An Excel spread sheet is available from Brooks Australia to calculate the total current consumption of the CIE and the battery capacity required. The spread sheet will return your expected current consumption, cable length, battery capacity etc. based on the COM loop cable resistance (Ω/km) and the specific units expected to be connected to a COM loop.

The loop units have different current consumption. Note that some units have much higher current consumption in "active state" than normal state. The tables below can be used:

- To get a total current consumption [overview](#).
- To check the current consumption on a COM loop in relation to the cable length, etc. See drawing F733 and chapter "FT1020G3 cable length" page 170.
- To check if the battery capacity is sufficient.

The current consumption is normally shown at nominal voltage (24 Vdc), in **Normal state** (quiescent) and in **Alarm state** (active). When the mains fail, the voltage of the battery back-up can be 27 – 21 V DC.

See also chapter "Power supply", page 177.

Table 16 FT1020G3 and CIE options current consumption

CIE units		Normal state (quiescent) (mA)	Alarm state (active) (mA)
Control Unit standard FT1020G3 (without printer)	¹⁶⁶	230	290
Control Unit standard FT1020G3 (with printer)	¹⁶⁶	253	312 ¹⁶⁷
Control Unit standard FT1020G3 (without front, printer, etc.)	¹⁶⁶	179	214
Printer in standard FT1020G3		23	350
8 zones expansion board 4580 (PCB 2B)	¹⁶⁸	22.2	22.2
8 zones expansion board 4580 (PCB 3A)		15 ¹⁶⁹	15 ¹⁷⁰
8 relays expansion board 4581		15	15
In & outputs expansion board 4583, no units connected		15	15
TLON connection board 5090		approx. 5	approx. 5
Web-server II 1598		60	65

The Control Unit current consumption shown above are measured during battery back-up i.e. no mains.

¹⁶⁶ Control unit – backup battery powered. COM loops and external equipment current consumption not included.

¹⁶⁷ When the printer is active the current consumption is 667 mA momentarily.

¹⁶⁸ Add 3.5 mA (quiescent) and 12 mA (activated) respectively, for each zone line input used.

¹⁶⁹ Add 0.5 mA per input (zone) for end-of-line capacitor (470 nF) and 3 mA per input for end-of-line resistor (10K).

¹⁷⁰ Add 30 mA per input (zone) activated. (Each input has a 30 mA current limitation, i.e. also for short-circuit on the line.)

Table 17 COM loop units current consumption

COM loop units (input / display units)	Normal state (quiescent) (mA)	Alarm state (activated) (mA)
Analogue heat detector 3308 + Analogue base 3312 ¹⁷¹	0.3	2.3
Analogue heat detector, enclosed 3309 ¹⁷¹	0.2	1.7
Analogue multi detector 4400 + analogue base 3312	0.3 ¹⁷²	1.3 ¹⁷³
Analogue smoke detector 4401 + analogue base 3312	0.3 ¹⁷²	1.3 ¹⁷³
Analogue multi detector 4300 + Analogue base 3312 ¹⁷¹	0.3	2.3
Analogue smoke detector 4301 + Analogue base 3312 ¹⁷¹	0.3	2.3
Addressable manual call point with isolator 4433 / 4439	1.6	2.7
Addressable manual call point 3333 / 3339	2	5
Alarm Acknowledge Facility (AAF)	2	5
Addressable short circuit isolator 4370	2.2	2.2
Analogue base with isolator 4313 ¹⁷⁴	≤ 1.3	≤ 1.3
Addressable multipurpose I/O unit 3361	2.2	max. 12 ¹⁷⁵
Addressable 2 voltage outputs unit 3364 ¹⁷⁶	≤ 6	≤ 6
(Addressable) External power supply 3366AU	≤ 15	≤ 15
Addressable siren 4477	1.8	≤ 10
Addressable sounder base 3379	0.75	max 2.5 ¹⁷⁷
Addressable beacon 4380	1.7	5
Light indicator 4383	1.5	4
I/O matrix board 4582 ¹⁷⁸	max. 6	max. 6
AS1668 Fan control application board ¹⁷⁹	6	6
Zone control application board ¹⁷⁹	6	6

Note: On each COM loop, up to 5 sensors / detectors can have their LEDs lit at the same time even if more alarm points are activated.

¹⁷¹ Remote LED current consumption BARIL: add 1 mA when Analogue base with isolator 4313 is used instead of Analogue base 3312.

¹⁷² Plus 0.025 mA if green polling LED is used.

¹⁷³ Plus 0.5 mA if external indicator (RIL) is used.

¹⁷⁴ Detector not included.

¹⁷⁵ Only if the input In0 is used as a zone line input, else approx. 2.2 mA.

¹⁷⁶ External 24Vdc power supply also required, e.g. the 3366AU unit.

¹⁷⁷ High sound output option = 4.5 mA

¹⁷⁸ Must be plugged in an application board

¹⁷⁹ Requires 24Vdc

Table 18 Other units current consumption

Other units	Normal state (quiescent) (mA)	Alarm state (activated) (mA)
Routing equipment (Fire brigade TX / Fault TX)	See foot note ¹⁸⁰	See foot note ¹⁸⁰
External Presentation unit 1728	26@24 V / 48@12 V	49@24 V / 88@12 V
Alert Annunciation unit 1736	26@24 V / 48@12 V	42@24 V / 79@12 V
Alarm devices (sounders, etc.)	0	Sounder type current
Occupant Warning System (OWS) 60W ¹⁸¹	118	3100
Magnetic door holder	Approximately 80	0

As more loop devices are added, they are summarised in the “Summary of loop units” providing information for total quiescent and maximum consumption in the “Properties for NMAST loop” dialog box. See Figure 57 below for steps to access the information from EBLWin under their respective loops.

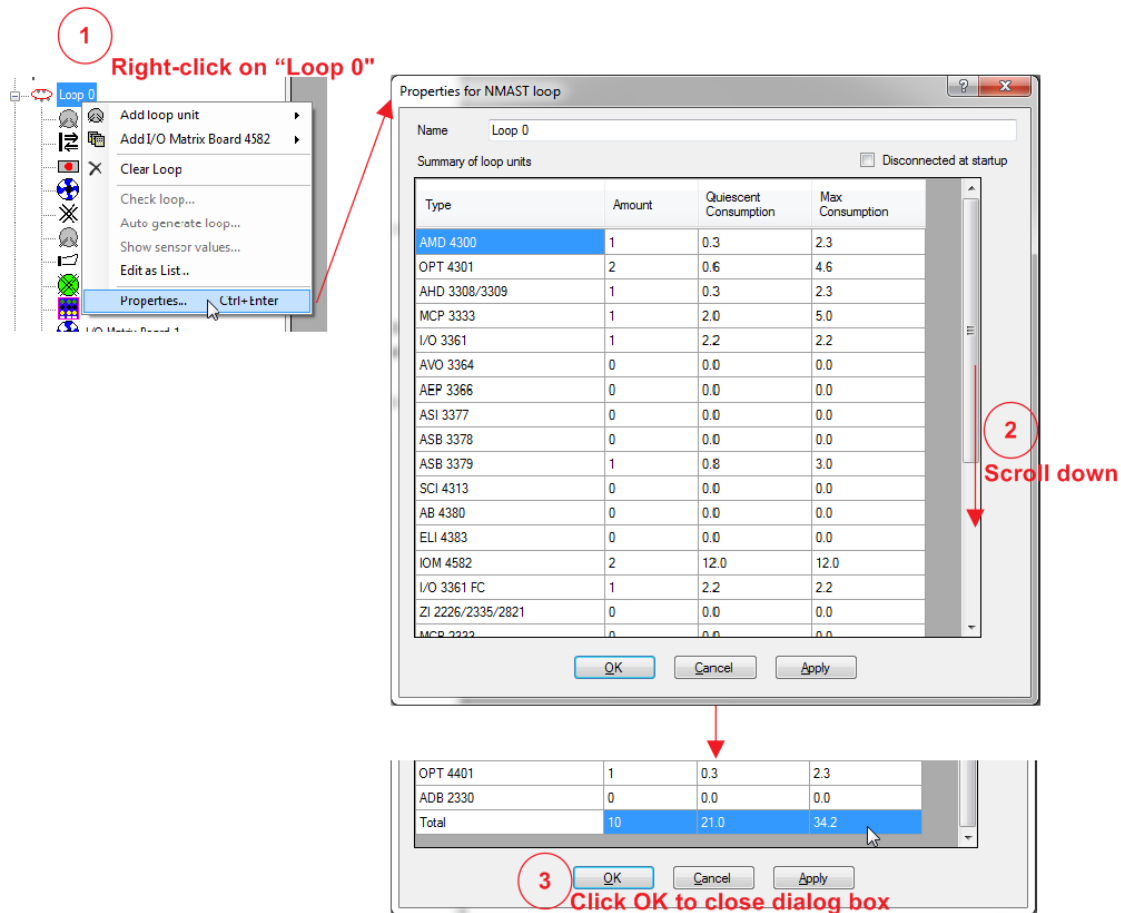


Figure 57 Access to COM loop units current consumption

The current consumption of FT1020G3 from the power supply and the charging current for the battery with battery temperature can be displayed via menu H5/A4.

An approximate value of individual COM loop is also displayed via menu H5/A5.

¹⁸⁰ Quiescent and alarm current must be added correctly for each brigade unit e.g. Romtec, Tyco ASE, etc. Separate power supply and batteries may be required.

¹⁸¹ OWS with higher wattage e.g. 120W or 250W requires separate power supply and battery backup.

28 Power supply

Main power source

FT1020G3 Control Unit is normally powered by 150W switching mode power supply (230VAC / 24VDC $\pm 1\%$, 6.5 A).

Standby power source

In case of mains failure i.e. loss of 230VAC, the FT1020G3 will be powered by a backup batteries, i.e. two Sealed Lead-Acid batteries, 12VDC, 17 – 65 Ah, see Table 16, Table 17 and Table 17 to calculate the battery backup size as per section 28.2 page 178.

A space in FT1020G3 Control Unit is available for two Sealed Lead-Acid batteries, 12 V, up to 24 Ah. Larger batteries may fit in the enclosure depending on equipment fitted and the ASE required.

Larger batteries can be placed in additional battery box.

The batteries and the power supply are connected to the Main board 5010 (see drawing F725 & F726), which also provide the charging current for the batteries.

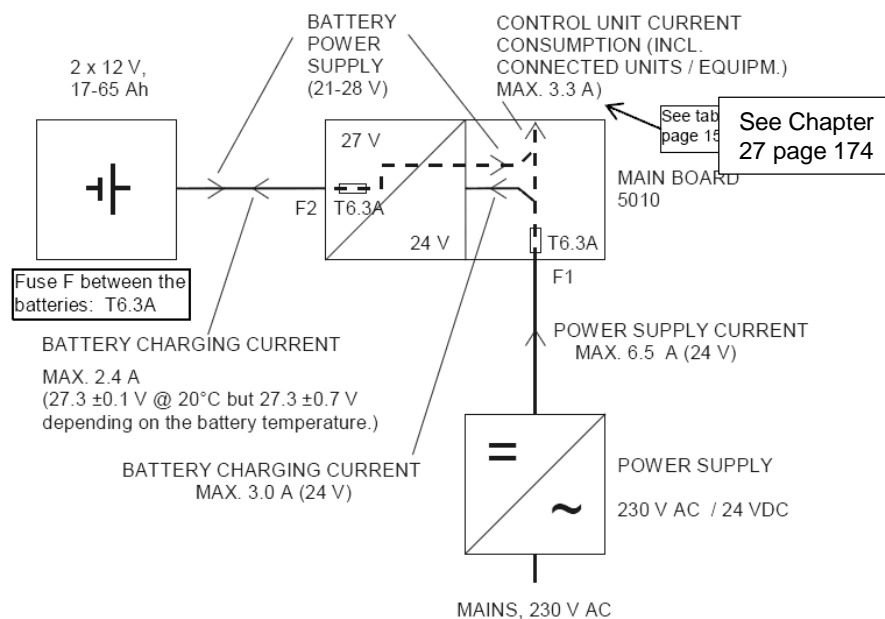


Figure 58 FT1020G3 power supply block diagram

Fuses F, F1 & F2: T6.3A H 250 V (5x20 mm Ceramic).

FT1020G3 is a very flexible system, i.e. number and type of loop units, number and type of expansion boards, external equipment, etc. can vary from one Control Unit to another.

28.1 Charger functions

According to AS7240.4, section 5.3.1 b), the charger shall be designed and rated so that a battery discharged to its final voltage can be recharged to at least 80% of its rated capacity within 24 hours and to its rated capacity within another 48 hours.

28.1.1 Battery charging

Batteries of larger capacity than 65 Ah are possible to use but may not be recharged within the prescribed time interval.

Batteries of smaller capacity, i.e. < 17 Ah, are not recommended since the charging current in step 1 (see below) is 2.4 A, which normally is higher than the recommended maximum charging current for these batteries. Too high charging current can cause abnormal internal heating which may damage the batteries.

28.1.2 Battery charging functions:

Battery charging is performed in two steps:

1. **Constant current.** The charging current is constant (fixed) until the battery / charging voltage reaches 29 VDC.
2. **Constant voltage.** The charging voltage is reduced from 29 to a value between 26.6 and 28.2 V (depending on the temperature) and will be constant (fixed) at this level until the batteries are fully charged.

When the battery is fully charged the stand-by "charging current" is 0-0.5 A (typical 0.1 A) and the "charging voltage" will stay constant (fixed) at the "step 2" level, until the batteries have been discharged and have to be charged again. A new charging cycle will then start. The duration of "step 1" and "step 2" respectively is dependent on the battery shape when the charging starts.

28.1.3 Battery protection functions

- The battery charging will be turned off if the current from the power supply to the Main board 5010 exceeds 6.3 A. The battery charging will remain turned off as long as the FT1020G3 current consumption exceeds 3.3 A. The following fault message will be shown:

FAULT: Control Unit xx high current consumption

- In case of faulty charger, the following fault message will be shown:

FAULT: Charger Control Unit xx

- In order to not damage the batteries, the voltage output will be switched off at approx. 18 V. This only happens in case of no main power source (230 V AC), i.e. when the backup batteries are used as power source.
- If the battery voltage is below 10 V (5 V per battery), the battery charging will be turned off. (The batteries are most certainly damaged and have to be changed.)
- In case of mains failure and after a time delay of 1-300 minutes (programmable in EBLWin but max. 30 minutes, the following fault message will be shown:

FAULT: Mains, Control Unit xx

28.2 Current consumption calculations

The following calculations should be carried according to the application requirements of the related current standards, such as AS7240.2, AS1670.1, and AS1670.4.

In order to avoid overloading the power supply, the battery capacity calculation must be performed as per AS1670.1 clause 3.16.4. The total FT1020G3 current consumption (excluding battery charging current) has to be calculated.

Note: The batteries will not charge when fire alarm is activated in FT1020G3.

Use the values in chapter "Current consumption", page 174, to calculate the total system current i.e. alarm current I_A and quiescent current I_Q .

As per AS1670.1 Section 3.16.4, the battery capacity requirement is calculated as follows:

$$C_{20} = 1.25 [(I_Q \times T_Q) + FC (I_A \times T_A)]$$

Where C_{20} = Battery Capacity in AH at 20h discharge rate at 15°C - 30°C

1.25 = Compensation factor for expected battery deterioration

I_Q = Total system quiescent current in Ampere ¹⁸²

T_Q = Quiescent standby power source time, normally 24 hours for externally monitored systems and 72 hours for unmonitored systems

FC = Capacity de-rating factor, typically 2

I_A = Total system alarm current in Ampere ¹⁸³

T_A = Alarm load standby power source time, normally 0.5 hour

Refer to Brooks spreadsheet to automatically calculate the battery capacity.

Comments regarding I_Q and I_A :

- I_Q has to be ≤ 3.3 A.
- I_A has to be ≤ 6.3 A.

For the total FT1020G3 current consumption in relation to backup time, see tables in chapter 28.4 "Standby power source" below.

28.3 Main power source (power supply)

The main power source is a Switching Power Supply which is an AC to DC converter from 230 VAC to 24 VDC, 6.5A but the main board fuse F1 = 6.3 A, i.e. **the total current consumption including maximum battery charging current must not at any time exceed 6.3 A.** Allowed input voltage is 176-264 VAC. The output voltage is 24 VDC with a tolerance of $\pm 1\%$. ¹⁸⁴

28.4 Standby power source (Batteries)

The standby power source is two x 12V batteries. Only batteries with a specified "Final voltage" of 10.5 V must be used.

The standby battery capacity must be calculated as per AS1670.1 (section 28.2 above). The battery backup time is **24** hours in normal state and **0.5** hour in alarm state.

The electrical capacity of the batteries varies with ambient temperature and discharge current. Furthermore the battery voltage at the end of a discharging period is not the same as at the start. As required by AS1670.1, the calculation of battery capacity shown in section 28.2 has included 80% de-rating in battery capacity. See FT1020G3 spreadsheet for battery capacity calculation.

Note: the battery leads between the 5010 board and batteries must be kept as short as possible, cable used should be at least 2.5 mm². If the battery leads cable require to be longer, 4 mm² cable should be used and maximum cable length should not exceed 3 metres.

¹⁸² Including the COM loop units and any external equipment connected to the CIE e.g. ASE, OWS, etc. but excluding battery charging current.

¹⁸³ External equipment connected to the control unit (e.g. 60W OWS, sounders, relays, routing equipment, etc.). Note: 120W or 250W OWS current consumption not included, they have its own power supply and batteries.

¹⁸⁴ The output voltage is factory set to 24Vdc. On the power supply, a potentiometer is provide for output voltage adjustment ($\pm 10\%$) available. **Do not use this potentiometer** unless the output voltage is not 24Vdc.

28.5 Fuses

The power supply fuses on the Main board 5010 are as follows:

- F1 = T6.3A Ceramic. +24 V DC from the power supply.
- F2 = T6.3 A Ceramic. + to/from batteries
- F = T6.3 A Ceramic. Between the batteries

28.6 Current consumption measurement

The current consumption of FT1020G3 should be measured, an approximate value is displayed via menu H5/A4.

To measure the actual current consumption of FT1020G3, turn off the mains power (230 VAC and use e.g. a “clamp current meter” on one the wires between one of the batteries and the main board 5010. If the clamp current meter is not available, use a multimeter in series with the same wire.

29 S/W versions

Due to continual development and improvement, different S/W versions can be found.

The S/W versions listed below are valid on the time this document was written (the date of this document or date of revision).

Table 19 Valid S/W versions

S/W for:	Latest version	Required version
FT1020G3 (5010 & 5011) system firmware	2.2.0	2.2.0
4580; 8 zones expansion board, PCB. no. 9287-2B	1.0.5	1.0.2
4580; 8 zones expansion board, PCB no. 9287-3A	2.0.4	2.0.4
4581; 8 relays expansion board	1.0.2	1.0.2
4582; I/O Matrix board	1.0.4	1.0.2
4582; I/O Matrix board for NZ Index Panels	1.0.5	1.0.5
4583; Inputs and Outputs expansion board	1.0.2	1.0
5090; TLON connection board	1.0.0	1..0.0
1728; Ext. Presentation unit (EPU)	1.4.1	1.4.1
1736; Alert Annunciation unit (AAU)	1.4.1	1.4.1
EBLWin ¹⁸⁵	2.2.0	2.2.0
TLON Manager	2.0.1	1.2
1598 Web-server II ¹⁸⁶	2.2.0	2.2.0
1598 Web-server II (RTOS)	1.90	1.51

¹⁸⁵ Sometimes the latest version is not required. It is possible to use an earlier version but check the difference between the versions before use.

¹⁸⁶ The Web server is used in other systems as well. The web-server S/W will be downloaded via the PC program "EBLWin V2.2.x". NOTE! The EBLWin version and the EBL512 G3 system S/W version must be the same (i.e. the first two digits; 2.2.x -- 2.2.x).

30 National regulations

When planning a fire alarm installation, national regulations, customer demands, etc. have to be followed.

FT1020G3 is very flexible with many built-in functions & facilities in the S/W and the PC program EBLWin. When downloading the S/W and/or the SSD, different settings, conventions, languages, etc. can be selected to fulfil the national regulations / requirements.¹⁸⁷

30.1 Conventions

In accordance with the section above, a convention is selected the very first time EBLWin is opened after the installation. This will be the default convention for every new installation¹⁸⁸. Normally the same convention shall be used in all installations thereafter. It is, however, possible to change the convention in the EBLWin dialog box "EBLWin settings" as in Figure 59. The conventions that can be selected are listed in the valid EBLWin version (under menu Tools | Options).

If the Most Recent Unit (MRU) check box is ticked, the MRU file will open when EBLWin is launched. The default COM port to communicate with the CIE can also be changed to your PC port available for "EBL512 G3".

Note: To change convention, a Level 2 special password is required. Access is via the menu, Advanced functions | Level 2. Also note that the convention will be changed only for the open installation.

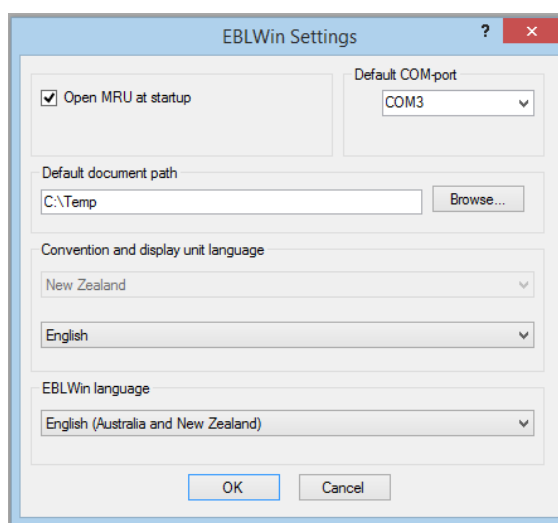


Figure 59 EBLWin Settings Dialog Box

30.2 Language

The language for the text shown in the FT1020G3 display (alarms, faults, menus, etc.) is dependent on which binary file (*.bin) has been downloaded (normally in conjunction with the S/W download).

The binary file (*.bin) for the selected language / convention shall be downloaded via EBLWin (menu Tools | Download software...).

¹⁸⁷ Some of the SSD settings might be a violation to the AS7240.2 or 1670.1-2. If this happens, a "Warning" will be displayed.

¹⁸⁸ Depending on convention, different default settings in EBLWin could be valid and also different functions in FT1020G3.

31 Drawings / Connection Diagrams

All drawings and connection diagrams quoted in this manual are shown on Table 20 below. These drawings are subject to change without notice, as are other technical features and data, resulting from continual development and improvement.

Table 20 List of FT1020G3 block wiring diagrams

<i>Item</i>	<i>Drawing No.</i>	<i>Issue</i>	<i>Description</i>
1	F725-01	1	FT1020G3 Block wiring diagram Sheet 1
2	F725-02	2	FT1020G3 Block wiring diagram Sheet 2
3	F726	1	FT1020G3 Main Board 5010
4	F727	1	FT1020G3 MMI Board 5011
5	F728	2	4580 - 8 Zone Expansion Board
6	F729	2	4581 – 8 Relay Expansion Board
7	F730	2	4582 – I/O Matrix Board
8	F731	2	4583 5 Inputs 3 Outputs Expansion Board
9	F732-01	2	FT1020G3 5010 AC & DC Power Connections
10	F732-02	1	FT1020G3 5010 Programmable Inputs & Outputs
11	F732-03	1	FT1020G3 5010 External Communications
12	F733	2	COM Loop Units Connection Diagram
13	F734	2	Web-Server II1598 Connection Diagram
14	F735	2	3361 Addressable Multi-purpose Module
15	F737	2	3364 / 3366AU Connection Diagram
16	F738-01	2	FT1020G3 TLON examples Sheet 1 of 3
17	F738-02	2	FT1020G3 TLON examples Sheet 2 of 3
18	F738-03	1	FT1020G3 TLON examples Sheet 3 of 3
19	F763	1	FT1020G3 General Arrangement
20	F765	6	FT1020G3 Standard connection Diagram
21	F768	2	FT1020G3 Gas Module Interface
22	F779	1	WA ASE Connection Diagram
23	F781	2	FT1020G3 Standard NZ Block Wiring Diagram
24	F784-01	0	COM Loop Cable Length & Specifications Sheet 1
25	F784-02	0	COM Loop Cable Length & Specifications Sheet 2
26	F786-01	1	FT1020G3 TP/FT10 TLON Connection Sheet 1
27	F786-02	1	FT1020G3 TP/FT10 TLON Connection Sheet 2

The above drawings will be available in a separate document, only two drawing are shown in this manual:

1. Figure 60 FT1020G3 General arrangement , page 184
2. Figure 62 FT1020G3 Standard Block Wiring Diagram, page 186

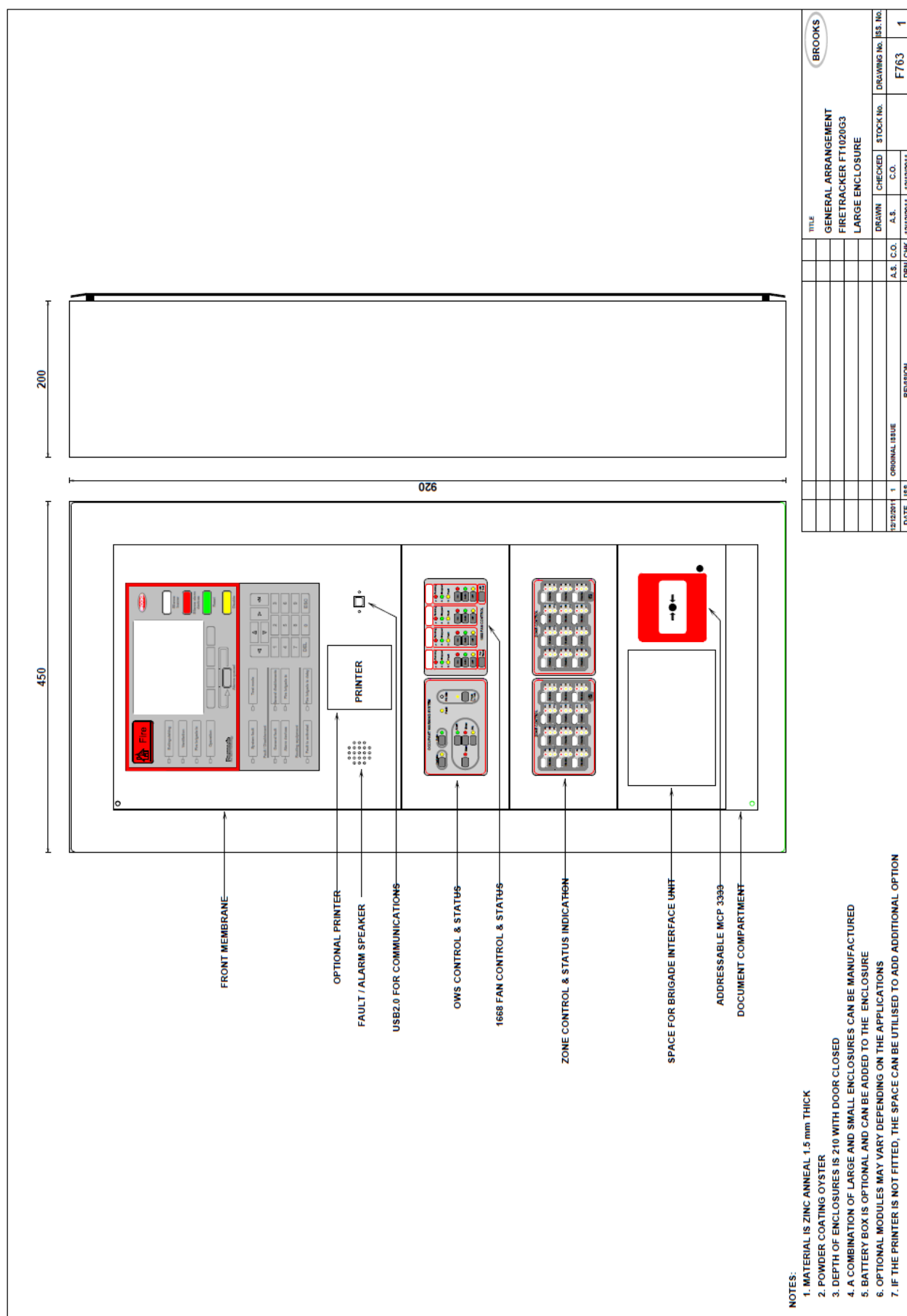


Figure 60 FT1020G3 General arrangement

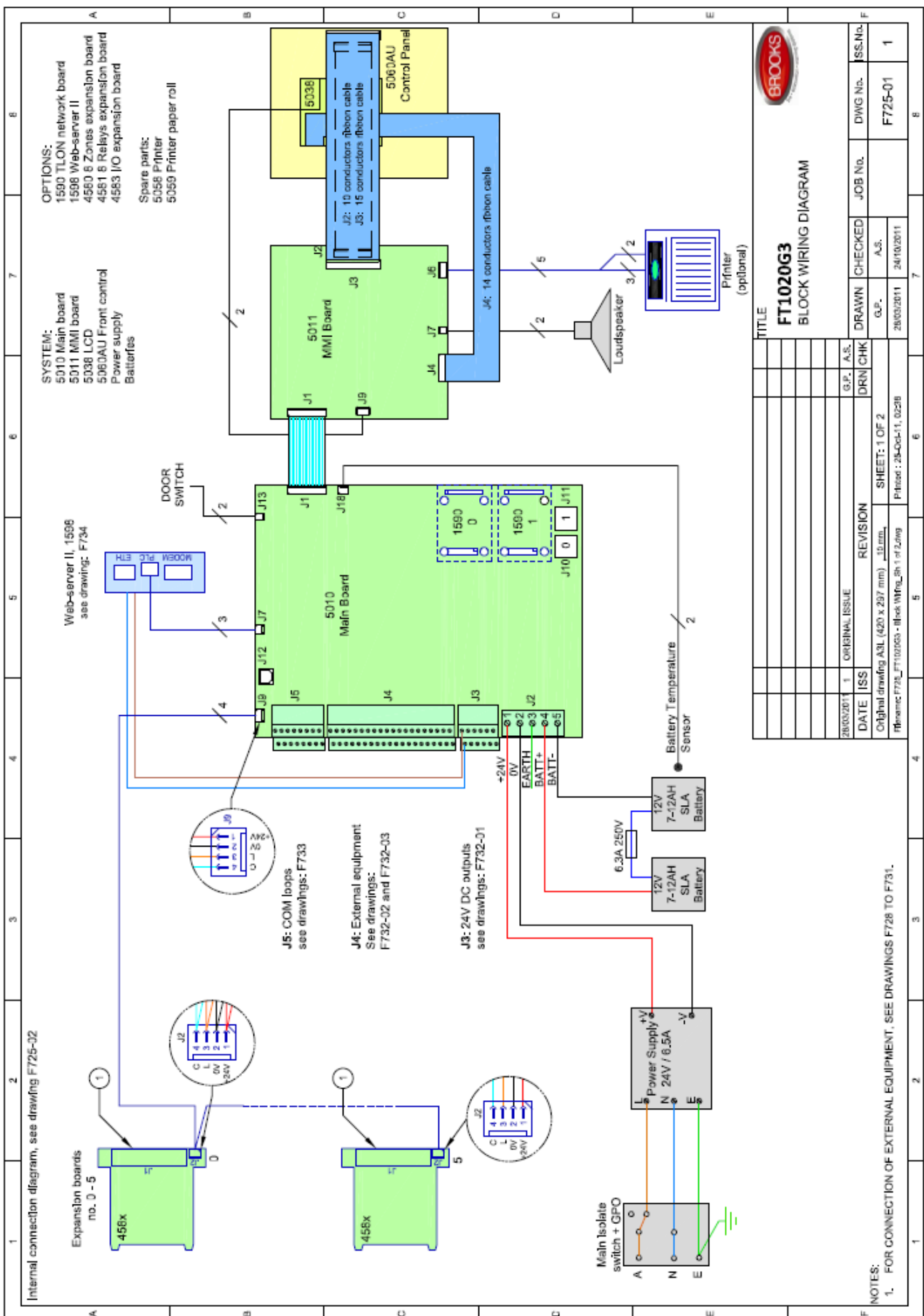


Figure 61 FT1020G3 Block Wiring Overview

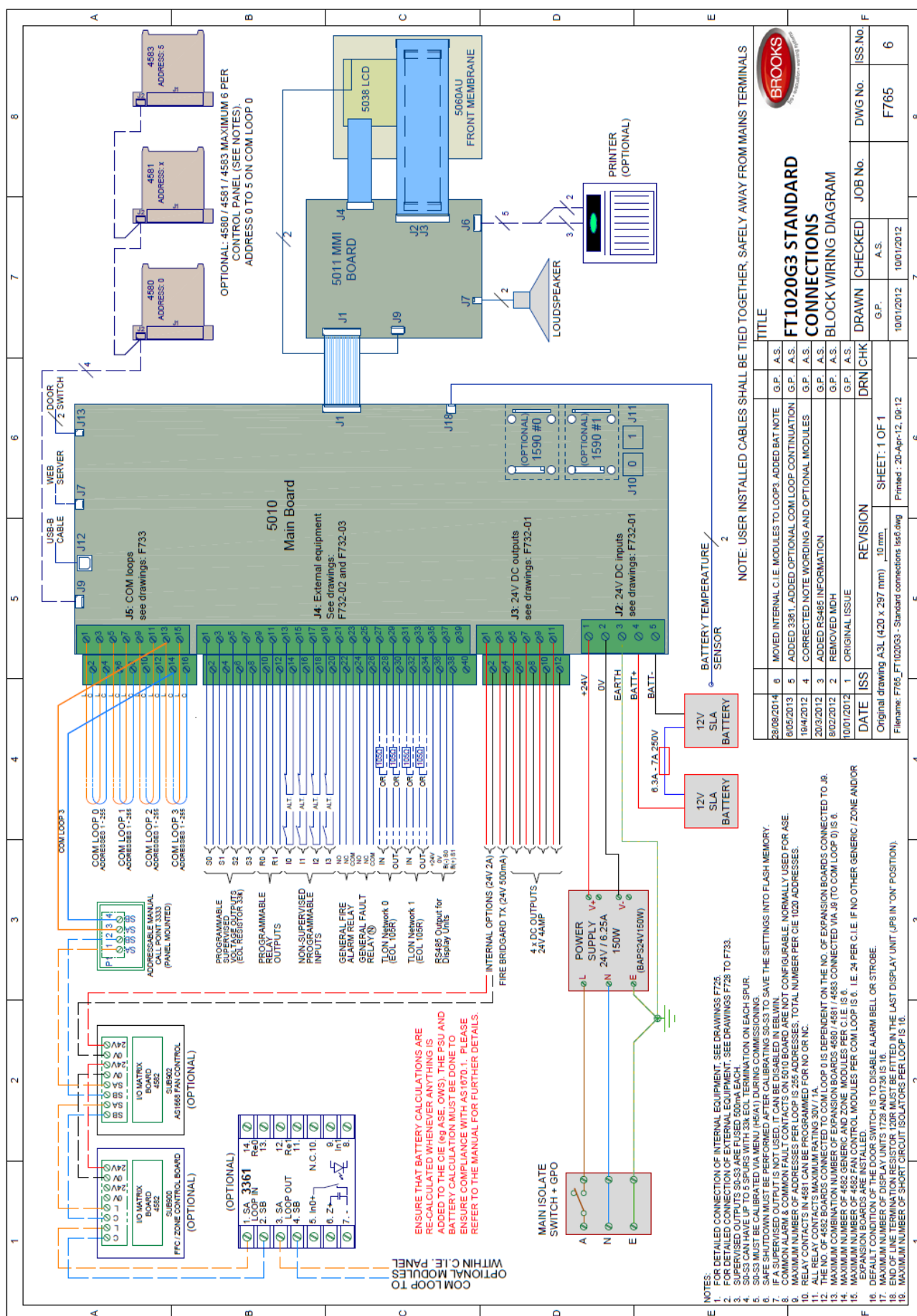


Figure 62 FT1020G3 Standard Block Wiring Diagram

32 Revision history

32.1 Revision History Table

Issue	Date	Description	Written By	Checked By
Panasonic	11/06/2010	Original Panasonic manual	J. Pattersson	A.S.
Rev 1	20/02/2012	Update the original MEW01351 Rev 1 document to suit AU & NZ market	A. Shenouda	E.T. / A.S.
Rev 1.1	30/05/2012	Update drawing F765 and F738, update section 6.4 & 6.5	Edwin Thein	A.S.
Rev 2.1	02/04/2015	Update to include S/W V2.1.1 & EBLWin V2.1.2. Transfer all drawings to a combined spate document MA437	E.T. / A.S.	A.S.
Rev 2.2	3/8/2015	Update to include S/W V2.2.0 and make minor corrections.	E.T. / A.S.	A.S.
Rev 2.2.1	19/2/2016	Change block wiring diagram and update Chapter 3	A.S.	

32.2 Software Revision V2.2.0 Modifications

32.2.1 New common features and additions

- **Local Alarm Acknowledgement Unit 4445**

The module is the Panasonic version of Brooks AAM, in EBLWin the module is called "Local Alarm Acknowledgement Unit" LA AU.

Note: Brooks AAM (AAFC in EBLWin) has been moved to the obsolete loop unit section in EBLWin.



- **Zone Groups**

This is new control expressions that can be used to group unlimited number of zones into one zone group. A single zone can only be a member in one zone group. Maximum of 30 zone groups can be defined in a system. The new control expressions for zone groups are as follow:

- ☞ PreWarningZoneGroup (Zone Group, No. of alarms)
- ☞ FireAlarmZoneGroup (Zone Group, No. of alarms)
- ☞ HeavySmokeAlarmZoneGroup (Zone Group, No. of alarms)
- ☞ FirstAlarmInZoneGroup (Zone, Zone Group)

- **Pulse on 3361 and 3364**

The "Pulse" and "Delayed pulse" (defined in output signal period) can now be programmed for the outputs of 3361 and 3364. The pulse width should be fixed for 7 seconds.

- **Selectable fire alarm types for zone line inputs**

In previous revisions, all fire alarms from a zone line input via 3361 or 4580 are treated as a normal fire alarm (type A). In V2.2.0, the zone line input can be programmed in EBLWin V2.2.0 to one of the following five different alarm types:

Smoke (B)

Heat (B)

MCP (A)

Other (A)

Other (B)

32.2.2 New or modified features in EBLWin only

- Fault latching in the Australian convention is set as default in system properties.
- If the CIE time differs more than 60 minutes to the time shown in the PC, a dialog box will display when logon is performed. Via this dialog box, the PC time can be used to update the CIE time.
- A user that is defined to have access to Web-server (not the CIE) can have a password containing between 6 and 10 character (not only digits).
- If a Single TLON network (no redundancy) is configured, the validation check will generate a warning "Convention violation".
- In V2.2.0, the fault list can be sorted by CIE and COM loop.

32.2.3 New or modified feature in system software EBL only

- Output without a control expression are considered to be non-existent in the system. In previous versions, an output with no control expression could be manually controlled from the menu system, fan control or via EBLnet. In V2.2.0, an output with no control expression is considered to be non-existent and cannot be controlled in any way.

If an output is to be controlled manually only, it must have a never-true control expression similar to "TimeChannelActivated" (Always off).
- If an input is set to "Not used", or if an output has no control expression, the supervision fault is not generated even if the "Supervised" check box in EBLWin is checked.

NSW - Head Office
4 Pike Street Rydalmere NSW 2116
Ph: 02 9684 1466
Fax: 02 9684 4146
Website: www.brooks.com.au

VIC
1/3 Molan Street, Ringwood, VIC 3134
Ph: 03 9879 5294
Fax: 03 9879 5249

SA
729A Port Road, Woodville, SA 5011
Ph: 08 8347 0000
Fax: 08 8347 0600

QLD
2/49 Boyland Ave Coopers Plains, QLD 4108
Ph: 07 3373 8222
Fax: 07 3373 8022

WA
P.O. Box 2114, Midland DC W.A. 6936
Ph: 08 6262 8095
Fax: 02 9684 4146

New Zealand
Unit 106 "The Zone" 23 Edwin St, Mt Eden, Auckland 1024
Ph: +64 9 638 4644, Toll Free 0800 220 007 (NZ only)
Fax: +64 9 638 4645

Or National Australian Sales Number: 1300 78 FIRE (3473)
For the cost of local call.