Panasonic

Planning Instructions

MEW01551

Revision -

Fire Alarm System EBL512 G3 V2.0.x

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Table of contents

Drawings according to the valid table of drawings.

1 Introduction

EBL512 G3 Planning Instructions is a document[1] intended to be used by planning engineers as well as service / commissioning engineers.

This document should be read in conjunction with the drawings according to the valid Table of drawings and the EBL512 G3 Operating Instructions MEW01552.

When planning a fire alarm installation the national regulations have to be obeyed. A lot of detector types can be used. Detector coverage area and detector placing in the room / building, etc. are matters for the planning engineers and are not described in this document.

Due to continual development and improvement, different S/W versions might be found. This document is valid for **S/W version 2.0.x**. On the date / revision date of the document **x = -**.

Since the EBL512 G3 control unit (c.i.e.) is produced for many countries the look, the texts, the functions, etc. might vary.

Products

Consists of one or more parts (HW) according to a **Product Parts List**. A product has:

- a **type number**

  5000 EBL512 G3 c.i.e. Configured for 128, 256 or 512 alarm points and with or without printer depending on article number.

  5001 EBL512 G3 c.i.e. No front panel and no Plexiglas in the door. Configured for 128, 256 or 512 alarm points depending on the article number.

- an **article number** is often the same as the type no. but a country code can be added (e.g. **SE** for Sweden). If the letters **PRT** also are added in the article number the product comes with a printer. If digits are added to the article number they are showing the configured number of alarm points (e.g. 5000**PRTSE-128**).

- a **product name** (e.g. **EBL512 G3 CU, 128 alarm points, with printer**)

HW

A HW (e.g. a **p**rinted **c**ircuit **b**oard) has:

- a **type number** (e.g. **5010**)
- an **article number**, often the same as the type no. but sometimes a country code is added (e.g. 5010**SE**)

[1] File name: L:\User documents\512 G3\V2.0.x\MEW01551(Rev -).doc

- a **product name** (e.g. **Main Board 128 alarm points**)
- a **p.c.b. 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**

S/W

A S/W has:

- a **version number** (e.g. **V2.0.x**)
- sometimes additional information, such as **Convention** (different functions / facilities), **Language**, **Number of addresses**, etc.

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. **V2.0.x**).

2 Definitions / Explanations

Definitions / explanations / abbreviations / etc. frequently used or not explained elsewhere in the document.

2.1 PESN AB

Panasonic **E**co **S**olutions **N**ordic AB

2.2 Alarm points

Units, which can generate a fire alarm (in the control unit), i.e. analog detectors (sensors), conventional detectors, manual call points, etc.

2.2.1 Smoke detector

Analog or conventional photoelectric (optical) smoke detector

2.2.2 Sensor

Sensor = Analog detector

2.2.3 Analog detector

Contains an A/D-converter. The **C**ontrol **U**nit pick up the digital values ("sensor values") for each detector individually. All evaluations and "decisions" are then made in the C.U. Analog detectors are addressable – an address setting tool is used for the detector's COM loop address and mode settings.

An analog detector has to be plugged in an Analog Sensor Base (**ASB**).

2.2.4 Analog Sensor Base (ASB)

An analog detector is plugged in an **ASB**, which is connected to a COM loop (see below).

2.2.5 Conventional detector

A detector with only two statuses, i.e. normal or fire alarm. The detector has a "closing contact" and a series alarm resistor. Normally plugged in a conventional detector base **CDB** (see below), which is connected to a conventional zone line input. Some types (e.g. water proof types) are connected directly on zone line. An end-of-line device has to be connected in the last unit on the zone line.

2.2.6 Conventional Detector Base (CDB)

A conventional detector is plugged in a **CDB**, connected to a conventional zone line input.

2.2.7 Addressable

A unit with a built-in address device, i.e. each unit is individually identified, handled and indicated in the Control Unit.

(The unit can be an I/O unit with a zone line input, to which one or more conventional "alarm points" can be connected.)

2.2.8 Conventional zone line input / External line

Input intended for one or more conventional alarm points. End-of-line device in the last alarm point on the line.

2.3 Output unit

Addressable unit with programmable control outputs. Connected to a COM loop (see below).

2.4 Output / Control output

Defined or programmable function. Relay output or voltage output (supervised / monitored or not), in the Control Unit or an output unit connected on a COM loop.

2.5 Short circuit isolator (ISO)

Addressable unit for automatic disconnection of a part (segment) of a COM loop (see below) in case of short circuit on the loop. (According to EN54-2, one ISO is required per 32 alarm points.)

2.6 Display unit (D.U.)

Addressable unit (RS485 line) for fire alarm presentation (incl. user definable alarm text), alert annunciation, etc.

2.7 COM loop

Loop = a cable, twisted pair, to which all the addressable units can be connected. Starts in the **C**ontrol **U**nit and returns back to the C.U.

2.8 Control Unit / C.U. / C.I.E.

Control **U**nit = **C**ontrol and **I**ndicating **E**quipment (c.i.e.) = Unit to which the alarm points are connected (via e.g. a COM loop). Indicates fire alarm, fault condition, etc. Fire Brigade Panel & Control Panel, i.e. the front, included or not included. Printer included or not included.

2.9 Fire Brigade Panel (FBP)

Intended for fire alarm presentation, etc. for the fire brigade personnel. Can be a part of the control unit (a part of the front) or a separate Display Unit (external FBP).

In an ext. FBP, a printer can be included.

2.10 Control panel (CP)

A part of the control unit (a part of the front), intended for the building occupier / officer, service personnel, etc., to "communicate" with the Control Unit / the System.

2.11 System / Installation

One control unit or several control units connected via a TLON network (co-operating control units).

2.12 Network / TLON® / LonWorks® / Echelon / Node / TLON Conn. board / Channel / Backbone net / Router / Repeater

Brief explanations to the words/expressions to be found in connection with a "TLON Network". See also separate TLON Technical description.

TLON® = TeleLarm Local Operating Network = a *LonWorks*®- based network[2] for communication between several control units/nodes. The protocol is called *LonTalk* and the transmission works with doubly-terminated bus topology (*Echelon FTT-10*). To connect a control unit to a network, a TLON connection board has to be plugged in each control unit. EBL512 G3 also supports a redundant TLON Network. In this case two TLON connection boards have to be plugged in each control unit.

A network can be one channel (FTT-10) or several channels, connected via routers. (In a TLON Network a sub net = a channel.)

Routers are used for safety reasons in a single TLON Network (up to six control units per channel). Routers can also be used to increase the distance (cable length) between the end nodes in a channel.

Router or Repeater is the same type of unit (different configuration). All network programming (configuration) is made with the PC program **TLON Manager**. See also separate TLON Manager Operating Instructions.

2.13 LED

LED (**L**ight **E**mitting **D**iode) = Yellow, green or red optical indicator ("lamp").

2.14 External Indicator (Ext. LED)

A unit with an red LED connected to a base (ASB / CDB) or a detector with an output for an ext. LED.
Lit when the built-in LED in the detector / base is lit.

2.15 Display / LCD

LCD (**L**iquid **C**rystal **D**isplay) = Display (in the c.i.e. or Display unit) for presentation of fire alarms, fault messages, etc. In EBL512 G3 it is a graphical monochrome LCD (320 x 240 dots) with backlight.

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[2] LonWorks® = A "summing-up-name" for the market of Echelon Corporation Inc. technology.

2.16 Door open (Door / Key switch)

In EBL512 G3 and ext. FBP 1826 there is a door switch, which is activated when the door is open. In the ext. FBP 1828 this door switch is replaced with a key switch.
An open door is indicated in the LCD (i.e. an "open door" icon).

2.17 Site Specific Data (SSD)

The SSD is unique for each installation. All alarm points, presentation numbers, user definable alarm texts, programmable outputs, etc. are created in the PC program **EBLWin** and also downloaded in EBL512 G3 unit(s) with **EBLWin**.

2.18 Software (S/W) / Firmware / System program

The software (S/W) – also called Firmware and System program – makes the control unit (the microprocessor) work. It is factory downloaded but another / new version can, via the PC program **EBLWin**, be downloaded in EBL512 G3 on site.

2.19 EBLWin

PC program used to create and download the SSD in EBL512 G3 unit(s). Also used to download another / new software version and to upgrade the maximum number of alarm points in EBL512 G3.
Can be used during commissioning / maintenance of the EBL512 G3 system (autogenerate COM loop SSD, acknowledge faults, etc.)

2.20 Web-server

The **Web-server** is used to get EBL512 G3 information as well as remote control via a PC (browser) and an intranet / internet. The Web-server is configured via the PC tool **EBLWin**.

3 Overview

3.1 The EBL512 G3 system

EBL512 G3 is a microprocessor controlled intelligent fire alarm system, intended for analog addressable detectors, as well as conventional detectors and manual call points. Programmable control outputs and output units are available. Up to 1020 addresses (of which up to 512 can be alarm points) can be connected to each control unit (c.i.e.) - according to EN54-2.
EBL512 G3 is available in several types, versions and configurations. **EBL512 G3** can be used as a stand-alone control unit or connected to a TLON Network, i.e. a "system" with up to 30 control units. Each control unit has access to all information.

Product type no.	*Product name*
5000	EBL512 G3 c.i.e. With or without a printer[3]. With front and display.
5001	EBL512 G3 c.i.e. (A "grey box".) Without a front, display and printer. No door.

EBL512 G3 is developed and designed according to the European standard EN54, part 2 and 4. The Swedish front conforms to SS3654.

3.1.1 Printer

The control unit EBL512 G3 type **5000** can be delivered with a printer[3] ("PRN" included in the article number) or without a printer.
In the Ext. Fire Brigade Panel 1826 it is possible to mount an optional Printer 1835.

3.1.2 Expansion boards

In the control unit (c.i.e.) it is possible to mount up to six expansion boards. The following expansion board types are available:

Product type no.	*Product name*	*Note*
4580	8 zones expansion board	
4581	8 relay outputs expansion board	
4583	In- and outputs expansion board	

Regarding the expansion boards, see also chapter "Expansion boards 458x", page 26 and EBL512 G3 drawings.

3.1.3 Power supply

The main power source is a built-in switched power supply (rectifier) 5037. 230 V AC, 1.6 A / 24 V DC, 6.5 A.

[3] The printer is available as a spare part (5058), i.e. it comes without any mounting frame, connection cable, etc.

The second power source is a backup battery (2 x 12 V). In the c.i.e. is space for two 28 Ah batteries. Larger batteries (up to 65 Ah) have to be placed outside the c.i.e.
The batteries and the power supply are connected to the Main board (5010), which handles the charging of the batteries, etc. See chapter "Power supply", page 174 for more information.

3.2 Software (S/W) versions

Due to continual development and improvement, different S/W versions can be found. When installing a new control unit in a system with "older" control units, you might have to upgrade the S/W in the old control units (or download an older S/W version in the new control unit). T**he same S/W version is required in all control units** in a TLON Network.

3.3 Documents

The following EBL512 G3 documents are available:

- Planning Instructions (this doc.)
- Operating Instructions MEW01552
- Drawings (connection diagrams, etc.)

Normally, information found in one of the documents is not found in another document, i.e. the documents complement each other.

For the TLON Network / TLON Manager, Web-server, etc. are separate documents available.

3.4 Applications

The EBL512 G3 system is intended for small, medium and large installations. The intelligent control units offer the system designer and end user a technically sophisticated range of facilities and functions. Programming (PC programs EBLWin and TLON Manager) and commissioning the control units / system is very easy.
Start with one control unit and later when it is required, add more units. The TLON Network makes it possible to install the control units in one building or in different buildings.

3.5 PC programs

The following PC programs are used together with the EBL512 G3 system.

3.5.1 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 and download / make a backup (upload) of site specific data (SSD).
- download new software / settings / convention / configurations / control unit & system properties / etc.
- create and download the user definable alarm texts shown in the display in the control units / ext. FBPs and other Display Units.
- see the fire alarms, faults and disablements as well as reset, acknowledge and re-enable respectively.
- configure the Web-server II (1598)

EBLWin shall have the same version number as the EBL512 G3 software version number, e.g. **2.0**.x and **2.0**.x respectively. (x indicates only 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 EBL512 G3 units with the corresponding version.

3.5.2 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 can be used.)

4 Control Unit / TLON Network

See also chapter "TLON connection board 5090", page 36.

4.1 The TLON Network

An installation (a system) can be **one control unit (c.i.e.)** or up to **30 control units** connected in a **TLON Network**.

In a TLON Network each control unit works independent but has nevertheless total access to all information in the system.

NOTE!
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 c.i.e.
- When the "Fire door closing" function is used, the alarm points and their "belonging" output must be connected to the same c.i.e.
- When the interlocking function is used, the input, the output and the Interlocking Combination (area-point) must be in / connected to one c.i.e. An input and an output can only be used in one Interlocking Combination.
- When the Alert Acknowledgement Facility (AAF) is used, all devices within the same AAF zone must be connected to the same c.i.e. (AAF is used on the Australian market only.)

4.2 Single TLON Network / Redundant TLON Network

The EBL512 G3 system can be build up as a **single TLON Network** or as a **redundant TLON Network**.

In the single TLON Network, one TLON connection board (1590 / 5090) has to be plugged in each control unit whereas in the redundant TLON Network, two TLON connection boards have to be plugged in each control unit.

In the single TLON Network, only one network is available (Network no. 0) but in the redundant TLON Network, two networks are available (Network no. 0 and Network no. 1). Network no. 1 is only supervised (no communication) until Network no. 0 is not working.

The redundant TLON Network supports full functionality also in case of a network fault (i.e. open circuit or short circuit) in one of the TLON networks. A fault in one of the TLON Networks generates the following fault:

FAULT: Control unit xx has no contact with control unit xx, network x

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

NOTE!

In a system where each control unit is independent of the other (i.e. each control unit works like a "standalone" control unit) a single TLON Network may be sufficient. To maintain security, in this case:

- All control units shall be of type 5000, i.e. including front panel.
- The alarm points and their "belonging" outputs shall be connected to the same control unit.
- If fire alarm routing equipment ("Fire brigade tx" output) shall be used, each control unit in the system shall be able to activate a fire alarm routing equipment independent of the other control units.

In all other cases and for highest security, a redundant TLON Network shall be used.

(According to EN54-13, 4.3.1.2: *A single fault on a transmission path connecting one CIE to another CIE, shall not adversely affect the correct functioning of any part of the networked system.*)

5 Control Units 5000 and 5001

Two types of control units are available:

Type no.	Product	Front (FBP with display & CP)
5000	EBL512 G3 c.i.e. configured for 128, 256 or 512 alarm points and with or without printer is depending on the article number. Expansion boards can be mounted (option).	Yes
5001	EBL512 G3 c.i.e. configured for 128, 256 or 512 alarm points depending on the article number. Printer **cannot** be mounted. Expansion boards can be mounted (option).	No

Figure 1. ***Left:*** *The EBL512 G3 Control Unit 5000, with printer. The look might vary according to configuration, etc.* ***Right:*** *The EBL512 G3 Control Unit 5001. (No front with display, no printer and no door.)*

The control unit is housed in a grey metal cabinet. Depending on country, convention, configuration, etc. the look, language and functions might vary, as well as the max. number of alarm points (128, 256 or 512) it is configured for[4]. In total, 1020 COM loop units (addresses) can always be used, of which 512 can be alarm points.

[4] Max. no. of alarm points can be upgraded on site.

The door in type 5000 has a Plexiglas ahead of the front, see Figure 1 and Figure 2 respectively.

*Figure 2. The EBL512 G3 front with display ("**M**an-**M**achine-**I**nterface"); The Fire Brigade Panel (**FBP**) is the upper part and the Control Panel (**CP**) is the lower part. The look might vary depending on the language, country, etc.*

The **FBP** is used by the fire brigade 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 depending on how many alarm points / zones having activated fire alarm. In the middle part will the fire alarms be shown, i.e. one alarm point or one zone together with a user definable alarm text (if programmed) plus some other information.

External FBPs are also available.

The **CP** is used to "communicate" with the system, i.e. for commissioning, monthly tests, maintenance, etc. 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 required.[5]
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 EBL512 G3 Operating Instructions MEW01552.

[5] The same User names and Passwords (for the different user levels) will be used for logon to the Web-server.

Each control unit 5000-5001 has the following basic configuration:

- Grey metal cabinet
  - DIN rail for Web-server (1598).
- MMI board (5011) (not in 5001). See dwg. 512 G3 - 12.
  - EBL512 G3 front with display (not in 5001)
- Main board (5010). See dwg. 512 G3 - 11.
  - Four COM loops (0-3) to which the loop units are connected. See dwg. 512 G3 – 25 and – 31.
  - Four programmable supervised voltage outputs (S0-S3). See dwg. 512 G3 - 23.
  - Two programmable relay outputs (R0-R1). See dwg. 512 G3 - 23.
  - Four programmable inputs (I0-I3). See dwg. 512 G3 - 23.
  - Six 24 V DC outputs (power supply outputs for Web-server II (1598), routing equipment and external equipment). See dwg. 512 G3 - 22.
  - Two not programmable relay outputs for routing equipment (**Fire alarm** output for Fire brigade tx and **Fault condition** output for Fault tx). See dwg. 512 G3 - 24.
  - Space & connectors for two TLON connection boards (1590 / 5090). See dwg. 512 G3 - 24.
  - RS485 and 24 V DC outputs for Display Units (1728, 1735, 1736, 1826 & 1828). See dwg. 512 G3 - 24.
  - Connector for expansion boards (4580, 4581 & 4583). See dwg. 512 G3 - 26.
  - Connectors for Web-server (1598). See dwg. 512 G3 - 32.
  - Battery charger.
    - Connectors for power supply (rectifier) and batteries. See dwg. 512 G3 - 21.
- Built-in power supply. See chapter "Power supply", page 174. Connections and more information, see dwg. 512 G3 - 21.
  - Switched power supply (rectifier), 230 V AC / 24 V DC (5037).
  - Space and connection cables for two Sealed Lead-Acid backup batteries (12 V, 28 Ah).
  - Battery temperature sensor.
- Space for up to six expansion boards (458x).

See following chapters for more and detailed information.

5.1 Mounting plates

The 5000 and 5001 units are delivered with a mounting plate approved for mounting on an incombustible wall (e.g. concrete).

5.1.1 Mounting plate for 19" mounting rack, 5020

When the 5000 and 5001 units shall be mounted in a 19" mounting rack, the standard mounting plate can be replaced with a Mounting plate for 19" mounting rack 5020.

5.1.2 Mounting plate for inflammable wall, 5021

When the 5000 and 5001 units shall be mounted on an inflammable wall (e.g. wood), the standard mounting plate should be replaced with a Mounting plate for inflammable wall 5021, which can be provided with cable glands.

Figure 3. The standard mounting plate, the Mounting plate for 19" mounting rack 5020 and the Mounting plate for inflammable wall 5021.

5.2 COM loops

Each control unit has four COM loops (0-3) to which the loop units are connected. Connections according to dwg 512 G3 – 25, - 31, - 36, - 37 & - 38.

On each COM loop can up to 255 COM loop units be connected (COM loop address 001 – 255). Regarding type and number of COM loop units in relation to the cable length / type, see dwg 512 G3 – 41 and chapters "COM loop cable length", page 166 and "Current consumption", page 169.

NOTE! In total, up to 1020 (4 x 255) COM loop units can be used but only 512 can be alarm points, according to EN54-2.

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 gets a technical number (040123). Each alarm point and zone line input has a fire alarm presentation number (Zone-Address), e.g. 001-01. See EBL512 G3 Operating Instructions MEW01552 for more information.

Normally the control unit communicates with the COM loop units in the COM loop A-direction only. In the B-direction is only the COM loop voltage checked, which has to be ≥ 12 V DC.

5.3 Programmable voltage outputs (S0-S3)

The 24 V DC outputs S0-S3 are supervised (monitored)[6]. Connections according to dwg 512 G3 – 23. When all connections are done a calibration has to be performed, see chapter "Calibration of supervised outputs", page 118 and the EBL512 G3 Operating Instructions MEW01552, chapter "Calibration of supervised outputs (menu H5/A1)".
Each output has to be programmed (via EBLWin) regarding:

- Type of output, i.e. output for Control, Alarm devices, etc.
- Logic, i.e. normally low (default) **or** normally high (24 V DC)[7].
- Activation time and type / output signal period (steady, pulse, delay, etc.).
- Control expression (one or more trigger conditions).

See also chapter "Programmable outputs", page 71.

5.4 Programmable relay outputs (R0-R1)

Connections according to dwg 512 G3 – 23.

Each output has to be programmed (via EBLWin) regarding:

- Type of output, i.e. output for Control, Alarm devices, etc.
- Logic, i.e. normally open (NO) **or** normally closed (NC) contacts.
- Activation time and type / output signal period (steady, pulse, delay, etc.).
- Control expression (one or more trigger conditions).

See also chapter "Programmable outputs", page 71.

5.5 Programmable inputs (I0-I3)

Connections according to dwg 512 G3 – 23.

Each input has to be programmed (via EBLWin) regarding:

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

Open = R > 20K. Closed = R < 500 Ω.
An input has to be activated ≥ 0.5 sec.

See also chapter "Programmable inputs", page 64.

[6] The outputs are in EBLWin default set as supervised but via EBLWin it is possible to set each output (S0-S3) individually to be not supervised.

[7] A normally high output cannot be supervised.

5.6 Relay outputs for routing equipment (tx)

Not programmable outputs. The outputs can be tested via menu H1, see the EBL512 G3 Operating Instructions MEW01552. Connections according to dwg 512 G3 – 24.

5.6.1 Fire alarm output

This output is normally used for fire alarm routing equipment (Fire brigade tx). It is a change-over relay contact that will be activated when a fire alarm is generated in the system[8]. Activated output is (normally) indicated by the LED "Fire brigade tx".[9]

5.6.2 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[10] in the control unit (c.i.e.)[11].

De-activated output (i.e. fault condition) is indicated by the LED **Routing equipment** "Fault tx activated".

[8] The output can be disabled via "door open" or via menu H2/B5. See also chapter "Alert Annunciation", page 104.

[9] 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.

[10] Also when the control unit is out of power (i.e. power supply and battery out of work) or Watch-dog fault.

[11] The output can be disabled via "door open" or via menu H2/B5.

6 Expansion boards 458x

Inside EBL512 G3 (5000 and 5001) there are spaces and holders for up to six optional expansion boards of the types **4580, 4581 and 4583** to be mounted, see drawing 512 G3 - 01. One Exp. boards connection cable **5089** shall be used for connection of up to six expansion boards to the main board. (Connector "J2" on the expansion board respectively and "J9" on the main board 5010.) See dwg 512 G3 - 26.

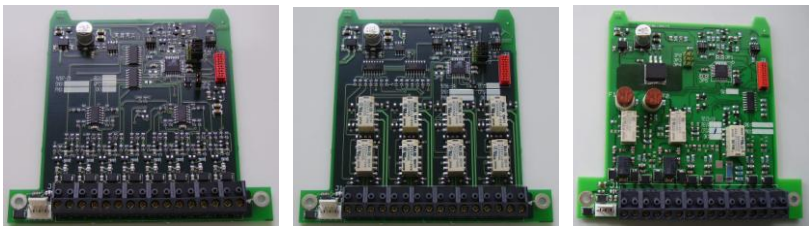


*Figure 4. 8 zones expansion board **4580**, 8 relays expansion board **4581** and In- and outputs expansion board **4583**.*

I/O Matrix board 4582[12] is a special type of "expansion board", plugged as a "piggy back" to an **Application board**[12], which is connected to a COM loop and to 24 V DC. On each COM loop 0-3 can **up to six** 4582 boards be used (i.e. up to 24 boards in total).

NOTE! COM loop **0** is however a special loop, since the exp. boards 4580, 4581 and 4583 actually are internally connected on this loop. On COM loop **0** can in total up to six 4580, 4581, 4583 and 4582 boards be used. This means that for each exp. board 4580, 4581 and 4583 used, the number of 4582 boards is reduced with one.

*Figure 5. I/O Matrix board **4582**.*

Max. six of the I/O Matrix boards 4582 can be programmed as type Generic and/or Zone control.
NOTE! ≤ 512 programmable outputs per c.i.e. can be used.

Each expansion board 4580, 4581 & 4583 and the I/O Matrix board 4582 have to have a board address (board no. 0-5) set via jumpers on the board respectively. On boards of type 4580, 4581 and 4583 jumpers "JP2-JP4" and on board type 4582 jumpers "JP1-JP3", see Figure 6, page 27. All the board programming is done via EBLWin.

[12] The 4582 board can be programmed as type Fan, Generic or Zone control. It is mostly used with Australian Application boards but the Fan control application board 4594 (used with the Fan control panel 4593) is available on all markets, see page 56.

6.1 Expansion board no. (address) setting

The expansion board no. (address) is set via jumpers on the expansion board respectively.

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

Figure 6. Expansion boards 4580 - 4583. Jumpers for expansion board no. (address) setting.

6.2 8 zones expansion board 4580

Each board has to be programmed via EBLWin regarding:

- Address / Board no. (set via the jumpers "JP2-JP4", see Figure 6 above.)

The 4580 board has eight conventional zone line inputs (0-7) intended for conventional detectors. In the last alarm point on each zone line, has to be connected an end-of-line device, depending on the selected "Type of zone line input", see below.
Connections to "J1:1-16" and "J2" according to drawing 512 G3 - 33.

Each zone line input has to be programmed via EBLWin regarding:

- 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 / No alarm at short circuit (i.e. if short-circuit on the zone line shall generate a fire alarm or a fault)
- Zone number (address optional)
- Fire alarm delay / No fire alarm delay
- Text (Alarm text – if you wish)
- Alert annunciation & time channel
- Disablement & time channel

The terminals support a wire size up to 1.13 mm^2 (1.2 mm).

6.2.1 Type of zone line input

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

6.2.1.1 Zone line input (EOL capacitor)

This type is normally used. It has the lowest zone line current consumption since the end-of-line device is a capacitor, 470 nF (±10 %). Max. allowed cable resistance is 50 ohm. Max. allowed cable capacitance is 50 nF. Total detector current consumption ≤ 1.5 mA.

6.2.1.2 EX zone line input (EOL resistor)

This type shall be used **only** when units for Hazardous (Ex) areas shall be connected, i.e. via the Galvanic isolator MTL5061 (2820). The end-of-line device has to be a resistor, 10K (±5 %) with a body surface area > 230 mm^2 (supplied with the Galvanic isolator). Max. allowed cable resistance is 40 ohm. Max. allowed cable capacitance is 70 nF. Total detector current consumption ≤ 1.0 mA.

6.2.1.3 Zone line input (EOL resistor)

NOTE! Valid for the Australian and New Zealand conventions only.

This type shall be used **only** when any of the other types cannot be used (e.g. for some older type of detectors and not Panasonic detectors). It has the highest zone line current consumption since the end-of-line device is a resistor, 4K7 (±5 %). Max. allowed cable resistance is 50 ohm. Total detector current consumption ≤ 2.0 mA.

6.2.2 Input states

Each input will be in one of six different states.

6.2.2.1 Normal state

The normal zone line input state, i.e. no alarm, no fault, etc. and the nominal voltage is 24 V DC[13]. From this state any other state can be reached / activated.

6.2.2.2 High current state

The max. current consumption limit[14] for the zone line input is exceeded, which is indicating that e.g. too many detectors are connected. This generates a fault condition in EBL512 G3. From this state any other state can be reached / activated except the open circuit state.

6.2.2.3 Alarm state

One alarm point (or more) on the zone line is in alarm state and the alarm limit[14] for the zone line is exceeded. This activates a fire alarm in EBL512 G3. In this state short-circuit, open circuit, high current and low voltage states cannot be reached / activated. After alarm reset (in EBL512 G3) the zone line input will return to the normal state.

[13] Allowed voltage 15-28 V DC.

[14] This limit is depending on the selected input mode.

6.2.2.4 Short-circuit state

The short-circuit current limit[14] is exceeded, indicating short-circuit on the zone line. This normally generates a fault condition in EBL512 G3 **but** instead a fire alarm can be activated, if this option is selected via EBLWin.

6.2.2.5 Open circuit state

The open circuit current limit[14] is passed, indicating no or too low zone line current consumption, i.e. the end-of-line device is not detected. This generates a fault condition in EBL512 G3. From this state any other state can be reached / activated.

6.2.2.6 Disconnected state

Via menu H8/S1 (Disconnect loop / zone line input) the zone line input can be disconnected[15], i.e. there is no voltage on the zone line. From this state no other state can be reached / activated.

6.3 8 relays expansion board 4581

Each board has to be programmed via EBLWin regarding:

- Address / Board no. (set via the jumpers "JP2-JP4", see Figure 6, page 27.

The 4581 board has eight programmable relay outputs (Output 0-7). Connections to "J1:1-16" and "J2" according to drawing 512 G3 - 34.

Each output has to be programmed via EBLWin regarding:

- Type of output, i.e. output for Control, Alarm devices, etc.
- Activation time and type / output signal period (steady, pulse, delay, etc.)
- Logic, i.e. normally open (NO) **or** normally closed (NC) contacts[16]
- Control expression (one or more trigger conditions)

For more information, see chapter "Programmable outputs", page 71.

The terminals support a wire size up to 1.13 mm^2 (1.2 mm).

6.4 Inputs and outputs expansion board 4583

Each board has to be programmed via EBLWin regarding:

- Address / Board no. (set via the jumpers "JP2-JP4", see Figure 6, page 27.

The I/O expansion board 4583 has two programmable supervised / not supervised voltage outputs (Output 0-1), one special / programmable

[15] This is indicated in EBL512 G3 by the LED **Fault / Disablements** "General disablements".

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

output (Output 2) intended for German extinguishing system and five programmable supervised / not supervised inputs (Input 0-4).
Connections to "J1:1-16" and "J2" according to drawing 512 G3 – 35, sheet 1/2 and sheet 2/2.

Output 0-1 has to be programmed via EBLWin regarding:

- Type of output, i.e. output for Control, Alarm devices, etc.
- Activation time and type / output signal period (steady, pulse, delay, etc.)
- Supervised / Not supervised[17]
- Logic, i.e. normally low (default) **or** normally high (24 V DC)[18].
- Control expression (one or more trigger conditions)

One to five 33K resistors can be connected. When the connections are finished, a calibration has to be done. Calibration value has to be in the range 4K7-50K. See also the EBL512 G3 Operating Instructions MEW01552 chapter "Calibration of supervised outputs (menu H5/A1)".

Voltage **Output 0** (J1:1-2): Max. 200 mA (Fuse F1). Can be used for German fire alarm routing equipment, fire alarm. *("E" Brandmeldung)*

Voltage **Output 1** (J1:5-6): Max. 200 mA (Fuse F2). Can be used for German fire protection equipment / key cabinet. *("G" FSK öffnen)*

See also chapter "Programmable outputs", page 71.

Output 2 has to be programmed via EBLWin regarding:

- Type of output, i.e. output for Control, Alarm devices, etc.
- Activation time and type / 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, when supervised) or Normally closed (low resistance, 680R, when supervised). Used for German extinguishing system *(Löschanlage)*.

See also chapter "Programmable outputs", page 71.

Input 0-4 have to be programmed via EBLWin regarding:

- Trigger condition (Triggered by)
- Supervised / Not 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

[17] A normally high output can not 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 an activated output.

[18] Regarding the **system voltage**, see chapter "Power supply", page 161.

Input 0 (J1:3-4): Can be used for German Fire alarm routing equipment fault *(Melder quittung)*
Input 1 (J1:7-8): Can be used for German key cabinet *(FSK rückmeldung)*
Input 2 (J1:9-10): Can be used for German key cabinet *(FSK überwachung)*
Input 3 (J1:13-14): Can be used for German extinguishing system *(Löschanlage ausgelöst)*
Input 4 (J1:15-16): Can be used for German extinguishing system *(Löschanlage quittung)*
See also chapter "Programmable inputs", page 64.

6.5 I/O Matrix board 4582

A special type of expansion board that only can be used together with an **Application board** (e.g. Fan, Generic or Zone), see pages 26 and 56. The I/O Matrix board makes it possible for any retailer to manufacture and connect three different types of "Application boards" to EBL512 G3 via the COM loop.

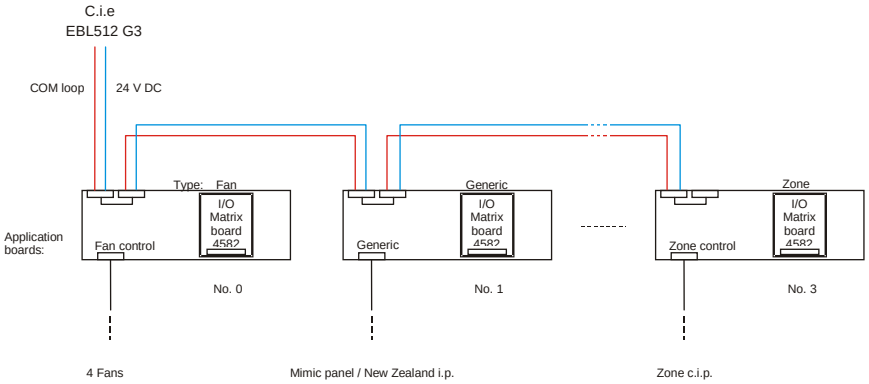


*Figure 7. I/O Matrix board application **overview**. The COM loop and 24 V DC are internally connected to the I/O Matrix board.*

The I/O Matrix board (80 x 63 mm) is plugged to the Application board respectively ("piggy back" connection) and has 16 switch inputs and 48 LED outputs. The COM loop and 24 V DC is connected to the Application board (and internally connected to the I/O Matrix board).
Three different **application board types** can be selected via jumpers (**JP4-JP5**) on the I/O Matrix board:

Generic control and indicating panel (Mimic panel alt. New Zealand indication panel), with 16 inputs (any input trigger condition can be used) and 48 outputs (any output trigger condition can be used).

Fan control and indicating panel, for four Fan control panels, each with six LEDs (On / Auto / Off / Running / Stopped / Fault) and

three push buttons (On / Auto / Off). One "Reset" switch.
Simple or Advanced function for a "Supply air fan" or a "Standard fan". Enhanced function for a "Smoke exhaust", "Smoke spill", "Stair pressurisation" or a "Supply air" fan.
This type is used with the "Fan control application board" 4594, which is used with the "Fan control panel 4593, see page 56.

Zone control and indicating panel, with outputs and inputs for 16 zone LEDs (Alarm / Fault / Disabled) and 16 push buttons (Disable).

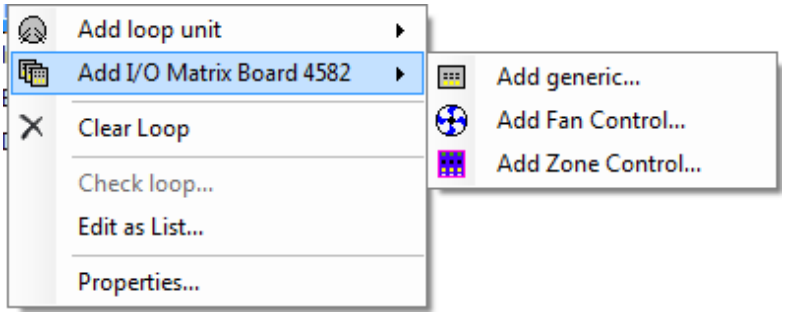
For the number and type of boards that can be used, see page 26.

There is no COM loop address to be set. Instead, the **expansion board no. / address** (0-7) is set with jumpers (**JP1-JP3**) on the I/O Matrix board respectively. See Figure 6, page 27.

In EBL512 G3 can totally up to 512 outputs be used, including all kinds of outputs.

For more information (e.g. application board type selected via jumpers JP4-JP5), see the I/O Matrix board 4582, Technical description MEW00914.

Each I/O Matrix board has to be added via EBLWin



....and **programmed** regarding:

- **Address** (shall be the same board no. as set via jumpers "JP1-JP3"), see Figure 6, page 27.
- **Name** (I/O Matrix Board # - normally not changed)
- **LED test on Input 15** (selected or not selected)

The 4582 board has 48 LED outputs and 16 switch inputs (0-15). Depending on the type (Generic, Fan or Zone), the outputs and inputs are programmed differently.

Available application board (fan control), see page 56.

6.5.1 Generic

Used for Application board type **Generic**, e.g. "General I/O application board" 4596 (see page 56).

Each output (0-47) has to be added and programmed via EBLWin regarding:

- Output no. (0-47)
- Properties, like any programmable relay output.

Each input (0-15) has to be added and programmed via EBLWin regarding:

- Input no. (0-15)
- Type (of input)
- Properties, like any programmable input.

6.5.2 Fan control

Used for Application board type **Fan control**, e.g. "Fan control application board" 4594, which has a front for control of four fans.

Fan control panel 4593 has two Fan control application boards 4594 and two Fan control fronts (see page 56).

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

For each fan, also one I/O unit 3361 is required. It has to be added in EBLWin as an **I/O unit for fan control 3361** and programmed regarding e.g:

- Technical address (COM loop address 1-255)
- Name (Fan control I/O unit - normally not changed)
- Fan control information
  - I/O Matrix fan control (Fan control / fan 0-3)
  - Supervised **or** not supervised (Input In0)
  - Output latched **or** not latched
  - Enhanced fan control function **or** not.[19]
  - Fault detection time (Input In0; 30-255 seconds)
- Properties (for Re0)[19], like any programmable output.
- Normally stopped **or** Normally running

6.5.3 Zone control

Used for Application board type **Zone control**. [20]

Each input (0-15) has to be programmed via EBLWin regarding:

- Zone (control) no. (0-15)

[19] If Re0 is normally open, Re1 will automatically be closed and vice verse. If "Enhanced fan control function" is selected an Re1 tab will be available for individual programming of Re1.

[20] Zone control is normally used on the Australian market only.

7 Printer

7.1 EBL512 G3

The EBL512 G3 control unit type **5000** is delivered with or without a printer depending on if "PRN" is added in the article number or not. It is mounted on the front panel door and is connected to the MMI board 5011. See drawing 512 G3 – 01, sheet **2**/2.

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

Alarms (Fire alarms – incl. test mode alarms & Heavy smoke / heat alarms, etc.) will always be printed. The following can be printed:

- Faults via menu H6
- Disablements, etc. via menus H4/U1 – U2
- Detectors activating service signal via menu H4/U5
- The event logs 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 and connection cable – is available as a spare part, type number 5058.

7.2 Ext. Fire Brigade Panel 1826

A printer 1835 can, as an option, be mounted in the ext. FBP 1826.

Alarms (Fire alarms – incl. Heavy smoke / heat alarms, etc.) will be printed but only if the door is open / opened while the alarms are activated.

8 TLON connection board 5090

On the EBL512 G3 control unit (5000 / 5001) main board (5010), there are spaces and connectors for two TLON connection boards type 5090. In a single (standalone) control unit there shall be **no** TLON connection board mounted.

A system, with two or more control units, uses a **single TLON Network** or a **redundant TLON Network**, see below.

The TLON connection boards are mounted on the main board (5010) according to dwg. 512 G3 – 11 and the networks are connected to the terminal block "J4" on main board according to dwg 512 G3 - 24.

8.1 Single TLON Network

In a single TLON Network (Network no. 0), the TLON connection board (5090) shall be mounted in position no. 0 on the main board. A single TLON Network is a violation to the EN54-13 standard.

8.2 Redundant TLON network

In a redundant TLON Network (Network no. 0 and no. 1), the TLON connection boards (5090) shall 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 fault (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 "Control Unit / TLON Network", page 18.

8.3 Network programming

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

In a redundant network two Projects have to be created and installed. The Projects have to be identical but with different Project names. One has to be installed for Network no. 0 and one installed for Network no. 1.

NOTE! By the TLON Network programming (installation), some data will be stored in a TLON connection board (5090) memory and some data will be stored in a main board (5010) memory.

After replacing a TLON connection board to another (or replacing both a TLON connection board and a main board), do "Replace" and "Update" in TLON Manager 2.0. (In TLON Manager 1.2 also "Save".)

After replacing a main board to another (i.e. not the TLON connection board), do "Update" in TLON Manager 2.0. (In TLON Manager 1.2 also "Save".)

9 Peripheral devices

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

Short circuit isolators can be used on the COM loops.

Sounders, door release magnets, etc. are connected to COM loop unit (e.g. 3361 / 3364) outputs and/or control unit outputs (S0-S3, R0-R1) and/or 8 relays expansion board (4581) outputs. Addressable sounders (3377 / 4477 / 3379) are connected directly to a COM loop.

Input devices as key cabinet, timers, external faults, etc. are connected to a programmable input, 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). (Any programmable output can also be used).

External Fire Brigade Panels and External Displays Units are connected directly to the RS485 channel.
As an **alternative** the RS485 channel can be used for:
German Fire Brigade Control Panel (FBF) and German Fire Brigade Indicator Panel (FAT).[21]

More information, see the Product Leaflet for the device respectively.

9.1 COM loop units

Each COM loop (0-3) can handle up to 255 addressable COM loop units, i.e. in total up to 1020 COM loop units. Max. 512 (of the 1020) can be alarm points. Depending on the type of units and the number of units the total current consumption will vary and this will affect the cable length. See chapters "COM loop cable length", page 166, "Current consumption", page 169 and dwg 512 G3 - 41.

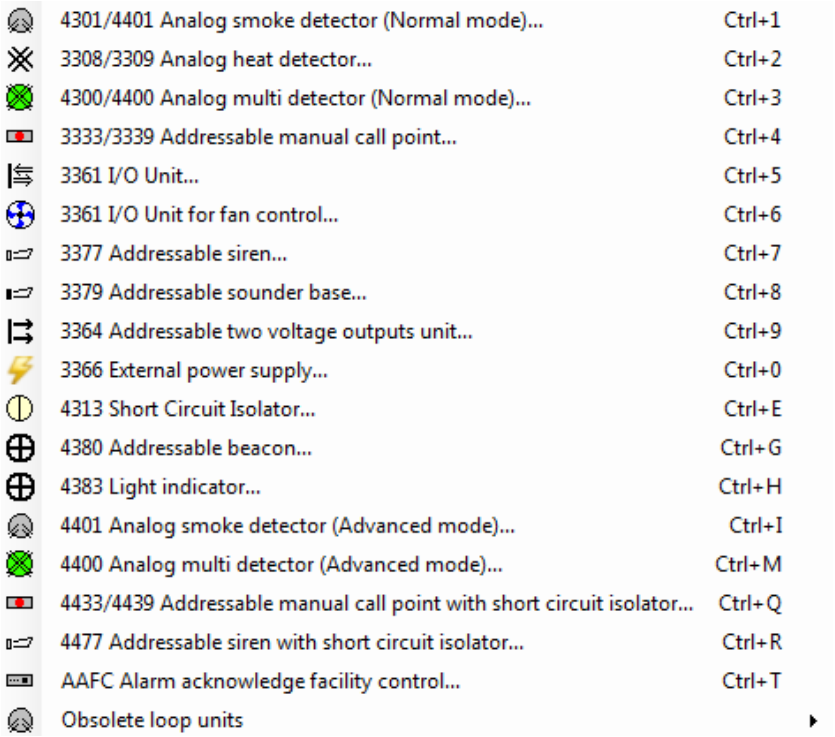
NOTE! The control unit can be configured for up to 128, 256 or 512 alarm points. Normally this is factory set but can be upgraded on site (via EBLWin)[22]. In menu H4/U8 is the current configuration shown. The units should be distributed as even as possible on each COM loop and between the COM loops (0, 1, 2 & 3).

Remember: **Up to 1020 COM loop addresses can always be used but max. 512 of these can be alarm points, according to EN54-2.**

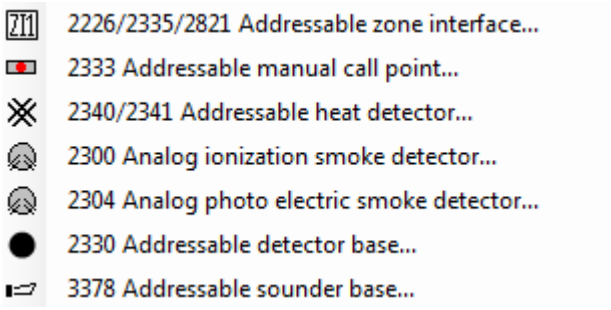
[21] If **German panels** are connected to the RS485 channel, **no other units** can be connected to the RS485 channel.

[22] This action require a special download password.

The following units can be connected to the COM loops (in **NORMAL** mode, if nothing else is stated):



NOTE!
3361 The **I/O Unit for Fan control** is used with the Fan control panel 4593 only.
4383 The **Light indicator** is a future product under construction, i.e. it cannot be used today.
4433 / 4439 The **Addressable Manual Call Point with short circuit isolator** is a future product under construction, i.e. it cannot be used today.
AAFC The **Alarm Acknowledge Facility Control** is used on the Australian market only.
Obsolete loop units (listed below) can be found in old installations and can be used in EBL512 G3 installations as well.



NOTE!
When one or more of the **Obsolete loop units** listed above are used on a COM loop, the maximum number of loop units is 127, i.e. only technical address **1-127** can be used.

Address setting

Each COM loop unit has to have a unique COM loop address (001-255). This address and the mode are set with the **Address Setting Tool** (3314 / 4414). The mode to use is for each unit described in the following chapters.

9.1.1 Input units

Each COM loop input unit is added and programmed via EBLWin. Depending on type of unit, regarding:

- 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 (Australian function)

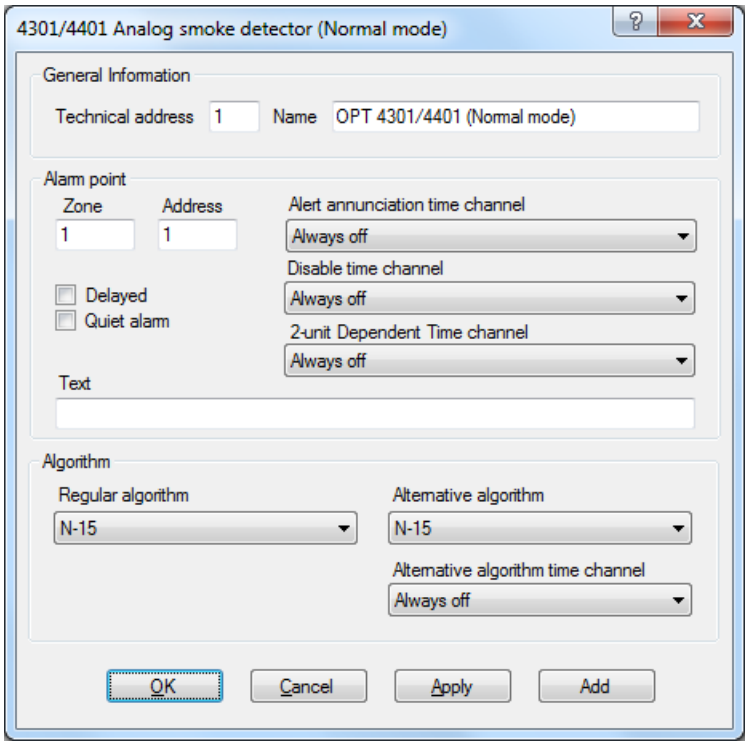


*Figure 8. An **example** of an EBLWin dialog box.*

Connections, if nothing else is specified, see drawing 512 G3 - 31.

9.1.1.1 Analog Sensor Bases (ASB)

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

3312 Analog Base.[23] 3312 has screw terminals for the COM loop and an ext. LED (2218). Prepared for mechanical lock of the detector - if required. Recess for label holder (3391). The base has an address label on which the COM loop address for the detector to be plugged in the base can be written.

3312FL Analog Base. Like 3312 but instead of screw terminals for the COM loop and an ext. LED this base has fast connectors (blue and grey respectively.

3312F Analog Base. Like 3312FL but no connector (grey) for an ext. LED.

4313 Analog Base with isolator. An analog detector (Sensor) is to be plugged in 4313. Terminals for an ext. LED (2218). 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 52). The isolator's COM loop address is set with the Address setting tool (3314 / 4414). The base has an address label on which the COM loop address for the detector to be plugged in the base can be written as well as the isolator's COM loop address.
The Address setting tool (3314 / 4414) is also used for mode setting:
NORMAL mode: Used for 4313 in system EBL512 G3.
2330 mode: Not used in system EBL512 G3.
2312 mode: Not used in system EBL512 G3.

9.1.1.2 Addressable Manual Call Points

3333 Addressable Manual Call Point.[24] 3333 conforms to EN54-11. A built-in LED will indicate that 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 is protecting the glass. The COM loop address is set with the Address setting tool (3314 / 4414).
3333 is to be surface mounted in the supplied red back box or flush mounted on a Swedish 65mm circular mounting box.
For indoor use and in dry premises.
The Address setting tool (3314 / 4414) is also used for mode setting.
NORMAL mode: Flashing or not flashing LED (see Product leaflet MEW00097) is set via EBLWin.

[23] This base will be replaced by 3312FL and 3312F.

[24] The manual call points have a response time ≤ 5 s.

2330 mode: Not used in system EBL512 G3.
2312 mode: Not used in system EBL512 G3.

3339 Enclosed Addressable Manual Call Point.[24] 3339 is like the 3333 unit but with another type of back-box (incl. a tightening gasket). For surface mounting. For indoor use in premises where IP56 rating is required. Operating temp. -10 to +55°C.

4433 Addressable Manual Call Point with isolator. 4433 is like the 3333 unit but it also has a built-in short circuit isolator (see page 52). The isolator does **not** use any COM loop address.

4439 Enclosed Addressable Manual Call Point with isolator. 4439 is like the 3339 unit but it also has a built-in short circuit isolator (see page 52). The isolator does **not** use any COM loop address.

9.1.1.3 Analog Detectors

3308 Analog heat detector. 3308 shall be plugged in an analog base (3312 / 3312F / 3312FL / 3379 / 4313). Built-in LED that 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 (3314 / 4414) is also used for mode setting:
NORMAL mode: 3308 is in this mode via EBLWin set 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
2330 mode: Not used in system EBL512 G3.
2312 mode: Not used in system EBL512 G3.

3309 Analog heat detector. Enclosed (IP67)[25]. Built-in LED that is lit to indicate that the detector has generated fire alarm. Terminals for an ext. LED (2218). Recess for label holder (3391). The COM loop address is set with the Address setting tool (3314 / 4414). The Address setting tool 3314 / 4414 is also used for mode setting:
NORMAL mode: 3309 is in this mode via EBLWin set 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

[25] This detector holds the ATEX classification:
Ex II 3GD EEx nA II T5 (T 70°C), -20°C ≤ T_a ≤ 65°C.

2330 mode: Not used in system EBL512 G3.
2312 mode: Not used in system EBL512 G3.

4300 Analog multi detector.[26] 4300 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. 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.
Shall be plugged in an analog base (3312 / 3312F / 3312FL / 3379 / 4313). Built-in LEDs are lit to indicate that the detector[27] has activated a fire alarm. Prepared for mechanical lock (screw attached) – if required.
Via EBLWin, it is set how the detector shall operate:

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-address[28]. (Can be used to disable e.g. the smoke detector during working hours and/or in control expressions for programmable outputs).

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

b) One presentation number (address): The detector unit works as one detector and is programmed for one zone-address.

Via EBLWin is set if the detectors in alt. **b)** shall work with "OR-functionality" or with a "Decision algorithm":

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 [29] $\geq$ 58.

The sensitivity is depending on the temp.
20°C => 3.8 %/m
↓ ↓
40°C => 1.8 %/m

Pre-warning will be activated if:
58 > temperature (°C) + adjusted smoke value[29] $\geq$ 50.

The "Decision algorithm" [30], see Figure 9, can be used to reduce so called false alarms (nuisance alarms), because at

[26] 4300 will be replaced by 4400 (in NORMAL mode).

[27] I.e. the heat detector and/or the smoke detektor.

[28] 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.

[29] 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 temp. can not be lower than 0°C in the algorithm / graph.

[30] The decision algorithm is a violation to the EN54-7 standard.

a normal room temperature, more smoke is required to activate fire alarm than when the room temperature is high (or is rising). By a real fire, the room temperature will rise rather fast and less and less smoke is required to activate fire alarm. Very little smoke require a "high" temperature to activate fire alarm and very much smoke will activate fire alarm also at a "low" temperature.

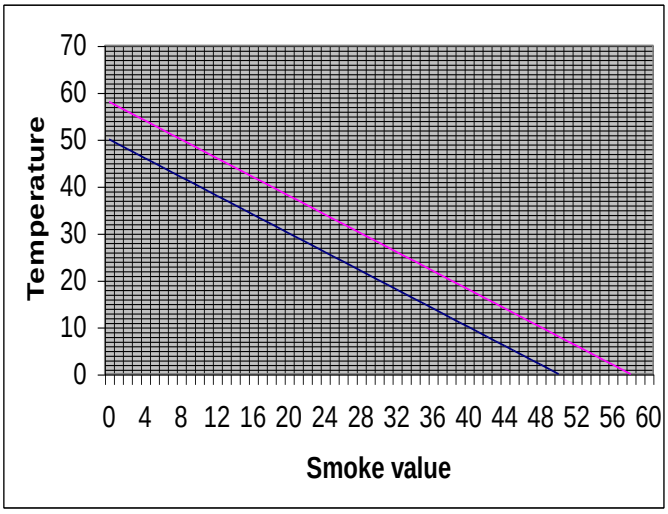


Figure 9. When the calculated value in the decision algorithm exceeds the lower graph, pre-warning will be activated. When it exceeds the upper graph, fire alarm will be activated. **Temperature = °C**. **Smoke value = *obscuration (%/m) x 10***.

The Analog 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 EBL512 G3 takes **two** COM loop (technical) addresses of the available 255. One address that is set with the 3314 / 4414 tool but also one more address will be "occupied" for the heat part of the detector.* [31]

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

NORMAL mode: 4300 in this mode is 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).

2330 mode: Not used in system EBL512 G3.

2312 mode: Not used in system EBL512 G3.

[31] The extra address is automatically assigned by EBLWin in conjunction with the SSD download and is not visible to the user.

4301 Analog photo electric smoke detector.[32] Scattered light (i.e. reflection of infrared light) is used to detect smoke.
The detector has unleaded soldering.
Shall be plugged in an analog base (3312 / 3312F / 3312FL / 3379 / 4313). 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 in this mode is in EBLWin set to one of the six algorithms H-15, H-35, L-15, L-35, **N-15** or N-35.
2330 mode: 4301 in this mode will work as a 2330 + 2321.
2312 mode: 4301 in this mode will work as the obsolete Analog photo electric smoke detector 2304.

4400 Analog multi detector. 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. The detector has unleaded soldering.
Shall be plugged in an analog base (3312 / 3312F / 3312FL / 3379 / 4313). Built-in LEDs (red) are blinking to indicate that the detector[33] has activated a fire alarm. Prepared for mechanical lock (screw attached) – if required. 4400 has a little different design than the 4300 detector and the smoke chamber net has even smaller holes. This will keep insects and particles[34] larger than smoke particles out of the chamber.
The Analog multi detector 4400 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 3314 / **4414** is also used for **mode setting**:
Advanced mode: 4400 has to be set to Advanced mode via 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 detector for fire alarm evaluation. It can be set to a Learning function **or** via EBLWin to one of five area algorithms (Normal, Clean, Smoke/Steam, Cooking/Welding or Heater area), see chapter "Advanced mode", page 127. An alternative smoke and/or heat algorithm can be used via one or two time channels. 4400 has a green

[32] 4301 will be replaced by 4401.

[33] I.e. the heat detector and/or the smoke detektor.

[34] For example dust, steam, etc.

polling LED. Via EBLWin is set if the green polling LED shall 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 and replace the Analog multi detector 4300 (see 4300 above) and two COM loop addresses will be occupied, see 4300 above. The smoke detector part has to be set to one of six 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 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.
2330 mode: 4400 in this mode will work as a 2330 + 2316/17.
2312 mode: Not used in system EBL512 G3.

4401 Analog photo electric smoke detector. Scattered light (i.e. reflection of infrared light) is used to detect smoke. The detector has unleaded soldering. Shall be plugged in an analog base (3312 / 3312F / 3312FL / 3379 / 4313). Built-in LEDs (red) are blinking to indicate that the detector has activated fire alarm. Prepared for mechanical lock (screw attached) – if required. 4401 has a little different design than the 4301 detector and the smoke chamber net has even smaller holes. This will keep insects and particles[34] larger than smoke particles out of the chamber.

The Analog photo electric smoke detector 4401 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 3314 / **4414** is also used for **mode setting**:
Advanced mode: 4401 has to be set to Advanced mode via 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 detector for fire alarm evaluation. It can be set to a Learning function **or** via EBLWin to one of three area algorithms (Normal, Clean or Smoke/Steam area), see chapter "Advanced mode", page 127. An alternative algorithm can be used via a time channel. 4401 has a green polling LED. Via EBLWin is set if the green polling LED shall 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: 4401 in this mode has to be programmed in EBLWin as a **4301** detector, i.e. the 4401 detector will work as and replace the Analog photoelectric smoke detector 4301 (see 4301 above) and has to be set to one of six algorithms H-15, H-35, L-15, L-35, **N-15** or N-35. An alternative algorithm can be

used via a time channel.
2330 mode: 4401 in this mode will work as a 2330 + 2321.
2312 mode: 4401 in this mode will work as the obsolete Analog photo electric smoke detector 2304.

9.1.1.4 Conventional Detector Bases (CDB)

2324 Base. A conventional detector shall be plugged in a conventional detector base 2324. A built-in LED is lit to indicate that the detector plugged in the base has activated fire alarm. Terminals for an ext. LED (2218).

9.1.1.5 Conventional Detectors

4318 Combination heat detector. Rate-of-rise **and** fixed temperature, 59°C, heat detector class **A1 R**. Static response temp. range 54-65°C, ambient temp. min./**typical**/max. -10/**+25**/+50°C.
Shall be plugged in a conventional detector base (2324).

4350 Multi detector. 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 prevent false (nuisance) alarms, an AI function is used, i.e.
a: combined heat and smoke sensing
b: variable delay function
c: adaptive learning function
See also chapter "Advanced mode, page 127.
The detector has unleaded soldering.
Shall be plugged in a conventional detector base (2324).

4352 Photoelectric smoke detector. 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 prevent false (nuisance) 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.)
The detector has unleaded soldering.
Shall be plugged in a conventional detector base (2324).
4352 will be replaced by 4452.

4452 Photoelectric smoke detector. Like 4352 but 4452 has a little different design than the 4352 detector (see 4401) and the smoke chamber net has even smaller holes. This will keep insects and particles[34] larger than smoke particles out of the chamber.
4452 will replace 4352.

4375 Heat detector. Fixed temperature heat detector, 60°C, class **A2S** (static response temp. range 54-70°C), latching.
Min./**typical**/max. ambient temp. -10/**+25**/+40°C.
The detector has unleaded soldering. Shall be plugged in a conventional detector base (2324).

4376 Heat detector. Like 4375 but 80°C, class **BS** (static response temp. range 69-85°C), latching.
Min./**typical**/max. ambient temp. -10/**+40**/+60°C.
The detector has unleaded soldering. Shall be plugged in a conventional detector base (2324).

6295 Heat detector: Enclosed (IP67)[35]. Fixed temperature heat detector, 57°C, class **A2 S** (static response temp. range 54-70°C), latching.
Min./**typical**/max. ambient temp. -40/**+25**/+50°C. Built-in LED is lit to indicate that the detector has activated a fire alarm. Terminals for an ext. LED (2218).

6296 Heat detector: Enclosed (IP67)[36]. Like 6295 but 72°C, class **B S** (static response temp. range 69-85°C), latching.
Min./**typical**/max. ambient temp. -40/**+40**/+65°C. Built-in LED is lit to indicate that the detector has activated a fire alarm. Terminals for an ext. LED (2218).

6297 Heat detector: Enclosed (IP67). Like 6295 but 87°C, class **C S** (static response temp. range 84-100°C), latching.
Min./**typical**/max. ambient temp. -40/**+55**/+80°C. Built-in LED is lit to indicate that the detector has activated a fire alarm. Terminals for an ext. LED (2218).

6298 Heat detector: Enclosed (IP67). Like 6295 but 117°C, class **E S** (static response temp. range 114-130°C), latching.
Min./**typical**/max. ambient temp. -40/**+85**/+110°C. **No** built-in LED but terminals for an ext. LED (2218) - to indicate that the detector has activated a fire alarm.

9.1.1.6 Accessories

3314 Address setting tool.[37] 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 (NORMAL, 2330 and 2312), see the COM loop unit respectively. A connection cable with crocodile clips and tab terminals is supplied with the tool and can be used when required.
Put the ON/OFF switch in position ON 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.[38]

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[35] This detector holds the ATEX classification:
Ex II 3GD EEx nA II T5 (T 100°C), -40°C ≤ T_a ≤ 50°C.

[36] This detector holds the ATEX classification:
Ex II 3GD EEx nA II T5 (T 100°C), -40°C ≤ T_a ≤ 65°C.

[37] 3314 will be replaced by 4414. **NOTE!** 3314 cannot be used for setting the detectors 4400 and 4401 in Advanced mode.

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

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" at the same time **and/or** write the address. Press "WRITE" and wait for a beep. ("READ" again as a check.)

4414 Address setting tool. 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 (Advanced[39], NORMAL, 2330 and 2312), 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 (orange front) will replace 3314 (grey front) but 4414 is only required when the 4400 and 4401 detectors shall be used in Advanced mode.
Turn on the tool (On/Off/CLR button). A blinking curser and mode **M0** 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.[40]
How to read: Press "Read", wait for the OK, address and mode info. and a beep.
How to write: To change the mode (if required) press "Write" and "Read" at the same time, then press 0, 1, 2 or 3 for the mode respectively. Type the address (no beginning zeroes) and press "Write". Wait for the OK, address and mode info. and a beep. (Press "Read" again for a double check.) More info. on the backside of the tool.

3390 Label holder. To be mounted in an analog base (3312 / 3312F / 3312FL / 3379 / 4313)[41]. 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. Excl. labels.

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

[39] 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.)

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

[41] Also in an enclosed analog heat detector (3309).

9.1.2 Addressable I/O units

3361 Addressable multipurpose I/O unit.[42] Power supplied via the COM loop. The unit has two **programmable** inputs:

Monitored input

….used as zone line input (Z) (terminals 6 & 7): End-of-line capacitor 470 nF mounted in the last unit on the zone line. Short circuit on the line can generate a fault or a fire alarm (set via EBLWin). This input is intended for conventional detectors.[43] Max. 1.5 mA. Cable: Max. 50 ohms and max. 50 nF.

....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 V DC / 8 mA is required). Normally low or high (set via EBLWin).

The unit has two **programmable** relay[44] outputs:
Relay output (Re0): NC or NO contacts (set via EBLWin).
Relay output (Re1): Like Re0.

Connections and examples, see drawings 512G3 - 31 & - 36. 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 (3362). 3361 has an LED to indicate communication "OK" 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 (3314 / 4414) is also used for the mode setting:
NORMAL mode: Used for 3361 in system EBL512 G3.
2330 mode: Not used in system EBL512 G3.
2312 mode: Not used in system EBL512 G3.

[42] The same physical unit (3361) is also used for Fan control together with the Fan control panel 4593. Then it has a separate dialog box in EBLWin.

[43] It is via EBLWin possible to define this input to function like a manual call point ("Used as MCP"), i.e. it will **not** be collectively disabled via menu "Disable zone, H2/B1", can **not** be included in two-unit dependence, it can **not** use the "alarm delay" function and it can **not** be disabled via a time channel.

[44] Relay contacts: max. 2 A @ 30 V DC / 125 V AC.

3364 Addressable 2 voltage outputs unit. The unit is connected to a COM loop. External 24 V DC power supply is required (via a 3366 unit or EBL512 G3).

The unit has two programmable and supervised voltage outputs (VO0-VO1), intended for alarm devices (e.g. sirens). An end-of-line capacitor (470nF) is to be mounted in the last device
alt. a capacitor (470nF) in up to five alarm devices:

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 95 and besides that function the output VO2 will also be powerless approx. 30 sec. after:

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

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

VO0: Normally low or high (set via EBLWin), 24 V DC, 1 A.[45]

VO1: Like VO0.

VO2: Normally high, 24 V DC, 1 A.[45] (Fire door closing function.)

24 V DC: From an external power supply (unit 3366 or EBL512 G3)

/Mains OK: From an external power supply unit (3366) when the fire door closing function (ABDL) is to be used. Normally low = The main power source (230 V AC) in the External power supply unit is okay.

Connections and examples, see drawings 512 G3 - 31 & - 38. 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. 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) 3362.

For more information, see the Technical Description and 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 programmed technical address can be written.

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

NORMAL mode: Used for 3364 in system EBL512 G3.

2330 mode: Not used in system EBL512 G3.

2312 mode: Not used in system EBL512 G3.

NOTE! See also chapter "Limitations", page 182.

[45] Cont. 1 A, during 10 ms 1.4 A.

9.1.3 Alarm devices (addressable sounders)

3377 Addressable siren. The siren is connected to a COM loop. It is power supplied via the COM loop, i.e. the number of sirens is depending on the type and number of other units connected to the COM loop.[46] Red ABS plastic housing. Three sound types (tones) and three priority levels are available.
Steady (cont.) 990 Hz
Intermittent (pulsed) 990 Hz, 0.5s / 0.5s (1 Hz)
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 Leaflet.
The COM loop address is set with the Address setting tool (3314 / 4414).
The Address setting tool (3314 / 4414) is also used for mode setting:
NORMAL mode: Used for 3377 in system EBL512 G3.
2330 mode: Not used in system EBL512 G3.
2312 mode: Not used in system EBL512 G3.
NOTE! See also chapter "Limitations", page 182.

4477 Addressable siren. 4477 is like the 3377 unit but it also has a built-in short circuit isolator (see page 52). The isolator does **not** use any COM loop address.

3379 Addressable sounder base.[47] 3379 consists of an analog base (3312) mounted together with a sounder. 3379 is mounted in the ceiling. An analog detector can be plugged in the base, which has screw terminals for the COM loop and an ext. LED (2218). Prepared for mechanical lock of the detector - if required. Recess for label holder (3391). 3379 is power supplied via the COM loop, i.e. the number of sounder bases is depending on the type and number of other units connected to the COM loop[46]. Three sound types (tones) and three priority levels are available.
Steady (cont.) 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. For more technical data, 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 programmed COM loop address can be written. (The detector has its own COM loop address set via the Address setting tool 3314 / 4414.)
The Address setting tool 3314 / 4414 is also used for mode

[46] The number of 3377 + 4477 + 3379 units must be ≤ 50.

[47] This unit has replaced the Sounder base 3378.

setting:
NORMAL mode: Used for 3379 in system EBL512 G3.
2330 mode: Not used in system EBL512 G3.
2312 mode: Not used in system EBL512 G3.
NOTE! See also chapter "Limitations", page 182.

4380 Addressable beacon. The LED beacon is connected to a COM loop. It is power supplied via the COM loop, i.e. the number of beacons is depending 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. 1 Cd light output. 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 EBL512 G3.
2330 mode: Not used in system EBL512 G3.
2312 mode: Not used in system EBL512 G3.

9.1.4 Short circuit isolators (addressable)

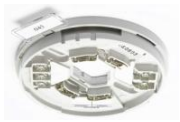
According to the EN54 standard, at least one short circuit isolator is required per 32 alarm points on the COM loop. In the Australian and New Zealand conventions at least one isolator per 40 alarm points. National regulations have to be followed.

Up to 64 isolators can be used per COM loop.

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

- COM loop address[48]
- Name (Normally not changed)
- Sequence Number (Serial Number in the COM loop's A-direction.) 0-63.[48]

Connections, see dwg 512 G3 - 31. (See especially the **L** / SA wire!)



4313 Analog base with isolator.[49] 4313 is an analog 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 power supplied via the COM loop. 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 programmed COM loop address is to be written.
The Address setting tool (3314 / 4414) is also used for mode

[48] The units 4433, 4439 and 4477 have a built-in isolator that don'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.

[49] This unit has replaced the Addr. isolator 4370.

setting:
NORMAL mode: Used for 4313 in system EBL512 G3.
2330 mode: Not used in system EBL512 G3.
2312 mode: Not used in system EBL512 G3.

Up to 64 isolators can be used, which gives 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!** EBL512 G3 has one built-in isolator in the-A direction (no. "A") and one in the B-direction (no. "B").

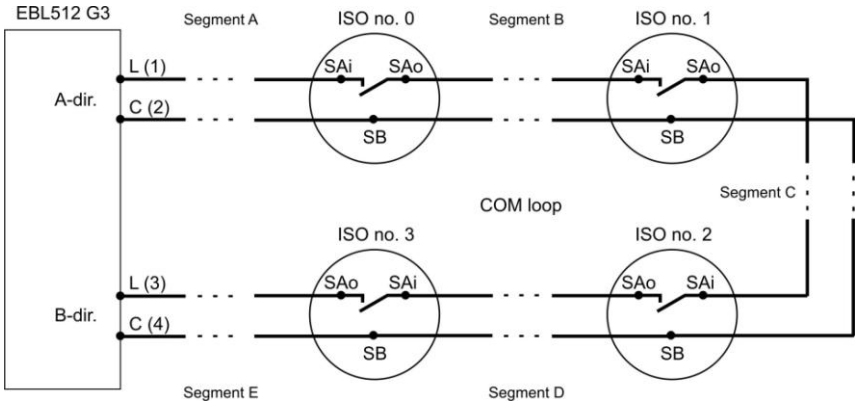


Figure 10. Four 4313 isolators connected to a COM loop gives five loop segments, i.e. Segment A (A-00), B (00-01), C (01-02), D (02-03) and E (03-B). If more isolators have to be added, the sequence numbers have to be updated (via EBLWin), e.g. if one isolator is put in between isolator no. 00 and no. 01 in the figure, the new isolator has to be no. 01 and the old no. 01 has to be no. 02 and so on.

Short circuit / cut-off (break) on the COM loop
See also EBL512 G3 Operating Instructions, chapter "Fault messages".

9.1.5 Units for Hazardous (Ex) areas

In hazardous (Ex) areas, **I**ntrinsically **S**afe (IS) and approved products are required. The IS alarm points are connected to an interface outside the Ex area.

Normally the analog addressable units (IS smoke and heat detectors) shall be used, else conventional units (e.g. IS manual call point).

Conventional units are connected via a Galvanic isolator MTL 5061 (2820) to an expansion board 4580 Ex zone line input. See also drawings 512 G3 – 33 and – 37.

Analog / addressable units are connected to a COM loop via an IS barrier unit 2842. See also drawing 512 G3 – 31.

9.1.5.1 Galvanic isolators / IS barrier units

MTL5061 Galvanic isolator (2820). The isolator is used to connect conventional IS 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 it is mounted in a Waterproof box (IP66/67). Four compression glands for the cable entries and an end-of-line resistor (10K) with an area >230 mm^2 are supplied. Box dimensions (L x W x H): 175 x 125 x 150 mm. BASEEFA classification: EEx ia IIC T_{amb}=60°C.

2842 Intrinsically safe (IS) barrier unit. The barrier unit is used to connect analog 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. ATEX class: Ex ia IIC.

9.1.5.2 Intrinsically Safe mounting bases

YBN-R / 4 IS Intrinsically Safe mounting base (2812). In the base can be plugged an intrinsically safe conventional smoke (2810) or heat (2811) detector. The base has terminals for the zone line (in/out) and for an ext. LED.

9.1.5.3 Intrinsically Safe photoelectric smoke detectors

SLR-E-IS Intrinsically Safe photoelectric smoke detector (2810). A conventional photoelectric (optical) smoke detector, shall 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 Analog IS smoke detector. An analog / addressable photo-electric smoke detector. The detector is supplied with a back-box and three cable glands. The detector has one built-in LED to indicate that the detector has generated fire alarm. The function is similar to the analog photoelectric smoke detector 4301, see page 44. It has to be connected to a COM loop via an IS barrier unit 2842. ATEX class: Ex ia IIC T5.

9.1.5.4 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 1 G EEx ia IIC T5, T_{amb}=55°C. Max 20 per zone.

2841 Analog IS heat detector. An analog / addressable heat detector. The detector is supplied with a back-box and three cable glands. The detector has one built-in LED to indicate that the detector has generated fire alarm. The function is similar to the analog heat detector 3308, see page 41. It has to be connected to a COM loop via an IS barrier unit 2842. ATEX class: Ex ia IIC T5

9.1.6 Other COM loop units

3366 External power supply. Conforms to EN54-4. 3366 is connected to a COM loop, i.e. it is monitored from EBL512 G3 and e.g. loss of the main power source will generate a fault in EBL512 G3. It can be used as power supply for external equipment requiring 24 V DC with battery backup, e.g. the 3364 unit (see page 50). It also has a "/Mains OK" output (normally low), intended to be connected to the corresponding input on the 3364 unit.

A light grey metal housing (HxWxD, 288 x 400 x 95 mm). There is **space** for two maintenance-free sealed Lead-Acid backup batteries, 2 x 12 V, 7.5 Ah 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, bottom and back sides of the housing. Two cable glands are supplied. The unit has one **24 V DC**[50] **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 active.[51] In case of an activated fire alarm in the system, the continuous current consumption can be up to **4 A**.

It has a number of security functions, e.g. against to high current output and to low battery voltage etc. For more information, see the Technical Description and the Product Leaflet. See also drawings 512 G3 – 31 and – 38.

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.

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[50] The rated output voltage for the main power source (rectifier) is 24 V ± 1%. Max. ripple 500 mVp-p. The rated output voltage for the second power source (the backup battery) is 18 – 28 V DC. **NOTE!** The voltage will, however, decrease to approx. 15 V when the output will be switched off in order not to damage the battery.

[51] 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 27 Ah**.

A current consumption ≤ **0.85 A** allows the **"high current charging mode"**, i.e. the battery capacity can be **up to 65 Ah**.

The Address setting tool (3314 / 4414) is also used for the mode setting:
NORMAL mode: Used for 3366 in system EBL512 G3.
2330 mode: Not used in system EBL512 G3.
2312 mode: Not used in system EBL512 G3.

AAFC Alarm Acknowledgement Facility Control.[52] The **AAFC** is a box with an alarm indication LED and a non-latching switch "Press to acknowledge false alarm". One AAFC per AAFC zone and up to 100 AAFC:s zones per control unit can be used. The COM loop address is set with the Address setting tool (3314 / 4414). See also chapter "**Alarm Acknowledgement Facility (AAF)**", page **111**.

4593 Fan control panel. A panel for control of eight fans. It contains of a light grey mounting plate, two **Fan control application boards 4594** and two **fronts** with LEDs and push buttons for the Fan control functions. The panel is intended to be mounted in the General control cabinet **4590**, in which three Fan control panels **4593** can be mounted. For connection to the c.i.e. is one I/O Matrix board **4582** required for each 4594 board. Each 4594 board is connected to a COM loop and 24 V DC. Up to eight **4593** panels can be used (i.e. sixteen 4594 with 4582). One I/O unit **3361** is also required for each fan. For more information, see Technical Description MEW01245.

9.1.7 Obsolete units

Obsolete units that can be used with EBL512 G3, V2.0.x:
See chapter "COM loop units", page 37.

NOTE! In 23xx mode:
Can only address 1-127 be used.
Cannot the "Autogenerate" function be used. (Via EBLWin)
Cannot the "Check loop" function be used. (Via EBLWin)

9.2 Units connected to the RS485 interface

Up to sixteen **D**isplay **U**nits type Ext. FBPs (1826 / 1828) and/or Alert Annunciation Units (1735 / 1736) and/or Ext. Presentation Units (1728) can be connected to the built-in RS485 interface (J4:37-38) in EBL512 G3. Note that the current consumption for 1826 with printer can be up to 200 mA when printing. (Power supply at J4:35-36.) Connections, see drawing 512 G3 – 24.

The number of units that can be power supplied via EBL512 G3 (or an external power supply) is depending on all other units connected to

[52] This unit is available on the Australian market only. This unit will be identified as a 3333 unit when the "Autogenerate" function is used. (Via EBLWin)

the same c.i.e. / external power supply. Up to 1200 m cable can be used. For more information, see Technical description respectively.

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 respectively) are used to set the address, which also can be changed via EBL512 G3. The S/W mode shall be set to **xxxx – 1587** (**xxxx** = type number). See the Technical Description for the unit respectively.

The first unit shall have the address 00, the second unit address 01 and so on[53]. Follow the Address setting instructions in the Technical Description for the unit respectively.

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

NOTE! As an **alternative**, German Fire Brigade Panels (see page 60) can be connected to the RS485 interface.

9.2.1 External Fire Brigade Panels

1826 External Fire Brigade Panel (ext. FBP). A light grey metal housing (HxWxD, 290x 415 x 128 mm) with a door. A key is required to open the door, which has a Plexiglas ahead of the FBP front. It has cable inlets on the top, bottom and back sides and is intended to be wall mounted. Two compression glands are attached.
LED indicators and push buttons on the front are like the upper black part of the EBL128 / 512 front. **The front's designation texts are in Swedish.** A neutral front is available, where the **designation texts, in any language**, are made separately and by production put into a transparent "text slot" for the LED and push button respectively.
All or selected 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 EBL512 G3. Furthermore, at least 617 texts for selected fire alarms can be stored in the unit and will in such a case be shown, instead of the texts sent from EBL512 G3 for these alarms. These text messages will be downloaded to the unit via EBL512 G3. A built-in buzzer will sound like in EBL512 G3. The buzzer can be silenced and the alarm devices in the installation can be silenced. They will re-sound for a new alarm.[54] When there are queued alarms in the system, you can scroll amongst them and they can be reset. Any fault in the

[53] The connection order on the line is not dependent of the address.

[54] Silenced or disabled can be set via EBLWin (System properties).

system will be presented as "General fault in system" and the buzzer will sound.[55] A **Printer 1835** can be mounted in ext. FBP 1826. It will print all the alarms, including the alarm texts. New S/W versions can be downloaded directly in the unit. The unit is power supplied from EBL512 G3 or an ext. power supply.
The unit shall run in **S/W mode 1826/28 – 1587**. Up to 1200 m cable can be used. For more information, see Technical description MEW00249.

1828 External Fire Brigade Panel (ext. FBP). "Like" 1826 but with a compact size enclosure (HxWxD, 145 x 220 x 50 mm) made of grey high impact ABS. Fitted with a supplementary "O" ring gasket, it will comply with IP61, in respect of dust and moisture. The unit has no door, i.e. the front is accessed directly but a key is required to get access to the push buttons. They are disabled until they are supposed to be used. The unit shall be wall mounted. Two compression glands are attached. In all other respects it is like 1826, except that a printer cannot be mounted in 1828.
The unit shall run in **S/W mode 1826/28 – 1587**. Up to 1200 m cable can be used. For more information, see Technical description MEW00249.

1835 Printer. Can be mounted in the External Fire Brigade Panel **1826**. It will print all the alarms, including the alarm texts. Note that the printer current consumption is up to 200 mA when printing.

9.2.2 Alert Annunciation Units

When the **A**lert **A**nnunciation (**AA**) function shall be used in system EBL512 G3, 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 109.

1735 Alert Annunciation Unit (AAU). A compact size enclosure (HxWxD, 145 x 220 x 50 mm) made of grey high impact ABS. Fitted with a supplementary "O" ring gasket, it will comply 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 they are supposed to be used. The unit shall be wall mounted. Two compression glands are attached. **The front's designation texts are in Swedish.**
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

[55] Not valid for the Swedish convention (SBF).

programmed in EBL512 G3. Furthermore, at least 617 texts can for selected fire alarms be stored in the unit and will in such a case be shown, instead of the texts sent out from EBL512 G3 for these alarms. These text messages will be downloaded to the unit via EBL512 G3. A built-in buzzer will sound to indicate a not acknowledged **AA** alarm.
New software versions can be downloaded directly in the unit. The unit is power supplied from EBL512 G3 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 EBL512 G3 because:
- the activated fire alarm is not an **AA** alarm
- the **AA** function has been ended, e.g. the acknowledge or investigation time respectively has run out, etc.

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

The unit has the following push buttons:

Alarms queued, used to scroll amongst the alarms.

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

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

The unit shall run in **S/W mode 1735 – 1587**. Up to 1200 m cable can be used. For more information, see Technical description MEW00224.

1736 Alert Annunciation Unit (AAU). This unit is like 1735, except it has a neutral front, where the **designation texts, in any language**, are made separately and by production put into a transparent "text slot" for the LED and push button respectively. (This front also holds one extra LED & two extra push buttons.).
The unit shall run in **S/W mode 1736 – 1587**. Up to 1200 m cable can be used. For more information, see Technical description MEW00224.

9.2.3 External Presentation Units

1728 External Presentation unit (EPU). A compact size enclosure (HxWxD, 145 x 220 x 50 mm) made of grey high impact ABS. Fitted with a supplementary "O" ring gasket, it will comply with IP61, in respect of dust and moisture. The unit has no door, i.e. the front is accessed directly, when required. The push buttons are disabled until they are supposed to be used.

The unit shall be wall mounted. Two compression glands are attached. **The front's designation texts are in Swedish.** This unit is intended for pre-warning, co-incidence[56], 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 (alpha-numeric LCD, 2x40 characters), with back-light. An alarm text will also be presented together with each alarm, if programmed in EBL512 G3. Furthermore, at least 617 texts can for selected fire alarms be stored in the unit and will in such a case be shown, instead of the texts sent out from EBL512 G3 for these alarms. These text messages will be downloaded to the unit via EBL512 G3.

Any fault in the system will be presented as "General fault in system". The buzzer will sound.[55] It can be silenced. Any disablement in the system will be presented as "General disablement in system".[55]

A built-in buzzer will sound like in EBL512 G3. The buzzer can be silenced but the alarm devices in the installation cannot be silenced via this unit. New software versions can be downloaded directly in the unit. The unit is power supplied from EBL512 G3 or an external power supply. The unit shall run in **S/W mode 1728 – 1587**. Up to 1200 m cable can be used. For more information, see Technical description MEW00290.

9.2.4 German Fire Brigade Panels

FBP 2003 [57] German Fire Brigade Control Panel (Feuerwehr-Bedienfeld). A grey metal housing (HxWxD, 185 x 255 x 58 mm) with a door. A key is required to open the door, which has a Plexiglas ahead of the front. It has cable inlets on the top, bottom and back sides and is intended to be wall mounted.

The function, LED indicators and push buttons on the front are in accordance with DIN 14661. **The front's designation texts are in German.** Serial RS485 interface for IHD protocol.

The unit is power supplied from EBL512 G3 (or an ext. power supply). Up to 1200 m cable can be used.

FAT 2002 [58] German Fire Brigade Indicator Panel (Feuerwehr-Anzeigetableau). A grey metal housing (HxWxD, 185 x 255 x 58 mm) with a door. A key is required to open the door, which has a Plexiglas ahead of the front. It has cable inlets on the top, bottom and back sides and is intended to be wall mounted.

---

[56] Two zone / address dependence.

[57] IFAM GmbH Erfurth, type FBF 2003.

[58] IFAM GmbH Erfurth, type FAT 2002.

The function, Display information, LED indicators and push buttons on the front are in accordance with DIN 14662. **The front's designation texts are in German.** Serial RS485 interface for IHD protocol.
The unit is power supplied from EBL512 G3 (or an ext. power supply). Up to 1200 m cable can be used.

9.3 Units connected to the RS232 interface J7

9.3.1 Web-servers

1598 Web-server II. This unit can be used:
a) for presentation of the actual c.i.e. status in a PC using the web browser Microsoft Internet Explorer. It can also send e-mails in case of pre-warning, fire alarm, fault, disablement, test mode alarm and/or service signal.
b) for remote control with encrypted and safe two-way communication and five different user (access) levels.
c) as a gateway to other PC systems etc. Three alternatives are available today:

c1) EBL Talk is an open protocol, used to transmit and present fire alarm information in a separate PC / system.
c2) Tateco, used to transmit and present fire alarm information in an Ascom Tateco paging system.
c3) SIA, used to transmit and present fire alarm information in a separate PC application.

A PC tool, **EBLWin Config tool** is used for the configuration, which is downloaded to the web-server via TCP/IP.

The Web-server II consists of a light grey plastic cabinet (90x25x69.5 mm), which shall be vertically mounted on the symmetric 35 mm DIN rail inside the EBL512 G3 c.i.e.

Web-server II has the following interfaces:
RS232 (PLC COM) to connect the web-server to J7 in the EBL512 G3 c.i.e.
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 V DC) in the EBL512 G3 c.i.e.

9.4 Other units

9.4.1 Alert Annunciation Controllers

1740 Alert Annunciation Controller (AAC). This unit has no display, i.e. it has to be mounted close to EBL512 G3 (or an ext. FBP) where the fire alarms will be presented.
The compact size enclosure (HxWxD, 145 x 220 x 50 mm) is

made of grey high impact ABS. Fitted with a supplementary "O" ring gasket, it will comply 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 they are supposed to be used. **The front's designation texts are in Swedish.**
The unit shall be wall mounted. The LED "Acknowledge" can be turned on by the push button "Acknowledge" or by an input, i.e. a programmable output. This is set via a jumper "JP1" in the unit. The unit is power supplied from EBL512 G3 or an external power supply. One supplementary compression gland can be used for cable entry.

The unit has the following LEDs:

Fire, 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 this function.

Fire brigade alerted, indicating that the "Fire brigade tx" output is activated in EBL512 G3 because:
- the activated fire alarm is not an **AA** alarm
- the **AA** function has been ended, e.g. the acknowledge or investigation time has run out, etc.

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

The unit has the following push buttons:

Acknowledge, used to acknowledge an **AA** alarm.

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

Connections and more details are to be found in the Technical Description MEW00283.

9.4.2 External LED

2218 Ext. LED (ext. indicator). Used when a detector is placed out of view or hidden. The LED is lit at the same time as the LED in the detector / base it is connected to. It has a "Burning house" symbol instead of any text. 2218 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 **analog** detectors / bases
J2:3 (0 V)
To be wall mounted (87 x 87 x 30 mm).

9.4.3 Alarm devices (sounders, etc.)

Regarding addressable alarm devices, see page 51.
In the Panasonic product range are no alarm devices intended for a supervised (monitored) voltage output (e.g. S0 – S3 in EBL512 G3).

Connections of alarm devices according to drawings 512 G3 – 23 and -38.

9.4.4 Door release magnets

In the Panasonic product range are no Door release magnets. Door release magnets shall always be provided with a "suppression diode" (e.g. 1N4004) in parallel with the coil, like in the alarm devices, see drawing 512 G3 - 23.

9.4.5 Boxes

3362 Waterproof box (IP66 / 67). A grey polycarbonate box with ingress protection rating IP66 / 67. Four compression glands are included for the cable entries. Dimensions (L x W x H): 175 x 125 x 75 mm. 3362 can be used for e.g.:

Addressable multipurpose I/O unit 3361
Addressable 2 voltage outputs unit 3364

9.4.6 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 analog fire alarm systems, depending on the base and detector mounted inside the housing (base 2324 + 4352 or base 3312 F/FL + 4301). 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 Data sheet MEW01280.

10 Programmable inputs

In each control unit are four programmable, not supervised inputs (I0-I3) available.

In EBL512 G3 can also be mounted the Inputs and Outputs expansion board 4583, with five programmable inputs (Input 0-4). See chapter "Expansion boards 458x", page 26. These inputs can be supervised or not supervised.

On the COM loops can be connected the addressable multipurpose I/O unit 3361 with two programmable inputs.

Each input is programmed (via EBLWin), see dialog boxes below.

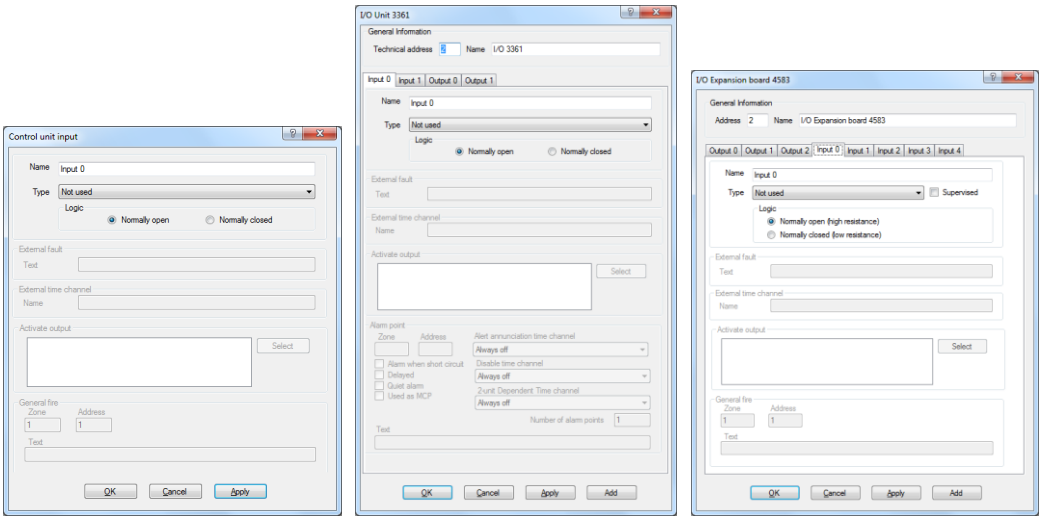


Figure 11. EBLWin "Input" dialog boxes. Different trigger conditions require different additional information, i.e. only the enabled fields can/shall be filled in.
NOTE! *The 3361 unit, Input 0, has a special input dialog box.*

10.1 Control unit Inputs I0 - I3 & Inputs 0 -4 on exp. board 4583

10.1.1 Not supervised

Normally open (R > 20K) **or** Normally closed (R < 500Ω)

Activation time: >0.5 sec.

Connections, see drawings 512 G3 – 23 and – 35, sheet 1.

10.1.2 Supervised

NOTE! Only valid for the exp. board 4583 Inputs 0 - 4.

Each supervised input can be in four different states:

- 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 following table is valid.

Line resistance **R**	Normally open (high resistance)	Normally closed (low resistance)
R > 6K8	Open circuit (cut-off)	Open circuit (cut-off)
6K8 ≥ R > 2K (nom. 3K3)	Not activated	Activated
2K ≥ R > 70 (nom. 680)	Activated	Not activated
R ≤ 70	Short-circuit	Short-circuit

Connections, see drawings 512 G3 – 35, sheets 1 & 2.

10.1.2.1 Input line fault

If open circuit (cut-off) or short-circuit is detected on a supervised input, a fault will be generated in EBL512 G3 and the following fault message will be displayed:

```
FAULT: Input x expansion board x,
control unit xx
```

10.2 The 3361 unit's Inputs In0 / Z & In1

Connections, see drawings 512 G3 – 31 and – 36.

10.2.1 Input In0

Input 0 can be used as a general input (In0) – like the c.i.e. inputs I0-I3 **or** used as a zone line input (Z) requiring an end-of-line capacitor (470 nF).

10.2.2 Input In1

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

11 Input programming

Input programming is done in EBLWin. For more information see EBLWin help. Each input has to have an individual Trigger condition ("Triggered by") and Logic. It is not allowed to let two or more inputs have the same trigger condition.

11.1 Trigger conditions

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

0. **Activate 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 per C.U.)
11. **External Time Channel** (one input per time channel. 49 ext. time channels (e.g. 1-49) are available per system)
12. **Extinguishing alarm**
13. **Extinguishing start** [59]
14. **Extinguishing stop** [59]
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**[60] (one input per system)

[59] All inputs and outputs involved have to be connected to the same c.i.e.

[60] Only valid for the New Zealand convention.

26. **Pre-warning** (input and corresponding fire alarm input have to be "connected" to the same C.U.)
27. **Technical warning** (max. 50 per C.U.)
28. **Zone Line Input**[61]

Comments to the trigger conditions (above)**:**

0. Activates any **COM loop unit output** 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 EBL512 G3 will light up the LED "Fault tx activated" on the front. Output with trigger condition "Indication Fault tx Activated" will be activated.[62]
2. Activated Ventilation equipment feedback to the EBL512 control unit to light up the LED "Ventilation".[63]
3. Output with trigger condition "Activated Key cabinet" will be activated.
4. Activated Fire brigade tx feedback to the EBL512 G3 control unit to light up the LED "Fire brigade tx".[63]
5. If the Key cabinet, where the fire brigade store the key(s) to the building, is opened when no fire alarm is activated, will activate a Key cabinet alarm. See EBL512 G3 Operating Instructions for more information.
6. Alert annunciation, see chapter "Alert Annunciation", page 109 and EBL512 G3 Operating Instructions for more information.
7. Like 6.
8. When one or more "Fire door closing" outputs are used, these outputs will be activated for 20 seconds by this trigger condition. **NOTE!** Only valid for inputs and outputs connected to the same c.i.e.
9. Normally used for the New Zealand key switch "Evacuation". The function is like the soft key "Evacuate" (P7)[64] on the c.i.e. front. The input has to be activated as long as the Evacuate function shall be on.
10. Ext. fault will activate a fault in EBL512 G3. A user definable fault message ("Error text") up to 40 characters will be shown.

---

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

[62] One input activated in any control unit, will light up the LED respectively in all control units.

[63] One input activated in a control unit, will light up the LED in that control unit.

[64] Available in some conventions only.

11. External clock, timer, key switch, etc. can disable / re-enable alarm points. The function Alert Annunciation, etc. can be turned on / off by a time channel. Control outputs can be turned on / off 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 EBL512 G3. Output with trigger condition "Extinguishing system fault" will be activated. The following fault message will be shown:

FAULT: Extinguishing system,
control unit xx

16. Activated Extinguishing equipment feedback to the EBL512 G3 control unit to light up the LED "Extinguishing".[63]
17. Ext. fuses (for ext. power supply equipment) fault output will activate a fault in the EBL512 G3 system. The following fault message will be shown:

    FAULT: External fuses, control unit xx

18. Ext. power supply equipment fault output will activate a fault in the EBL512 G3 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 EBL512 G3:

FAULT: Fault warning routing equipment,
control unit xx

20. A special detector, push button, etc. can activate a fire alarm in EBL512 G3. 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 91.
22. "Loss of the battery charger to external power supply equipment" fault output will activate a fault in the EBL512 G3 system. It will have the same time delay, as set for the Loss of main power

source fault for the c.i.e. 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 EBL512 G3 system. It will have the same time delay, as set for the Loss of main power source fault for the c.i.e. 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" (i.e. the New Zealand FB silence switch). Turned on: Alarm devices and the c.i.e. 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 c.i.e. 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 have to be 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 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 0 used as zone line input (Z), i.e. with end-of-line capacitor.

11.2 Logic

The logic has to be set. [65]

(•) Normally open / normally low Normally open contact or normally low optocoupler input.

( ) Normally closed / normally high Normally closed contact or normally high optocoupler input.

11.2.1 Supervised

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

[65] In the EBLWin dialog box "Input".

(•) 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 on page 65.

12 Programmable outputs

In each control unit are four programmable voltage outputs (S0-S3) and two programmable relay outputs (R0-R1) available. 8 relays expansion boards (4581) and Input and Output expansion board (4583) with three programmable outputs (Output 0-2) can be mounted in each EBL512 G3. See chapter "Expansion boards 458x", page 26. On the COM loops can be connected Addressable Multipurpose I/O units (3361) with two programmable relay outputs (Re0-Re1) per unit and Addressable 2 voltage outputs units (3364). Addressable siren (3377 / 4477), Addressable sounder base (3379) and Addressable beacon (4380) can also be connected on the COM loops, i.e. the units have no physical outputs, only the siren and sounder respectively.

Each output is programmed via EBLWin, see dialog boxes below.

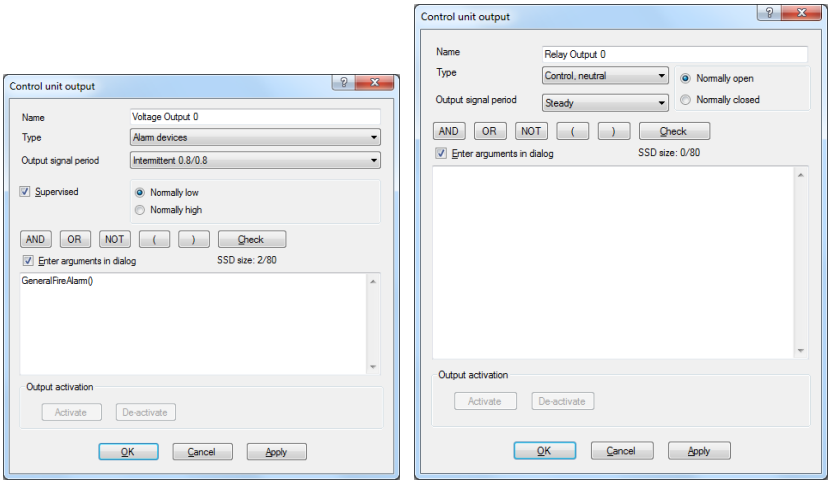


Figure 12. EBLWin Control unit Voltage Output and Relay Output dialog boxes.

Each 3377 and 3379 unit is programmed via EBLWin, see dialog box below.

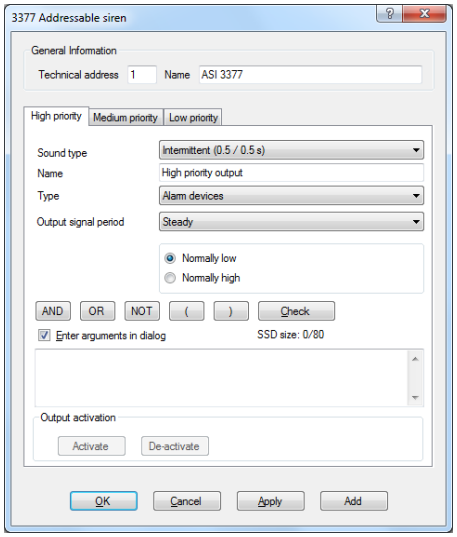


Figure 13. EBLWin "Addressable siren 3377" dialog box. The dialog box for "Addressable sounder base 3379" is similar.

Test of outputs

When a PC is connected to a control unit, EBLWin open and you are logged on, each output can be activated / de-activated.

12.1 Control unit outputs S0 – S3

Each control unit has four programmable, supervised (monitored)[66] voltage outputs:

S0 Supervised (monitored) voltage output, 24V DC, max. 500 mA (Fuse F4)

S1 Supervised (monitored) voltage output, 24V DC, max. 500 mA (Fuse F5)

S2 Supervised (monitored) voltage output, 24V DC, max. 500 mA (Fuse F6)

S3[67] Supervised (monitored) voltage output, 24V DC, max. 500 mA (Fuse F7)

Connections and more information, see dwg. 512 G3 - 23.

12.2 Control unit outputs R0 & R1

Each control unit has two programmable relay outputs. Relay contact ratings: 30 V, 1A.

---

[66] 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 112.

[67] 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).

R0 Relay output, NO or NC contacts programmable

R1 Relay output, NO or NC contacts programmable

Connections and more information, see dwg. 512 G3 - 23.

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 dwg. 512 G3 – 34.

12.4 Inputs and Outputs expansion board 4583 Output 0 & Output 1

Expansion board 4583 has two programmable, supervised (monitored)[68] voltage outputs:

Output 0 Supervised (monitored) voltage output, 24V DC[69], max. 200 mA (Fuse F1).

Output 1 Supervised (monitored) voltage output, 24V DC[69], max. 200 mA (Fuse F2).

Connections and more information, see drawing 512 G3 – 35, sheet 1.

See also chapter "Inputs and outputs expansion board 4583", page 29.

12.5 The 3361 unit's Outputs Re0 & Re1

Each 3361 unit has two programmable relay outputs. Relay contact ratings: 30 V DC (125 V AC), 2A.

Re0 Relay output, NO or NC contacts programmable

Re1 Relay output, NO or NC contacts programmable

Connections and more information, see dwg. 512 G3 – 36.

---

[68] 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 112.

[69] See chapter "Technical data", page 168, regarding **system voltage**.

12.6 The 3364 unit's VO0 – VO2

Each 3364 unit has two programmable, supervised (monitored)[66] voltage outputs:

Output **VO0** Supervised (monitored) voltage output, 24V DC[70]

Output **VO1** Supervised (monitored) voltage output, 24V DC[70]

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

Output **VO2** Voltage output, 24 V DC, max. 1A[70]. Normally high. For more information see the Technical Description MEW00529.

24 V DC is required from an external power supply unit (e.g. 3366).

Connections and more information, see dwg. 512 G3 – 31 & - 38.

12.7 The 3377 / 4477 unit's Output (siren)

Each 3377 / 4477 unit has one programmable output:

Output **Siren** Three priority levels and three types of tones.

Connections and more information, see dwg. 512 G3 – 31.

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 for additional 4.5 dB.

Connections and more information, see dwg. 512 G3 – 31.

12.9 The 4380 unit's Output (beacon)

Each 4380 unit has one programmable output:

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

Connections and more information, see dwg. 512 G3 – 31.

[70] Cont. 1 A, during 10 ms 1.4 A.

13 Output programming

Output programming is done in EBLWin. See the EBLWin dialog box respectively. See also EBLWin help.

13.1 Type of output

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

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

Comments to the output types:

0. Default. General (normal) control output[71]
1. Used to activate fire ventilation equipment[71],[72]
2. Used to activate extinguishing equipment[71],[73]
3. Used for sounders, etc.[74]
4. Used for **fire brigade tx** outputs only[75]
5. General (normal) control output. No collective disablement and no LED indication.
6. This output[71] can be used together with a corresponding interlocking input. See chapter "Interlocking function", page 91. Activated output is shown in menu H9/C1.

---

[71] Controlled by menu H2/B3 Disable / Re-enable output type.

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

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

[74] 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.

[75] Activated according to its control expression (trigger cond. 21 *Indication Fire brigade tx activated* must **not** be used). Disabled like 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 shall be used the following trigger condition has to be added to the control expression:
&!Alert Annunciation activated. ("&!" is the same as "and not".

13.2 Logic

(•) Normally open / low Normally open relay contact or normally low voltage output. [76]

( ) Normally closed / high Normally closed relay contact or normally high voltage output (24V DC).[77]

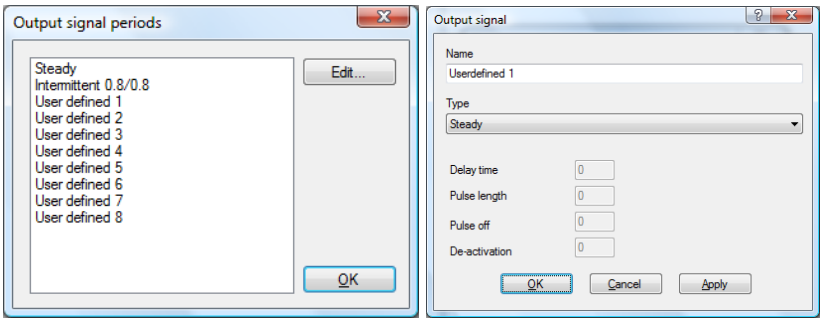
13.3 Supervised / Not supervised

A voltage output is supervised (default). By unmarking the "Supervised" checkbox the voltage output will be not 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:



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

Types:

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

Times:

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

---

[76] The logic is set in the EBLWin dialog box "Voltage / Relayed Output".

[77] The logic is set in the EBLWin dialog box "Voltage / Relayed Output".
NOTE! A normally high output can not be supervised and it will be low for a few seconds during restart of the c.i.e.

Regarding the programming, see chapter "Output Signal Periods", page 151.

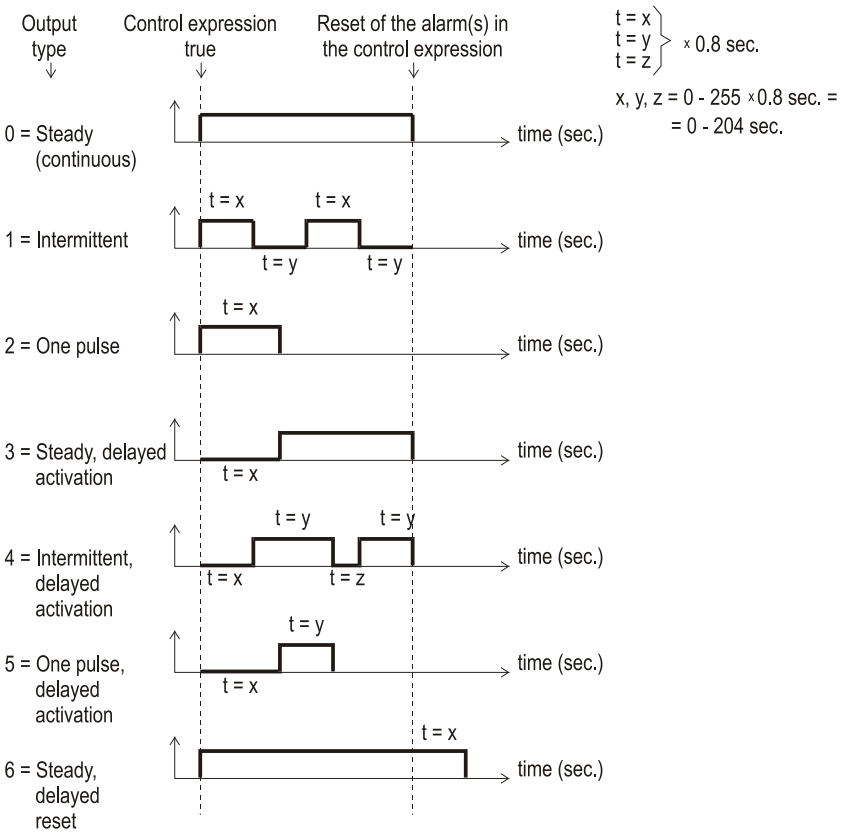


Figure 14. Delay time, Pulse length, Pulse off and/or De-Activation, have to be set for the type respectively.

NOTE! The different types can be used together with the different outputs according to the following table:

	In EBL512 G3				COM loop units				
Output / **Type**	**S0-S3**	**R0, R1**	**4581 board**	**4583 board**	**I/O unit 3361**	**Unit 3364**	**Siren, S/B & Beacon 3377, 3379 & 4380**	**4582 board**	**Inter locking**
0 Steady (continuous)	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
1 Intermittent	**X**	**X**	**XXX**	**--**	**--**	**XX**	**--**	**--**	**--**
2 One pulse	**X**	**X**	**XXX**	**--**	**--**	**--**	**--**	**--**	**--**
3 Steady (continuous), delayed activation	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
4 Intermittent, delayed activation	**X**	**X**	**XXX**	**--**	**--**	**XX**	**--**	**--**	**--**
5 One pulse, delayed activation	**X**	**X**	**XXX**	**--**	**--**	**--**	**--**	**--**	**--**
6 Steady (continuous), delayed de-activation	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**--**

Figure 15. The types that can be used in the "Output signal period" for the programmable output respectively
***X** = Output type can be used. **XX** = Output type can be used but only 0.8s/0.8s. **XXX** = Output type 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 expression. It is created by so called Boolean algebra.

Trigger conditions (see "Available functions"), logical "Operators" (**AND**, **OR, NOT**) and parentheses are used to make a "control expression" containing up to 40 trigger conditions. See also chapter "Control expression examples" page 85.

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

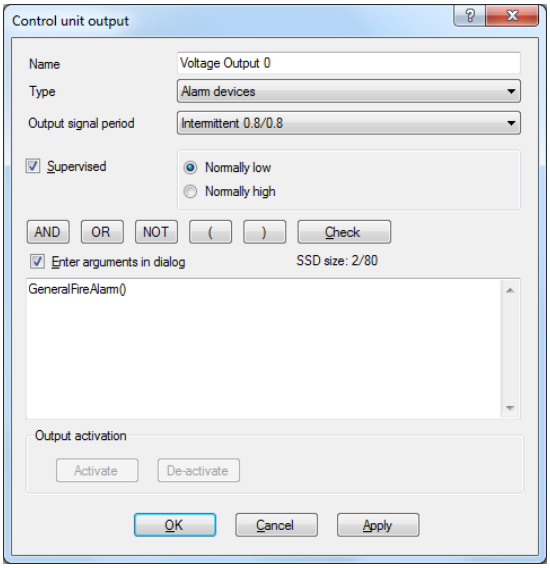


*Figure 16. In any output dialog box, click the right mouse button in the large white field. Select **Alarm**, **Interlocking**, **Disablement** or **Other** to open a "Trigger conditions list". Depending on the selected trigger condition, different arguments / data have to be entered. In the figure is the trigger condition "General Fire Alarm" selected.*

13.5.1 Trigger conditions

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

The trigger conditions are divided into four groups as follows:

Alarm
Interlocking
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.)
19 **Quiet Alarm Zone** (+Zone no.)
20 **Quiet Alarm Zone Address** (+ Zone no. +Address)
21 **General Fire Alarm Reset**

13.5.1.2 Interlocking

22 **Interlocking Input Area Activated** (+Area no.)
23 **Interlocking Input Area Point Activated** (+Area no. +Point)
24 **General Interlocking Input Activated**
25 **Consecutive Interlocking Input Activated** (sequence) (+start Area no. and point +stop Area no. and point +Quantity)

13.5.1.3 Disablement

26 **Fire Brigade Tx Disabled**
27 **Zone Disabled** (+Zone no.)
28 **Zone Address Disabled** (+Zone no. +Address)
29 **General Zone Address Disabled**
30 **All Control Disabled**
31 **All Alarm Devices Disabled**
32 **Control Disabled Control Unit** (+Control unit)
33 **Alarm Device Disabled Control Unit** (+Control unit)
34 **General Disablement**

13.5.1.4 Other

35 **Indication Fire Brigade Tx Activated**
36 **Indication Fault Tx Activated**
37 **General Fault**
38 **General Mains Fault**
39 **Reset Pulse Zone Address** (+Zone no. +Address) [78]
40 **Time Channel Activated** (+Time channel name / no.)
41 **Alert Annunciation Activated**
42 **Alert Annunciation Acknowledged**
43 **Door Open**
44 **Fire Door Closing** (+Zone no. +Address)
45 **General Service Signal**
46 **Fire brigade Tx**
47 **Door Open Control Unit** (+Control unit)
48 **Extinguishing System Fault**
49 **Extinguishing System Released**
50 **Activated Key Cabinet**
51 **Fault Control Unit** (+Control unit)
52 **Consecutive Fault Control Unit** (+start Control unit and stop Control unit)
53 **Zone Fault** (+Zone no.)
54 **External Fault** (+ext. fault)
55 **Technical Warning** (+techn. warning)
56 **General Technical Warning**

Comments to the trigger conditions (functions):

Alarm

1 Fire alarm. For more information regarding **fire alarm**, see EBL512 G3 Operating Instructions MEW01552. 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 any alarm point or Zone is in alarm.
4 See 1. Quantity (1-10): "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.[79] For more information regarding **pre-warning**, see EBL512 G3 Operating Instructions MEW01552. Output is activated when the specified Zone is over the pre-warning level.

[78] Not valid for the 3364 outputs (VO0-VO2).

[79] 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).

6 See 5. Output is activated when the specified alarm point is over the pre-warning level.
7 See 5. Output is activated when any alarm point or Zone is over the pre-warning level.
8 See 5. See also 4. above regarding "Quantity".
9 Heavy smoke / heat alarm. For more information regarding **heavy smoke / heat alarm**, see EBL512 G3 Operating Instructions MEW01552. Output is activated when the specified Zone is over the heavy smoke / heat level.
10 See 9. Output is activated when the specified alarm point is over the heavy smoke / heat level.
11 See 9. Output is activated when any alarm point is over 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 EBL512 G3 Operating Instructions MEW01552.
14 Output is activated when only one zone (in two-zone dependence) is in fire alarm state. For more information, see EBL512 G3 Operating Instructions MEW01552.
15 Output activated when "Multiple detector alarm" is true, i.e. fire alarm type A.[80]
16 Output activated when "One detector alarm" is true, i.e. fire alarm type B[80].
17 General Key cabinet alarm activated. For more information, see EBL512 G3 Operating Instructions MEW01552.
18 **A**larm **A**cknowledgement **F**acility. Australian facility (require special hardware). "Alarm" is activated in the specified AAF zone.
19 Output activated for any "Quiet alarm" in the specified zone. Used e.g. for the fan control function.
20 Output activated for one specified "Quiet alarm" in the specified zone-address. Used e.g. for the fan control function.
21 This control expression is true (i.e. output activated) for 15 seconds after the last alarm is reset.

Interlocking

22 Output activated when one or more interlocking inputs, in the specified interlocking area, are activated.
23 Output activated when the interlocking input, in the specified interlocking area/point, is activated.
24 Output activated when any interlocking input is activated.

[80] See chapter "Fire alarm type A and Fire alarm type B", page 108.

25 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

26 Output activated when any Routing equipment output (Fire brigade tx) is disabled.[81]

27 Output activated when the specified zone is disabled.[82]

28 Output activated when the specified alarm point (zone-address) is disabled.[82]

29 Output activated when any alarm point (zone-address) or zone is disabled. [82]

30 The control expression is true (output activated) when all control outputs of the types **Control**, **Fire ventilation** and **Extinguishing** in all control units are disabled via menu H2/B3[82]. This output shall be type Control – neutral.

31 The control expression is true (output activated) when all control outputs of type **Alarm** device in all control units are disabled via menu H2/B4[83]. This output shall be type Control – neutral.

32 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/B3.[82] This output shall be type Control – neutral.

33 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 shall be type Control – neutral.

34 The control expression is true (output activated) when any disablement exists in the system.[82]

Other

35 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 cond. "Activated Routing Equipment" is activated.[84]

---

[81] Which is indicated by LED **Fault / Disablements** "Fire brigade tx".

[82] Which is indicated by LED **Fault / Disablements** "General Disablements".

[83] Which is indicated by LED **Fault / Disablements** "Alarm devices".

[84] 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)".

36 The control expression is true (output activated) when LED "Fault tx activated" is lit, i.e. when the routing equipment output (Fault tx) is activated.[85]

37 Output activated when one or more faults are generated in the system.[86]

38 Output activated for loss of mains (in a c.i.e. or external power supply 3366).[87] **NOTE!** The output(s) will be activated immediately but the corresponding fault is normally delayed (set via EBLWin).

39 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 same c.i.e. as the specified Zone-Address.

40 Output activated when the specified time channel is activated.

41 Output activated when Alert annunciation alarm is activated (by any alarm point set to activate this function).[88] For more information, see EBL512 G3 Operating Instructions MEW01552.

42 Output activated when Alert annunciation alarm is activated (by any alarm point set to activate this function)[88] and acknowledged. For more information, see EBL512 G3 Operating Instructions MEW01552.

43 Output activated for Door open in any control unit in the system.[89]

44 This trigger condition plus the OR operator shall be used for each detector (Zone-Address) controlling a fire door (normally ≥ two detectors). Type of output is normally "Control, neutral".[90] Output activated, see chapter "Fire Door Closing", page 95.

45 Output activated when Service signal is activated (by any sensor).[91]

46 The control expression is true (output activated) when the control unit standard output "Fire brigade tx" is activated.

---

[85] Which is indicated by LED **Routing equipment** "Fault tx activated". This output will also be activated when the routing equipment test is performed via menu H1.

[86] Which is indicated by LED **Fault / Disablements** "General fault" and/or LED **Routing equipment** "Fault tx activated".

[87] Which is indicated by a symbol in the c.i.e. display.

[88] Valid until the AA alarm is reset or becomes a normal fire alarm.

[89] Which is indicated by a symbol in the c.i.e. display.

[90] In Danish convention (DBI), must only the c.i.e. outputs R0-R1 and S0-S3 be used (or COM loop unit 3364) and the type has to be "control neutral".

[91] Indicated by a symbol in the c.i.e. display.

NOTE! Normally used with output type *Routing equipment (Fire brigade tx)*.

47 Output activated for Door open in the specified control unit.[89]

48 Output activated when input trigger condition "Extinguishing system fault" is true.

49 Output activated when input trigger condition "Extinguishing system released" is true.

50 Output activated when input trigger condition "Activated key cabinet" is true.

51 Output activated when one or more faults are generated in the specified control unit.[86]

52 Output activated when one or more faults, in the specified range (from control unit to control unit), are generated.[86]

53 Output activated when one or more faults are generated in the specified Zone.[86]

54 Output activated when the specified external fault is generated.[86]

55 Output activated when the specified technical warning is generated.[92]

56 Output activated when one or more technical warnings are generated.

13.5.2 Logical operators

The logical operators available in EBLWin are in 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 also shown in the following table:

[92] Indicated by a symbol in the c.i.e. display.

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 also shown in the following 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 following 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

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 following 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 the output S0.

Example 2

Output: Relay output **R1**

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

Explanation: Controls OFF (via menu H2/B4) 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 ore 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

A break or short circuit on a COM loop has to generate a fault in the control unit within 60-100 seconds (EN54-2 requirement).

If one or more short circuit isolators are used[93], 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.

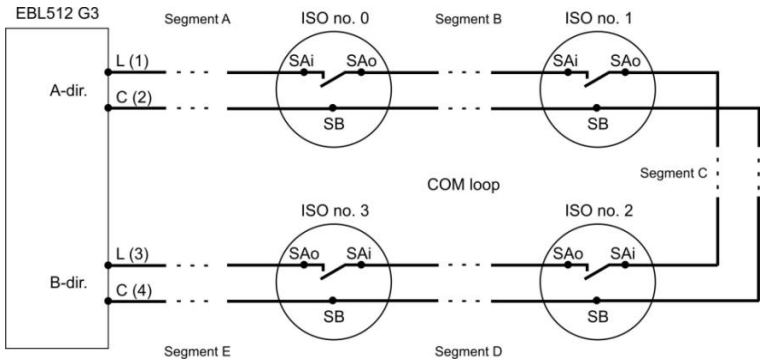


Figure 17. The first isolator (ISO) in the A-direction has to have the sequence no. 0 (ISO no. 0), the next sequence no. 1 and so on. The sequence no. is programmed via EBLWin.

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

COM loop return voltage <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 powerless (= 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 (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.

[93] One short circuit isolator per 32 alarm points is required according to EN54-2.

- 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 17). 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, 06, 07, 08, 09, 10, 11, 12, 13, 14, 15 - - 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, 06, 07, 08, 09, 10, 11, 12, 13, 14, 15 - - up to 63or 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 EBL512 G3 Operating Instructions MEW01552.

NOTE! After the faults are acknowledged it can take up to 10 minutes before the faults will 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 really is 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

EBLWin is used for the programming. Up to 400 Interlocking Combinations per c.i.e. can be used and up to 4000 in a system.
NOTE! One Interlocking Combination (the input, the output and the area) has to be in / connected to one c.i.e. An input and an output can only be used in one combination.

15.1.1 Interlocking output

The "Voltage Output" / "Relay Output" dialog boxes are used.
Type: "Interlocking" shall be selected.
Output signal period: Type Steady (continuous) or Type Steady, delayed activation can be selected (checked by the "Validate" function in EBLWin).
A **Control Expression** shall be programmed for the output, i.e. for the equipment to be controlled.
Activated output will be indicated in menu H9/C1.
Name: The interlocking combination's presentation number (Area-Point) could be added.

15.1.2 Interlocking input

The "Input" dialog box is used.
Type "Interlocking" shall be selected.
Activated input will be indicated in menu H9/C1.
Name: The interlocking combination's presentation number (Area-Point) could be added.

15.1.3 Interlocking combination

One interlocking output and one interlocking input are programmed in an interlocking combination to get the interlocking functions.

NOTE!
The interlocking outputs and inputs have to be programmed before the programming of an interlocking combination is possible to do.[94]

(An interlocking combination can have only an output or only an input programmed, e.g. when a user definable text message is wanted to indicate an activated output or input.)

[94] In the "Interlocking Combination" dialog box are listed all the outputs and inputs previous programmed for interlocking, see Figure 18.

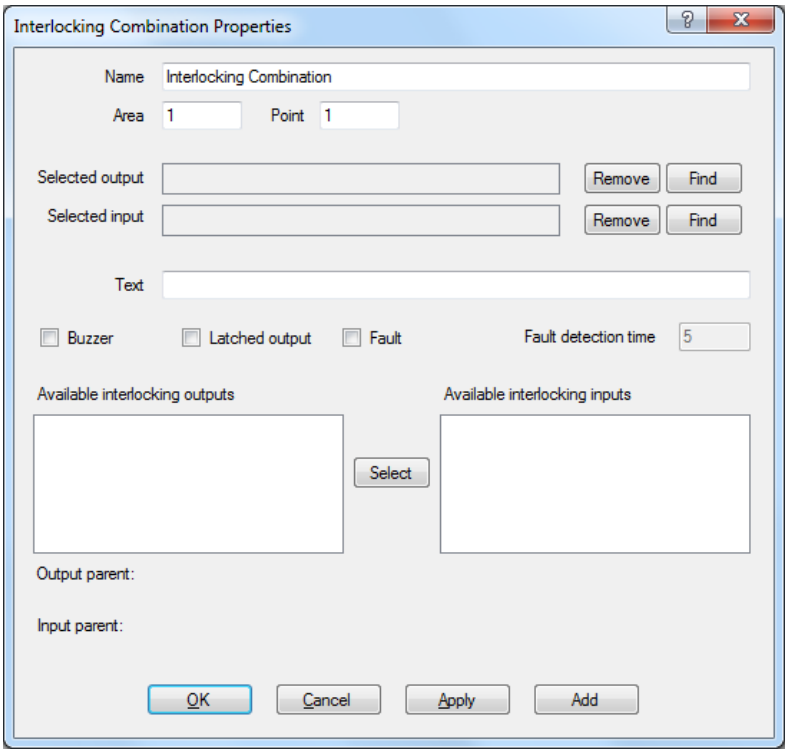


Figure 18. EBLWin "Interlocking Combination" dialog box.

Name: Displayed in the EBLWin Tree and List views. Default is "Interlocking Combination" that can be edited when wanted / required. "Area-Point" will be added in the tree view. "Area-Point" will be shown under "Zone-Address" in the list view.

The **Available interlocking outputs** list displays all the previous programmed outputs, Type = "Interlocking".
The **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** the output / input (from the field).

It is possible to **Find** (open the dialog box) the 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.

Area and **Point**: Each "Interlocking Combination" is presented as Area-Point (compare with Zone-Address). Area numbers 1-999 are possible and within each Area, Point numbers 1-99 are possible to use. An Area can only be used in one c.i.e.

Text = User definable text message to be shown in the menu H9/C1. Can be written in this field or in the "Texts" dialog box, see chapter "Creating the alarm texts via EBLWin", page 119.

Buzzer checked = activated interlocking input will turn on the c.i.e. buzzer (0.8 / 0.8 sec.)[95]. 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 activated[96], 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 c.i.e. display[97]:

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)

In menu H9/C1 will information be shown as follows:

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

or

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

or

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

AAA = Interlocking combination Area
PP = Interlocking combination Point within the Area
Date (**yyyy-mm-dd**) and time (**hh:mm**).

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

[95] Priority order: Fire alarm – Pre-warning - Interlocking - Fault.

[96] After the end of the any delay time.

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

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. **NOTE!** 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.
Via menu H2/B3 can all interlocking outputs in the system be disabled / re-enabled.

Re-enable

Interlocking outputs (i.e. Output Type = Interlocking) can be re-enabled via this menu. **NOTE!** 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 80), i.e. one or more outputs can be activated when one or more interlocking inputs are activated.

16 Fire Door Closing

Programmable outputs can be used for fire door closing.[98] 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.

NOTE! The alarm points and their "belonging" output have to be in / connected to the same c.i.e.

In case of one of the following "events", the output will be activated, i.e. the fire door will close:

- Fire alarm (any of the detectors controlling the fire door)
- Fire alarm in "Test mode" (any of the detectors controlling the fire door)
- Fault (i.e. "no answer" from any of the detectors controlling the fire door[99])
- Disablement (any of the detectors controlling the fire door, the zone(s) involved or the COM loop involved)[100]
- 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 c.i.e. 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, is it 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 91.

[98] In the DBI (Danish) convention, must only the c.i.e. outputs R0-R1 and S0-S3 in the c.i.e. be used. Also the COM loop unit Addressable 2 voltage outputs unit 3364 can be used. "Type of output" has to be "Control, neutral".

[99] E.g. if the detector is faulty or if there are two breaks or short-circuit on the COM loop.

[100] If an I/O unit 3361 output is used, it is recommended, for safety reasons, to **not** connect it to the same COM loop as the detectors controlling the fire door.

17 Functions / Services / Features

Some Functions / Services / Features require programming in EBLWin, see chapter "PC programs ", page 16.
How to connect the PC and for more information, see chapters "Download SSD", page 157 and "New system program (S/W) version download", page 160.

The information in the following chapters 17.1 - 17.7 is valid for the **analog smoke detectors 430x / 440x in NORMAL mode.**
Chapter 17.5 is valid for the **analog heat detectors 3308 / 3309 in NORMAL mode**.
For the analog detectors 440x in Advanced mode, see chapter "Advanced mode", page 127.

17.1 Sensor value

An analog smoke detector is like a "sensor". It detects its environment at all times. Each detected analog value is, in the detector, converted to a digital "**sensor value**", which for each individual detector, is continuously picked up and evaluated by EBL512 G3. In Figure 19 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 EBL512 G3) and each week, these stored sensor values are used for a "**week average sensor value**" calculation.[101] This is done for each analog smoke detector individually. In Figure 19 the (digital) week average sensor values (during a certain time) are represented by the graph "**Week average sensor value**" (B).

Each analog 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 19 represented by the graph "**Fire alarm level**" (C) - parallel with the graph "**Week average sensor value**" (B).

In Figure 19 (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

[101] The first week average sensor value will be calculated within 2½ minutes after any restart, i.e. also after SSD download. During these 2½ minutes all analog smoke detector fire alarms are suppressed.

detector is "dirty" and has to be replaced. See "**Service level**" (D) in Figure 19. 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.

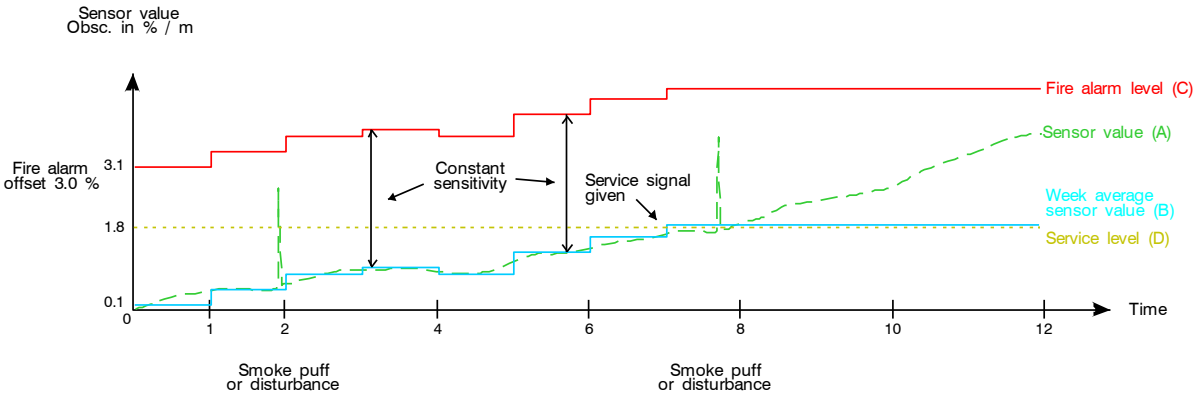


*Figure 19. The basic working **principle** for an analog smoke detector ("sensor"). Sensor value (A), Week average sensor value (B), Fire alarm offset (3 %/m), Fire alarm level (C) and Service level (D).*

"Sensor Information" is available via menu H4/U4. Via EBLWin and a PC connected to EBL512 G3 you can also get continuous "Sensor Information" for one or several detectors.

Also via the Web-server II 1598 you can get "Sensor Information" for one or several analog detectors on a COM loop.
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 101). The decision value is calculated, see chapter "Filtering algorithm, page 99.

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, for the whole system, be set in EBLWin, see chapter "Alarm algorithms", page 149.

The fire alarm offset can, for the whole system, be set in EBLWin, see chapter "Alarm algorithms", page 149.

NOTE! This is not a normal action and a special password is required.

"Pre-warning", "Fire Alarm" and "Heavy Smoke Alarm" can activate programmable outputs respectively, see chapter "Control expression", page 79. See also EBL512 G3 Operating Instructions MEW01552.

17.4.1 Alarm algorithm / Alternative alarm algorithm

In order to reduce the nuisance alarms[102] and ensure that the real fire alarms will be activated, six different alarm algorithms are available. See Figure 20., page 99. They 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. Can be used when an "early" fire alarm is wanted.

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[102] but might not fulfil the EN54-7 specifications.

Normal detection time - 15 sec. (Default) There will always be min. 15 seconds alarm delay[103]. This is a "normal filter" to reduce nuisance alarms.

Slow detection time - 35 sec.. There will always be min. 35 seconds alarm delay[103]. This is an "extra filter" to reduce nuisance alarms[102] but might not fulfil the EN54-7 specifications.

Each analog 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[102] during working hours).
The alarm algorithm in use can be read in menu H4/U4.

---

[102] So called false / unnecessary alarms.

[103] 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.

The alarm algorithm parameters can, for the whole system, be set in EBLWin, see chapter "Alarm algorithms", page 149. (To change fire alarm parameters a special password is required.)

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 is zero from the beginning. Each time a new sensor value is picked up (sampled) from an analog smoke detector 430x, this new sensor value is compared with the actual decision value and the decision value will be adjusted or not adjusted as follows:

If the difference, between the new sensor value and the actual decision value is ≤ "**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 depending on the selected alarm algorithm, see Figure 20.

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.

Analog 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 / 4301 4400 / 4401	X=8	X=10	X=12	X=4	X=5	X=6

*Figure 20. The six alarm algorithms. Default is alarm algorithm **N-15**, i.e. normal detection time (15 sec.) and normal sensitivity (3%). X=The step value. (The L-15, H-35, N-35 and L-35 algorithms might not fulfil the EN54-7 specifications.)*

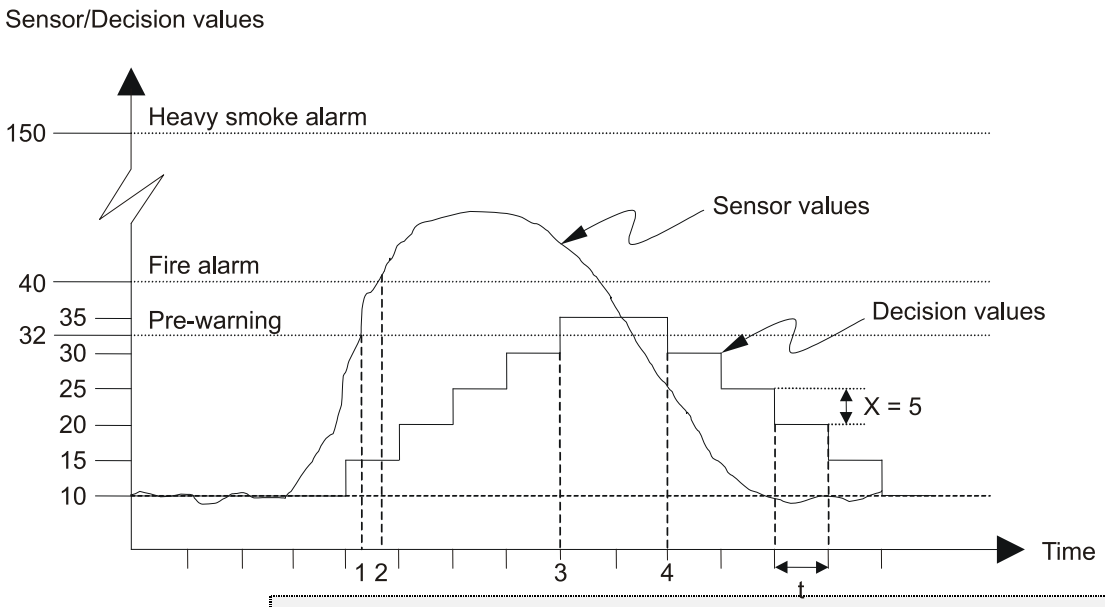


*Figure 21. An **example** of the filtering algorithm for an Analog smoke detector with the step value X = 5. The polling time (t) in this example is approx. 2.56 seconds.*

Explanations to the figure:

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** ≈ 2.56 sec. (**In system EBL512 G3** the detector polling time **t** ≈ 7 seconds and the step value "X" is according to Figure 20 – but the **principle** is the same.)

At start the sensor values and decision values are approx. equal ("10"). When smoke comes into 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 comes up 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.

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 brings the sensor value to rise very 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 depending 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 continue 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, for the whole system, be set in EBLWin, see chapter "Alarm algorithms", page 149.

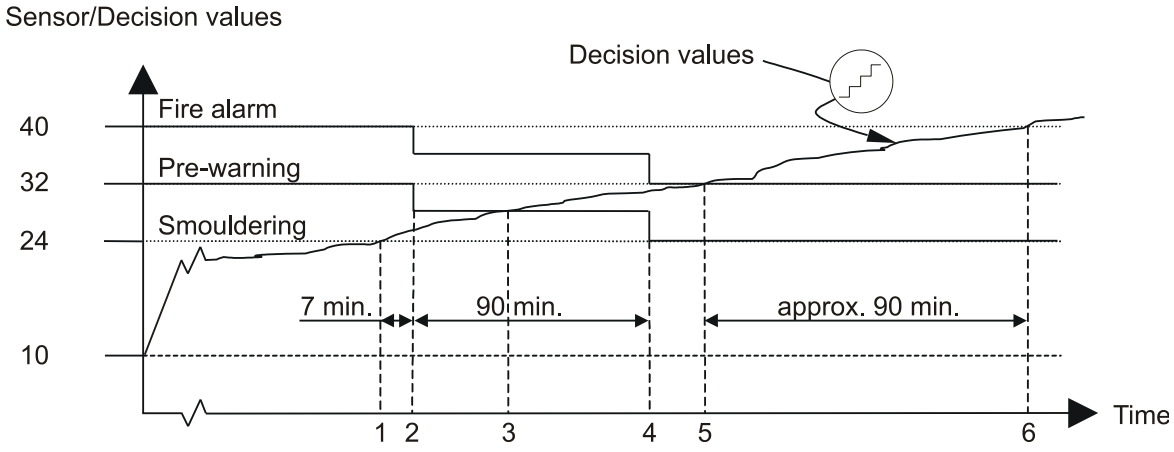


*Figure 22. An **example** of the smouldering smoke algorithm for an Analog smoke detector 4301.*

Explanations to the figure:

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 upwards from "10".

1. The decision value has here 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 here 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 here reached the original fire alarm level, i.e. the fire alarm would have been activated approx. 90 minutes later than with the smouldering algorithm!

17.4.4 Performance factor

To find out how the environment is where an analog smoke detector 430x and 440x in NORMAL mode is mounted, the **performance factor** can be studied. The performance factor is shown in menu H4/U4 together with the min. and max. sensor values. All three

values should be studied together. (E.g. one or two high sensor values will not result in a high performance factor.) The performance factor is calculated for each detector individually.

$$\frac{\sum_{m=0}^{12343} |X_m - X_{wa}|}{12343} = Pf$$

X_m = momentary sensor values for 24 hours.
X_{wa} = weak average sensor value
12343 = pollings during 24 hours

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" calculated, i.e. the performance factor.

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.

17.5 Algorithms for analog heat detectors

The detectors conforms to a class (see EN54-5:2000, clause 4.2) according to the requirements of the tests specified in EN54-5:2000, clause 5.

Each analog 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.

When the c.i.e. 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 c.i.e. (This results in an approx. 5 seconds alarm delay).

The same is valid for **pre-warning** except it is a lower level (xx° C) than for fire alarm. (If pre-warning shall be generated or not, is selected in EBLWin – System Properties).

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, for the whole system, be set in EBLWin, see chapter "Alarm algorithms", page 149.
See EBL512 G3 Operating Instructions MEW01552 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 ≤ 4° 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° 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° 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 an A2 S algorithms).

17.6 Self verification

The analog detectors 430x / 44ox 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 receive a question from the c.i.e. If the self verification function has detected any fault it will be reported back to the c.i.e. A fault will be activated in the system and the following fault message will be shown:

```
FAULT: Detector xxx-xx
Technical number xxxxxx
```

17.7 Minimum / Maximum sensor values

To find out how the environment is, where an analog 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 (c.i.e.) for each detector individually. Every value is checked if it is a new minimun 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/U4[104].

For analog smoke detectors the minimum and maximum sensor values are shown as XX.X % (obscuration) per meter.

For analog heat detectors the values are shown as XX°C.

[104] I.e. the min. / max. sensor values shown, are from the previous day.

17.8 2-zone / 2-address dependence (Co-incidence alarm)

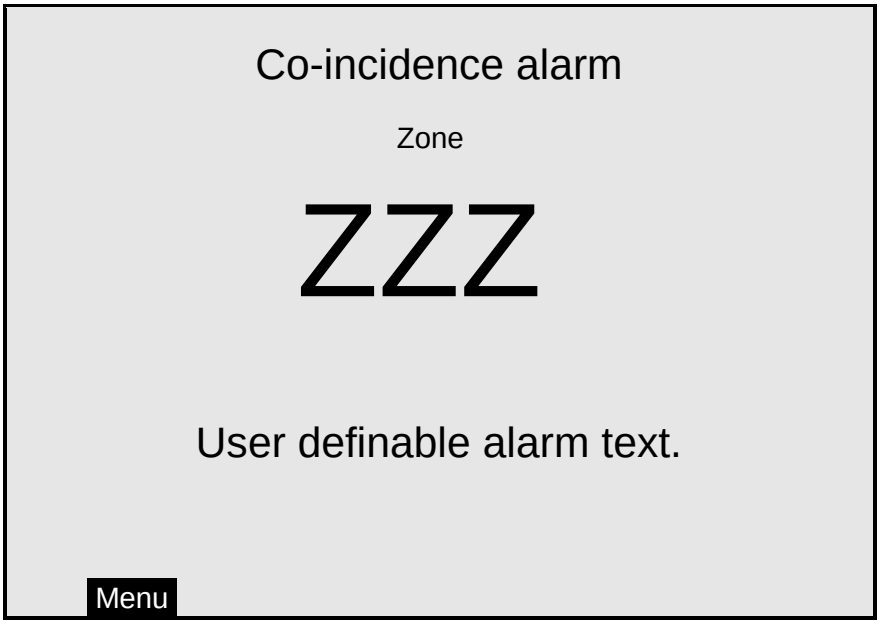
In some premises 2-zone or 2-address dependent fire alarm ("Two unit dependent" in EBLWin) can be used to avoid unwanted / false alarms (nuisance alarms). A time channel can turn on/off this function.

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).[105]

Function:
Two or more zones in the same group have to be in "fire alarm state"[106] 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 (c.i.e.) as follows:

- The buzzer sounds like for pre-warning (0.8 / 5 sec.).
- In the c.i.e. 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.

[105] See also chapter "

Two zone dependence", page 143.

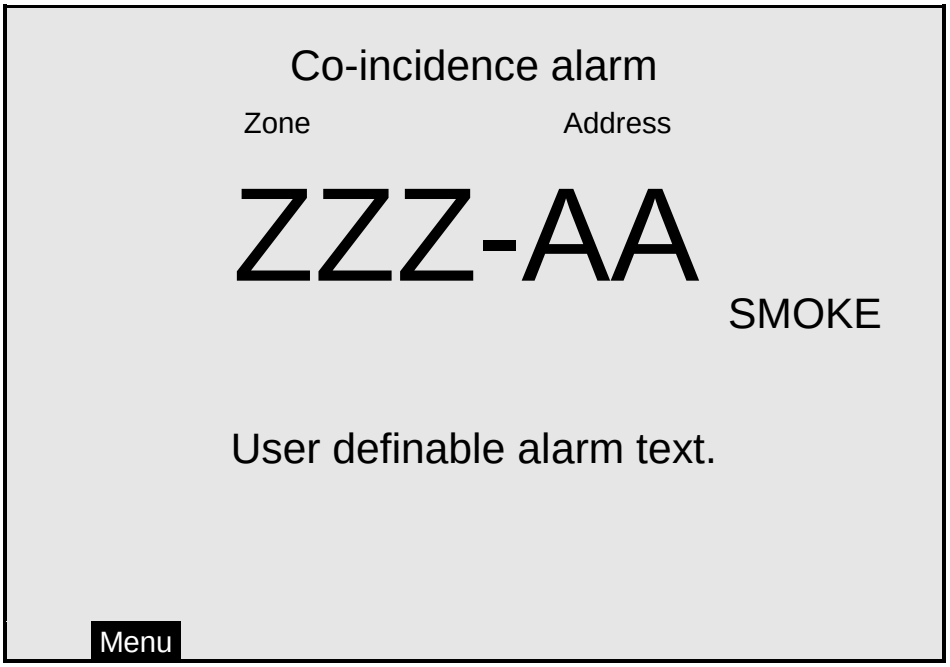
[106] Fire alarm state is when a fire alarm normally would have been activated in the c.i.e.

17.8.2 2-address (-unit) dependence

Each analog 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"[106] 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 (c.i.e.) as follows:

- The buzzer sounds like for pre-warning (0.8 / 5 sec.).
- In the c.i.e. LCD the following information is shown:



Programmable outputs can be activated by trigger condition "Two Address Dependent Fire Alarm" but no other outputs will be activated.

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 c.i.e. front / FBP, 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 c.i.e.

17.9 Delayed alarm

In some premises delayed fire alarm activation can be used to avoid unwanted false alarms (nuisance alarms). The delay time will be added at the end when a fire alarm normally would have been activated in the c.i.e. This function is a violation to the EN54-2 standard.

Each analog or addressable detector, each addressable multipurpose I/O unit (3361) monitored input (Z) and 8 zones expansion board (4580) input in the system can be programmed (in EBLWin) to delayed fire alarm activation. (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.[107]

Function for an analog or addressable smoke detector:
An alarm point has to be in "fire alarm state"[106] all the delay time, in order to activate a fire alarm in the c.i.e. If an alarm point goes back to "normal state" during the delay time, the delay time will be reset and start again if/when the alarm point comes in "fire alarm state" again.

Function for each addressable multipurpose I/O unit (3361) monitored Input 0 (Z) and 8 zones expansion board (4580) input:
A zone in "fire alarm state" will be recorded in the c.i.e. but fire alarm will not be activated. When the delay time has run out the zone will be automatically reset and if it still is in "fire alarm state" a fire alarm will now be activated in the c.i.e.

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

In some premises AVF can be used to avoid unwanted false alarms (nuisance alarms). Note, this function is a violation to the EN54-2 standard.

This function is valid for any **zone line input** but only in the **Australian** and **New Zealand convention** respectively.

In these conventions the function "Delayed alarm" (see above) is not valid.

The function "Delayed" is selected in the dialog box for the zone line input respectively.

[107] Default is 30 seconds and a recommended delay time is ≤ 30 seconds.

Function: A zone in "fire alarm state"[108] will be recorded in EBL512 G3 but a fire alarm will not be activated. After 15 seconds the zone will be automatically reset. If the zone comes in "fire alarm state" again within 110 seconds a fire alarm will be activated in EBL512 G3, else 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 **A**lert **A**nnunciation function can be used to avoid unwanted false alarms (nuisance alarms) to the fire brigade. A time channel can turn on/off this function.[109]

Trained personnel are required on site to locate the fire (the room) and take the correct measures/actions depending on if there is a fire or not.

Normally analog smoke detectors and zones with smoke detectors only, come in question to be programmed (via EBLWin) for alert annunciation. Heat detectors and manual call points should normally not come in question 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)[110].

The **AA** function is normally turned on (enabled) during daytime working hours only. A time channel can 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 c.i.e. 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) via menu H2/B6 and will then stay so until turned on (normal) again via menu H2/B6.

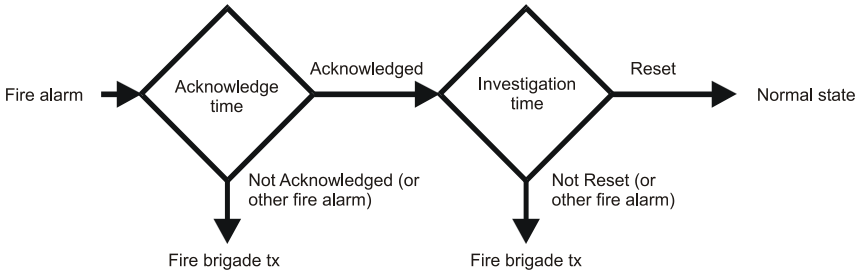


Figure 23. The Alert Annunciation function flow chart.

[108] A zone with the AVF not selected would in this state activate a fire alarm in EBL512 G3.

[109] Using an internal time channel is a VdS violation.

[110] This is valid even if "Multiple alarms within same zone" is selected (via EBLWin).

Alert **A**nnunciation 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 c.i.e. that will not be activated directly.** [111]
The **AA** alarm has to be acknowledged within an acknowledge time and the **AA** alarm has to be reset within an investigation time, else the output(s) for routing equipment (fire brigade tx) will be activated.

During the acknowledge 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.
- 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 allowed.

Acknowledge and Reset is done on the Alert annunciation unit 1735 / 1736 or Alert annunciation controller 1740. A programmable output ("Alert Annunciation Activated") for indication and programmable inputs ("Alert Annunciation Acknowledge" and "Alert Annunciation Reset") can also be used. In some conventions can this also be done in the c.i.e. (when a soft key "Ackn. alert annunciation" is available).

NOTE! The text "Ackn. alert annunciation" above the soft key will only be visible when there is an AA alarm activated, i.e. when there is an AA alarm that can be acknowledged.

The Acknowledge time can be set to 0-120 seconds.

The Investigation time can be set to 0-9 minutes.

NOTE! According to EN54-2, the total delay of fire alarm routing equipment must not exceed 10 minutes (i.e. Acknowledge time + Investigation time $\leq$ 10 min.).

[111] **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**.

17.13 Alarm Acknowledgement Facility (AAF)

This facility is used on the Australian market only.

One AAF zone can consist of one to five analog smoke detectors (4300 / 4301 / 4400 / 4401), one AAF buzzer (e.g. Sounder base 3379) and one AAF Control (AAFC)[112]. All connected on one COM loop.

NOTE!
All devices belonging to an AAF zone must be connected to one c.i.e.

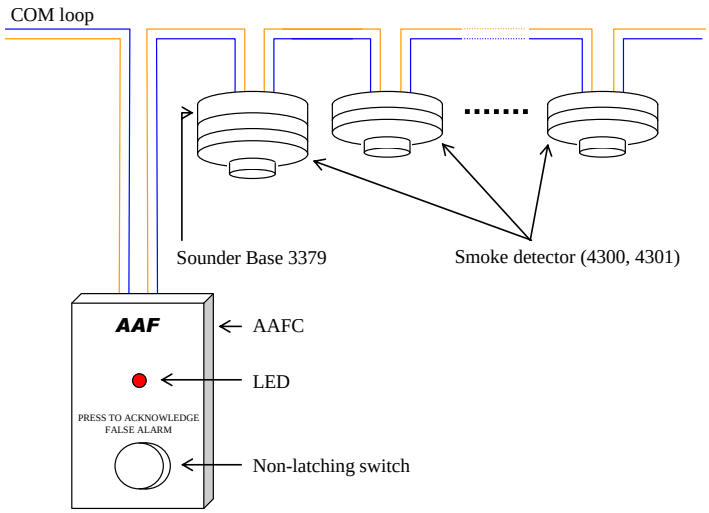


Figure 24. Alarm Acknowledgement Facility units.

AAF function (see also the flow chart in the following figure):
- One of the detectors in an AAF zone reaches its fire alarm level. The **AA** Process starts and the AAF buzzer sounds.
- The **A**cknowledgement **P**eriod starts (**A** Period=10-60 sec. -- programmable via EBLWin).
- If it is a false alarm, acknowledge the alarm on the AAFC before the **A** Period is ended.
- After acknowledgement an **I**nvestigation **P**eriod starts and the AAF buzzer is silent (**I** Period =0-3 min. -- programmable via EBLWin).

The AA Process ends if all the detectors in the AAF zone becomes normal again (goes below its fire alarm level) during the **I** Period.

If the **A** or **I** Periods run out during the **AA** Process and any detector in the AAF zone still is over its fire alarm level, normal fire alarm(s) will be activated.

[112] This unit is available on the Australian market only.

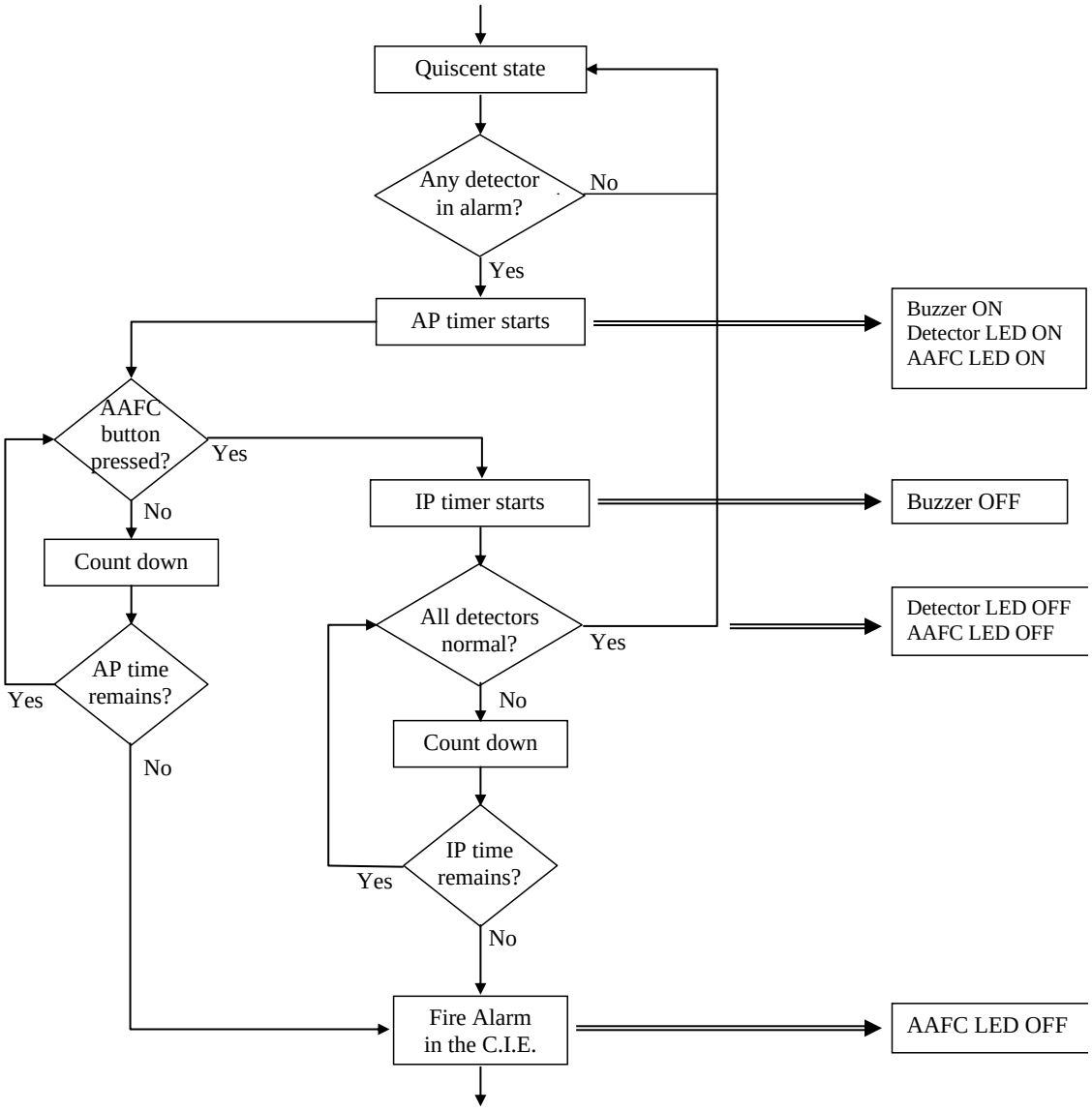


Figure 25. Alarm Acknowledgement Facility (AAF) flow chart.

During the AAF Process, an AAF alarm will be indicated in the c.i.e. display ….

…. during the **A**cknowledgement **P**eriod (**A** Period):

`AAF zone xx, activated`

…. during the **I**nvestigation **P**eriod (**I** Period):

`AAF zone xx, investigation in progress`

The AAF zone xx (xx=00-99) is only valid for the c.i.e. it is shown in, i.e. not for the whole system.

NOTE!

The AAF alarm indication is only shown in one control unit, i.e. in the control unit to which the AAF equipment is connected.

The detectors in an AAF zone can be one to five and not be programmed as 2-unit-dependent and not be controlled by the Alert Annunciation function.

Only Analog photo electric smoke detector 4301 and Analog multi detector 4300 can be used for AAF. If the Analog multi detector 4300 is used, it must be programmed as type "Two addresses", so that only the "smoke part" of the detector can be used for AAF.

Max. 100 AAF zones (00-99) per c.i.e.

The AAF buzzer (e.g. Sounder base 3379) has to be programmed with the trigger condition "AAF zone alarm" (and other trigger conditions).

17.14 Quiet alarm

Quiet alarm is normally used in conjunction with the I/O Matrix board 4582[113], an application board for fan control[114] and an I/O unit 3361 for fan control.

Smoke detectors, programmed for quiet alarm, can be used e.g. for controlling fans (stop / start depending on the type of fan).

Indications and actions:

- Detector LEDs are turned on (i.e. also a connected ext. LED).
- In the c.i.e. display: **`Quiet alarm detector ZZZ-AA`** and a user definable alarm text, if programmed.
- LEDs "Fire" in the c.i.e. are blinking (0.4 / 0.4 sec.) in the Australian and New Zealand conventions only.
- Buzzer in the c.i.e. sounding (0.8 / 5 sec.).
- Programmable outputs for quiet alarm, e.g. 3361 outputs controlling supply air fans and standard fans i.e. any output with a control expression containing trigger conditions "Quiet Alarm Zone" or "Quiet Alarm Zone Address".

Quiet alarms are non-latching, i.e. they will be automatically reset when the alarm point / zone is no longer above alarm level.

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 c.i.e. 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

[113] See "I/O Matrix board 4582", page 32.

[114] The Fan control panel 4593 can be used for control of up to eight fans.

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 shall 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** analog addressable smoke, heat or multi[115] detector only.

17.15.2 Fire alarm type A

The output shall 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** analog 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 alarm points and outputs

Temporary disablements are made via the menu H2 sub menus. For more information see EBL512 G3 Operating Instructions MEW01552, chapter "Disable or re-enable (H2)". The disablements are re-enabled via the menu H2 sub menus.

Regular disablements are made via time channels, see chapter "Time channels", page 147.

When alarm reset method "Single with automatic disablement" 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 c.i.e. front and are listed in menu H4/U1-U2.

[115] **NOTE!** A multi detector can have one presentation number (Zone-Address) or two presentation numbers depending on how it is programmed via EBLWin. One presentation number = one detector and two presentation numbers = two detectors regarding fire alarm types A and B.

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 shall be disabled, "Enhanced Disablement" shall not be selected, see chapter "System properties, Page 2", page 141.

NOTE! Enhanced Disablement is NOT valid when a time channel is used for disablements, only when menu H2/B1 is used.

17.16.1 Disable zone

A whole zone (all addresses within a zone, except the manual call points) can be disabled via menu H2/B1. Re-enabled via menu H2/B1.

17.16.2 Disable zone / address

Individual alarm points (zone-address) can be disabled and re-enabled via menu H2/B1.
Time channels can be used to disable and re-enable automatically.

17.16.3 Disable 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.

17.16.4 Disable / Re-enable output type

The control outputs can be collective 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.

17.16.5 Disable / Re-enable alarm devices

The control outputs of type "Alarm device (sounder)" can be collective disabled and re-enabled via menu H2/B4. It is only possible to do this for all control units (i.e. the whole system). Disabled outputs will stay in (or return to) the normal condition for the output respectively.

17.17 Disable interlocking output

Individually disabled and re-enabled via menu H9/C3. See also chapter "Disable / re-enable interlocking output (H9/C3)", page 94.

17.18 Disable outputs for routing equipment

Disabled and Re-enabled via menu H2/B5. For more information see EBL512 G3 Operating Instructions MEW01552.

17.19 Disconnect & Re-connect loop / zone line input

Disconnected and re-connected via menu H8/S1:

COM loop
Zone line input
Addr. zone interface (3361 zone line input)

For more information see EBL512 G3 Operating Instructions MEW01552.

17.20 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 analog detector types 430x and 440x on/off
- turn the 2-unit dependence function on/off

The 49 external time channels are for the whole system. One programmable input with trigger condition/type "External Time Channel" is used for each external time channel, which also is given a "Name". The input is controlled by some external equipment, e.g. another time system, a key switch, a timer, 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).

17.21 Test mode

Zones can be set in Test mode. Alarm points / zones can be tested during the Monthly test via menu H1 (in H1 up to four zones at the same time) or separately via menu H7 (in H7 up to 100 zones at the same time). For more information see EBL512 G3 Operating Instructions MEW01552. The LED "Test mode" on the c.i.e. front indicates one or more zones in Test mode. Zones in Test mode are also simultaneously shown in the c.i.e. display. Disablements, 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 before alarm will be "turned off" in Test mode.[116]

17.22 Test alarm devices

The programmable outputs of 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 fire alarm already is 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 (±1s)[117], "off" for 29 seconds (±1s), "on" for 1 second and so on.[118]
NOTE! Also disabled (and silenced) alarm devices will be tested.

The test is stopped via menu H8/S4, if a fire alarm is activated in the system or after one hour.

17.23 Test of outputs

The programmable outputs (incl. 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 respectively will be activated no matter if its control expression is false. At the end of the test the output respectively will be de-activated but only if its control expression at that time is false.

17.24 Test of routing equipment

Via menu H1 it is possible to test the "Fault condition" 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 activated[119], indicated by LED "Fault tx activated" on the c.i.e. front. After 30 seconds will also the "Fire alarm" output(s) be activated, indicated by LED "Fire brigade tx" on the c.i.e. front. After 30 seconds more (60 sec. in all) the test will be ended and the outputs and LEDs will go back to "normal" status.

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[116] Any 2-zone / -address dependence and the function "delayed alarm" will be ignored.

[117] Some COM loop unit outputs might be "on" a little longer.

[118] The output activation will be continuously (steady). For the alarm devices 3377 and 3379, the tone with the highest priority level (and type "alarm device") will be automatically selected.

[119] **NOTE!** Fault condition outputs are normally activated in "normal" state, i.e. they will in this case be de-activated.

17.25 Calibration of supervised outputs

The supervised (monitored) outputs have to be calibrated after the installation.[120] This is done via a menu (H5/A1) in the c.i.e.

Calibration range is **4K7 – 50K** or **470 nF – 5 x 470 nF**. If the calibrated value is outside the range respectively or if the actual value differs from the calibrated value ± a small tolerance, a fault will be generated.

17.26 Service signal

All smoke detectors get contaminated no matter what environment they are mounted in. In some environments it goes faster than in others – depending on type of activity etc.

Conventional smoke detector: The sensitivity will normally increase in most environments. This can result in unwanted false alarms (nuisance alarms) since all conventional smoke detectors (except 4350, see page 133) 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 too contaminated).

Analog smoke detector: The sensitivity will automatically be constant.[121] **Service signal** will be activated at a fixed **service level**. For detectors 4300, 4301, 4400 and 4401, all in NORMAL mode, Service signal will be activated when the week average sensor value is $\geq$ 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.

For more information, see EBL512 G3 Operating Instructions MEW01552 chapter "Sensors activating Service signal (H4/U5)" and "Acknowledge Service signal (H8/S3)".

17.27 Fault signal (fault condition)

Fault signal, fault messages, fault acknowledge, etc. are described in EBL512 G3 Operating Instructions MEW01552, chapter "Fault".

Programmable inputs can be used for external equipment to generate fault signal in the EBL512 G3 c.i.e. See chapter "Programmable inputs", page 64.

For faults from zones and alarm points also the Alarm text (see below) will be shown.

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[120] C.i.e. outputs S0-S3: E-o-l resistor 33K. 1 – 5 resistors (33K) can be used. 3364 outputs VO0-VO1: E-o-l capacitor 470 nF. 1 – 5 capacitors (470 nF) can be used.

[121] The detector is supervised at all times and adapts its fire alarm level in relation to the contamination of the detector, see chapter "Week average sensor value", page 91.

The fault list can be printed via menu H6.

17.28 Alarm texts

The alarm texts are shown in case of fire alarm.

When a fire alarm is activated, the presentation number (Zone – Address) will be shown in a field in the middle of the c.i.e. display. On the row just below the presentation number, the user definable alarm text for that alarm point will be shown, if programmed.[122] The alarm text will also be presented in Ext. Fire Brigade Panels, etc. The alarm text, together with the presentation number, will be printed when a printer is available in the c.i.e or the Ext. FBP.

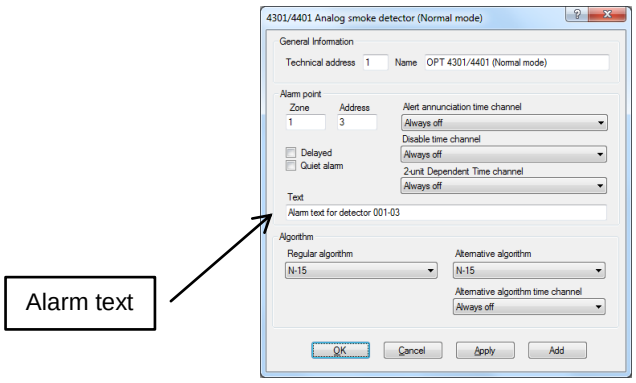
See also EBL512 G3 Operating Instructions MEW01552, chapter "Fire alarm".

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 Ext. FBPs 1826 & 1828, the Alert Annunciation units 1735 & 1736 and in the Ext. 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.

17.28.1 Creating the alarm texts via EBLWin

In the dialog box for any alarm point (e.g. a detector/sensor)[123], 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 c.i.e. display when this alarm point has activated fire alarm and also together with the fault message when this alarm point has generated a fault.



Text editor

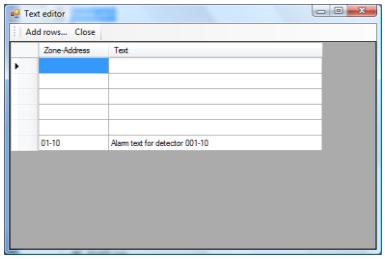
The alarm text can, as an alternative, be typed (or edited) in the EBLWin "Text editor" (menu System | Edit Alarm Texts…).

No matter where the text is typed, it will be shown on both places.

---

[122] See also chapter "Limitations", page 169.

[123] In EBLWin.



Explanations:

Zone-Address column

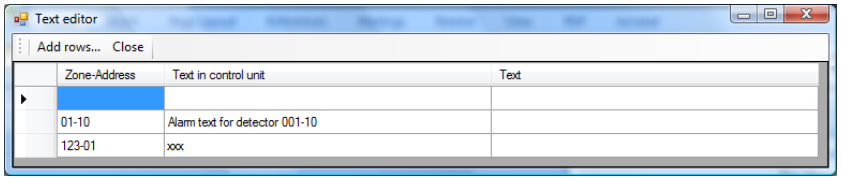
Shows the already programmed alarm points (e.g. 001-01, 001-02, 002-01 etc.).
Only the texts have to be typed / edited in the "Text" column.

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.

NOTE! If any alarm point shall have a different alarm text in one or more of the "**display units**" 1826, 1828, 1735, 1736 or 1728[124], the text has to be typed in the EBLWin "Text editor", **for the "display unit" respectively** (Properties | Edit texts…):



Explanations (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. ZZZ – **00)**.

Text in control unit column (cannot be edited here)

Shows the already programmed alarm texts for each alarm point / zone. This is only information and cannot be edited here. These texts will be displayed in the c.i.e. and all "display units" 1826, 1828, 1735,

[124] Regarding text priority order etc. see Technical Description (chapt. "User definable text messages") for the "display unit" respectively.

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 respectively, has to be typed (edited) here. **NOTE!** In this "display unit" this text will now be shown instead of the text in the "Text in control unit" column, for the alarm point / zone respectively.

17.28.2 Downloading alarm texts to the DU:s 1728 / 1735 / 1736 and ext. FBP:s 1826 / 1828

The texts will be downloaded when the site specific data (SSD) is downloaded via EBLWin.

The unit respectively has to be set in S/W mode xxxx – **1587**

17.29 Real time clock (RTC)

Each control unit has an RTC. It is used for (date) and time presentation for fire alarms, faults, event logging and the time channels 2-14. In a system with two or more control units in a TLON network is the time in all control units synchronised.[125]

17.29.1 Daylight saving time

The time is automatically changed when the Daylight saving time period starts and stops respectively, if set so in EBLWin. When, is depending on which convention that is used:

- 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.
- All other conventions: Forward 1 hour the last Sunday in March, 02:00 → 03:00. Backward 1 hour the last Sunday in October, 03:00 → 02:00.

17.30 Loss of main power source

Regarding the Main power source and Second power source, see chapter "Power supply", page 174.

17.30.1 Fault: Loss of main power source

The delay time for the fault "Loss of main power source" can be set (in EBLWin) to 1 – 300 minutes. (A delay time > 30 minutes is a violation to the EN54-2 standard.

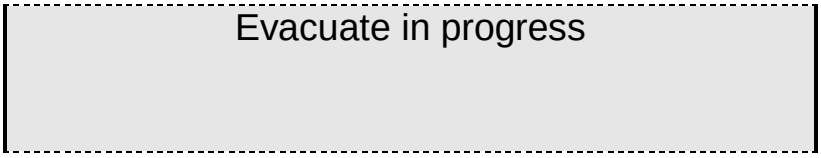
[125] The calendar and clock can be set in any c.i.e. for the whole system. Every day (at midnight) all calendars and clocks will be synchronised.

17.30.2 LCD backlight

In order to reduce the current consumption the LCD backlight will never be turned on during loss of the main power source.

17.31 Evacuate

When the soft key "Evacuate" (P7)[126] is pressed[127], all outputs programmed for sounders (i.e. type "Alarm devices"), will be collective turned ON (steady). This is indicated in the LCD:



The sounders will remain turned ON until they are turned OFF by pressing the soft key "Evacuate off" (P7).[128]

NOTE 1! The alarm devices (sounders) will always be activated steady (sound continuously) irrespective of the fact that the outputs can be set to anything else for fire alarm (e.g. intermittent).

NOTE 2! The text “Menu” above the soft key (P4) is visible in the display only if the door in the c.i.e. is open, while the text "Evacuate" / "Evacuate off" above (P7) is always visible in the current conventions.

[126] The soft key "Evacuate" is only visible / valid for the Belgian, British Standard, Hungarian, Spanish and Ukrainian conventions.

[127] Alt. when a programmable input is activated. One input per c.i.e.

[128] Alt. when the programmable input is de-activated.

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 alarm devices (inside switch)

On the c.i.e. front, the button "Silence alarm devices" (see Operating Instructions MEW01552, button "P2") is called the "inside switch" and toggles between two states:

- **Alarm devices disabled**
  All programmable outputs of type "Alarm devices" are disabled, i.e. they cannot be activated.
- **Alarm devices not disabled**
  All programmable outputs of type "Alarm devices" enabled, i.e. they can be activated.

If the inside switch is in its disabled state when you are closing the c.i.e. door the buzzer will beep steady (continuously) and the message "**`Silence switch left active`**" will be shown in the display. This message has lower priority than fire alarms but higher than other disablements and faults.

NOTE! The inside switch has no function if the outside switch (see below) is activated (on).

18.1.2 New Zealand FB Silence switch (outside switch)

The "**New Zealand FB Silence switch**" is called the "outside switch" since it is placed outside the c.i.e. The outside switch is a key switch and is connected to a programmable input with the trigger condition "Silence alarms".

The outside switch is turned ON (i.e. from not activated to activated state).

- All programmable outputs of type "Alarm devices" are disabled[129], i.e. they cannot be activated. The "inside switch" (see above) has no function.
- The c.i.e. built-in buzzer is silenced.
- A fault is generated[130]: "**`FAULT: FB Silence switch active, control unit xx`**"

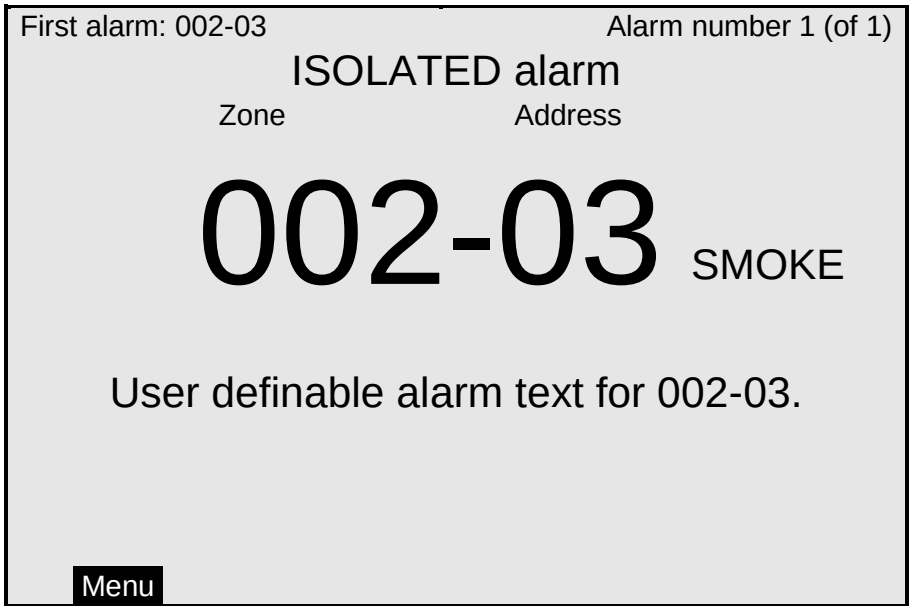
[129] Indicated by LED "General disablements" on the c.i.e. front.

[130] Always latched, regardless of if faults are programmed to be not latched.

The outside switch is turned OFF (i.e. from activated to not activated state).

- **"FAULT: FB Silence switch active"** will be **Serviced**.[131]
- Any fire alarm ("ALARM") and acknowledged alarm ("ACKNOWLEDGED") will automatically be disabled / isolated. (I.e. it has to be re-enabled via menu H2/ B5.) Indicated by LED "General disablements" on the c.i.e. 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



18.1.2.1 Isolated alarm

A fire alarm will automatically change state to "Isolated alarm" when the "outside switch" (see above) 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 c.i.e. front) not activated.
- The c.i.e. built-in buzzer not activated.
- Presented as isolated alarm, see the example above (**ISOLATED** ……).
- Programmable outputs not activated.
- Output for routing equipment (Fire brigade tx) not activated.

[131] Since this fault is always latched, it has to be acknowledged via menu H6.

18.2 Battery faults

For other conventions, see chapter "Security functions", page 175.

18.2.1 FAULT: Battery

The following battery check is performed:

- The battery charging is turned off every 30th second.
- Battery voltage is checked.
- Battery voltage < 18.9 V generates a fault.
  Fault message: **`FAULT: Battery`**

18.2.2 FAULT: Low battery capacity

The following battery check is performed:

- The battery charging is turned off 60 minutes every 24th hour.
- Battery voltage is checked during this 60 minutes period.
- Battery voltage < 24.4 V generates a fault.
  Fault message: **`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 Fire alarm output for routing equipment (Fire brigade tx or Fault tx) is disabled and you are closing the c.i.e. door, 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 c.i.e. it can be acknowledged by pressing the soft key "Acknowledge alarm" on the c.i.e. front.

An acknowledged alarm has the same functionality as a normal fire alarm except for the indication in the c.i.e. display.

In the fire alarm list (presented in the display) will **`"ALARM"`** 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.

19 Advanced mode

The latest generation of detectors are the following:

- Conventional photoelectric smoke detector 4452
- Analog photoelectric smoke detector 4401
- Analog multi detector 4400

NOTE! NOTE! NOTE! NOTE! NOTE! NOTE! NOTE!

The analog detectors **4401** and **4400** can via the address setting tool **4414** be set in different modes. In this chapter is only the **Advanced mode** described. The detectors are factory set to the **NORMAL mode**, see chapters "COM loop units", page 37 and "Functions / Services / Features", page 96. The analog detectors 4401 and 4400 in NORMAL mode will function as and replace the analog detectors **4301** and **4300** in NORMAL mode respectively. (The analog detectors 4301 and 4300 **cannot** use the Advanced mode.)

The **Advanced mode** can be set with the address setting tool **4414** only. **Not** with the address setting tool **3314**.

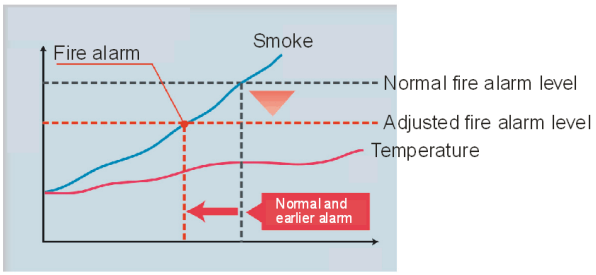
The conventional detector **4452** uses some of the advanced mode functions, see the function respectively below in this chapter.

Artificial **I**ntelligence (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 not wanted false (nuisance) alarms with up to 46 %.

The AI function is depending 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 raise the sensitivity (i.e. lower the alarm threshold level).

Fire alarm activation in conjunction with temperature rise.



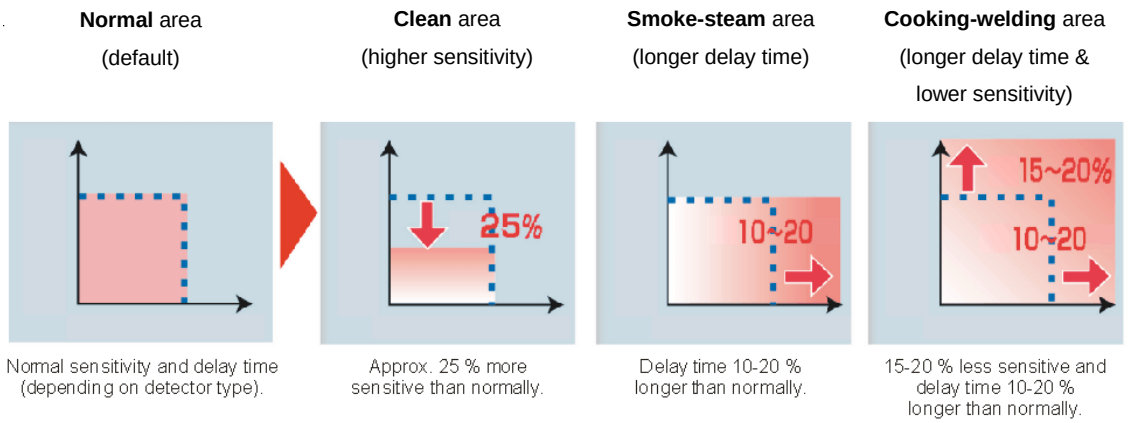
By combined smoke and heat sensing a lower fire alarm level can be used.

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 false (nuisance) alarms.

A **learning function** will after a **learning period** adapt an **Alarm algorithm** suitable for the smoke and temperature conditions in the **area** where the detector is located.

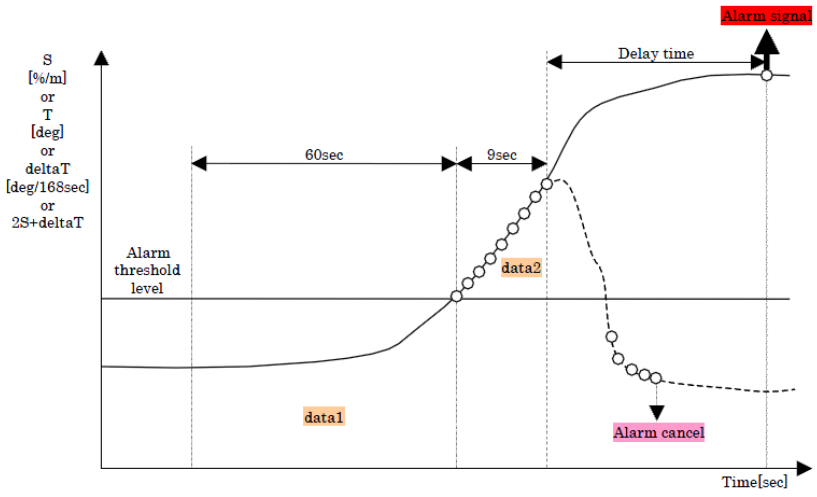
Alarm algorithms for the following **areas** can be adapted:



There is also a **Heater** area Alarm algorithm. This is similar to the alarm algorithm for the **Normal** area but the rate-of-rise function (deltaT) will not be used for alarm activation.

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) ≥ 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** (°C) ≥ the alarm threshold level, "3" is added to the counter every second)

When the temperature rise **deltaT** (°C/168sec.) ≥ the alarm threshold level, "3" is added to the counter every second.

When **T** or **deltaT** < the alarm threshold level, "2" is subtracted from the counter every second.

19.1.3 Pulse up – down counter for smoke & temperature

When **2S+deltaT** ≥ the alarm threshold level, "1" is added to the counter every second.

When **2S+deltaT** < the alarm threshold level, "2" is subtracted from the counter every second.

19.2 Fire judgement

The fire judgement is depending on the **alarm threshold level**, which is depending 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+deltaT** 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+deltaT** and after three seconds in case of **T** or **deltaT**), the delay time starts and has to run out before a fire alarm will be activated in the c.i.e.

19.3 Alarm threshold levels

Depending on the detector type and **Area alarm algorithm** there are alarm threshold levels (**S**, **T**, **deltaT** and **2S+deltaT**) not only for fire alarm but also for pre-warning 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+deltaT #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≧2.5%/m and deltaT≧3deg/168sec

19.4 Alarm delay time

The alarm delay time will be different for the different type 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 ≦ data1 < 0.3	39
	0.3 ≦ data1 < 0.4	30
	0.4 ≦ data1 < 1.3	18
	1.3 ≦ data1	9
Smoke/Steam	data1 < 0.2	45+data2/2
	0.2 ≦ data1 < 0.3	39+data2/2
	0.3 ≦ data1 < 0.4	30+data2/2
	0.4 ≦ data1 < 1.3	18+data2/2
	1.3 ≦ data1	9+data2/2

4400:

Delay time[sec]					
Area alarm algorithm \ Cause of alarm	S data1[%/m]		T	deltaT	2S+deltaT
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".

NOTE!
Max. 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) ≥ fire threshold level (S) x 2
T (°C) ≥ fire threshold level (T)
deltaT (°C/168 sec.) ≥ fire threshold level (deltaT)

19.5 Learning function / Learning period

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**.[132] See also page 128.

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 depending on occurrence of smoke, i.e. **level 1** = **S** [%/m] ≥ half the fire alarm threshold level (S).
- Heater area, is depending on rise of temperature, i.e. **level 2** = **deltaT** [°C/168 sec.] ≥ 12 (approx. 4.3°C/min.).
- Cooking – Welding area, is depending on occurrence of smoke together with rise of temperature, i.e. **level 3** = **2S+deltaT** ≥ 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

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

A **learning period** contains twenty **36h-periods** (i.e. 20 x 36h = 720h = 30 days = one month).

During each **36h-period** it is recorded if **level 1** is exceeded at least one time. If so, the **36h-period** will get a check-mark, see **example**.

When three (or more) of the **36h-periods** during the **learning period** have a check-mark, the Smoke - Steam area Alarm algorithm will be adapted (i.e. as earliest after 3 x 36h = 108h = 4½ days). In the **example** this will happen in the **36h-period** no. 10 (i.e. after 10 x 36h = 360h = 15 days).

After the **36h period** no. 20, a new **learning period** starts. The check-marks are inherited from the previous **learning period**. Depending on if **level 1** is exceeded or not during each **36h period**, the check-marks will remain or be removed.

[132] Via EBLWin is set if an Area Alarm algorithm shall be automatically adapted via the Learning function or manually set via EBLWin. If manually set, also an alternative Area Alarm algorithm can be set that can be controlled via a time channel.

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 Alarm algorithm will be changed back to the Normal area Alarm algorithm after the **36h period** no. 3, since at that time there are left only two **36h periods** with check-marks in this **learning period**. (If later, one or more **36h periods** will 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 this learning period have a check-mark.)

19.5.1.2 Heater 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 what so ever. The Clean area Alarm algorithm cannot be adapted until earliest one month after c.i.e. power on.

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 what so ever.

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** is 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 Analog data output

The smoke obscuration value (%/m) and the temperature (°C) can be shown via the c.i.e. 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 analog output.
4400: This detector has a smoke obscuration value output and a temperature value output to the c.i.e.
4401: This detector has a smoke obscuration value output to the c.i.e.

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:

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.

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.)

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.

A new 18 + 18 = 36 hours period starts with an average value calculation every 13^{th} minute.

Max. Contamination Compensation Factor (CCF) **is 2 %/m. Service signal will then be activated and shown in the c.i.e.**

The following is valid for the different type of detectors:

4452: This detector has no 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 c.i.e.
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 c.i.e.
4401: This detector has self diagnosis of internal devices. A fault message will be shown in the c.i.e.

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 / 6 s), indicating that it receives the commands from the c.i.e. 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

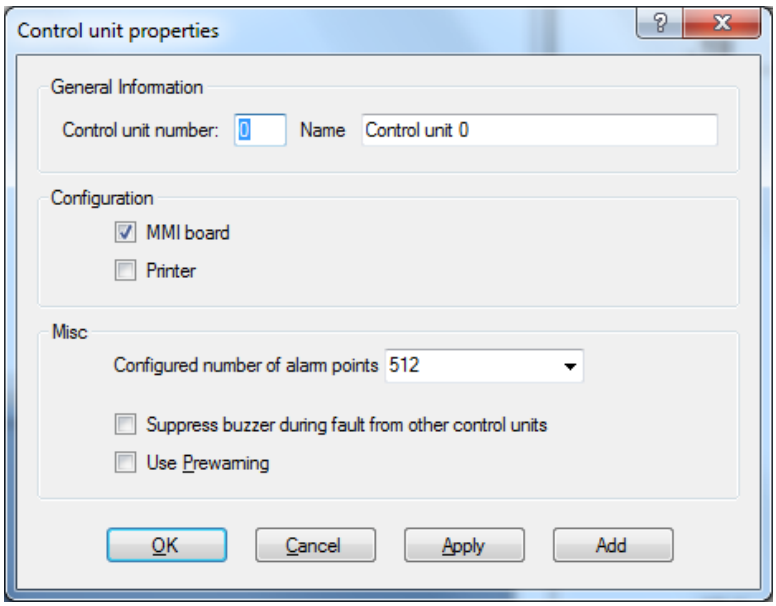


Figure 26. The EBLWin "Control unit properties" dialog box.

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 has to 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 shall be marked when the c.i.e. has a front with display (i.e. EBL512 G3 type 5000). This check box shall not be marked when the c.i.e. has no front (i.e. EBL512 G3 type 5001).
- **Printer** (only valid for EBL512 G3 type 5000) This check box shall be marked when the c.i.e. is equipped with a printer.

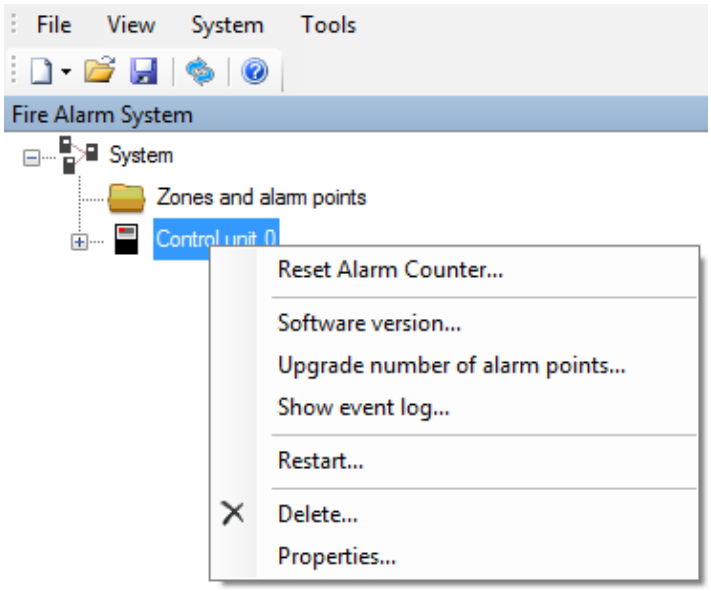
20.1.3 Misc.

Configured number of alarm points: 128, 256 or 512.
NOTE! 1020 COM loop unit addresses are always available but max. 512 of these 1020 addresses can be alarm points.
In the **Australian convention only**, the number of alarm points per c.i.e. can be set to 128, 256, 512 or **1020**.

Set the wanted 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 c.i.e.

- **Suppress buzzer during fault from other control units**: This check box shall be marked if faults generated in other control units shall be suppressed in this control unit, i.e. if the buzzer shall sound for faults generated in this control unit only.
- **Use Pre-warning**: This check box shall be marked if the pre-warning detection shall 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.

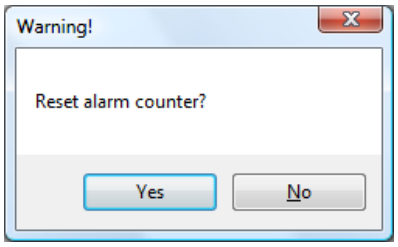
20.2 EBLWin Control unit pop-up menu



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.)

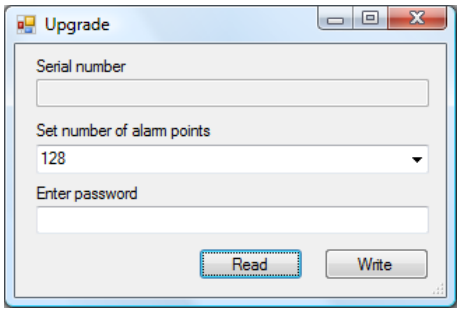


20.2.2 Software version

The control unit software (S/W) version will be displayed.

20.2.3 Upgrade number of alarm points

The control unit is by delivery be configured for 128, 256 or 512 alarm points. Any number of **alarm points** can via EBLWin be changed on site, normally 128 → 256 → 512.



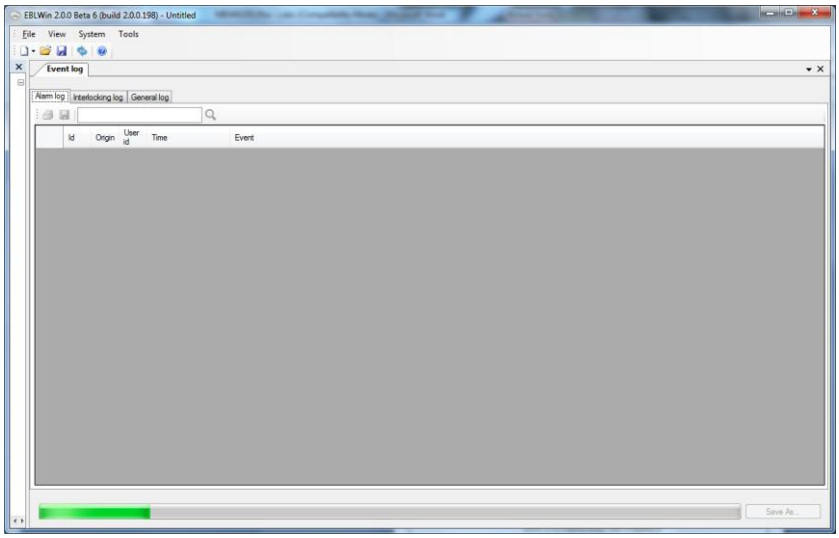
Click "Read" for the current number of alarm points and the serial number for the control unit you are connected to.

If the number of alarm points shall be changed, report the serial number to the producer, in order to receive a password.[133]

Click "Write" to configure the control unit for the new number of alarm points.

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. They are valid for the system.



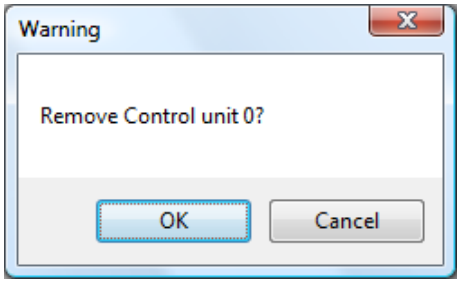
20.2.5 Restart

You can restart control unit via this menu command.

[133] 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.

20.2.6 Delete

The selected control unit can be deleted.



20.2.7 Properties

See beginning of this chapter – Control unit properties dialog box.

21 System properties (settings)

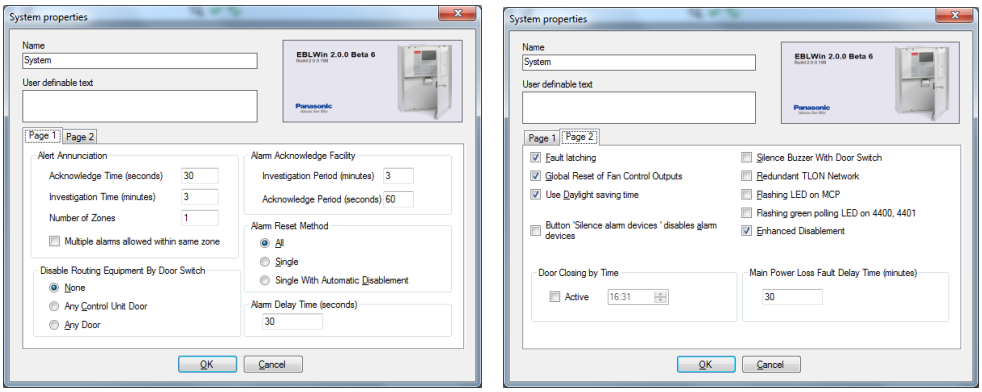


Figure 27. The EBLWin "System properties" dialog box, Page 1 and Page 2.

NOTE! Default settings in EBLWin might vary depending on convention.

21.1 System properties dialog box

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

For user definable text. Two rows á 40 characters are available. The text will be shown in all control units. For more information see EBL512 G3 Operating Instructions MEW01552.

21.1.3 System properties, Page 1

21.1.3.1 Alert Annunciation

See also chapter "Alert Annunciation", page 109.

Acknowledgement time: 30 **sec.**
30 is default. 0-120 (= 2 min.) is possible.

Investigation time: 3 **min.**
3 is default. 0-9 is possible.

NOTE! According to EN54-2, the total delay of fire alarm routing equipment (Acknowledge time + Investigation time) must not exceed 10 minutes.

Number of zones: 1
1 is default. 1-4 is possible.

- **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 shall be marked.

21.1.3.2 Alarm Acknowledgement Facility

Used in conjunction with the AAF Control that is available on the Australian market only.

See also chapter "Alarm Acknowledgement Facility (AAF)", page 111.

Investigation period (IP) time: 3 **min.**
3 is default. 1-9 is possible.

Acknowledge period (AP) time: 60 **sec.**
60 is default. 10-120 is possible.

21.1.3.3 Disable routing equipment by door switch

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. or an ext. FBP 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. or any ext. FBP 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)`

21.1.3.4 Alarm reset method

One of the following alternatives shall be selected.

- ⊙ **All** (default): All fire alarms in the system will be reset simultaneously by pressing the "Reset" button (on the c.i.e. front) once.
- ○ **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 the same way, one by one.
  This function is a violation to the EN54-2 standard.
- ○ **Single With Automatic Disablement**: Like "Single" reset but with the Disablement function (see below) as well.
  This function is a violation to the EN54-2 standard.

Disablement function: If an alarm point or zone is reset while it still is in alarm state (e.g. smoke in a smoke detector or a manual call point with a broken glass) this unit will be 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 c.i.e. front is indicating one or more disablement in the system.

21.1.3.5 Alarm delay time (seconds)

Valid for the detectors and zone line inputs with this option selected via EBLWin[134].

30 is default. 0-255 seconds is possible. Note, this delay time starts when the fire alarm normally should have been activated.

21.1.4 System properties, Page 2

- ☐ **Fault latching** (default): All faults have to be acknowledged, also corrected faults.
  Checkbox not marked = No fault latching = Not corrected faults have to be acknowledged but corrected faults will automatically be deleted from the fault list.
- ☐ **Global reset of Fan Controls Outputs**: Reset of fan control system is **global**, i.e. all fan control systems in the EBL512 G3 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 c.i.e. 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.
  All other conventions: According to the current EU regulations, i.e. forward 1 hour the last Sunday in March, 02:00 → 03:00. Backward 1 hour the last Sunday in October, 03:00 → 02:00.
  Checkbox not marked = Daylight saving time is not used.
- ☐ **Button "Silence alarm devices" disables alarm devices**: Function, see page 123. Can be used in all conventions.
- ☐ **Silence Buzzer With Door Switch**: If the buzzer in the c.i.e. shall be silenced when the door is opened, this checkbox shall be marked. This is a violation to the EN54-2 standard.
- ☐ **Redundant TLON Network**: This checkbox shall be marked when two TLON Networks shall be used, i.e. each control unit in the system has to be equipped with two TLON connection boards (5090). See also chapter "TLON connection board ", page 36.
- ☒ **Flash LED on MCP**: The manual call point (type 3333 / 3339 / 4433 / 4439) built-in LED will flash to indicate communication with the c.i.e.
  Checkbox not marked = This option is disabled, i.e. the LED is switched off until the call point is operated.

[134] Regarding the Australian and New Zealand conventions the "Alarm Verification Facility" is valid, see page 103.

☒ **Green polling LED**:
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 20 ms / 6 sec. indicating the communication with the c.i.e.
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 point[135] will not activate pre-warning, fire alarm or fault.
Checkbox not marked = Disabled alarm point[135] will not activate pre-warning or fire alarm. Fault can still be activated.
This is a violation to the EN54-2 standard.

21.1.4.1 Door closing by time

☐ **Active**: If all fire doors (trigger condition "Fire Door Closing") shall be closed at a definite time every day, this checkbox shall be marked and the time (*hh:mm*) set, e.g. 23:00.

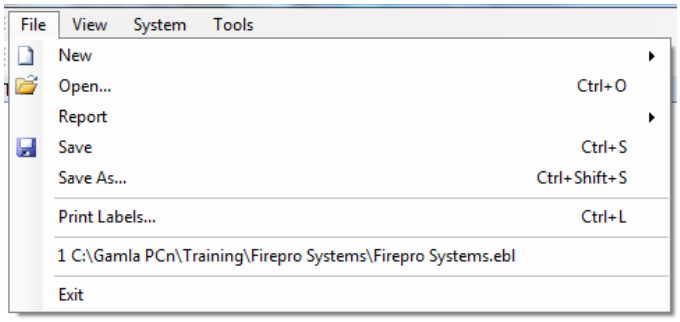
21.1.4.2 Main power loss fault delay time (minutes)

A fault will be activated *mm* minutes after loss of mains (230 V AC). 30 is default. 0-300 minutes is possible.

[135] The sensor values for a disabled analog smoke detector will not be saved.

22 EBLWin menus

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
System EBL128 NOTE! Not possible in version 2.0.0.

22.1.2 Open

To open an installation via a standard Windows dialog box "Open".

22.1.3 Report

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".

22.1.4 Save

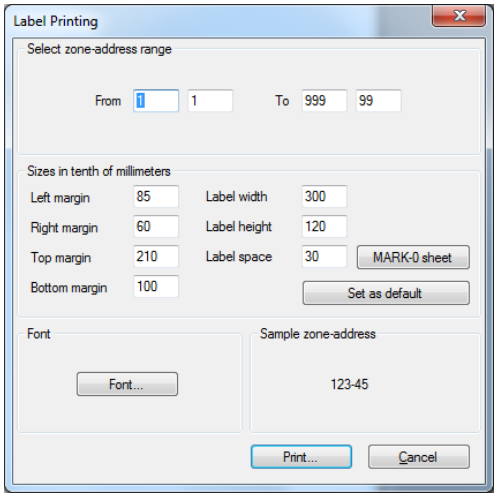
To save an installation (xxxxxx.ebl). The very first time, via a standard Windows dialog box "Save As".

22.1.5 Save As

To save an installation (xxxxxx.ebl), via a standard Windows dialog box "Save As".

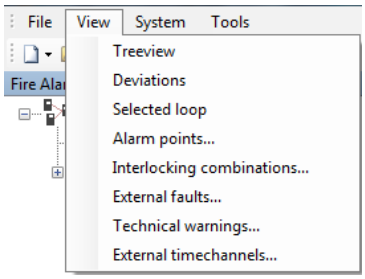
22.1.6 Print labels

Labels with Zone-Address for the specified range of programmed alarm points will be printed. In order to set the margins etc. the following dialog box will open:



For the **Label holder** (3390) can a MARKO sheet be used, i.e. **Labels for 3390** (3391) 10 sheets à 132 labels.

22.2 The View menu



First time EBLWin is opened after installation the tree view will be visible to the left in the window. (To the right will the tabs "Deviations" and "Selected loop" be available.)

22.2.1 Tree view

Visible / open by default.

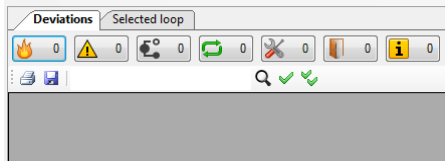
If the tree view for some reason has been closed it can be opened again via menu "View" and "Tree view".

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.

22.2.2 Deviations

To the right of the tree view, the tab "Deviations" is available by default.

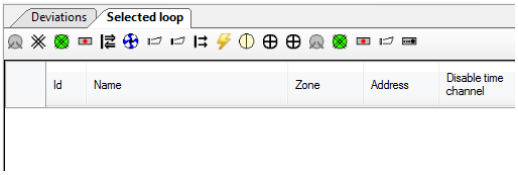


There is a button to open a list of:
- fire alarms (selected or all can be reset)
- faults (selected or all can be acknowledged)
- disablements (selected or all can be re-enabled)
- activated interlocking combinations
- service signals (selected or all can be acknowledged)
- open doors
- technical warnings

You can print and save what you see in the list respectively. A filter function is available.

22.2.3 Selected loop

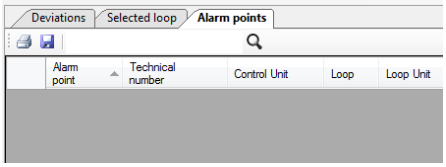
To the right of the tree view, the tab "Selected loop" is available by default.



COM loop units can be added two ways. Via the tree view (COM loop pop-up menu) or via the "Selected loop" tab. Click a COM loop unit symbol to add the unit to the list. Then edit its properties. The "Selected loop" list and the tree view will show the same information.

22.2.4 Alarm points

To the right of the of the tree view can the "Alarm points" tab be available.



This is a list, for the whole system, showing all alarm points and their properties.

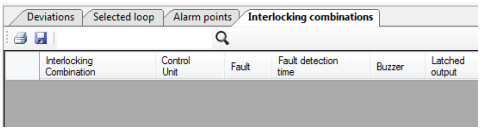
The list can be sorted by clicking the column header respectively.

Double click an alarm point row to open its dialog box.

You can print and save what you see in the list. A filter function is available.

22.2.5 Interlocking combinations

To the right of the tree view can the "Interlocking combinations" tab be available.



This is a list, for the whole system, showing all interlocking combinations and their properties.

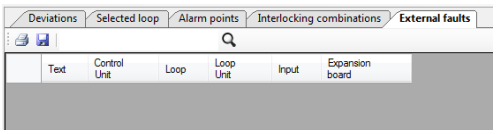
The list can be sorted by clicking the column header respectively.

Double click an interlocking combination row to open its dialog box.

You can print and save what you see in the list. A filter function is available.

22.2.6 External faults

To the right of the tree view can the "External faults" tab be available.



This is a list, for the whole system, showing all external faults and their properties.

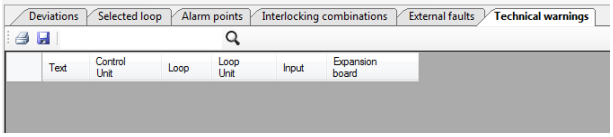
The list can be sorted by clicking the column header respectively.

Double click an external fault row to open its dialog box.

You can print and save what you see in the list. A filter function is available.

22.2.7 Technical warnings

To the right of the tree view can the "External faults" tab be available.



This is a list, for the whole system, showing all technical warnings and their properties.

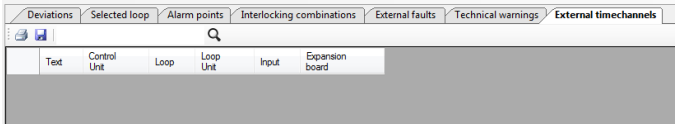
The list can be sorted by clicking the column header respectively.

Double click a technical warning row to open its dialog box.

You can print and save what you see in the list. A filter function is available.

22.2.8 External time channels

To the right of the tree view can the "External time channels" tab be available.



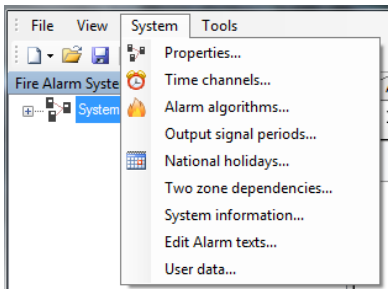
This is a list, for the whole system, showing all external time channels and their properties.

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.

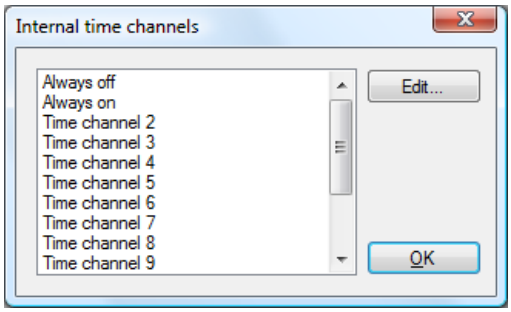
22.3 The System menu



22.3.1 Properties

The same dialog box opens as in Figure 27, page 139.

22.3.2 Time channels



Always off and Always on cannot be edited.

The control unit RTC (real time clock) controls the time channels 2-14. **Five intervals** (interval = one time on & one time off) can be set for each day in time channel 2-14.

Time channels can:

- 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 analog detector types 430x / 440x 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 channel respectively.

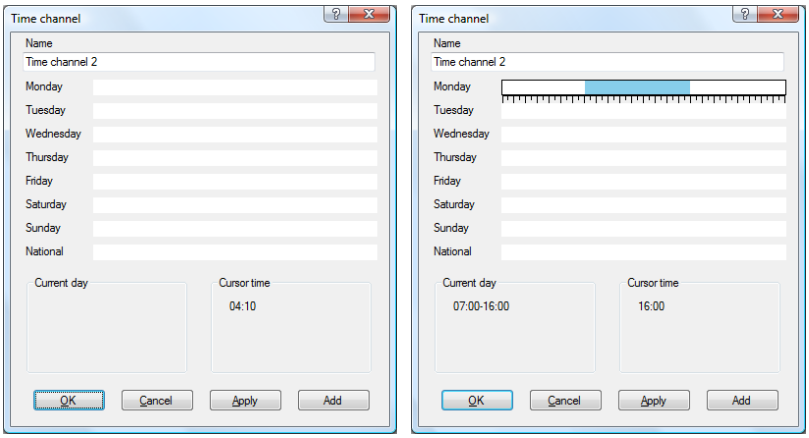
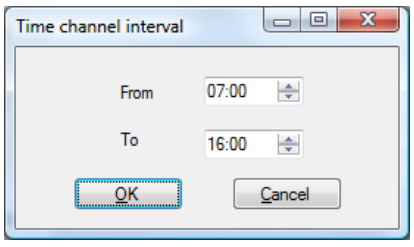


Figure 28. ***Left:*** *The "Time channel 2" dialog box without any programming done.* ***Right:*** *One time interval is programmed for the Monday (time channel 2 is "on" 07:00 – 16:00).*

Name: "Time channel n" is default. Normally not changed but an informative text can be added (e.g. office hours).

Monday: Place the cursor (the "arrow") in the white day field (e.g. Monday). In the "Cursor Time" area (down to the right) is the actual cursor time displayed. Move the cursor in the day field. In the "Cursor Time" area will the corresponding time be displayed. In the correct time position (e.g. 07:00) click the left mouse button and drag the cursor to the right (or left) to the next time position (e.g. 16:00) and drop the cursor. There will now be a box in the day field indicating the time interval when the time channel is "on". The time interval (e.g. 07:00 – 16:00) is also displayed in the "Current Day" area (down to the left).

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:



A time interval can be copied in one day field and pasted into another day field.

Tuesday: Programmed the same way as the Monday.

Wednesday: Programmed the same way as the Monday.

Thursday: Programmed the same way as the Monday.

Friday: Programmed the same way as the Monday.

Saturday: Programmed the same way as the Monday.

Sunday: Programmed the same way as the Monday.

National: Programmed the same way as the Monday. See also chapter "National holidays", page 152.

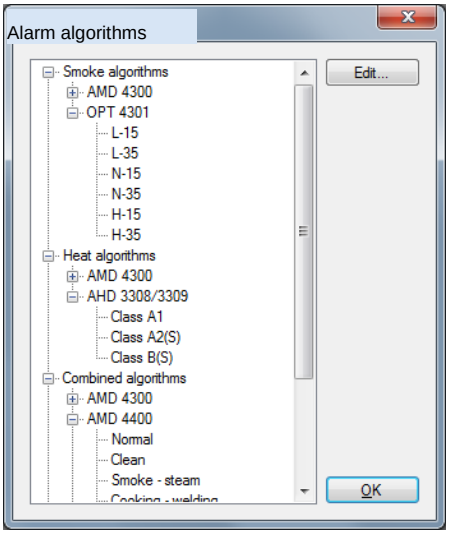
Current day: The programmed time intervals (when the time channel is "on") for the selected day, are shown here.

Cursor time: The cursor position (time) in the day field respectively, 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 4400 and 4401 detectors in Advanced mode. (See chapter "Advanced mode", page 127.)



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:

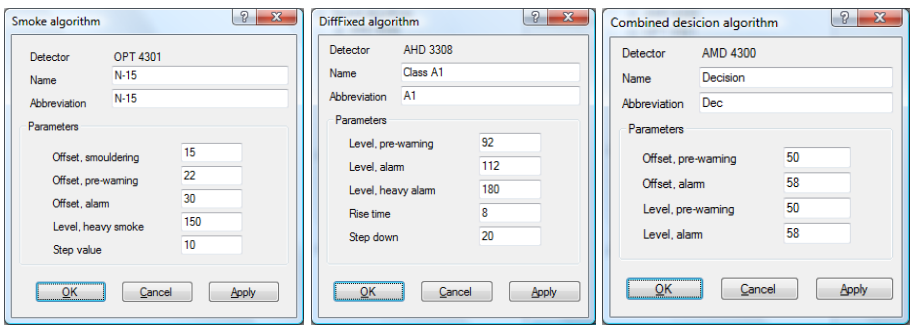


*Figure 29. Smoke algorithm **N-15** for 4301 / 4401, Heat algorithm **Class A1** for 3308 and Combined **Decision** algorithm **Dec** for 4300 / 4400 respectively. All in NORMAL mode.*

Detector: Shortening and Type number (e.g. **OPT 4301** = Analog photoelectric (**opt**ical) smoke detector, **AHD 3308** = Analog heat detector and **AMD 4300** = **A**nalog **M**ulti **D**etector).

Name: Name of the algorithm (e.g. N-15, Class A1 & Decision). Normally not changed.

Abbrevation: The algorithm abbreviation (≤ six characters) as shown in the EBL512 G3 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*).[136]

The step value gives the alarm delay time to the algorithm respectively, see chapter "Functions / Services / Features", page 96.

The following example is for the *N-15 algorithm* for the 4301 detector. The values for other algorithms 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 the detectors 3308 / 3309 and the multi detectors 4300 / 4400. All in NORMAL mode.

The "heat 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

[136] 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 or not, 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.

algorithm only). See also chapter "Algorithms for analog heat detectors", page 103.

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 42.

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).

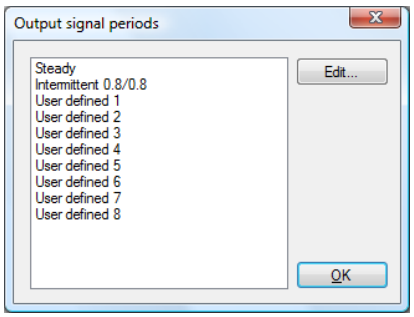
Level, pre-warning: Level, default 50° C

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.

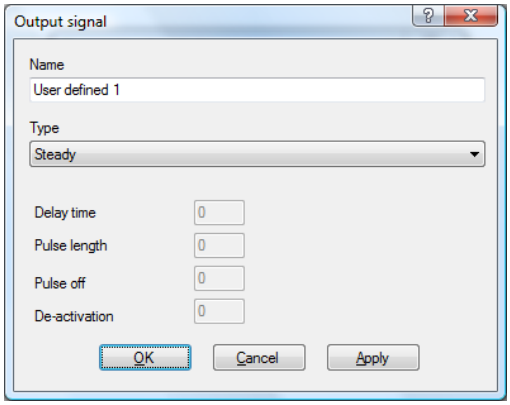
22.3.4 Output Signal Periods

See also chapter "Output signal period", page 76.



In the list (to the left), **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.

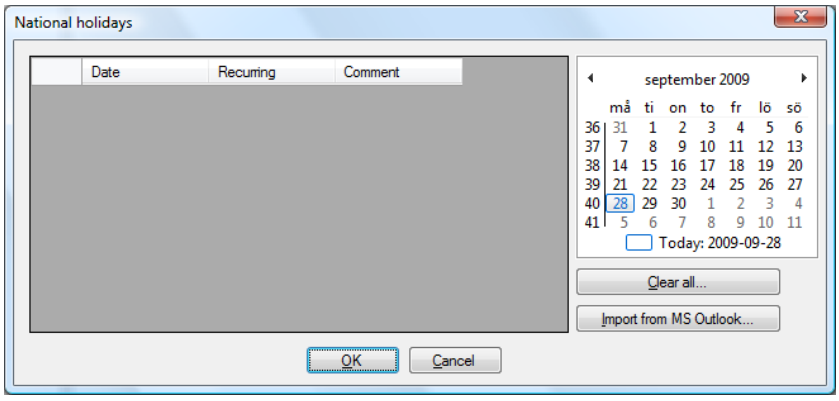
Delay time: Can be set to 0-255 **x 0.8** = **0 - 204 sec.**

Pulse length: Can be set to 0-255 **x 0.8** = **0 - 204 sec.**

Pulse off: Can be set to 0-255 **x 0.8** = **0 - 204 sec.**

De-activation: Can be set to 0-255 **x 0.8** = **0 - 204 sec.**

22.3.5 National holidays



Up to twenty national holidays can be set for the whole system.[137]

National holidays can be added one by one, i.e. by selecting a date in the calendar (up to the right) and click with the left mouse button. A

[137] **NOTE!** ON/OFF times for each time channel (1-14) and every day of the week (incl. national holidays) have to be set.

row with that date will be added in 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…**".[138]

Mark the checkbox "**Recurring**" if a holiday recur the same date every year, e.g. Christmas Day, Boxing Day, etc.

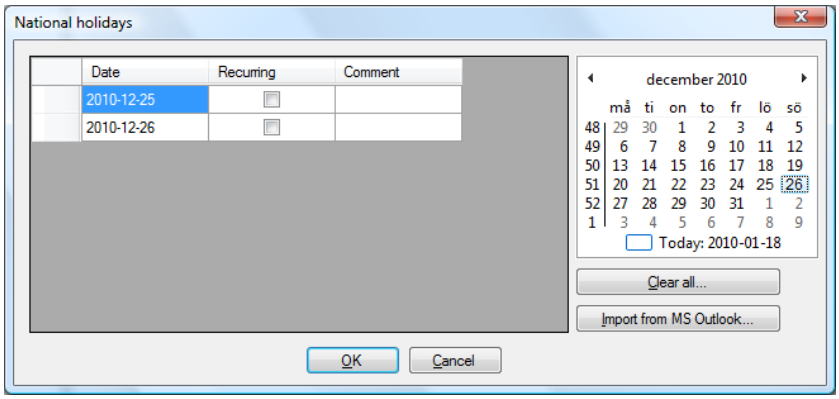
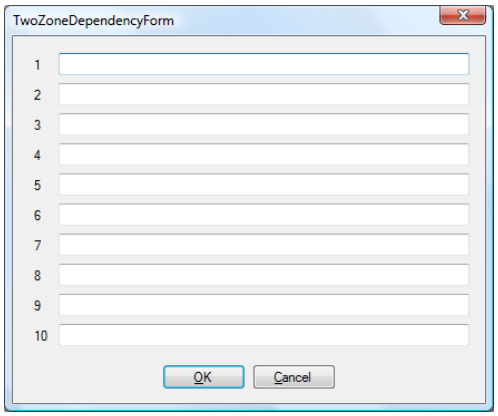


Figure 30. In this example the first row is selected (blue marked).

22.3.6 Two zone dependence



See also chapter "2-zone dependence", page 106.

Default for all zones is no two zone dependence.

NOTE!
Normally, only conventional zones (i.e. zone line inputs with

[138] The National holidays have first to be imported to Microsoft® Outlook. The number and dates of national holidays varies between different countries.

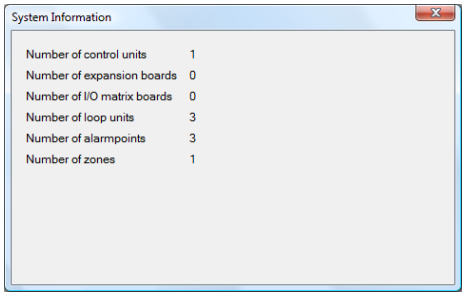
conventional detectors) should be used for two-zone dependence.
For analog / addressable detectors the two-address (unit) dependence should be used.

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 System information

In this dialog box you can **read** the following information:



This is what has been programmed so far in the system. The information will be updated when units etc. are added or deleted.

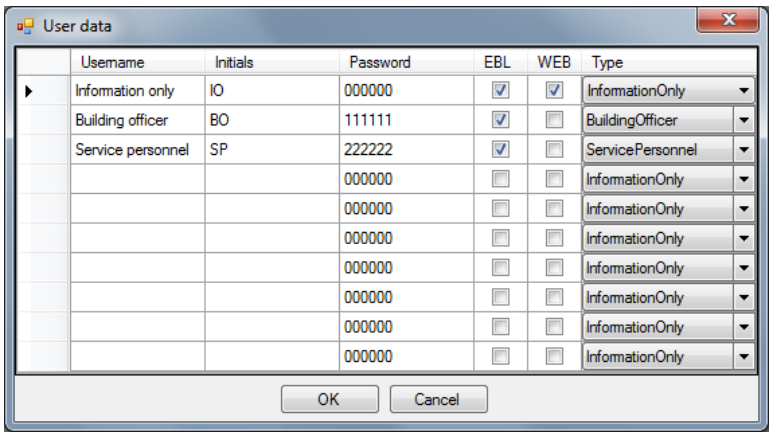
22.3.8 Edit Alarm texts

The user definable alarm text for each alarm point can be created / edited in the alarm point dialog box respectively or via the menu: Systems | Edit Alarm texts. See **Text editor**, page 119.

22.3.9 User data

To log on to the c.i.e. 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,[139] H9 and H10. (Level 2B according to EN54-2.)

User level **Building officer** gives access to the menus H1 – H4, H6, H7, H9 and H10. (Level 2C according to EN54-2.)

User level **Service personnel** gives access to the menus H1 - H10. (Level 3A according to EN54-2.)

For more information regarding user names, passwords, user levels, logon to a control unit, etc. see EBL512 G3 Operating Instructions, MEW01552.

22.4 The Tools menu

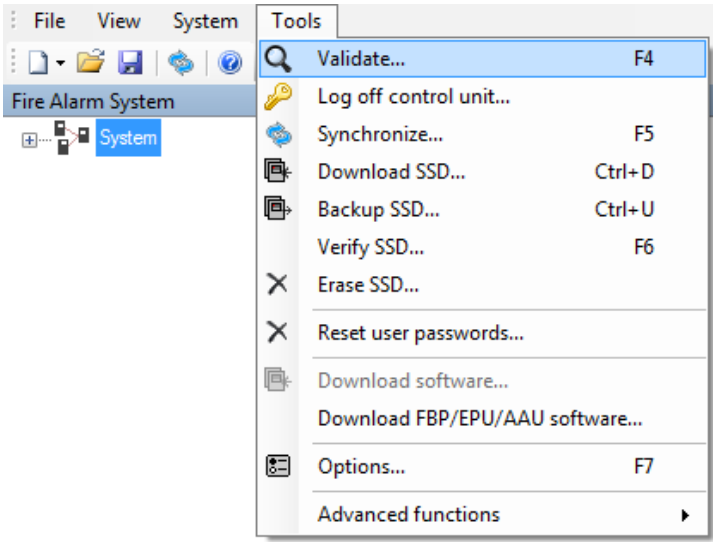


Figure 31. EBLWin menu "Tools". Some commands are disabled if you have not logged on to the control unit.

The EBLWin menu "Tools" is used, when the PC is connected to an EBL512 G3 control unit for e.g. download / backup of SSD.

Validate: The SSD is validated automatically before downloaded to an EBL512 G3 but can also be done via this menu.

Log on control unit: Log on / Log off to an EBL512 G3.

NOTE! An EBLWin key is required.

Synchronize: (When connected and logged on to an EBL512 G3.) Data (i.e. faults, disablements, etc.) will be synchronized, i.e. the same data / information in all control units and EBLWin. Can also be done via menu H8/S7 in the c.i.e.

Download SSD: (When connected and logged on to an EBL512 G3.) For downloading of SSD to one or more EBL512 G3 control units and connected Display Units (e.g. ext. FBP).

[139] NOTE! The faults **cannot** be acknowledged on this level.

Backup SSD: (When connected and logged on to an EBL512 G3.) For backup (upload) of SSD from all the EBL512 G3 control units and connected Display Units (e.g. ext. FBP).

Verify SSD: (When connected and logged on to an EBL512 G3.) The SSD stored in an EBL512 G3 control unit is compared with the SSD open in EBLWin. If they are the same, the checksums should also be the same.

Erase SSD: (With EBL512 G3 in **boot mode**.) The SSD stored in an EBL512 G3 control unit will be erased. Also the SSW (see Operating Instructions) will be erased. **NOTE!** An EBLWin key is required.

Download software: When connected and not logged on to an EBL512 G3. **NOTE!** An EBLWin key is required. For download of S/W (**.bin** file) to one EBL512 G3 control unit. (There is one **.bin** file for each language / customer.)

Reset password: The passwords will be reset to default settings.

Download FBP/EPU/AAU software: (When connected to a Display Unit.) For download of S/W **(.bin** file) to one Display unit. **NOTE!** An EBLWin key 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 three alternatives:
No Level selected: Alarm algorithm parameters cannot be changed.
Level 1 selected: All alarm algorithm parameters except the fire alarm parameters can be changed.

Level 2 selected (which require a special password): All alarm algorithm parameters can be changed. The convention for the open installation can be changed.

23 Download SSD

The PC program **EBLWin** is used for creating the **S**ite **S**pecific **D**ata (SSD) and to download it to the EBL512 G3 control unit(s) and/or Display Units 1728, 1735, 1736, 1826 & 1828.

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 wanted 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, to which the SSD shall 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. It is however, in the COM loop Properties, possible to select the option "Disable at start up". The COM loop will then be disabled directly after the download restart and therefore not generate any faults.

NOTE!
A COM loop "Disabled at start up" can be re-enabled via menu H8/S1 but it will then be disabled again after next restart. Finally the SSD for that control unit has to be downloaded again with the option "Disable at start up" not selected.

23.1 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 that are 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.

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).

23.2 Auto generate loop

The units connected to the selected COM loop will be identified by EBLWin and added to the COM loop with some auto generated settings, which can be edited before the download of the SSD to the control unit takes place.

23.3 Single Control Unit

Start the SSD download from EBLWin, see page 157. 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 03
YYYY-MM-DD  HH:MM
```

Code 03 indicates a normal restart after the SSD download that is ok. Acknowledge the restart fault.

If the download was not ok another fault will be generated.

```
FAULT: Site specific data (SSD), CU nn
YYYY-MM-DD  HH:MM
```

This text message means that the SSD have **not** been downloaded properly, i.e. a new download has to be performed.

23.4 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 the 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.

23.5 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 display and in the ext. FBP 1826 / 1828 display[140] together with its 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 alarm text.

[140] This is also valid for the Ext. Presentation unit 1728 and the Alert Annunciation units 1735 / 1736.

24 Download software (S/W)

The latest software (S/W) version of the EBL512 G3 system program is factory downloaded before the delivery. Due to continual development and improvement, different S/W versions can be found.

The valid S/W version for the Main board 5010 and the MMI board 5011 respectively, can be read in menu H4/U8 (Information) or via EBLWin. On site, new S/W can be downloaded via EBLWin.

EBL512 G3 type **5000** has both a Main board 5010 and an MMI board 5011. EBL512 G3 type **5001** has only a Main board 5010.

On site can also new S/W for the 1728, 1735, 1736, 1826 & 1828 units be downloaded via EBLWin. See the "Technical Description" for the unit respectively.

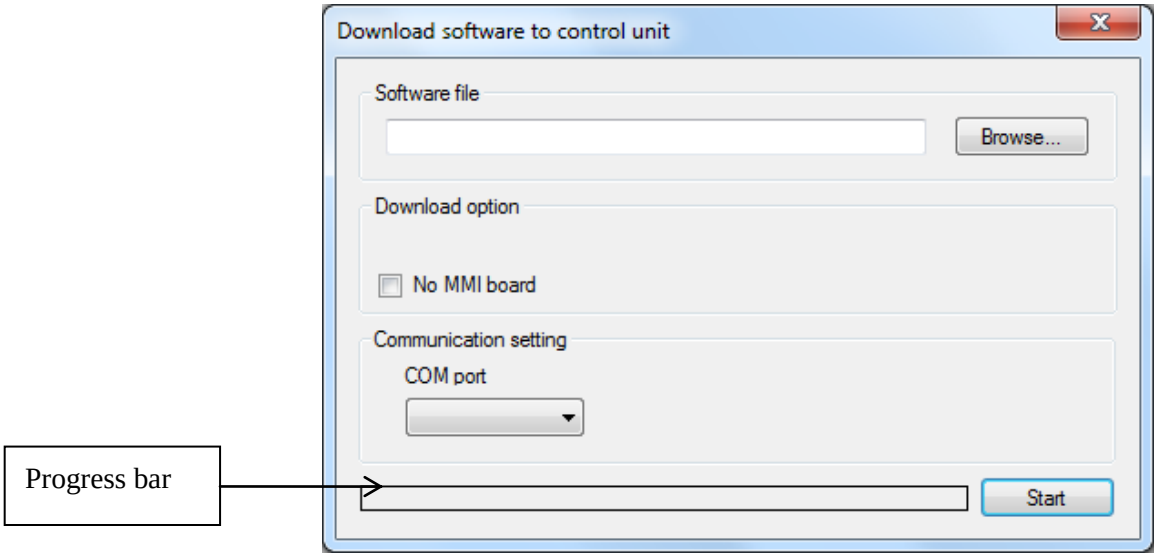
24.1 Single control unit (c.i.e.)

A single c.i.e. shall not have any TLON connection board 5090 mounted. (When a c.i.e. has a TLON connection board 5090 mounted, it is expected to be one c.i.e. in a TLON network and TLON network programming is required.)

To download a new software (system program) version, a PC and **EBLWin** are used. The BIN file that shall be downloaded contains 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 language / country.

Connect the PC to the USB connector in the c.i.e. and start EBLWin.

1. In the "Tools" menu select "Download Software…" to open the dialog box and do the required settings:

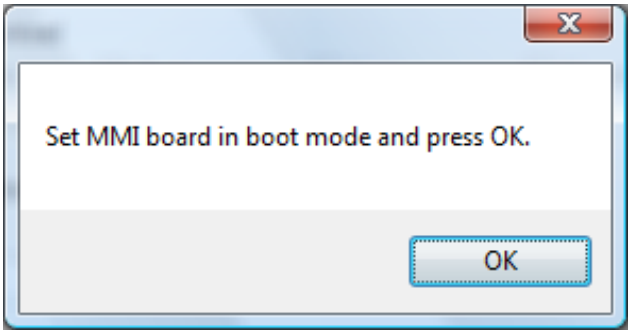


- Select the path and the software file name, e.g. *English_EBL512G3_200.BIN* (200 = version 2.0.0.)
- Mark the checkbox "No MMI board" if it is an EBL512 G3 type

5001, i.e. the MMI software and the text file will **not** be downloaded.
- Select the COM port to be used on your PC.

2. Set the Main board 5010 in "boot" mode, i.e. hold the "Boot" button (SW2) down and push 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.

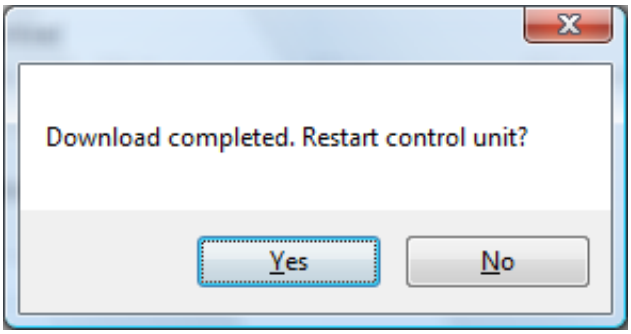
3. Start the download, i.e. click "Start".
If it is an EBL512 G3 type **5000** (i.e. with front), another dialog box opens,



Set the MMI board 5011 in "boot" mode, i.e. hold the "BOOT" button (SW2) down and push the "RESET" button (SW1) momentarily. Release the "BOOT" button. The MMI board LED "D18" is turned off while the MMI board is in "boot" mode. The buzzer is turned on.

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 has gone from "red to green" the download is completed and the following dialog box opens:



Click "Yes" and the control unit will restart. Regarding the restart, see also chapter "Restart" in Operating Instructions. (Restart code 00 or 03.)

6. LED "Operation" (L5) on the front shall now be turned on and all other LEDs on the front shall normally be turned off.

24.2 Control Units in a TLON network

All control units connected to a TLON network **shall** have the same software version.

For download of new software in each control unit, follow the procedure described above.

Since some control units do not have contact with some control units during the downloading, the following faults might be generated:

```
FAULT: Control unit xx has no contact with control unit xx,
network x
yyyy-mm-dd   hh:mm
```

```
FAULT: CU xx has wrong information
yyyy-mm-dd   hh:mm
```

The faults have to be acknowledged.

25 Compatibility

Regarding backwards compatibility:

- Addressable short circuit isolator 4313 is compatible with the older Addressable short circuit isolator 4370.
  NOTE! In system EBL512 G3 shall all Addressable short circuit isolators be set to NORMAL mode.
- If the Analog smoke detector 3304 has to be used in an EBL512 G3 system, the detectors with serial no. 7000001 – 7004527 cannot be used in NORMAL mode.

26 Cable types

A fire alarm installation is a safety installation and it is important that the cables used are of correct types and according to national regulations, e.g. regarding cable colour, method of mounting, etc. Fire alarm cables should, when possible, be installed as far away from other cables as possible, in order to avoid disturbances from these.

The maximum cable length is depending on the cable type (area, twisted / not twisted pairs, screen / no screen), the units' current consumption, etc.

26.1 TLON Network cables

A shielded Belden cable with twisted pair should be used, e.g. JY (St) Y 2 x 2 x 0.8 or 7703 NH 1 pair 22 AWG.[141]

See also separate TLON Technical description.

26.2 COM loop cables

Loop topology is used for highest safety, i.e. the cable, connected in the control unit, returns back to the control unit. In case of a break on the loop, communication in two directions starts.
See dwg. 512 G3 – 25, – 31 and – 41.

Cable length is depending on the type and number of loop units, etc. See chapter "COM loop cable length", page 166 and dwg. 512 G3 - 41.

ELQYB 2 x 1 mm (0.75 mm^2) or equivalent (twisted pair).

ELQYB 10 x 2 x 1 mm or equivalent, when feeder line is required.

If screened cable is used, the screen shall be connected close to each loop unit and only incoming (or outgoing) screen to the c.i.e. earth point.

26.3 Ext. FBP / Display Units cables

RS485. Max. cable length $\leq$ 1200 m to the furthest away D.U.
Cable type LIHCH-TP 2 x 2 x0.75 mm^2 or equivalent (twisted pair).

26.4 Conventional zone line cables

Inputs to 8 zones expansion board 4580 and Multipurpose I/O unit 3361. See dwg. 512 G3 - 33 and - 36.

ELQRB 2 x 0.6 mm (0.3 mm^2) or equivalent. Max. 50 ohm cable resistance (= 400 m cable length).

[141] For longest possible cable length Echelon recommends an unshielded cable type but the EBL512 G3 VdS approval require shielded cable.

26.5 Alarm device cables

Alarm devices (sounders, etc.), see dwg. 512 G3 – 23, – 35 and – 38.

ELQRB 2 x 0.6 mm (0.3 mm^2) or equivalent.

ELQRB 10 x 2 x 1 mm (0.75 mm^2) or equivalent, when feeder line is required.

26.6 Other cables

External indicator (LED), door release magnets, etc. E.g:

ELQRB 2 x 0.6 mm (0.3 mm^2) or equivalent.

27 COM loop cable length

The cable length and max. COM loop current, are depending on the number and type of loop units and the cable type, see Figure 32 and Figure 33, page 167 and 168 respectively.
One of the graphs in each figure has to be used depending on which type of units that are connected to the COM loop. Start checking the terms below for Graph 1, Graph 2 and finally Graph 3.

1. Graph with square dots (when "old" conventional smoke detectors requiring ≥ 15 V are used).
Has to be used when at least one of the following units are used:

2335 / 3361[142] + (2316, 2317, 2318 or 2321 plugged in a 2324)
2330 + (2316, 2317, 2318 or 2321 plugged in 2330 or plugged in a 2324 connected on the external line)

2. Graph with circular dots (when no "old" conventional smoke detectors requiring ≥ 15 V, are used)
Has to be used when at least one of the following units are used:

2300 / 2304
2226 / 2821
2330 + (4318, 4350, 4352, 4452 and all other conventional types **except** 2316, 2317, 2318 or 2321 plugged in base 2330 / 2324)
2335 / 3361[142] + (4318, 4350, 4352, 4452 and all other conventional types **except** 2316, 2317, 2318 or 2321 plugged in base 2324.)
2333
2340 / 2341

3. Graph with no dots
Shall normally be used, i.e. if Graph 1 or Graph 2 above not has to be used.

The following two figures are showing graphs for maximum conductor (wire) resistance and maximum cable length respectively.
Valid for the cable type ELQYB 2 x 1 mm (0.75 mm^2) or equivalent.

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 max. current consumption for the COM loop units connected on that COM loop.

[142] The monitored input used as a zone line input (Z).

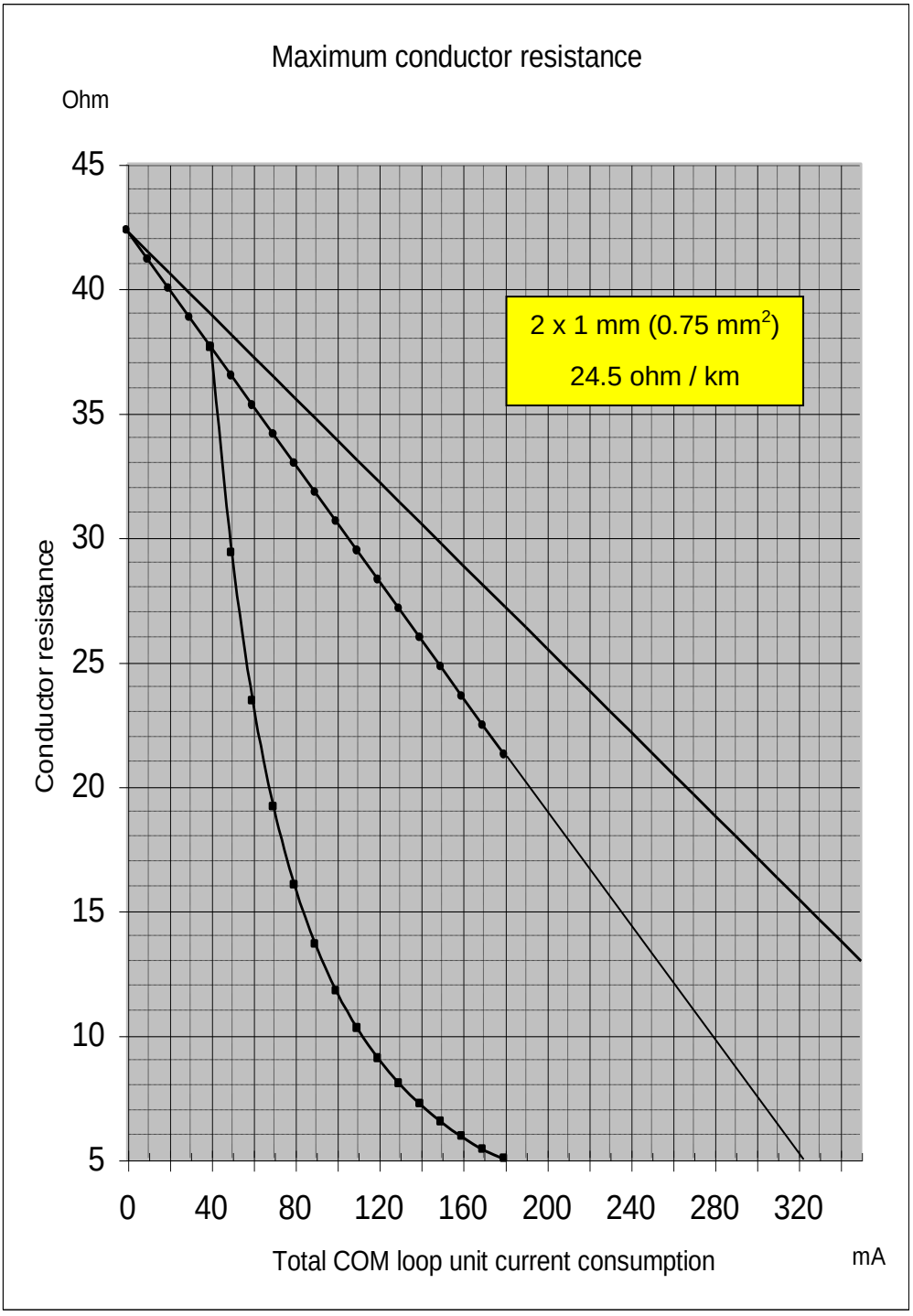


Figure 32. Graphs showing the total conductor resistance in relation to the COM loop units' total current consumption. ***NOTE!*** *The graphs start at "0 mA" but graph 1 ends at "320 mA" and graph 2 ends at "350 mA". End of graph = max. allowed loop current. (42.3 ohm = 863 m cable length.)*

NOTE! The graphs are valid for the cable type ELQYB 2 x 1 mm ($0.75mm^2$) with the conductor resistance 24.5 ohm / km. The total conductor resistance (ohm) = L conductor (ohm) + C conductor (ohm).

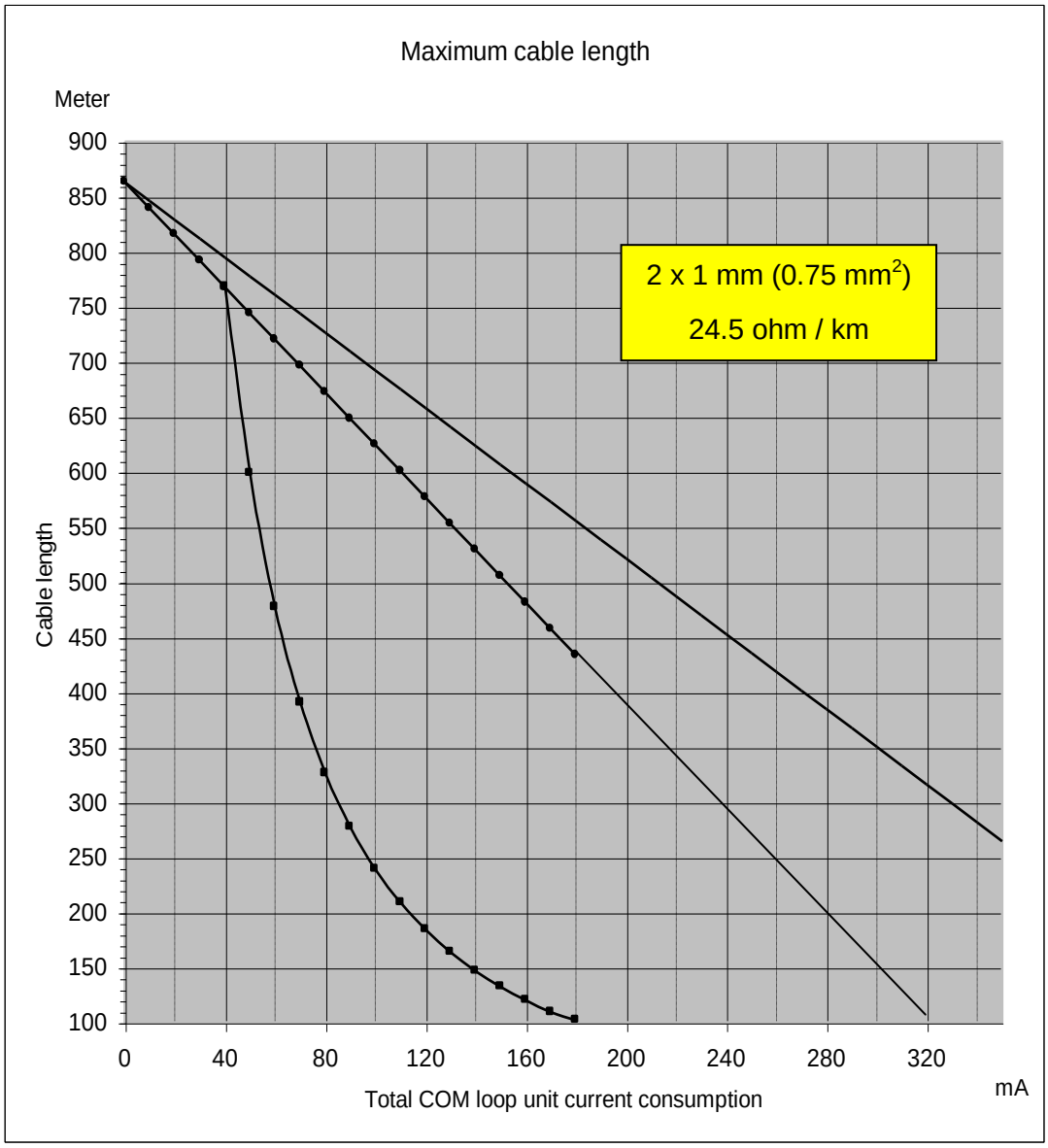


Figure 33. Graphs showing the cable length in relation to the COM loop units' total current consumption. ***NOTE!*** *The graphs start at "0 mA" and 863 m cable length respectively but graph 1 ends at "320 mA" and graph 2 ends at "350 mA". End of graph = max. allowed loop current. (863 m cable length = 42.3 ohm.)*

NOTE! The graphs are valid for the cable type ELQYB 2 x 1 mm ($0.75mm^2$) with the conductor resistance 24.5 ohm / km. The total conductor resistance (ohm) = L conductor (ohm) + C conductor (ohm).

28 Current consumption

The different loop units have different current consumption. Note that some units have much higher current consumption in "active state". To check the current consumption on the COM loops, cable lengths, etc. the tables below can be used. See also dwg. 512-41 and chapter "COM loop cable length", page 166. Also, to get a total current consumption overview and to check if the battery capacity is enough, the tables below can be used.
The current consumption is normally shown at nominal voltage (24 V DC), in **Normal state** (quiescent) and in **Alarm state** (active). By battery back-up (i.e. no mains) the voltage can be 27 – 21 V DC.

See also chapter "Power supply", page 174.

NOTE! A grey row in the tables = obsolete unit, can be found in old installations.

C.i.e. units	**Normal state** (quiescent) (mA)	**Alarm state** (active) (mA)
Control unit 5000 (**without** printer) [143]	230	290
Control unit 5000 (**with** printer) [143]	253	312[144]
Control unit 5001 ("grey box without front, printer, etc.) [143]	179	214
Printer in 5000	23	350
8 zones expansion board 4580	15[145]	15[146]
8 relays expansion board 4581	15	15
In & outputs expansion board 4583, no units connected	15	15
TLON connection board 1590 / 5090	approx. 5	approx. 5
Web-server II 1598	60	65

The control unit values above are measured during battery back-up (i.e. no mains).

[143] Control unit – backup battery powered. COM loops and ext. equipment current consumption not included.

[144] When the printer is active the current consumption is 667 mA momentarily.

[145] 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).

[146] Add 30 mA per input (zone) activated. (Each input has a 30 mA current limitation, i.e. also for short-circuit on the line.)

COM loop units (input units, etc.)	**Normal state** (quiescent) (mA)	**Alarm state** (activated) (mA)
Analog smoke detector 2300 / 2304 + analog base 2312 [147]	1.7 / 1.8	3.7 / 3.8
Analog smoke detector 3304 + analog base 3312 [148]	0.3	2.3
Analog heat detector 3308 + analog base 3312xx [148]	0.3	2.3
Analog heat detector, enclosed 3309 [148]	0.2	1.7
Analog multi detector 4300 + analog base 3312xx [148]	0.3	2.3
Analog smoke detector 4301 + analog base 3312xx [148]	0.3	2.3
Analog multi detector 4400 + analog base 3312xx	0.3[149]	1.3[150]
Analog smoke detector 4401 + analog base 3312xx	0.3[149]	1.3[150]
Addressable heat detector 2340 / 2341 [147]	2	5
Addressable zone interface, isolated 2226 [151]	3	6
Addressable IS zone interface 2821 [151]	3	6
Addressable zone interface 2335	5	20
Addressable manual call point 2333	2	5
Addressable manual call point 3333 / 3339	2	5
Addressable manual call point with isolator 4433 / 4439	1.6	2.7
Alarm Acknowledge Facility Control (AAFC) [152]	2	5
Addressable detector base 2330 + detector Incl. external line.	1.7 3.5	3.9 [153] 13.2

NOTE! On each COM loop, up to 5 sensors / detectors can have their LEDs lit at the same time.

[147] External indicator (LED) current consumption. 2216: add 2 mA. 2217 / 2218: add 1 mA.

[148] External indicator (LED) current consumption. 2216: add 2 mA. 2217 / 2218: add 1 mA.
Analog base with isolator 4313 can be used instead of Analog base 3312.

[149] Plus 0.025 mA if green polling LED is used.

[150] Plus 0.5 mA if External indicator (LED) is used (e.g. 2218).

[151] 2226 / 2821 also require external power supply, 24V DC, 30 mA.

[152] This unit is available on the Australian market only.

[153] Ext. LED current consumption max. 1 mA. Alarm state on detector and external line: 15.4 mA. **NOTE!** The external line can be used for an ext. indicator (LED) or for conventional detector(s) that will get the same presentation number (zone-address) as the detector plugged in the base.

COM loop units (output units, etc.)	**Normal state** (quiescent) (mA)	**Alarm state** (activated) (mA)
Addressable short circuit isolator 4370	2.2	2.2
Analog base with isolator 4313 [154]	≤ 1.3	≤ 1.3
Addressable multipurpose I/O unit 3361	2.2	max. 12[155]
Addressable 2 voltage outputs unit 3364 [156]	≤6	≤6
(Addressable) External power supply 3366	≤15	≤15
Addressable siren 3377	1	max. 13
Addressable siren with isolator 4477	1.8	≤ 10
Addressable sounder base 3378 (low/high)	2	max. 6 / 12
Addressable sounder base 3379	0.75	max 2.5[157]
Addressable beacon 4380	1.7	4-5
I/O matrix board 4582	max. 6	max. 6
Fan control application board 4594 [158]	4-6	4-6

[154] Detector not included.

[155] Only if the input In 0 is used as a zone line input, else approx. 2.2 mA.

[156] External 24 V DC power supply also required, e.g. the 3366 unit.

[157] High sound output: 4.5 mA.

[158] Two 4594 boards are mounted on a Fan control panel 4594. 24 V DC power supply also required.

Other units	**Normal state** (quiescent) (mA)	**Alarm state** (activated) (mA)
Routing equipment (Fire brigade tx / Fault tx)	Acc. to the producer	Acc. to the producer
External Presentation unit 1728	**26**@24 V / 48@12 V	**49**@24 V / 88@12 V
Alert Annunciation unit 1735 / 1736	**26**@24 V / 48@12 V	**42**@24 V / 79@12 V
External FBP 1826 / 1828	**26**@24 V / 48@12 V	**49**@24 V / 88@12 V
Printer 1835 (for ext. FBP 1826) [159]	**4**@24 V / 7@12 V	**4**@24 V / 7@12 V
Alarm devices (sounders, etc.)	0	Acc. to the producer
Door release magnets	Acc. to the producer	0
Alert annunciation controller 1740	10	40

NOTE! Regarding the 1728, 1735, 1736, 1826, 1828 and 1835 units, see the next page.

[159] When the printer is active the current consumption is 161 / 345 mA momentarily.

The following table is a **help** when calculating the cable length and/or the number of units. The table is based on the current consumption at the lowest power supply voltage allowed i.e. 21 V DC by battery back-up (no mains).

Recommended cable type is LIHCH-TP 2 x 2 x 0.75 mm^2.
Wire resistance for this cable is approx. 25 ohm / 1000 m.

Up to sixteen units can be connected but it is depending on the type of units and the cable (type and length).

Number of units	**Allowed cable resistance (ohm) / length (m)**		
	Units 1735, 1736	**Units 1728, 1735, 1736, 1826[160], 1828[160] & no printers 1835**	**Units 1728, 1735, 1736, 1826, 1828 & one[161] printer 1835**
8	12 / 240	11 / 220	-
7	14 / 280	13 / 260	-
6	17 / 340	15 / 300	-
5	20 / 400	18 / 360	-
4	25 / 500	21 / 420	4 / 80
3	34 / 680	28 / 560	10 / 200
2	50 / 1000	42 / 840	16 / 320
1	100 / max. 1200	84 / max. 1200	18 / 360

Explanation: 12 (ohm) ÷ 25 (ohm wire resistance per 1000 m) = 480 m but the wire goes from the c.i.e. to the last unit and back to the c.i.e. again, i.e. the cable length = 480 (m) ÷ 2 = 240 m.

NOTE!

The table is based on the recommended cable type. If a cable with greater area is used the wire resistance (ohm per 1000 m) will be lower and the possible cable length will be longer.

It is also possible to use an external power supply, e.g. 3366, when a greater number of units are required or if a longer cable length is required.

[160] Max. six 1826 / 1828 units.

[161] Printing will only be performed if and when the door in the ext. FBP is being opened. If the door is not opened until after all the alarms are reset, there will be no printing.

29 Power supply

Main power source

Normally the EBL512 G3 control unit is powered by the built-in power supply (rectifier), 230 V AC / 24 V DC ±1%, 6.5 A.

Second power source

By loss of 230 V AC etc. the control unit is powered by a backup battery[162], i.e. two Sealed Lead-Acid batteries, 12 V, 17 – 65 Ah (see tables on page 178 and forward).

There is space in the EBL512 G3 control unit for two Sealed Lead-Acid batteries, 12 V, 28 Ah, physical size 175 x 165 x 125 mm.

Recommended battery type is Panasonic LC-X1228AP.

Larger batteries have to be placed outside the control unit.

The batteries and the rectifier are connected to the Main board 5010 (see dwg. 512 G3 – 21), which also handles the charging of the batteries.

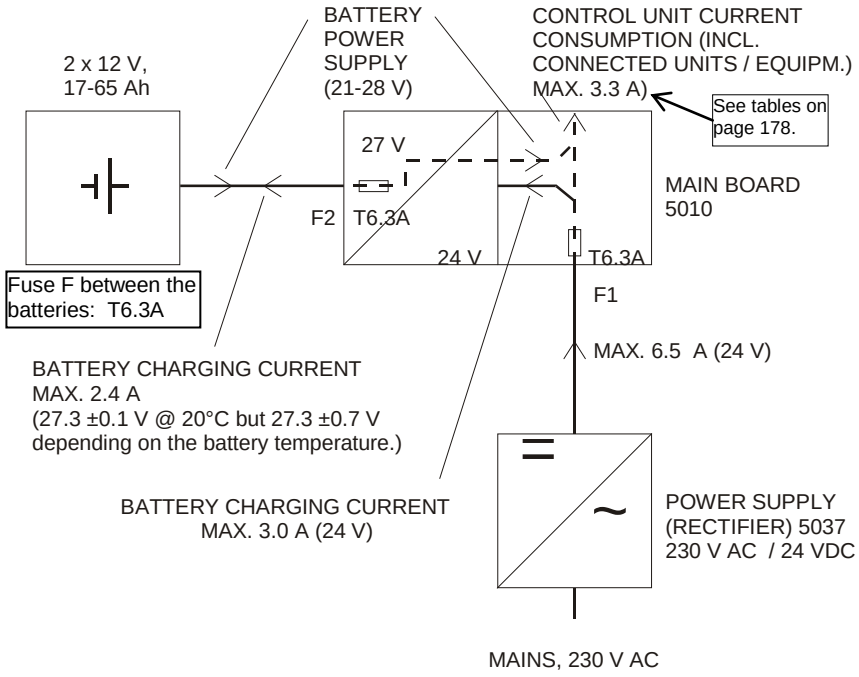


Figure 34. EBL512 G3 power supply block diagram.
Fuses F, F1 & F2: T6.3A H 250 V (5x20 mm Ceramic).
Batteries inside the c.i.e.: Max. 28 Ah.

EBL512 G3 is a very flexible system, i.e. number of and types of loop units, number of and types of expansion boards, ext. FBPs, ext. equipment, etc. can vary from one control unit to another.

[162] **NOTE!** The batteries (2 x 12 V) are not included in the Control unit type no. 5000 & 5001. Batteries with the same physical size but with different capacities are available on the market (e.g. 24 / 28 Ah).

29.1 Charger functions

According to EN54-4, 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.*

29.1.1 Charging

If the EN54-4 section is to be fulfilled, the battery capacity of the backup batteries is limited to 65 Ah.

However, batteries of larger capacity are possible to use but will not be recharged within the prescribed time interval, i.e. an EN54 violation.

Batteries of smaller capacity, i.e. < 17 Ah[163], 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.

29.1.2 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 V.
2. **Constant voltage.** The charging voltage is reduced from 29 to something 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 depending on the battery shape when the charging starts.

29.1.3 Security functions

- The battery charging will be turned off if the current from the Rectifier 5037 to the Main board 5010 exceeds 6.3 A. The battery charging will remain turned off as long as the EBL512 G3 current consumption exceeds 3.3 A. The following fault message will be shown:
  `FAULT: Control unit xx high current consumption`

[163] The Panasonic 17 Ah battery of type **LC-RD1217AP** can be used.

- In case of charger out of work 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. 20.8 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 damaged and have to be changed.)
- In case of no mains and after a time delay of 1-300 minutes (programmable in EBLWin but max. 30 min. according to the EN54-2 standard), the following fault message will be shown:

  FAULT: Mains, control unit xx

29.2 Current consumption calculations

For each control unit, in order to get a current consumption overview so that the rectifier will not be overloaded and to check / calculate the required battery capacity, the total EBL512 G3 current consumption (excl. battery charging current) have to be calculated. **NOTE!** There is no battery charging during fire alarm.

Use the values in chapter "Current consumption", page 169, to calculate the following current consumptions:

- $\mathbf{I^{CN}}$ = current consumption for the control unit[164] in normal state.
- $\mathbf{I^{RN}}$ = current consumption for all other equipment[165] in normal state.
- $\mathbf{I^{CA}}$ = current consumption for the control unit[164] in alarm state.
- $\mathbf{I^{RA}}$ = current consumption for all other equipment[166] in alarm state.

The total EBL512 G3 current consumption in **Normal** (quiescent) **state**: $\mathbf{I^{TN} = I^{CN} + I^{RN}}$

The total EBL512 G3 current consumption in **Alarm** (activated) **state**: $\mathbf{I^{TA} = I^{CA} + I^{RA}}$

Comments regarding ($\mathbf{I^{TN}}$):

$\mathbf{I^{TN}}$ shall be $\leq$ **0.93 A** if the built-in battery is a 28 Ah battery, because this results (theoretically) in 30 hours battery backup time.

---

[164] Including the COM loop units but excl. the battery charging current.

[165] External equipment connected to the control unit (e.g. ext. FBPs, door release magnets, relays, routing equipment, etc.).

[166] External equipment connected to the control unit (e.g. ext. FBPs, sounders, relays, routing equipment, etc.).

I^{TN} is max. 3.3 A but if the required battery backup time is 30 hours **I^{TN}** can be max. **0.93 A**.

Comments regarding (**I^{TA}**):

I^{TA} has to be ≤ **6.3 A**. (The battery charging will be turned off in conjunction with fire alarm activated in the system.)

For the total EBL512 G3 current consumption in relation to **backup time**, see tables in chapter "Battery - second power source", page 177.

29.3 Power supply (rectifier) - main power source

The power supply unit (5037) technical data is 230 V AC / 24 V DC, 6.5 A but the main board fuse F1 = 6.3 A, i.e. **the total current consumption incl. max. battery charging current must not at any time exceed 6.3 A**. Allowed input voltage is 176-264 V AC. The output voltage is 24 V with a tolerance of ±1%. [167]

29.4 Battery - second power source

Only batteries with a specified "Final voltage" of 10.5 V must be used.

Find out the required battery backup time, according to national regulations / customer demands, in normal state and in alarm state.

Calculate the battery capacity required in normal state (**Q^N**) and the battery capacity required in alarm state (**Q^A**) respectively.

- **Q^N** (Ah) = I^{TN} (A) x battery backup time in normal state (h)
- **Q^A** (Ah) = I^{TA} (A) x battery backup time in alarm state (h)

The total battery capacity **$Q = Q^N + Q^A$** (Ah)

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. For this reason it is wise to round up the calculated capacity and add 10%, as safety margin. Note! If the ambient temperature is below 20 °C the safety margin has to be even larger since the electrical capacity of the batteries decreases. At 0 °C add 30% and at 10 °C add 20% to the calculated capacity.

The following tables show the relation between the total current consumption in normal state (**I^{TN}**) and the backup time.

NOTE! The values are calculated and will only give you a rough idea of the backup time.

A battery ≤ (24) 28 Ah[168] can be placed inside the control unit.

A battery > (24) 28 Ah has to be placed outside the control unit.

---

[167] The output voltage is factory set to 24 V. On the rectifier is a potentiometer for output voltage adjustment (±10%) available. **Do not use this potentiometer** unless the output voltage is not 24 V.

[168] The battery's physical size is 175 x 165 x 125 mm.

NOTE! For external batteries the following is valid: Max. 3 m cable length (min. 4 mm[2)]. National regulations have to be followed, e.g. regarding external fuses etc. Also, the voltage drop has to be as low as possible, not to affect the battery checking function.

The relation between the total current consumption in normal state (I^{TN}) and the backup time.

One table for the built-in 28 Ah batteries and one table for the external 65 Ah batteries:

NOTE! Theoretical values.

Built-in **28 Ah** batteries:

I^{TN} (A)	**Backup time** (hours)
3.3	8½
3.1	9
2.55	11
2	14
1.55	18
1	28
0.93	30
0.8	35
0.6	46
0.4	70

External **65 Ah** batteries.

I^{TN} (A)	**Backup time** (hours)
3.3	19½
3.25	20
2.7	24
2.2	30
1.6	40
1.0	65
0.9	72
0.65	100
0.4	162

29.5 Fuses

There are power supply fuses on the Main board 5010 as follows:

F1 = T6.3A Ceramic. +24 V DC from the rectifier (5037).

F2 = T6.3 A Ceramic. + to/from batteries

Between the batteries:

F = T6.3 A Ceramic.

29.6 Form / Table of current consumption

Some national regulations require different forms / tables regarding current consumption, to be filled-in. In such a case an ampere meter shall be used to read a true value instead of a calculated current consumption.

A tip: Turn off the main power source (230 V AC) and use e.g. a "clamp current meter" on one of the wires between one of the batteries and the Main board 5010, to read the true total control unit current consumption.

An approx. value is displayed via menu H5/A4.

30 S/W versions

Due to continual development and improvement, different S/W versions can be found.

Different S/W versions can be found on different markets.

The S/W versions listed below were the valid ones when this document was written (the date of this document or date of revision).

S/W for:	Latest version	Required version
5000 / 5001; EBL512 G3	2.0.0	2.0.0
4580; 8 zones expansion board, P.c.b. no. 9287-2B	1.0.5	1.0.2
4580; 8 zones expansion board, P.c.b. no. 9287-3A	2.0.4	2.0.4
4581; 8 relays expansion board	1.0.2	1.0
4582; I/O Matrix board	1.0.4	1.0.2
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
1735 / 1736; Alert Annunciation unit (AAU)	1.4.1	1.4.1
1826 / 1828; Ext. Fire Brigade Panel (FBP)	1.4.1	1.4.1
EBLWin	2.0.0	2.0.0
TLON Manager	2.0.0	1.2
1598 Web-server II [169]	2.0.0	2.0.0

[169] The Web server is used in other systems as well. The web-server S/W will be downloaded via the PC program "EBLWin V2.0.x". **NOTE!** The EBLWin version and the EBL512 G3 S/W version has to be the same (i.e. the first two digits; **2.0**.x -- **2.0**.x).

31 Technical data

Voltage

Primary (V AC): **230** (176-264) -- 1.6 A

System (V DC): **24**[170]

Current consumption (A)

Quiescent / active: Depending on type (5000 or 5001), type and number of exp. boards, connected external equipment, etc.
See chapter "Current consumption", page 169

Ambient temperature (°C)

Operating: 0 to +40

Storage: -40 to +70

Ambient humidity (%RH)

max. 90, non condensing

Ingress protection rating

IP 30

Size H x W x D (mm)

5000: 628 x 438 x 187. See also drawing 512 G3 - 01

5001: 625 x 418 x 177.

Weight (kg)

5000: 20

5001: 19

Colour

5000: Metal cabinet: Aluminium & light grey (NCS S 1500-N / PMS Cool Gray 2)

5001: Metal cabinet: light grey (NCS S 1500-N / PMS Cool Gray 2)

Approvals

Conforms to EN 54-2 and EN 54-4.

The Swedish front conforms to SS3654.

[170] The rated output voltage is 24 V DC ± 1% for the main power source (rectifier). Max. ripple 240 mVp-p. The rated output voltage for the second power source (backup battery) is 20-27 V DC.

32 Limitations

See also "Control Unit / TLON Network", page 18.

32.1 User definable texts

All alarm points etc. can have its own "alarm text" in EBL512 G3.

At least 617 "User definable texts" can be programmed per 1728, 1735, 1736, 1826 and 1828 unit.[171]

32.2 C.i.e. / System

Max. number of "items" for the system is the same as per C.i.e. if nothing else is specified:

.....table on following page...

[171] The texts have to be with "English characters" but for some languages might some already defined language dependent characters be used.

Item	C.i.e.	System
General fire alarm via progr. input	100	
External fault via progr. input	50	30 x 50
Programmable outputs (= control expressions)[172]	512	
Technical warnings	50	30 x 50
Addressable 2 voltage outputs unit 3364	40	
Interlocking Combinations	400	4000[173]
Presentation numbers / alarm points[174] that can be presented in the display(s) in case of fire alarm	512	512
Presentation numbers[174] that can be programmed	512	30 x 512 = 15 360
Zones that can be programmed	512[175]	999
Faults		300
Disabled zones		512
Disabled alarm points (zone/address) + Disabled COM loops		200[176]
Disabled outputs		200[177]
Disabled interlocking outputs		200[178]
Sensors activating SERVICE signal		200
Max. number of AAF zones (Max. 5 detectors per AAF zone.)[179]	100	

[172] Approx. 4000 trigger conditions can be used in these control expressions.

[173] Max. 100 user definable texts can be displayed "at the same time".

[174] Presentation number is a ZONE only or ZONE – ADDRESS.

[175] Any zone number between 001 and 999 can be used for the 512 zones.

[176] Zone/address disabled via time channel not included.

[177] Control outputs disabled via menu H2/B3 and Alarm devices disabled via menu H2/B4 not included.

[178] Interlocking outputs disabled via menu H2/B3 not included.

[179] Used in conjunction with the AAF Control, which is available on the Australian market only.

33 National regulations

When planning a fire alarm installation, national regulations, customer demands, etc. have to be followed.

EBL512 G3 is very flexible. Many functions / facilities are built-in the system, e.g. in the S/W and EBLWin.

When downloading S/W and SSD, different settings, conventions, languages, etc. can be set to fulfil national regulations.

34 Drawings / connection diagrams

Resulting from continual development and improvement, all dimensions quoted are approximate only and subject to change without notice, as are other technical features and data.

35 Revision history

The changes in conjunction with the latest revision are, when possible, written with red font colour in the document.

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Panasonic ideas for life

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