Panasonic

Planning Instructions

MEW01472

Revision -

Fire Alarm System EBL512 G3
United version 2.7.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 MEW01473.

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 United version 2.7.x**. On the date / revision date of the document **x = 0**.

EBL512 G3 S/W United version 2.7.x. is a bit special since it can be used only for EBL512 G3 units in a TLON Network with both EBL512 units[2] and EBL512 G3 units, i.e. a mixed network.

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 addresses 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 addresses 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 number of addresses configured (e.g. 5000PRTSE-**128**).

[1] File name: L:\User documents\512 G3\United 2.7.x\MEW01472 (Rev -).doc

[2] The EBL512 units have to have a special S/W version (2.7.x), which makes it possible to use EBL512 G3 units (5000 / 5001) together with EBL512 units (1548 / 1549 / 1550), in a TLON Network, i.e. a **mixed system**.

- 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**)
- 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. **V2.7.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. Win512 V2.7.x). It has a **version number** (e.g. **V2.7.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 and conventional photoelectric (optical) smoke detectors are available.

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.i.e. Analog detectors are addressable – an address setting tool is used for detector types **430**x.

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

Detector with only two statuses, i.e. normal and fire alarm. The detector has a closing contact and a series alarm resistor. Normally plugged in a conventional detector base **CDB** (see below) connected to a conventional zone line input, with an end-of-line device. Some types (e.g. water proof types) are connected directly on 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 c.i.e.

(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 c.i.e. 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 for fire alarm presentation (incl. user definable alarm text messages, if programmed).

2.7 COM loop

Loop = a cable, with two wires, to which all the addressable units can be connected. Starts in the c.i.e. and it returns back to the c.i.e.

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

Control **U**nit = **C**ontrol and **I**ndicating **E**quipment = 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)

Unit 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 unit (external FBP).

In the ext. FBP, a printer can be included or not included.

2.10 Control panel (CP)

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

2.11 System

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 "network". See also separate TLON Technical description.

TLON® = TeleLarm Local Operating Network = a LonWorks®- based network[3] for communication between several 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 the network, a TLON connection board has to be plugged in the control unit. EBL512 G3 also supports redundant TLON system communication. 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 the TLON Network a sub net = a channel.)

Routers are also used to increase the maximum cable length, node to node, in a network.

Router or Repeater is the same type of unit (different configuration). All network programming (configuration) are made with the PC program "TLON Manager".

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 LED. Connected to an ASB, CDB or any detector with an output for an ext. LED. (In old installations also an ADB.)
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.

2.16 Door open (Door / Key switch)

In EBL512 G3 there is a door switch, which is activated when the control unit's 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).

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

2.17 Site Specific Data (SSD)

The SSD is unique for each installation. All alarm points, presentation numbers, user definable alarm text messages, programmable outputs, etc. are created in the PC program **Win512 V2.7.x** and also downloaded in EBL512 G3 united version 2.7.x with **Win512 V2.7.x**.

2.18 Software (S/W) / System program

The S/W (firmware) makes the control unit (the microprocessor) work. It is factory downloaded but a new version can, via the PC program **WinG3 version 1.1.x**, be downloaded in EBL512 G3 united version 2.7.x on site.

2.19 Mixed system

EBL512 units (1548 / 1549 / 1550) with software **EBL512 version 2.7.x** together with **EBL512 G3 units** (5000 / 5001) with software United version 2.7.x in a **TLON Network**, i.e. a **mixed system**.

EBL512 G3 united version 2.7.x can **only** be used in a mixed system.

3 Overview

3.1 The EBL512 G3 system

EBL512 G3 is a microprocessor controlled intelligent fire alarm system, intended for analog addressable smoke detectors, as well as conventional detectors and manual call points. Programmable control outputs and output units are available. In EBL512 G3 United version 2.7.x, up to 512 addresses can be connected to each control unit (c.i.e.) - according to EN54-2.
EBL512 G3 is available in several types, versions and configurations. It can be connected to a TLON network, i.e. in 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. With front and display.
5001	EBL512 G3 c.i.e. Without front, display and printer. No door.

EBL512 G3 is 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 ("PRN" included in the article number) or without a printer.[4]
In 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 types are available:

Product type no.	*Product name*	*Note*
4580	8 zones expansion board	
4581	8 relay outputs expansion board	

Regarding the expansion boards, see also chapter "Expansion boards 458x, page 27 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.
The second power source is a backup battery (2 x 12 V). In the c.i.e.

[4] Printer 5058 is a spare part for the c.i.e. type 5000 with a printer, i.e. it comes without a mounting frame etc.

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 152 for more information.

3.2 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 update the S/W in the old control units (or download an older version in the new control unit). T**he same S/W version is required in all control units** in a TLON network. In a mixed system must only be used the S/W **EBL512 version 2.7.x** and **EBL512 G3 United version 2.7.x** respectively.

3.3 Documents

The following documents are available:

- Planning Instructions (this doc.)
- Operating Instructions MEW01473
- Drawings

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

3.4 Applications

The mixed 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 and commissioning of the control units / system is very easy. (PC software Win512 version 2.7.x and TLON Manager.)
Start with one control unit and then later when it is required, add more units. The TLON network makes it possible to install the control units in one building or in many buildings.

3.5 PC software (S/W)

The following PC software is used together with the EBL512 G3 system.

3.5.1 Win512 version 2.7.x

Win512 version 2.7.x is used for programming and commissioning of one or more **EBL512 control units** (version 2.7.x) but in a mixed system (see chapter "Mixed system", page 14) it is also used for the **EBL512 G3 control units** (United version 2.7.x), i.e. to:

- create / download / backup (upload) the site specific data (SSD)
- program convention / configurations / C.U. & system data / etc.

- create and download the user definable text messages (alarm texts) shown in the display in the C.U. / ext. FBP and other Display units (AAU / EPU).
- download S/W & EBL512 settings in an EBL512 C.U.
  NOTE! For the **EBL512 G3 control units** in a mixed system, **Win512 version 2.7.x** has to be used to download S/W.

Old SSD files can be opened in a newer (higher) version of Win512, saved, edited and thereafter downloaded to an EBL512 G3 / EBL512 control unit with the corresponding version.

3.5.2 WinG3 version 1.1.x

In a mixed system, WinG3 version 1.1.x is used to download new software and change max. number of addresses in an EBL512 G3 control unit.

3.5.3 TLON Manager

TLON Manager is used for the TLON Network programming, i.e data / addresses / etc.

3.5.4 Web512 II Config Tool 2.7

A PC tool, **Web512 II Config tool** version 2.7.x is used for configuration of the Web-server II (1598).

4 Control Unit / TLON Network

4.1 The TLON network

In a mixed system, up to **30 control units** (EBL512 G3 United version 2.7.x and EBL512 version 2.7.x) can be connected in a **TLON Network**. At least one has to be an EBL512 control unit.

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 AAF function is used, all devices within the same AAF zone must be connected to the same c.i.e.

4.2 Single TLON Network / Redundancy in distributed system

The EBL system can be build up as a single TLON Network system or a Redundancy in distributed system.

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

A fault in a TLON Network generates the following fault:

```
FAULT: Control unit xx has no contact
with control unit xx
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NOTE!
For highest security in a mixed system the function **Redundancy in distributed system** can be used in a system with a TLON Network. One EBL512 control unit has to be the "master" unit and the other control units in the system are "slave" units that are connected to the

"master" unit via a separate network and a 1580 board[5] in the "master" unit.

In a mixed system can only an EBL512 unit (S/W version 2.7.x) be the "maser".

For more information see chapter "Redundancy in distributed system", in the EBL512 Planning Instruction MEW01456.

NOTE!
EBL512 S/W version 2.7.x is a special version that has to be used for the EBL512 units a mixed system, i.e. a system with both EBL512 units and EBL512 G3 units.

EBL512 G3 United version 2.7.x can **only** be used in a mixed system.

[5] As an alternative the I/O unit 3361 zone line input can be used.

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. Expansion boards can be mounted (option). Configured for 128, 256 or 512 addresses and with or without printer is depending on the article number.	Yes
5001	EBL512 G3 c.i.e. Expansion boards can be mounted (option). Configured for 128, 256 or 512 addresses depending on the article number. Printer **cannot** be mounted.	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.*

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 COM loop units (addresses), 128, 256 or 512.

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. (A front with texts in English is shown in the figure).*

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 to "communicate" with the system, i.e. for commissioning, monthly tests, maintenance, etc. Access codes for different access levels are required. A keypad is used to get access to the system (a menu tree with main and sub menus) and for operational control of the system. The CP has several system status LEDs.

NOTE! Regarding LED indicators, keypad / push buttons / soft keys, access levels and for more information, see EBL512 G3 Operating Instructions MEW01473.

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

- Grey metal cabinet
- MMI board (5011) (not in 5001)
  - EBL512 G3 front with display (not in 5001)
- Main board (5010)
  - Space & connectors for two TLON connection boards (1590/5090). **NOTE!** In **EBL512 G3 United version 2.7.x** can only one TLON connection board be used (Network 0).
  - Four COM loops (0-3) to which the loop units are connected.
  - Four programmable supervised voltage outputs (S0-S3).
  - Two programmable relay outputs (R0-R1).
  - Four programmable inputs (I0-I3).
  - Six 24 V DC outputs (power supply outputs for Web-server II (1598), routing equipment and external equipment). Connections and more information, 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). Connections and more information, see dwg. 512 G3 - 24.
  - Battery charger.
- Built-in power supply. See chapter "Power supply", page 152. 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).
- 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.

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 127 COM loop units be connected (COM loop address 001 – 127). 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 145 and "Current consumption", page 148.

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 MEW01473 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.

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 Addressable short circuit isolators (4313) are used[6], 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 or the break is situated.

If no addressable short circuit isolator (4313) 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 break(s)** or **COM loop short circuit**:

This will start a “cycle” as follows.

- The whole loop will be disabled, i.e. no voltage on the loop which means that the relay in all isolators will be powerless, i.e. there will be a “break” on the L (SA) wire in each isolator.

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

- The control unit (an algorithm) will now try to re-enable the first isolator (sequence no. 0) in the A-direction. If this is possible the next isolator (sequence no. 1 in the A-direction) will be re-enabled, if this is possible. And so on. The isolator just before a short circuit cannot be re-enabled.

- The control unit will now try to re-enable the first isolator (sequence no. ?) in the B-direction. If this is possible, the next isolator, 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 corrected, the communication will return to be in the A-direction only, else the communication will be in both directions for another 10 minutes when a new "cycle" starts, and so on.

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 or B.
- **FAULT: Short circuit loop x, control unit xxSCI nn <-> SC**
  NOTE! nn = A, 00, 01, 02, 03, 04, 05, 06, 07 or B.

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

- **FAULT: Multiple faults, COM loop x, control unit xx**

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

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

- **FAULT: No reply zone: xxx address xx technical number xxxxxx**

Regarding Fault acknowledge, see the EBL512 G3 Operating Instructions MEW01473.

Regarding functions and fault messages for EBL512 (in a mixed system), see EBL512 Operating Instructions MEW01457.

5.3 Programmable voltage outputs (S0-S3)

The 24 V DC outputs are supervised (monitored)[7]. 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 105 and the EBL512 G3 Operating Instructions MEW01473, chapter "Calibration of supervised outputs (menu H5/A1)".

Each output has to be programmed (via Win512 version 2.7.x) regarding:

- Type of output, i.e. output for Control, Alarm devices, etc.
- Logic, i.e. normally low (default) **or** normally high (24 V DC)[8].
- Activation time and type (steady, pulse, delay, etc.).
- Control expression (one or more trigger conditions).

See also chapter "Programmable outputs", page 64.

5.4 Programmable relay outputs (R0-R1)

Connections according to dwg 512 G3 – 23.

Each output has to be programmed (via Win512 version 2.7.x) 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 (steady, pulse, delay, etc.).
- Control expression (one or more trigger conditions).

See also chapter "Programmable outputs", page 64.

5.5 Programmable inputs (I0-I3)

Connections according to dwg 512 G3 – 23.

Each input has to be programmed (via Win512 version 2.7.x) 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 60.

[7] The outputs are in Win512 version 2.7.x default set as supervised but via Win512 version 2.7.x it is possible to set each output (S0-S3) individually to be not supervised.

[8] A normally high output is not 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 MEW01473. 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[9]. Activated output is (normally) indicated by the LED "Fire brigade tx".[10]

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[11] in the control unit (c.i.e.)[12].

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

[9] The output can be disabled via "door open" or via menu H2/B9. See also chapter "Alert Annunciation", page 97.

[10] 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.

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

[12] The output can be disabled via "door open" or via menu H2/B9.

6 Expansion boards 458x

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

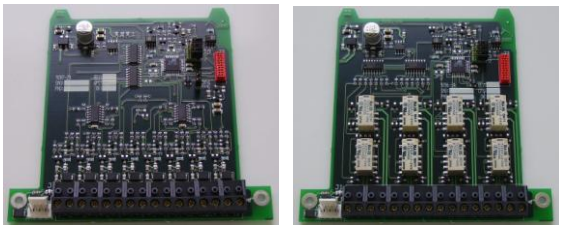


*Figure 3. 8 zones expansion board **4580** and 8 relays expansion board **4581**.*

I/O Matrix board 4582[13] is a special type of "expansion board", plugged as a "piggy back" to an **Application board**[13], which is connected to a COM loop and to 24 V DC. On each COM loop 0-3 can up to four 4582 boards be used (i.e. up to 16 boards in total).

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

*Figure 4. I/O Matrix board **4582**.*

Max. four of the I/O Matrix boards 4582 can be programmed as type Generic and/or Zone control.
NOTE! ≤ 200 programmable outputs per c.i.e. can be used.

Each expansion board 4580 & 4581 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 and 4581 jumpers "JP2-JP4" and on board type 4582 jumpers "JP1-JP3", see Figure 5, page 28. All the board programming is done via **Win512 version 2.7.x**.

[13] The 4582 board can be programmed as type Fan, Generic or Zone control. It is mostly used with Australian Application boards but the General I/O application board 4596 and Fan control application board 4594 (used with the Fan control panel 4593) are available on all markets, see page 52.

NOTE! NOTE! NOTE! NOTE! NOTE!

In **Win512 version 2.7.x** the following is valid for an **EBL512 G3** control unit:

4580 boards have to be programmed as **1580** boards.

4581 boards have to be programmed as **1581** boards.

1582 boards cannot be used.

4583 / 1583 boards cannot be used.

1584 boards cannot be used.

1587 board has to be used (selected) when Display Units (1728, 1735, 1736, 1826 and 1828) shall be connected to an **EBL512 G3** control unit United version 2.7.x. No physical board is required – the Display Units are connected directly in the **EBL512 G3** control unit (RS485).

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 and 4581			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 5. Expansion boards 4580 - 4582. Jumpers for expansion board no. (address) setting.

6.2 8 zones expansion board 4580

Each board has to be programmed via **Win512 version 2.7.x as a *1580* board** (4580 cannot be selected), regarding:

- Address / Board no. (jumpers "JP2-JP4", see Figure 5 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 capacitor (470 nF).
Connections to "J1:1-16" and "J2" according to drawing 512 G3 - 33.

Each zone line input has to be programmed via **Win512 version 2.7.x** regarding:

- Type of detectors = Type of zone line input, depending on detectors, etc.
- Alarm at short circuit / No alarm at short circuit
- Zone number (address optional)
- Fire alarm delay or No fire alarm delay
- Text (Alarm text – if you wish)
- Alert annunciation & time channel
- Disablement & time channel
- Two unit dependence
- Number of alarm points

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

6.2.1 Type of detectors = Type of zone line input

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

6.2.1.1 Conventional detector loop = 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 $\leq$ 1.5 mA.

6.2.1.2 Alarm on short-circuit = Alarm at short-circuit

Like the "Conventional detector loop" but short-circuit on the zone line will generate a fire alarm instead of a fault, i.e. used for old types of detectors.

6.2.1.3 Alarm from control unit

This option **cannot be used for an EBL512 G3 control unit**.

6.2.1.4 EX zone line input (EOL resistor)

This option **is not available for an EBL512 G3 control unit**.

6.2.1.5 Zone line input (EOL resistor)

This option **is not available for an EBL512 G3 control unit**.

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[14]. From this state any other state can be reached / activated.

[14] Allowed voltage 15-28 V DC.

6.2.2.2 High current state

The max. current consumption limit[15] 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[15] 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.

6.2.2.4 Short-circuit state

The short-circuit current limit[15] 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 Win512 version 2.7.x.

6.2.2.5 Open circuit state

The open circuit current limit[15] 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[16], 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 Win512 version 2.7.x **as a *1581* board** (4581 cannot be selected), regarding:

- Address / Board no. (set via the jumpers "JP2-JP4", see Figure 5, page 28.

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 Win512 version 2.7.x regarding:

- Type of output, i.e. output for Control, Alarm devices, etc.
- Activation = Output signal period (steady, pulse, delay, etc.)

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

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

- Logic, i.e. normally open (NO) **or** normally closed (NC) contacts[17]
- Control expression (one or more trigger conditions)

For more information, see chapter "Programmable outputs", page 64.

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

6.4 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 27 and 53. 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.

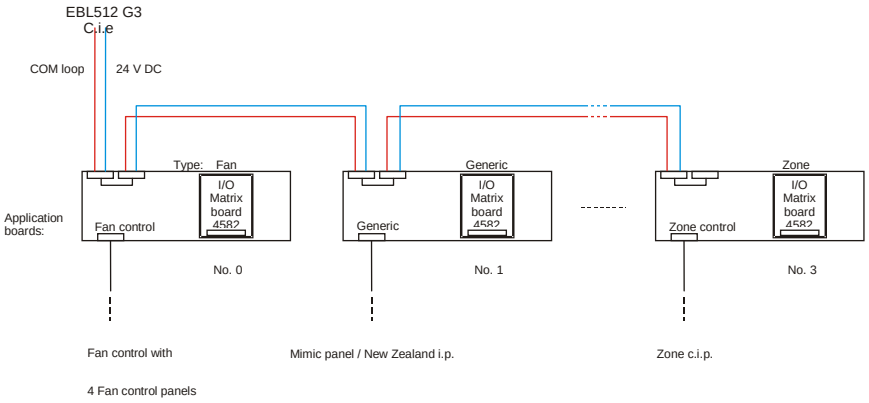


*Figure 6. I/O Matrix board application **overview**. The COM loop and 24 V DC are internally connected to the I/O Matrix board.*

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.

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).
This type is used with the "General I/O application board" 4596.

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.
Function for a "Supply air fan" or a "Standard fan". Function for a

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

"Smoke exhaust", "Smoke spill", "Stair pressurisation" or a "Supply air" fan.
This type is used with the "Fan control application board" 4594.

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

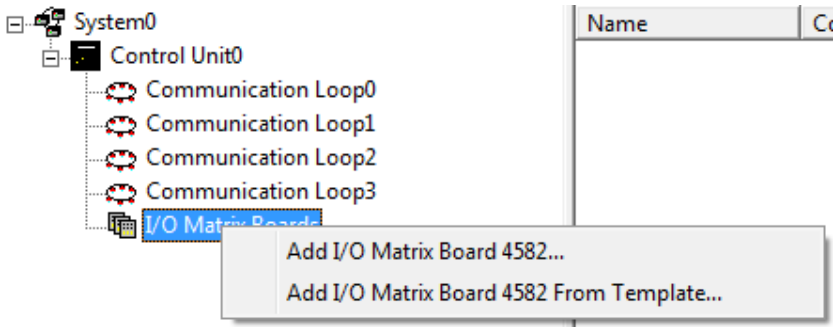
For the number and type of boards that can be used, see page 27.

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 5, page 28.

In EBL512 G3 can totally up to 200 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 Win512 version 2.7.x



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

- **Loop no.**
- **Board no.** (shall be the same board no. / address as set via jumpers "JP1-JP3"), see Figure 5, page 28.
- **Name** (I/O Matrix Board - normally not changed)
- **LED test on Input 15** (selected or not selected)
- **Type of I/O Matrix board** (Generic, Fan control or Zone control)

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 boards (fan control and general I/O boards), see page 53.

6.4.1 Generic

Used for Application board type **Generic**, e.g. "General I/O application board" 4596 (see page 53).

Each output (0-47) has to be added and programmed via Win512 version 2.7.x regarding:

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

Each input (0-15) has to be added and programmed via Win512 version 2.7.x regarding:

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

6.4.2 Fan control

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

Fan control panel 4593 has two Fan control application boards 4594 and two Fan control fronts (see page 53).

Each Fan (0-3) (i.e. each Fan control) **has to be added and programmed** via Win512 version 2.7.x.

For each fan (Fan control), also one **I/O unit for fan control 3361** (COM loop unit) has to be added and programmed via Win512 version 2.7.x regarding e.g:

- Technical number
- Name (Fan control I/O unit - normally not changed)
- Fan control information
  - Fan number (0-3)
  - Supervised **or** not supervised
  - Output latched **or** not latched
  - Normally stopped / normally running
- Properties, like any programmable output.
- Normally stopped **or** Normally running

6.4.3 Zone control

Used for Application board type **Zone control**. [18]

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

Each input (0-15) has to be programmed via Win512 version 2.7.x regarding:

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

6.5 Inputs and outputs expansion board 4583

Cannot be used for EBL512 G3 United version 2.7.x.

6.6 External FBP / DU interface board 1587

One 1587 board has to be programmed when Display Units type 1728, 1735, 1736, 1826 and 1828 shall be connected to an **EBL512 G3** control unit with S/W United version 2.7.x, i.e. connected in a mixed system. No physical board shall be mounted – the Display Units are connected directly in the **EBL512 G3** control unit (RS585).

The "board" has to be programmed (via Win512 version 2.7.x) in spite of that no physical board is used, regarding:

- Address (one exp. board address 0-5)
- Name (Default is **FBP/DU 1587**, which is normally not changed)

This board is programmed for connection of Ext. FBPs 1826 / 1828, Presentation units 1728 and Alert annunciation units 1735 / 1736 to EBL512 G3 United version 2.7.x. They shall be running in **S/W mode xxxx – 1587**.[19] The data rate in this mode is 9600 baud.

The theoretical number of units that can be connected is sixteen but it is depending on the type and the number of the units respectively, the cable type and length, etc.

Connections according to dwg 512-47.

[19] For more information about each type of unit, see chapter "Other units", page 57.

7 Printer

The control unit type **5000** can be 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 board connected to Main board" has to be marked in the Win512 version 2.7.x "Control unit properties" dialog box.

The following will / can be printed:

- Alarms (Fire alarms – incl. test mode alarms & Heavy smoke / heat alarms, etc.)
- Disablements, etc. via menus H4/U1 – U2
- Detectors activating service signal via menu H4/U5
- The event log via menu H4/U6
- The control unit configuration via menu H4/U7
- Activated Interlocking inputs and outputs via menu H9/C1

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

8 TLON connection board 1590/5090

On the EBL512 G3 control unit (5000 / 5001) main board (5010), there are spaces and connectors for two TLON connection boards type 1590/5090[20].

A single (standalone) EBL512 G3 United version 2.7.x control unit is not possible.

A mixed system, (two or more control units EBL512 version 2.7.x and EBL512 G3 United version 2.7.x), uses one **single TLON Network**. Min. one control unit EBL512 version 2.7.x is required in a mixed system.

The TLON connection board (Network 0) is mounted on the main board (5010) according to dwg. 512 G3 – 11 and the network is 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 (1590/5090) shall be mounted in position no. 0 on the main board.

8.2 Network programming

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

NOTE! By the TLON Network programming (installation), some unique data will be stored in a TLON connection board (1590/5090) memory and some unique data will be stored in a main board (5010) memory.

After replacing a TLON connection board only or replacing both a TLON connection board and a main board, do "Replace" and "Update" in TLON Manager V2.0.

After replacing a main board to another (not the TLON connection board), do "Update" in TLON Manager V2.0.

[20] TLON connection board type 1590 will be replaced with the next generation TLON connection board 5090 (which still might be under development).

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 / 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). (Also, any programmable output can be used).

External Fire Brigade Panels and External Displays Units are connected directly to the RS485 channel.

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

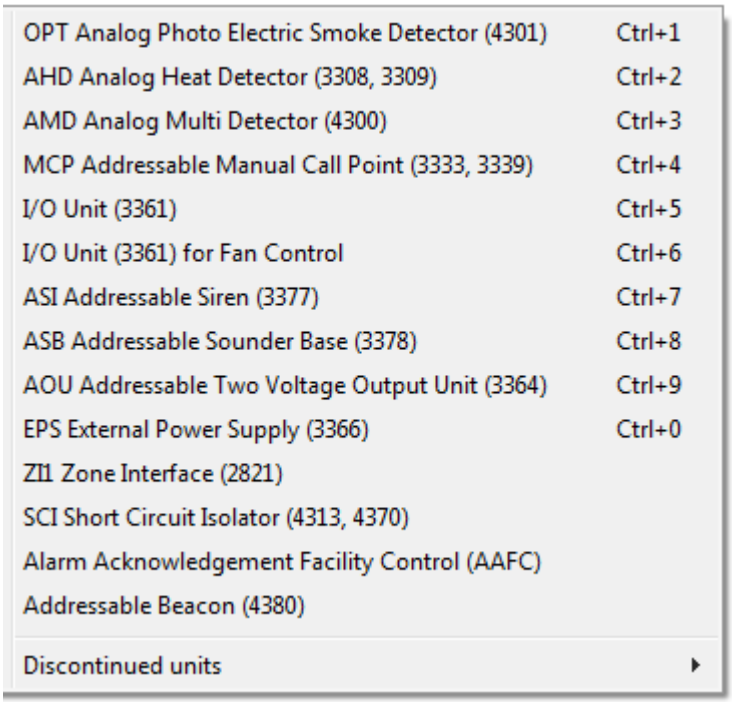
9.1 COM loop units

Each COM loop (0-3) can handle up to 127 addressable COM loop units, i.e. in total up to 512 COM loop units. 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 145, "Current consumption", page 148 and dwg 512 G3 - 41.

NOTE! The control unit can be configured for up to 128, 256 or 512 addresses. Normally this is factory set but can be changed on site.[21]. In menu H4/U7 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).

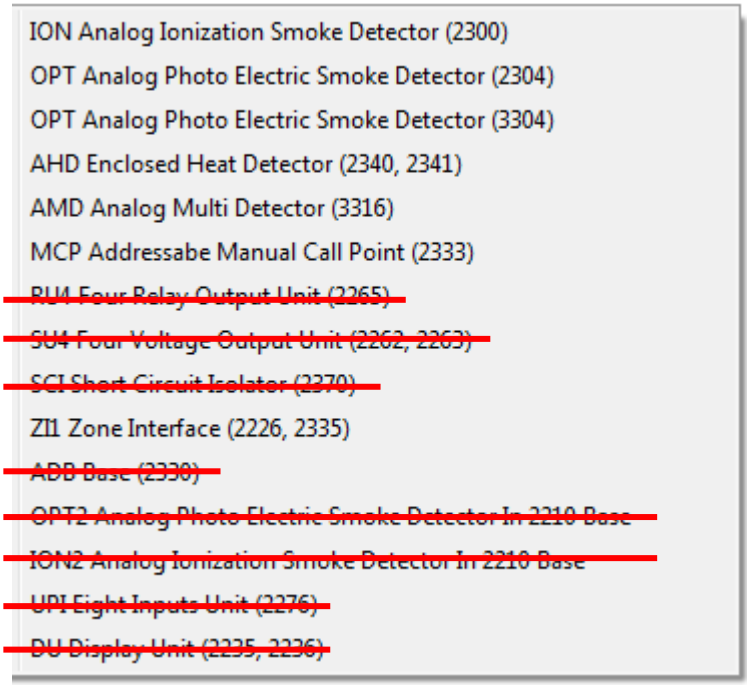
The following units can be connected to the COM loops (in **NORMAL** mode, except 4313 and 4370 that has to use **2330** mode):

[21] WinG3 version 1.1.x has to be used to download the EBL512 G3 software version 1.1.x. Change the number of addresses. This action requires a special download password. Then download the EBL512 G3 United version 2.7.x again (via WinG3 version 1.1.x).



NOTE!
The **Alarm Acknowledge Facility Control (AAFC)** is used on the Australian market only.
The **I/O Unit for Fan control (3361)** is normally used with the Fan control panel 4593 only.
Discontinued units (listed below) can be found in old installations and the following can be used in EBL512 G3United version 2.7.x installations as well.

NOTE! The red "Strikethrough" units **cannot** be used in EBL512 G3 United version 2.7.x.



Address setting

Each COM loop unit has to have a unique COM loop address (001-127). This address and the mode are set with an Address Setting Tool (3314). For **EBL512 G3** is always the **NORMAL** mode to be used (default).

9.1.1 Input units

Each COM loop input unit is added and programmed via Win512 version 2.7.x. Depending on type of unit, regarding:

- Technical number (NOTE! COM loop address range 001-127)
- 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-unit-dependent fire alarm, i.e. co-incidence alarm & Time Channel (some units only)
  - Delayed fire alarm
  - Quiet alarm (Fire alarm will **not** be activated.)

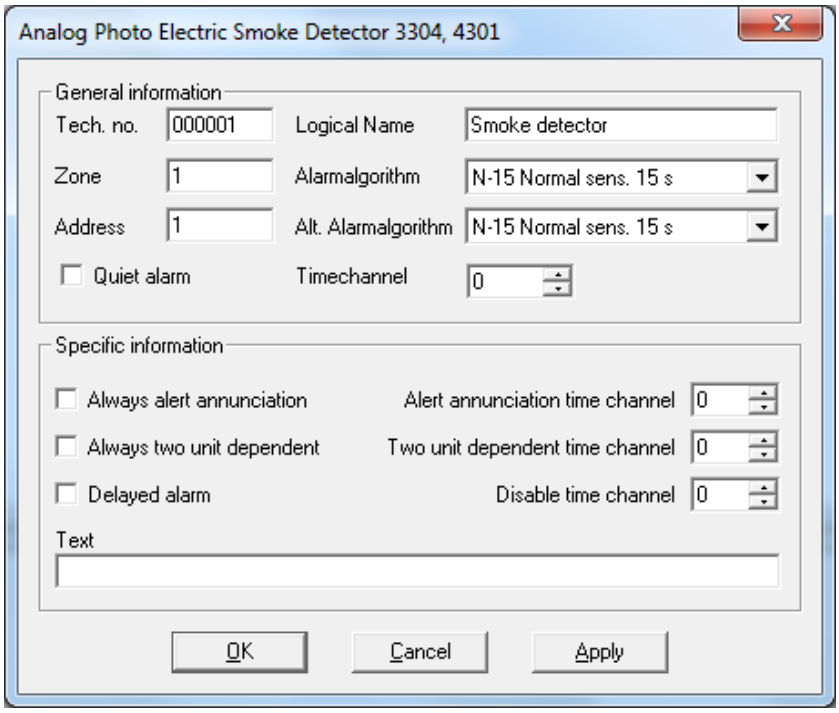


*Figure 7. An **example** of a Win512 version 2.7.x dialog box is the "Analog photo electric smoke detector 3304, 4301" dialog box.*

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.[22] 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 plugged-in detector's COM loop address 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 49). The isolator's COM loop address is set with the Address setting tool (3314). The base has an address label on which both the plugged-in detector's COM loop address and the isolator's COM loop address can be written.
The Address setting tool (3314) is also used for mode setting:
NORMAL mode: Used for 4313 in system EBL512 G3.
2330 mode: Used for **EBL512 G3 United version 2.7.x** in a mixed system.
2312 mode: Not used in a mixed system.

9.1.1.2 Addressable Manual Call Points

3333 Addressable Manual Call Point.[23] 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).
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) is also used for mode setting.
NORMAL mode: Flashing or not flashing LED (see Product leaflet MEW00097) is set via Win512 version 2.7.x.
2330 mode: "2333 mode" and "flashing LED mode".
2312 mode: "2333 mode" and "non-flashing LED mode".

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

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

3339 Enclosed Addressable Manual Call Point.[23] 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.

9.1.1.3 Analog Detectors

3308 Analog heat detector. 3308 shall be plugged in an analog base (3312 / 3312F / 3312FL / 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). The detector has an address label on which the programmed COM loop address can be written.
The Address setting tool (3314) is also used for mode setting:
NORMAL mode: 3308 is in this mode via Win512 version 2.7.x 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 a mixed system.
2312 mode: This mode **cannot** be used for 3308.

3309 Analog heat detector. Enclosed (IP67)[24]. 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). The Address setting tool 3314 is also used for mode setting:
NORMAL mode: 3309 is in this mode via Win512 version 2.7.x 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 a mixed system.
2312 mode: This mode **cannot** be used for 3309.

4300 Analog multi detector. 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.

---

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

Shall be plugged in an analog base (3312 / 3312F / 3312FL / 4313). Built-in LEDs are lit to indicate that the detector[25] has activated a fire alarm. Prepared for mechanical lock (screw attached) – if required.
Via Win512 version 2.7.x, 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 <u>two separate detectors</u>. The smoke detector is programmed for one zone-address and the heat detector for another zone-address[26]. (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 <u>one detector</u> and is programmed for one zone-address.

Via Win512 version 2.7.x 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:
<u>Fire alarm</u> will be activated if:
temperature (°C) + adjusted smoke value [27] $\geq$ 58.

<u>Pre-warning</u> will be activated if:
58 > temperature (°C) + adjusted smoke value[27] $\geq$ 50.

20°C => 3.8 %/m
↓ ↓
40°C => 1.8 %/m

The "Decision algorithm" [28], see figure can be used to reduce so called false alarms (nuisance alarms), because at a normal room temperature, more smoke is required to activate fire alarm than when the room temperature is high (or is rising). 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.

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

[26] 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.

[27] 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 WinG3. The temp. can not be lower than 0°C in the algorithm / graph.

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

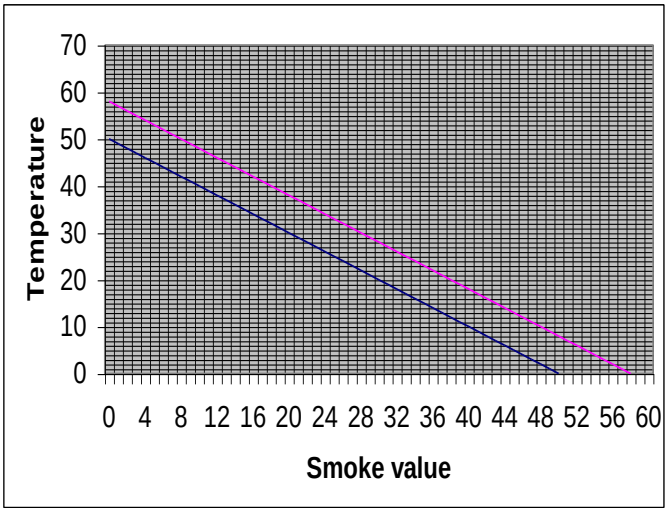


Figure 8. When the calculated value in the decision algorithm exceeds the lower graph, pre-warning will be activated. When it exceeds the upper graph, fire alarm will be activated. **Temperature = °C**. **Smoke value = *obscuration (%/m) x 10***.

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

The Address setting tool 3314 is also used for mode setting:
NORMAL mode: 4300 in this mode is in Win512 version 2.7.x, 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.
2312 mode: Not used.

4301 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 / 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). The detector has an address label on which the programmed COM loop address can be written.
The Address setting tool (3314) is also used for mode setting:
NORMAL mode: 4301 in this mode is in Win512 version 2.7.x set to one of the six algorithms H-15, H-35, L-15, L-35, **N-15** or N-35.
2330 mode: Not used.

2312 mode: 4301 + base 3312 is in this mode an analog photoelectric smoke detector and can be a spare part for 2304 + base 2312. Set as 2304 in Win512.

9.1.1.4 Conventional Detector Bases (CDB)

2324 Base. A conventional detector shall be plugged in 2324. 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 "Cyber sensor functions, page 122.
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).

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)[29]. 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)[30]. 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. Is used to write or read the units' **COM loop address** (Technical address 001-127). It is also used to write or read the mode, see the 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.[31]
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.)

3390 Label holder. To be mounted in an analog base (3312 / 3312F / 3312FL / 4313)[32]. Intended for a label with "zone-address",

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

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

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

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

"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 Win512 version 2.7.x.

9.1.2 Addressable I/O units

3361 Addressable multipurpose I/O unit.[33] 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 Win512 version 2.7.x). This input is intended for conventional detectors.[34]

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 Win512 version 2.7.x).

Isolated input (In1) (terminals 8 & 9): An optocoupler input (external 24 V DC / 8 mA is required). Normally low or high (set via Win512 version 2.7.x).

The unit has two **programmable** relay[35] outputs:

Relay output (Re0): NC or NO contacts (set via Win512 version 2.7.x).

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). The unit has an

[33] 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 Win512 version 2.7.x.

[34] Via Win512 version 2.7.x it is 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.

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

address label on which the unit's COM loop address can be written.
The Address setting tool (3314) is also used for the mode setting:
NORMAL mode: Used for 3361.
2330 mode: Not used.
2312 mode: Not used.


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 83 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 Win512 version 2.7.x), 24 V DC, 1 A.[36]
VO1: Like VO0.
VO2: Normally high, 24 V DC, 1 A.[36] (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). The unit has an address label on which the programmed

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

technical address can be written.
The Address setting tool (3314) is also used for mode setting:
NORMAL mode: Used for 3364.
2330 mode: Not used.
2312 mode: Not used.
NOTE! See also chapter "Limitations", page 160.

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.[37] Red ABS plastic housing. Three sound types (tones) and three priority levels are available. For each level an output control expression and a sound type is programmed (via Win512 version 2.7.x). For more technical data, see the Product Leaflet. The COM loop address is set with the Address setting tool (3314).
The Address setting tool (3314) is also used for mode setting:
NORMAL mode: Used for 3377.
2330 mode: Not used.
2312 mode: Not used.
NOTE! See also chapter "Limitations", page 160.

3379 Addressable sounder base.[38] 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[37]. Three sound types (tones) and three priority levels are available. For each level an output control expression and a sound type is programmed (via Win512 version 2.7.x). For more technical data, see the Product Leaflet.
The COM loop address is set with the Address setting tool (3314). 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.)
The Address setting tool 3314 is also used for mode setting:
NORMAL mode: Used for 3379.
2330 mode: Not used.
2312 mode: Not used.
NOTE! See also chapter "Limitations", page 160.

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

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

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

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 Win512 version 2.7.x). For more technical data, see the Product Leaflet.
The COM loop address is set with the Address setting tool (3314). The beacon has an address label on which the programmed address can be written.
The Address setting tool (3314) is also used for mode setting:
NORMAL mode: Used for 4380.
2330 mode: Not used.
2312 mode: Not used.

9.1.4 Short circuit isolators (addressable)

Each COM loop short circuit isolator is to be programmed (via Win512 version 2.7.x) regarding:

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

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

4313 Analog base with isolator.[39] 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). The unit has an address label on which the programmed COM loop address is to be written.
The Address setting tool (3314) is also used for mode setting:
NORMAL mode: Used for 4313 in system EBL512 G3.
2330 mode: Used for **EBL512 G3 United version 2.7.x** in a mixed system.
2312 mode: Not used in a mixed system.

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.

Up to eight 4313 can be used, which gives nine loop segments. Each isolator has to be given a Sequence Number, 00-07. The isolators have to be connected consecutively (Sequence Number 00-01-02-03-04-05-06-07) 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").

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

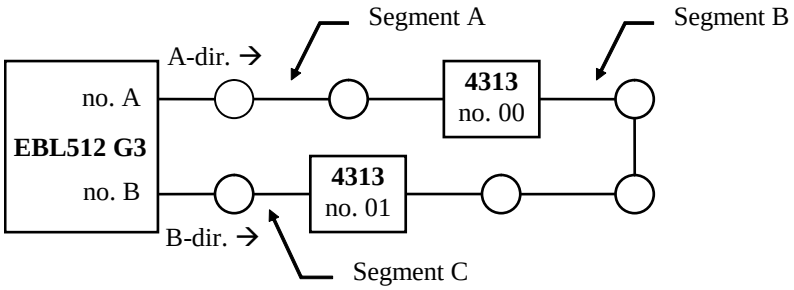


Figure 9. Two 4313 isolators connected to a COM loop gives three loop segments, i.e. Segment A (A-00), B (00-01) and C (01-B). If more isolators have to be added, the sequence numbers have to be updated (via Win512 version 2.7.x), e.g. if one isolator is put in between isolator no. 00 and no. 01 in the figure, the new isolator has to be no. 01 and the old no. 01 has to be no. 02.

Short circuit / cut-off (break) on the COM loop
See chapter "COM loop units", page 37. 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).

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.[40] 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, 50 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

[40] This unit might still be under construction.

cable entries are supplied. Box dimensions (L x W x H): 300 x 300 x 132 mm. DEKRA 11ATEX0106, II (1) G [Ex ia Ga] 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.[40] 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 43. It has to be connected to a COM loop via an IS barrier unit 2842. ATEX class: II 1 G Ex ia IIC T5 Ga.

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.[40] 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: II 1 G Ex ia IIC T5 Ga.

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 47). 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**[41] **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.[42] 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). The unit has an address label on which the programmed technical address can be written.
The Address setting tool (3314) is also used for the mode setting:
NORMAL mode: Used for 3366.
2330 mode: Not used.
2312 mode: Not used.

AAFC Alarm Acknowledgement Facility Control.[43] 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 AAFCs zones can be used. The COM loop address is set with the Address setting tool (3314). See also chapter "**Alarm Acknowledgement Facility (AAF)**", page **99**.

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

[41] 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.

[42] 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**.

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

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.

9.2 Units connected to the RS485 interface

NOTE! In a mixed system[44] one 1587 Ext.FBP/DU interface board has to be added in the Site Specific Data (SSD), in spite this board is not used physically.

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.

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[45]. Follow the Address setting instructions in the Technical Description for the unit respectively.

Via Win512 version 2.7.x 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.

9.2.1 External Fire Brigade Panels

1826 External Fire Brigade Panel (ext. FBP). A light grey metal housing (HxWxD, 288 x 400 x 95 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

[44] EBL512 G3, S/W United version 2.7.x.

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

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 Win512 version 2.7.x. 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 Win512 version 2.7.x. 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. When there are queued alarms in the system, you can scroll amongst them and they can be reset. Any fault in the system will be presented as "General fault in system" and the buzzer will sound.[46] 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

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

Alert Annunciation function, see chapter "Alert Annunciation", page 97.

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 programmed in Win512 version 2.7.x. 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 Win512 version 2.7.x. 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.

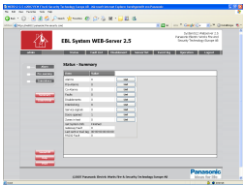
9.2.3 External Presentation Units

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[47], 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 Win512 version 2.7.x. 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 Win512 version 2.7.x.
Any fault in the system will be presented as "General fault in system". The buzzer will sound.[46] It can be silenced. Any disablement in the system will be presented as "General disablement in system".[46]
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**.
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 the same c.i.e. / external power supply. Up to 1200 m cable can be used. For more information, see Technical description MEW00290.

[47] Two zone / address dependence.

9.3 Units connected to the RS232 interface J7

9.3.1 Web-servers



1598 Web-server II. This unit can be used:

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, **Web512 II Config tool** version 2.7.x 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 in 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 48.
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.

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

Each input is programmed (via Win512 version 2.7.x), see dialog boxes below.

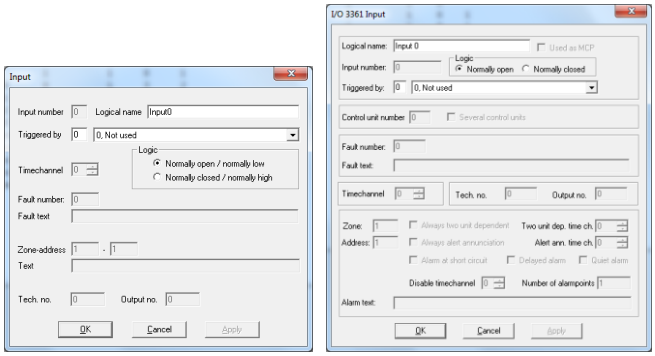


Figure 10. Win512 version 2.7.x "Input" dialog boxes. Different trigger conditions require different additional information, i.e. only the enabled fields can/shall be filled in.
NOTE! *The 3361 unit, Input 0, has a special input dialog box.*

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

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

10.1.1 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).

10.1.2 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 Win512. For more information see Win512 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:

0. **Not used**
1. **Alarm Key Cabinet** (one input per control unit)
2. **Alert Annunciation Acknowledge**
3. **Alert Annunciation Reset**
4. **Fault Signal External Power Supply** (one input per control unit)
5. **Fault Signal External Fuses** (one input per control unit)
6. **Time Channel 15 - 63** (one input per time channel per system)
7. **General Fire** (max. 127 per C.U.)
8. **Activated Routing Equipment** (one input per C.U.)
9. **Activated Extinguishing** (one input per C.U.)
10. **Activated Fire Ventilation** (one input per C.U.)
11. **External Fault** (50 inputs per system)
12. **Extinguishing start** [48]
13. **Extinguishing stop** [48]
14. **Interlocking input** (200 inputs per C.U. / 1000 per system)
15. **Loss of main power source to external power supply** (one input per C.U.)
16. **Loss of battery charger to external power supply** (one input per C.U.)
17. **Door Closing Test Input**
18. **Pre-warning Input** (input and corresponding fire alarm input "connected" to the same C.U.)
19. **Evacuate** (one input per C.U.)
20. **Activate output**
21. **Extinguishing alarm**
25. **Alarm from CU** [49]
26. **Silence alarms** (one input per system)
99. **Zone Line Input** [49]

---

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

[49] Only valid for the Addressable multipurpose I/O unit 3361, Input 0, used as zone line input (Z).

Comments to the trigger conditions:

0. Default. The input does not work.
1. Key cabinet, where the fire brigade store there key to the building. Will activate a Key cabinet alarm. See EBL512 Operating Instructions for more information.
2. Alert annunciation, see EBL512 Operating Instructions for more information.
3. Like 2.
4. Ext. power supply equipment fault output will activate a fault in the EBL512 system. The following fault message will be shown:
   `FAULT: External power supply, CU xx`
5. Ext. fuses (for the ext. power supply equipment) fault output will activate a fault in the EBL512 system. The following fault message will be shown:
   `FAULT: External fuses, control unit xx`
6. External clock, timer, key switch, etc. can disable / re-enable alarm points. The function Alert Annunciation, etc. can be set on / off by a time channel. Control outputs can be set on / off by a time channel.
7. A special detector, push button, etc. can activate a fire alarm in EBL512. Zone no. and Address (+ user definable text).
8. Activated Fire brigade tx feedback to the EBL512 control unit to light up the LED "Fire brigade tx".[50]
9. Activated Extinguishing equipment feedback to the EBL512 control unit to light up the LED "Extinguishing".[50]
10. Activated Ventilation equipment feedback to the EBL512 control unit to light up the LED "Ventilation".[50]
11. Ext. fault will activate a fault in EBL512. An user definable fault message ("Error text") up to 40 characters, will be shown.
12. Used to start a new "countdown", see 13 below.
    Push button: NO, momentary action. One or more push buttons can be used.
13. Output for Extinguishing equipment (type of output = 2) has normally a delayed activation (a "countdown"). This "countdown" will be stopped when an input with trigger condition 13 is activated. To start a new "countdown", see 12 above.
    Push button info: NO, latching action. One or more push buttons can be used. Manual reset of push button(s).
14. 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 79.

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

15. "Loss of main power source to external power supply equipment" fault output will activate a fault in the EBL512 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, ext. power supply, CU xx`
16. "Loss of the battery charger to external power supply equipment" fault output will activate a fault in the EBL512 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 ext. power supply CU xx`
17. 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.
18. Pre-warning, e.g. from a High Sensitive Smoke Detector's pre-warning output. Zone no. and Address set to the same as the corresponding fire alarm (from the same detector).
19. Activated input will activate all programmable outputs of type "Alarm devices" steady (continuous).
20. Activates any output as long as the input is active.
21. Input activated when the specified zone has activated fire alarm. The specified zone is an "extinguishing zone", e.g. a sprinkler zone. This trigger condition is normally used only for the "New Zealand indicating panel" in order to control the function of the key switch "Silence alarms".
25. The Addressable multipurpose I/O unit 3361 monitored Input 0 used as zone line input (Z) for a single "slave" unit (control unit) or several control units connected in parallel, see chapter "Redundancy in distributed system", page 112.
26. Used for the "outside switch" (i.e. the New Zealand FB Silence switch).
99. The Addressable multipurpose I/O unit 3361 monitored Input 0 used as zone line input (Z).

11.2 Logic

The logic has to be set. [51]

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

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

[51] In the Win512 version 2.7.x dialog box "Input".

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) can be mounted in each EBL512 G3. See chapter "Expansion boards 458x", page 27. 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) and Addressable sounder base (3379) can also be connected on the COM loops, i.e. these units have no physical outputs, only the siren and sounder respectively.

Each output is programmed via Win512 version 2.7.x, see dialog boxes below.

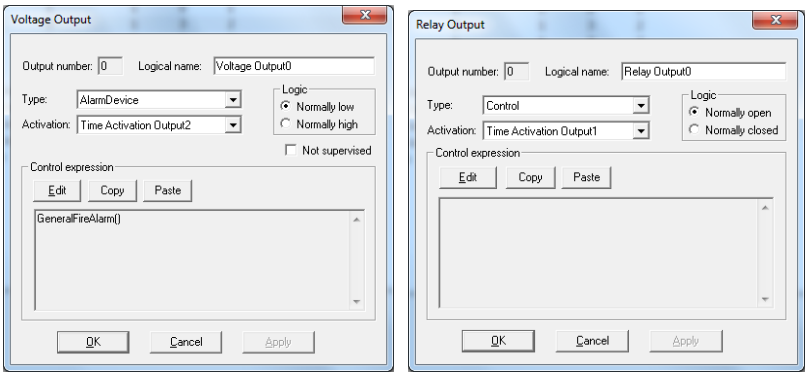


Figure 11. Win512 version 2.7.x Control unit Voltage Output and Relay Output dialog boxes.

Each 3377 and 3379 unit is programmed via Win512 version 2.7.x, see dialog box below.

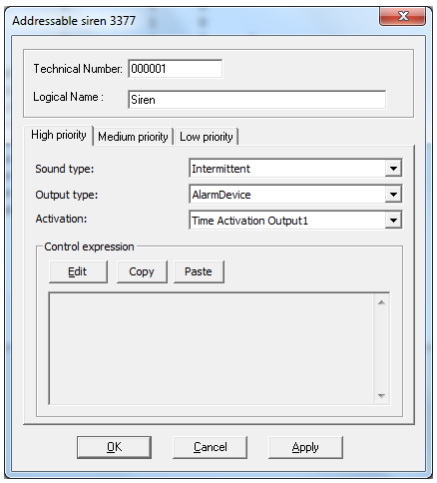


Figure 12. Win512 version 2.7.x "Addressable siren 3377" dialog box. The dialog box for "Addressable sounder base 3379" is similar.

12.1 Control unit outputs S0 – S3

Each control unit has four programmable, supervised (monitored)[52] 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[53] 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.

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

NOTE! This board has to be programmed in Win512 version 2.7.x as a 1581 board.

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.

---

[52] This is default, but via Win512 version 2.7.x 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 105.

[53] 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).

Connections and more information, see dwg. 512 G3 – 34.

12.4 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.

12.5 The 3364 unit's VO0 – VO2

Each 3364 unit has two programmable, supervised (monitored)[52] voltage outputs:

Output **VO0** Supervised (monitored) voltage output, 24V DC[54]

Output **VO1** Supervised (monitored) voltage output, 24V DC[54]

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[54]. 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.

12.6 The 3377 unit's Output (siren)

Each 3377 unit has one programmable output:

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

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

12.7 The 3379 unit's Output (sounder)

Each 3379 unit has one programmable output:

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

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

12.8 The 4380 unit's Output (beacon)

Each 4380 unit has one programmable output:

Output **Beacon**

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

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

13 Output programming

Output programming is done in Win512 version 2.7.x. See the Win512 version 2.7.x dialog box respectively.

13.1 Type of output

Some output types can be collectively 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[55]
1. Used to activate fire ventilation equipment[55],[56]
2. Used to activate extinguishing equipment[55],[57]
3. Used for sounders, etc.[58]
4. Used for **fire brigade tx** outputs only[59]
5. General (normal) control output. No collective disablement and no LED indication.
6. This output[55] can be used together with a corresponding interlocking input. See chapter "Interlocking function", page 79. Activated output is shown in menu H9/C1.

---

[55] Controlled by menu H2/B7 Disable / Re-enable output type.

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

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

[58] Controlled by menu H2/B8 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.

[59] 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. [60]

( ) Normally closed / high Normally closed relay contact or normally high voltage output (24V DC).[61]

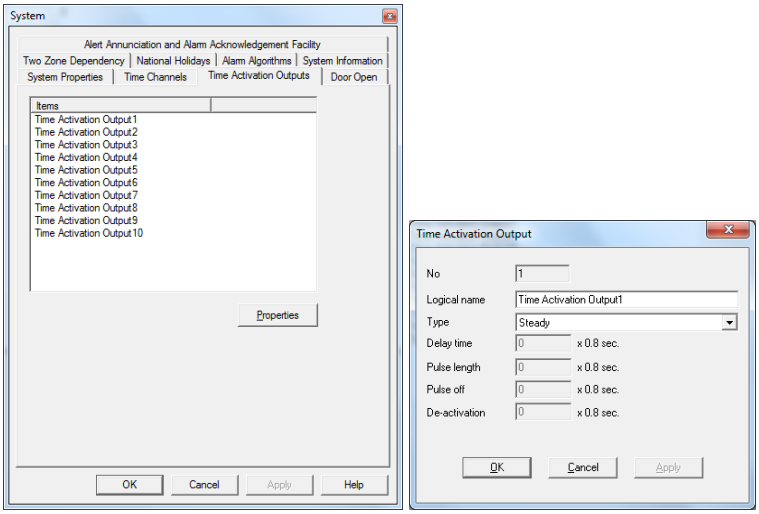
13.3 Supervised / Not supervised

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 Time Activation Output

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



No. 1 is default Steady / Continuous. No. 2 is default intermittent 0.8/0.8s. No. 3-8 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

---

[60] The logic is set in the Win512 version 2.7.x dialog box "Voltage / Relayed Output".

[61] The logic is set in the Win512 version 2.7.x 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.

Times:

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

Regarding the programming, see chapter "Time activation output", page 135.

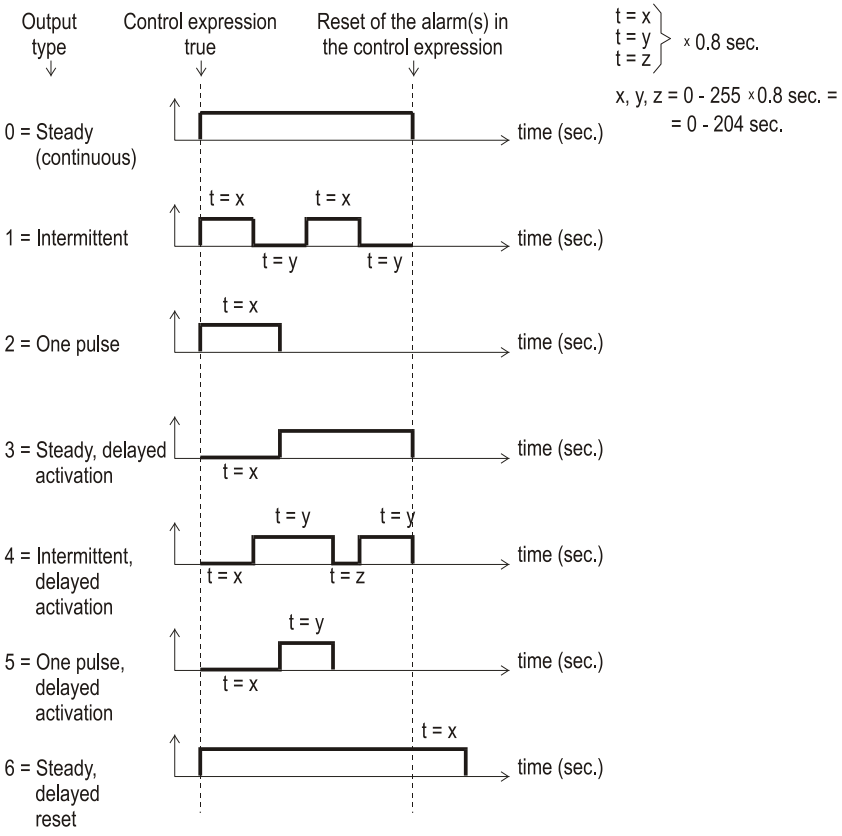


Figure 13. Delay time, Pulse length, Pulse off and/or De-Activation, have to be set for the type respectively.

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		**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**
1 Intermittent	X	X	--		**--**	**XX**	**--**	**--**	**--**
2 One pulse	X	X	--		**--**	**--**	**--**	**--**	**--**
3 Steady (continuous), delayed activation	X	X	X		**X**	**X**	**X**	**X**	**X**
4 Intermittent, delayed activation	X	X	--		**--**	**XX**	**--**	**--**	**--**
5 One pulse, delayed activation	X	X	--		**--**	**--**	**--**	**--**	**--**
6 Steady (continuous), delayed de-activation	X	X	X		**X**	**X**	**X**	**X**	**--**

Figure 14. 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.*

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 75.

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

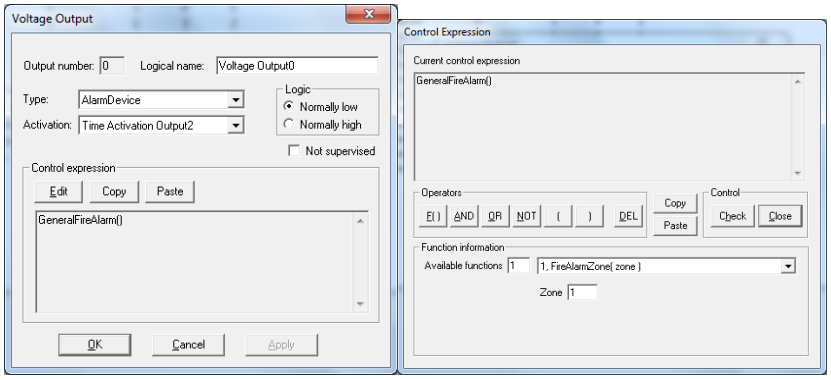


Figure 15. In any output dialog box, click the "Edit" button to open the Control expression dialog box. Select a "Trigger conditions" in the list. Depending on the selected trigger condition, different arguments / data have to be entered. In the figure is the trigger condition "General Fire Alarm" selected.

13.5.1 Trigger conditions

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

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

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 **Interlocking Input Area Activated** (+Area no.)
16 **Interlocking Input Area Point Activated** (+Area no. +Point)
17 **General Interlocking Input Activated**
18 **Consecutive Interlocking Input Activated** (sequence) (+start Area no. and point +stop Area no. and point +Quantity)
19 **Fire Brigade Tx Activated**
20 **Fault Tx Activated**
21 **Fire Brigade Tx Disabled**
22 **Zone Disabled** (+Zone no.)
23 **Zone Address Disabled** (+Zone no. +Address)
24 **General Zone Address Disabled**
25 **General Fault**
26 **General Charge Fault**
27 **Reset Pulse Zone Address** (+Zone no. +Address) [62]
28 **Time Channel Activated** (+Time channel no.)
29 **Alert Annunciation Activated**
30 **Alert Annunciation Acknowledged**
31 **Door Open** (+Control unit)
32 **General Door Open**
33 **Key Cabinet Open**
34 **General Control Disabled**
35 **Control Disabled** (+Control unit)
36 **General Alarm Device Disabled**
37 **Alarm Device Disabled** (+Control unit)
38 **Fire Door Closing** (+Zone no. +Address)
39 **General Service Signal**
40 **General Encapsulated**[63]
41 **AAF Zone Alarm** (+AAF zone no.)
42 **Quiet Alarm Zone** (+Zone no.)
43 **Quiet Alarm Zone Address** (+ Zone no. +Address)
44 **Multiple Detector Alarm**
45 **One Detector Alarm**

[62] Only valid for the c.i.e. outputs (S0-S3, R0 and R1), 4581 outputs and 3361 outputs.

[63] Not valid any more. This trigger condition will never be true.

Comments to the trigger conditions (functions):

1 Fire alarm. For more information, see EBL512 G3 United version 2.7.x Operating Instructions.
2 See 1.
3 See 1.
4 See 1.
5 Pre-warning.[64] For more information, see EBL512 G3 United version 2.7.x Operating Instructions.
6 See 5.
7 See 5.
8 See 5.
9 Heavy smoke / heat alarm. For more information, see EBL512 G3 United version 2.7.x Operating Instructions.
10 See 9.
11 See 9.
12 See 9.
13 One address (in two-address dependence) is in fire alarm state. For more information, see EBL512 G3 United version 2.7.x Operating Instructions.
14 One zone (in two-zone dependence) is in fire alarm state. For more information, see EBL512 G3 United version 2.7.x Operating Instructions.
15 One or more interlocking inputs, in the specified interlocking area, are activated.
16 The interlocking input, in the specified interlocking area/point, is activated.
17 One or more interlocking inputs are activated.
18 One or more interlocking inputs, in the specified range, are activated (from interlocking area no./point to interlocking area no./point).
19 Routing equipment output (any Fire brigade tx output) is activated.[65]
20 Routing equipment output (Fault tx) is activated.[66]
21 Routing equipment output (Fire brigade tx) is disabled.[67]
22 The specified zone is disabled.
23 The specified alarm point (zone/address) is disabled.
24 One or more alarm points (zone/address) are disabled.[70]
25 One or more faults are generated in the system.[68]

[64] 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 Win512 version 2.7.x).

[65] Indicated by LED "Fire brigade tx". Output can be tested via menu H1. This trigger condition must **not** be used for type of output 4 = *Routing equipment (Fire brigade tx)*.

[66] Indicated by LED "Fault tx activated". Output can be tested via menu H1.

[67] Indicated by LED "**Fault/Disablements** Fire brigade tx".

26 Loss of mains (in a c.i.e. or output unit 2262). **NOTE!** The output(s) will be activated immediately but the corresponding fault is normally delayed.

27 This control expression is true 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.

28 The programmed time channel (1-63) is activated.

29 Alert Annunciation activated (by any alarm point set to activate this function). Valid until the AA alarm is reset or becomes a normal fire alarm. For more information, see EBL512 G3 United version 2.7.x Operating Instructions.

30 Alert Annunciation activated (by any alarm point set to activate this function) and acknowledged. Valid until the AA alarm is reset or becomes a normal fire alarm. For more information, see EBL512 G3 United version 2.7.x Operating Instructions.

31 Door open in the specific control unit.[69]

32 Door open in any control unit in the system.[69]

33 General Key cabinet alarm. For more information, see EBL512 G3 United version 2.7.x Operating Instructions.

34 General control disabled (via menu H2/B7).[70] This output should be of type Control – neutral.

35 Control disabled for a specific control unit (via menu H2/B7).[70] This output should be of type Control – neutral.

36 General alarm device disabled (via menu H2/B8[71] or via "Silence alarm devices). This output should be of type Control – neutral.

37 Alarm device disabled for the specific control unit (via menu H2/B8 or via "Silence alarm devices). This output should be of type Control – neutral.

38 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".[72] See also chapter "Fire Door Closing", page 83.

---

[68] Indicated by LED "General fault" and/or LED "Fault tx activated".

[69] Or ext FBPs connected to the control unit(s).
Indicated by LED "Door open".

[70] Indicated by LED "Disablements".

[71] Indicated by LED "**Fault / Disablements** Alarm devices".

[72] In Danish convention (DBI), must only the c.i.e. outputs R0-R1 and S0-S3 be used. (No COM loop units.) and the type has to be "control. neutral".

39 Service signal is activated (by any sensor).[73]

40 Due to revised encapsulation function this trigger condition has no function. (It will never be true.)

41 **AAF zone** is used for the **A**larm **A**cknowledgement **F**acility in conjunction with the AAF Control, which is available on the Australian market only.

42 Any "Quiet alarm" in the specified zone. Used e.g. for the fan control function.

43 One specified "Quiet alarm" in the specified zone. Used e.g. for the fan control function.

44 Output activated when:
a. Two or more analog smoke or heat detectors have activated fire alarm
or
b. A manual call point has activated fire alarm
or
c. A zone line input has activated fire alarm
or
d. An input with trigger condition "General fire" has activated fire alarm
….i.e. a fire alarm type **A**.[74]

45 Output activated when only **one** analog smoke or heat detector has activated fire alarm, i.e. a fire alarm type **B**.[74]

13.5.2 Logical operators

The logical operators available in Win512 V2.7.x are in priority order:

( ) **parentheses**, changes priority order

NOT **not**-function (inverts), is written NOT in Win512 V2.7.x

AND **and**-function, is written AND in Win512 V2.7.x

OR **or**-function, is written OR in Win512 V2.7.x

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:

[73] Indicated by LED "Service".

[74] See chapter "**Error! Reference source not found.**", page 101.

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/B8) will activate the output R1 when the door in control unit 01 is not open (i.e. closed).

Example 3

Output: Relay output **R0**

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

Explanation: Fire alarm activated in zone 145 and zone 45 will activate the output R0 when there are one 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 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).

14.1 Programming of interlocking function

Win512 version 2.7.x is used for the programming. Up to 200 Interlocking Combinations per c.i.e. can be used and up to 1000 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.

14.1.1 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 Win512 version 2.7.x).

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.

14.1.2 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.

14.1.3 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.[75]

(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.)

[75] In the "Interlocking Combination" dialog box are listed all the outputs and inputs previous programmed for interlocking, see Figure 16.

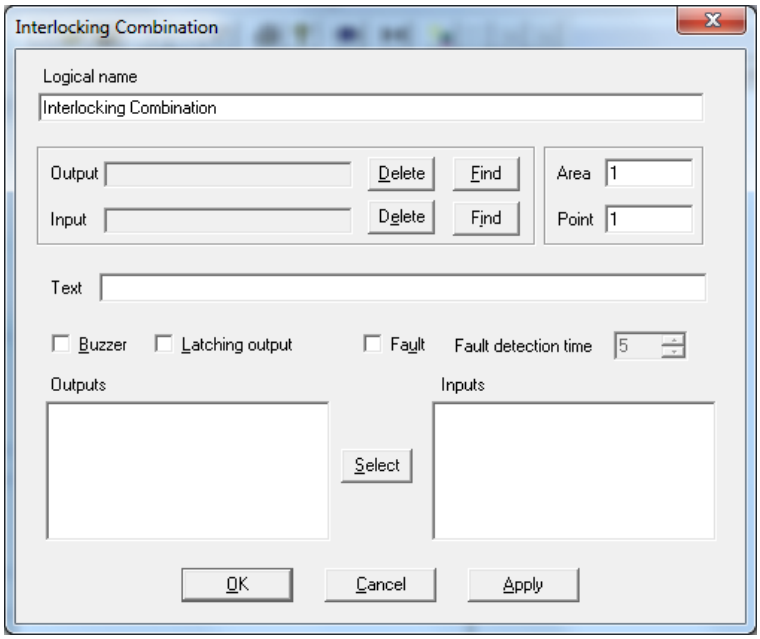


Figure 16. Win512 version 2.7.x "Interlocking Combination" dialog box.

Name: Displayed in the Win512 version 2.7.x 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.

Outputs The available interlocking outputs list displays all the previous programmed outputs, Type = "Interlocking".
Inputs 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 **Output** and **Input** fields above.

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

It is possible to "jump" to the output and input respectively by clicking **Find**.

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 Win512 version 2.7.x", page 107.

Buzzer checked = activated interlocking input will turn on the c.i.e. buzzer (0.8 / 0.8 sec.)[76]. The buzzer can be silenced. It will be automatically turned on again, if a new interlocking input is activated.

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

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[77], a fault will be generated:

```
FAULT: Interlocking input AAA/PP
```

14.2 Interlocking indications

One or more activated Interlocking Combinations (interlocking output and/or input) are listed in the c.i.e. display[78]:

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

14.3 Information of interlocking combinations (H9)

Menu H9 has the following sub menus.

14.3.1 Display interlocking information (H9/C1)

See also chapter "Interlocking indications", page 81.
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.

14.3.2 Activate interlocking output (H9/C2)

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

---

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

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

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.
Reset has to be performed via menu H9/C3.

14.3.3 Reset interlocking output (H9/C3)

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 menu H9/C2: The output has to be reset via this menu.

14.3.4 Disable interlocking output (H9/C4)

Interlocking outputs (i.e. Output Type = Interlocking) can be individually disabled via menu H9/C4. **NOTE!** Not via menu H2/B3. 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.
If Area / Point 000/00 is entered all interlocking outputs in the system will be disabled / re-enabled.

14.3.5 Re-enable interlocking output (H9/C5)

Interlocking outputs (i.e. Output Type = Interlocking) can be re-enabled via menu H9/C5. **NOTE!** Not via menu H2/B6.
Disabled interlocking outputs are listed in menu H9/C5. Use "↑" "↓" to scroll between the "Interlocking Combinations" (i.e. Area / Point) or type it via the key-pad. Area / Point 000/00 can also be used.

14.4 Interlocking control expressions

A programmable output control expression can contain "interlocking" trigger conditions ("Functions") numbers 15-18 (see chapter "Control expression", page 71), i.e. one or more outputs can be activated when one or more interlocking inputs are activated.

15 Fire Door Closing

Programmable outputs can be used for fire door closing.[79] 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[80])
- Disablement (any of the detectors controlling the fire door, the zone(s) involved or the COM loop involved)[81]
- A definite time every day, if programmed via Win512 version 2.7.x. 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) 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 79.

[79] In the DBI (Danish) convention, must only the c.i.e. outputs R0-R1 and S0-S3 as well as 3364 units be used and "Type of output" has to be "Control, neutral".

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

[81] 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.

16 Functions / Services / Features

Some Functions / Services / Features require programming in Win512 version 2.7.x, see chapter "PC software (S/W)", page 16. For more information see also EBL512 G3 United version 2.7.x Operating Instructions MEW01473.
How to connect the PC and more information, see EBL512 G3 United version 2.7.x Operating Instructions MEW01473 chapter "Programming (SSD download)" and "New system program (S/W) version download".

16.1 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 United version 2.7.x. In Figure 17 the (digital) sensor values (during a certain time) are represented by the graph "**Working level**".

16.2 Week average sensor value

Each hour, one sensor value is stored in a special memory (in EBL512 G3 United version 2.7.x) and each week, these stored sensor values are used for a "**week average sensor value**" calculation.[82] This is done for each analog smoke detector individually. In Figure 17 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 = 1 and a week average sensor value = 1 (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 17 represented by the graph "**Fire alarm level**" (C) - parallel with the graph "**Week average sensor valu**" (B).

In Figure 17 (at Time = 0):
The week average sensor value (B) is 1 (=0.1 %/m) and the fire alarm offset is 3 %/m, i.e. the fire alarm level (C) is 0.1+3=3.1 %/m.

Service signal will be given when the week average sensor value for a detector has reached the service signal level (1.8 %/m), i.e. the detector is "dirty" and has to be replaced. See "**Service level**" (D) in Figure 17. The week average sensor value will now stay on 1.8 %/m,

[82] The week average sensor value will be calculated within 2 minutes after any restart, i.e. also after SSD download. During these "2 min." all analog smoke detector fire alarms are suppressed.

i.e. the detector will be more sensitive until it is replaced with a new one.

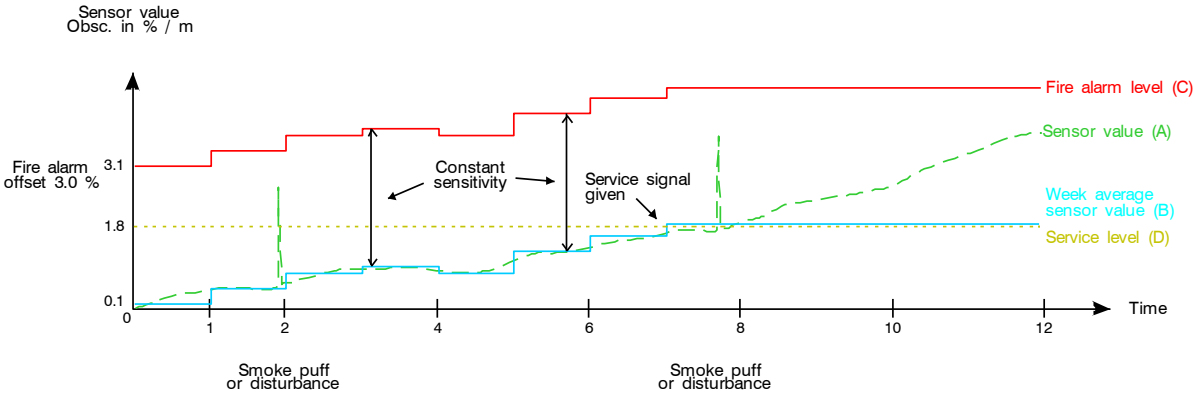


*Figure 17. The basic working **principle** for an analog smoke detector ("sensor"). Sensor value (A), Week average sensor value (B), Fire alarm offset (3 %/m), Fire alarm level (C) and Service level (D).*

"Sensor Information" is available via menu H4/U4. Via Win512 version 2.7.x and a PC connected to EBL512 G3 United version 2.7.x you can get "Sensor Information" for all analog detectors on a COM loop or an individual detector. For an individual detector you can also get continuous information:

Technical no. | Zone-Address | Min. | Max. | Momentary | Weekly | Performance factor.

Also via the Web-server II 1598 you can get "Sensor Information" for all analog detectors on a COM loop.
The smoke detector sensor values are presented as obscuration in % per meter (%/m). (Heat detector values as °C.)

16.3 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 89). The decision value is calculated, see chapter "Filtering algorithm, page 87.

16.4 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 Win512 version 2.7.x – 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 Win512 version 2.7.x, see chapter "Alarm algorithms", page 137.

The fire alarm offset can, for the whole system, be set in Win512 version 2.7.x, see chapter "Alarm algorithms", page 137.

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 71. See also EBL512 G3 United version 2.7.x Operating Instructions MEW01473.

16.4.1 Alarm algorithm / Alternative alarm algorithm

In order to reduce the nuisance alarms[83] and ensure that the real fire alarms will be activated, six different alarm algorithms are available. See Figure 18., page 87. 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[83].

Normal detection time - 15 sec. (Default) There will always be min. 15 seconds alarm delay[84]. This is a "normal filter" to reduce nuisance alarms.

Slow detection time - 35 sec.. There will always be min. 35 seconds alarm delay[84]. This is an "extra filter" to reduce nuisance alarms[83].

Each analog smoke detector can have two alarm algorithms programmed (via Win512 version 2.7.x). 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

[83] So called false / unnecessary alarms.

[84] 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.

low sensitivity during daytime (i.e. the alternative alarm algorithm is used to reduce nuisance alarms[83] during working hours).
The alarm algorithm in use can be read in menu H4/U4.

The alarm algorithm parameters can, for the whole system, be set in Win512 version 2.7.x, see chapter "Alarm algorithms", page 137. (To change some parameters a special password is required.)

16.4.2 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**" = Step Value. Is different depending on the sensitivity and detection time, i.e. it's depending on the selected alarm algorithm, see Figure 18.

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	X=8	X=10	X=12	X=4	X=5	X=6

*Figure 18. The six alarm algorithms. Default is alarm algorithm **N-15**, i.e. normal detection time (15 sec.) and normal sensitivity (3%). X = Step value.*

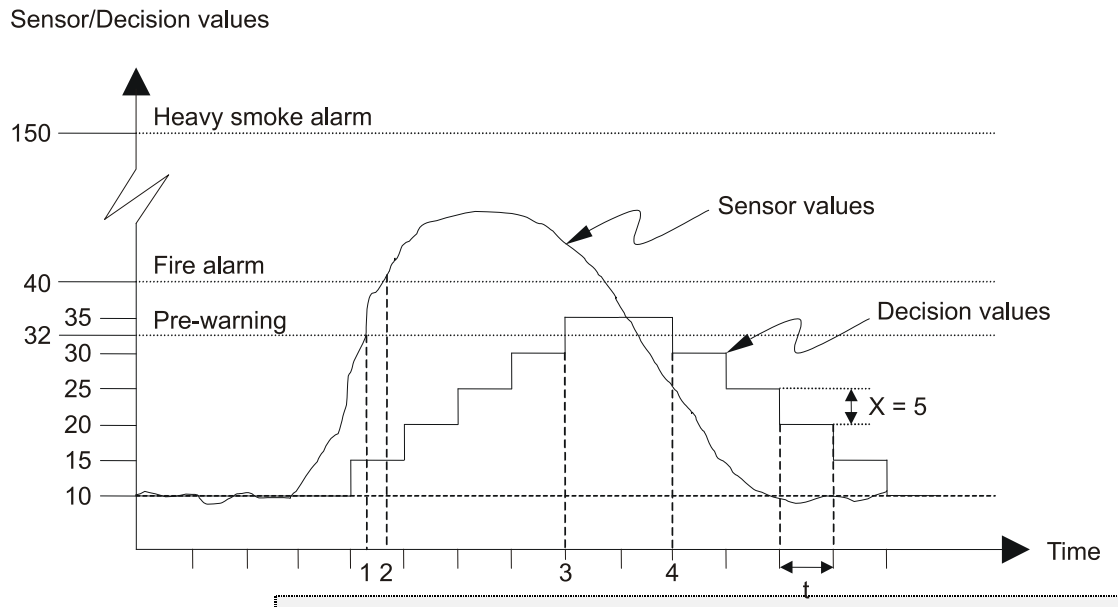


Figure 19. An example of the filtering algorithm for an Analog smoke detector with the step value X = 5. The polling time (t) in this example is approx. 2.56 seconds.

Explanations to the figure:

In this example, the week average sensor value is "10" 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 United version 2.7.x** the detector polling time **t** ≈ 4 seconds and the step value "X" is according to Figure 18 – 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.

16.4.3 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 Win512 version 2.7.x, see chapter "Alarm algorithms", page 137.

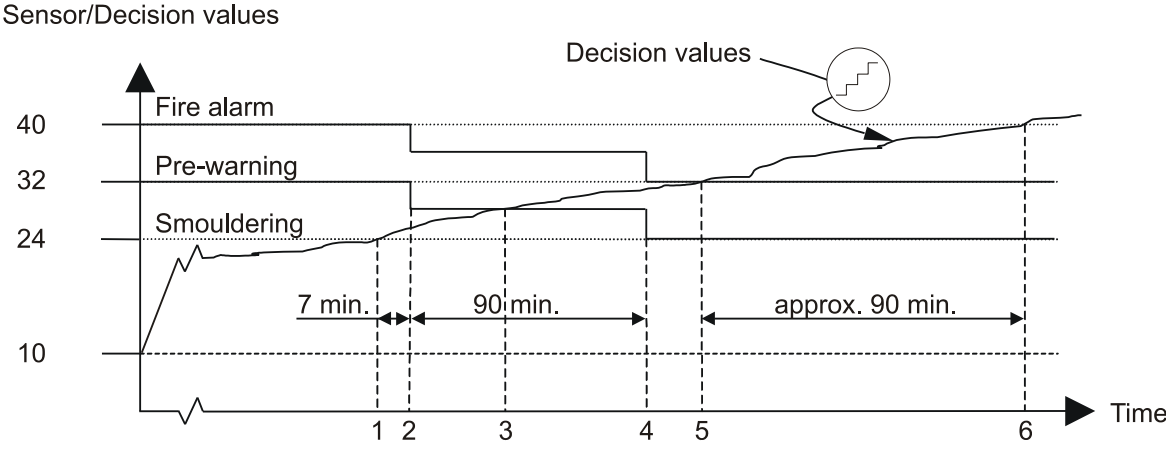


*Figure 20. An **example** of the smouldering smoke algorithm for an Analog smoke detector 4301.*

Explanations to the figure:

In this example, the week average sensor value and the decision value are "10" 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!

16.5 Performance factor

To find out how the environment is where an analog smoke detector 430x 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.

$$\frac{\sum_{m=0}^{14400} |X_m - X_{wa}|}{14400} = Pf$$

X_m = momentary sensor values for 24 hours.
X_{wa} = weak average sensor value
14400 = 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.

16.6 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 Win512 version 2.7.x). 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. 8 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 Win512 version 2.7.x – Control unit 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 Win512 version 2.7.x, see chapter "Alarm algorithms", page 137.
See EBL512 G3 United version 2.7.x Operating Instructions MEW01473 for more information.

16.6.1 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".

16.6.2 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.

16.6.3 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).

16.7 Self verification

The analog detectors 430x (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: Loop unit zone: xxx addres:xx
Technical number xxxxxx

16.8 Minimum / Maximum sensor values

To find out how the environment is, where an analog detector 33xx / 430x (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 minimum or maximum value for that detector. At midnight every day a memory will be updated and the new minimum and maximum sensor values can be read in menu H4/U4[85].

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.

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

16.9 2-zone / 2-address dependence (Co-incidence alarm)

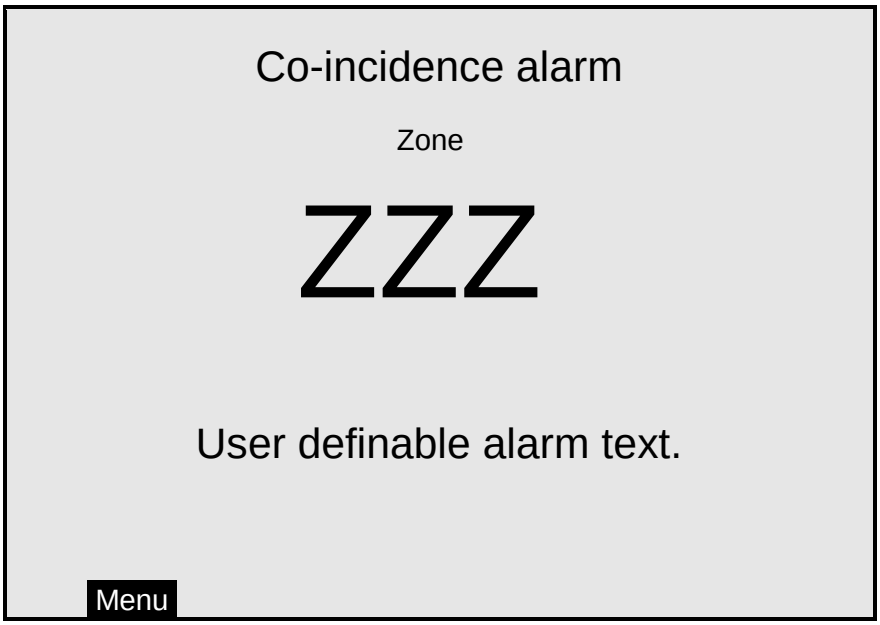
In some premises 2-zone or 2-address dependent fire alarm ("Two unit dependent" in Win512 version 2.7.x) can be used to avoid unwanted / false alarms (nuisance alarms). A time channel can turn on/off this function.

16.9.1 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).[86]

Function:
Two or more zones in the same group have to be in "fire alarm state"[87] 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.

[86] See also chapter "Two zone dependence", page 140.

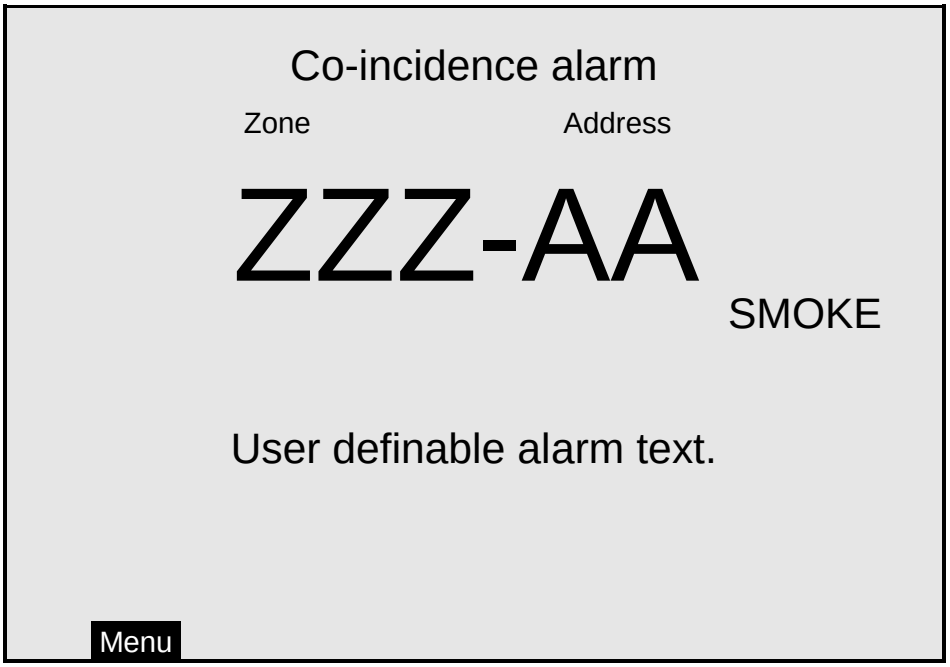
[87] Fire alarm state is when a fire alarm normally would have been activated in the c.i.e.

16.9.2 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 for safety reasons be 2-unit dependent).

Function:
Two or more units within the same zone have to be in "fire alarm state" [87] at the same time to activate 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.

16.9.3 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.

16.10 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 Win512 version 2.7.x) for delayed fire alarm activation. (Heat detectors should not and manual call points must not for safety reasons have delayed fire alarm activation). The delay time can be set (in Win512 version 2.7.x, System Properties) to 0-255 seconds.[88]

Function for an analog or addressable smoke detector:
An alarm point has to be in "fire alarm state"[87] 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 from zero 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.

16.11 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 is "Delayed alarm" (see above) not valid.

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

Function: A zone in "fire alarm state"[89] will be recorded in EBL512 G3 United version 2.7.x 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 United version 2.7.x, else nothing will happen until the next time the zone is in "fire alarm state" and so on.

---

[88] Default is 0 seconds and a recommended delay time is ≤ 30 seconds.

[89] A zone with the AVF not selected would in this state activate a fire alarm in EBL512 G3 United version 2.7.x.

16.12 Alert Annunciation

In some installations the **A**lert **A**nnunciation function can be used to avoid unwanted false alarms (nuisance alarms) to be sent to the fire brigade. A time channel can turn on/off this function.[90]

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 Win512 version 2.7.x) for Alert Annunciation. Heat detectors and manual call points should normally not for safety reasons 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)[91].

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/B10 and will then stay so until turned on (normal) again via menu H2/B10.

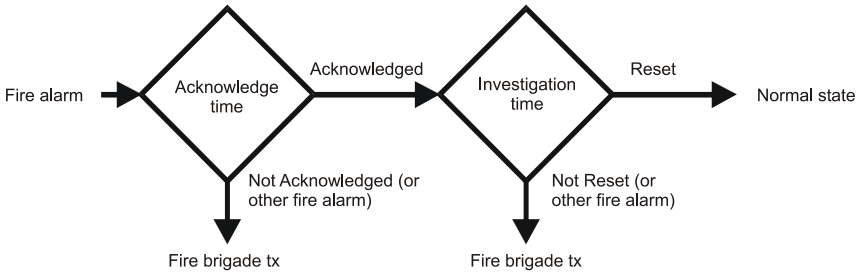


Figure 21. The Alert Annunciation function flow chart.

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.** [92]

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

[91] This is valid even if "Multiple alarms within same zone" is selected (via Win512 version 2.7.x).

[92] **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**.

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 Win512 version 2.7.x, more than one AA alarm is allowed within that zone.
- "Number of zones" can be set via Win512 version 2.7.x. 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).

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.).

16.13 Alarm Acknowledgement Facility (AAF)

This facility is used on the Australian market only.

The **AAF** function is similar to the "**A**lert **A**nnunciation function" (see page 97).

One AAF zone can consist of one to five analog smoke detectors (4300 / 4301), one AAF buzzer (e.g. Sounder base 3379) and one AAF Control (AAFC)[93]. All connected on one COM loop.

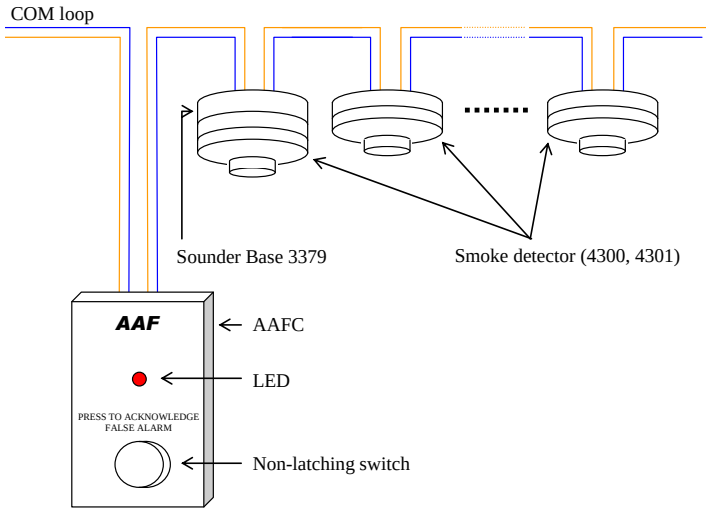


*Figure 22. **A**larm **A**cknowledgement **F**acility units.*

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 Win512 version 2.7.x).
- 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 Win512 version 2.7.x).

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.

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

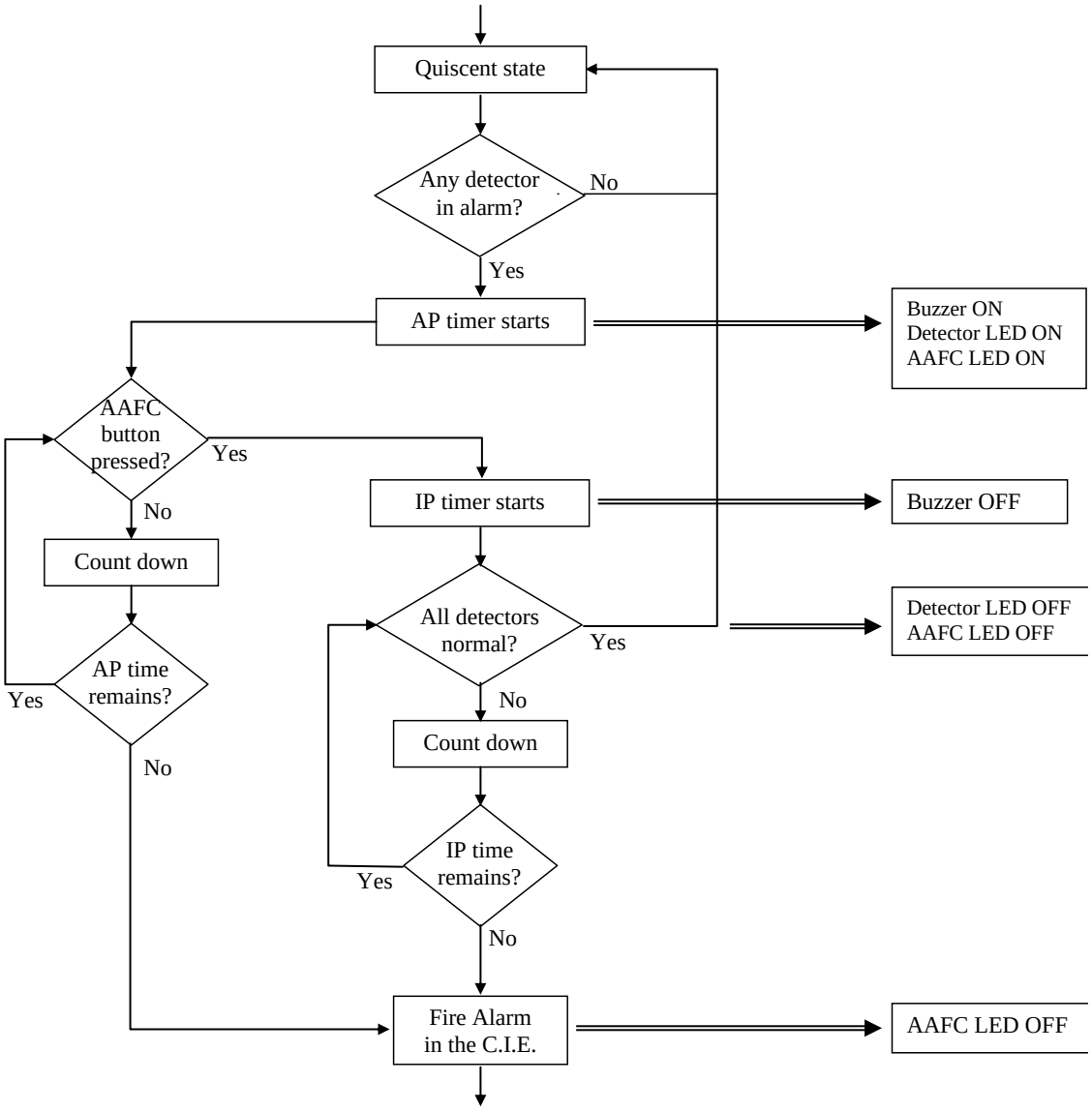


*Figure 23. **A**larm **A**cknowledgement **F**acility (AAF) flow chart.*

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

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 maybe other trigger conditions).

16.14 Quiet alarm

Quiet alarm is normally used in conjunction with the I/O Matrix board 4582[94], an application board for fan control[95] and an I/O unit 3361 for fan control.

Smoke detectors, programmed for quiet alarm (via Win512 version 2.7.x), can be used e.g. for controlling fans (stop / start depending on the type of fan).

NOTE! Normal fire alarm will not be activated.

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.).
- 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.

16.15 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).

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[94] See "I/O Matrix board 4582", page 31.

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

If the fire alarm routing equipment has provision for transmission of several fire alarm signals and the alarm receiver has provision for reception of several fire alarm signals, a fire alarm type **B** will indicate that only one detector is activated, which *could* be a nuisance alarm. If a fire alarm type **A** is received, the probability of a real fire is higher than for a fire alarm type B. The alarm receiver can take different actions depending on if it is a type A or B fire alarm.

16.15.1 Fire alarm type B

The output shall be programmed (via Win512 version 2.7.x) 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[96] detector only.

16.15.2 Fire alarm type A

The output shall be programmed (via Win512 version 2.7.x) 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"

16.16 Disable alarm points and outputs

Temporary disablements are made via the menu H2 sub menus. For more information see EBL512 G3 United version 2.7.x Operating Instructions MEW01473, 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 135.

When alarm reset method "Single encapsulated reset" is selected via the Win512 version 2.7.x "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/B5) the same way as if it was disabled via menu H2/B1-B2.

[96] **NOTE!** A multi detector can have one presentation number (Zone-Address) or two presentation numbers depending on how it is programmed via Win512 version 2.7.x. One presentation number = one detector and two presentation numbers = two detectors regarding fire alarm types A and B.

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.

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 "Miscellaneous", page 134.

NOTE! Enhanced Disablement is NOT valid when a time channel is used for disablements, only when menu H2/B1 or B2 is used.

16.16.1 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/B4.

16.16.2 Disable zone / address

Individual alarm points can be disabled via menu H2/B2. Re-enabled via menu H2/B5.
Time channels can be used to disable and re-enable automatically.

16.16.3 Disable control output

All outputs (except outputs of type "Alarm Device") can be individually disabled via menu H2/B3. Re-enabled via menu H2/B6. Disabled output will stay in (or return to) the normal condition for the output respectively.

16.16.4 Disable / Re-enable output type

The control outputs can be collectively disabled via menu H2/B7, type:
"Control (general)"
"Extinguishing"
"Ventilation"
"Control/exting./vent.
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/B7. Disabled outputs will stay in (or return to) the normal condition for the output respectively.

16.16.5 Disable / Re-enable alarm devices

The control outputs of type "Alarm device (sounder)" can be collectively disabled / re-enabled via menu H2/B8. Disabled outputs will stay in (or return to) the normal condition for the output respectively.

16.17 Disable interlocking output

Individually disabled via menu H9/C4. Re-enabled via menu H9/C5. See also chapter "Disable interlocking output (H9/C4)", page 82.

16.18 Disable outputs for routing equipment

Disabled and Re-enabled via menu H2/B9. For more information see EBL512 G3 United version 2.7.x Operating Instructions MEW01473.

16.19 Disconnect & Re-connect loop / zone line input

Disconnected via menu H8/S1 and Re-connected via menu H8/S2:

COM loop
Zone line input
Addr. zone interface (2335 and 3361 zone line input)

For more information see EBL512 G3 United version 2.7.x Operating Instructions MEW01473.

16.20 External time channels

39 external time channels 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 on/off
- turn the 2-unit dependence function on/off

The 39 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 Number (15-63). 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 Win512 version 2.7.x).

16.21 Test mode

Up to four zones can be set in Test mode at the same time. Alarm points / zones can be tested during the Monthly test via menu H1 or separately via menu H7. For more information see EBL512 G3 United version 2.7.x Operating Instructions MEW01473. 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.[97]

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

16.22 Test alarm devices

The programmable outputs of type "Alarm device" can be collectively activated via menu H8/S5, 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)[98], "off" for 29 seconds (±1s), "on" for 1 second and so on.[99]

NOTE! Also disabled (and silenced) alarm devices will be tested.

The test is stopped via menu H8/S5, if a fire alarm is activated in the system or after one hour.

16.23 Test of routing equipment

Via menu H1 it's 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 060 seconds count-down starts. The "Fault condition" output will be activated[100], 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 additional 30 seconds the test will be ended and the outputs and LEDs will go back to "normal" status.

16.24 Calibration of supervised outputs

The supervised (monitored) outputs have to be calibrated after the installation.[101] 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.

16.25 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.

---

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

[99] 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.

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

[101] 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.

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 124) 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.[102] **Service signal** will be activated at a fixed **service level**. For detectors 4300 and 4301 (in NORMAL mode), Service signal will be activated when the week average sensor value is ≥ 1.8 %/m.

For more information, see EBL512 G3 version 2.7.x Operating Instructions MEW01473 chapter "Sensors activating Service signal (H4/U5)" and "Acknowledge Service signal (H8/S3)".

16.26 Fault signal (fault condition)

Fault signal, fault messages, fault acknowledge, etc. are described in EBL512 G3 version 2.7.x Operating Instructions MEW01473, chapter "Fault".

Programmable inputs can be used to activate fault signal in the EBL512 G3 c.i.e. (United version 2.7.x). See chapter "Programmable inputs", page 60.

16.27 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.[103] The alarm text will also be presented in Ext. Fire Brigade Panels, etc. The alarm text will be printed when a printer is available in the c.i.e or the Ext. FBP.

See also EBL512 G3 version 2.7.x Operating Instructions MEW01473, chapter "Fire alarm".

The alarm texts, up to 40 alphanumeric characters, are created and downloaded via Win512 version 2.7.x. 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.

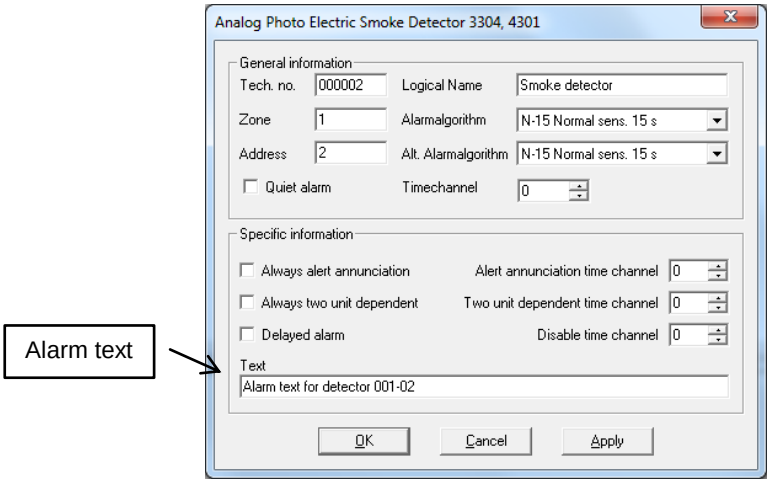
---

[102] 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 84.

[103] See also chapter "Limitations", page 160.

16.27.1 Creating the alarm texts via Win512 version 2.7.x

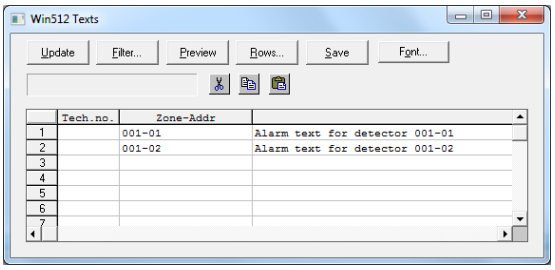
In the dialog box[104] for any alarm point (e.g. a detector/sensor), there is a "Text" field where the alarm text for that alarm point can be typed (or edited). The alarm text will be shown in the c.i.e. display when this alarm point has activated fire alarm.



Text editor

The alarm text can, as an alternative, be typed (or edited) in the Win512 version 2.7.x "Text editor" (menu Text | Edit).

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



Explanations:

Zone-Address column

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

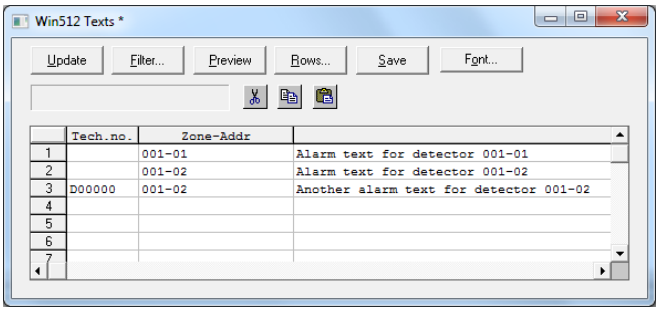
Shows also the already programmed zones, i.e. I/O unit 3361 zone line inputs programmed with address "00" (i.e. ZZZ – **00)** and 8 zones expansion board 4580 zone line inputs.
Only the texts in the "Text" column have to be typed / edited.

[104] In Win512 version 2.7.x.

Text column

Shows already programmed alarm texts. Texts can be typed / edited here.

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[105], the text has to be typed in the Win512 version 2.7.x "Text editor":



Explanations for row 3:

Tech. no. column

Display unit connected to control unit "00", board "0" and display unit (address) "00".

Zone-Address column

The Zone-Address that shall show another alarm text in the Display unit D00000.

Text column

The text to be shown in the Display unit D00000 for the alarm point 001-02.

16.27.2 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 Win512 version 2.7.x.

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

16.28 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 1-14. In a system with two or more control units in a TLON network is the time in all control units synchronised.[106]

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

[106] 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.

16.28.1 Daylight saving time

The time is automatically changed when the Daylight saving time period starts and stops respectively, if set so in Win512 version 2.7.x. 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.

16.29 Loss of main power source

Regarding the Main power source and Second power source, see chapter "Power supply", page 152.

16.29.1 Fault: Loss of main power source

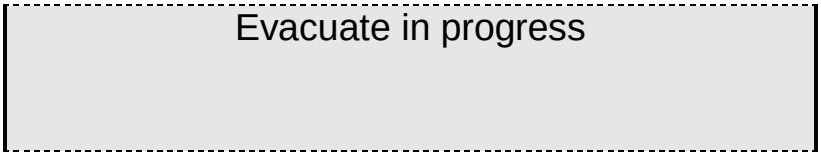
The delay time for the fault "Loss of main power source" can be set (in Win512 version 2.7.x) to 1 – 300 minutes. (A delay time > 30 minutes is a violation to the EN54-2 standard.

16.29.2 LCD backlight

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

16.30 Evacuate

When the soft key "Evacuate" (P7)[107] is pressed[108], all outputs programmed for sounders (i.e. type "Alarm devices"), will be collectively 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).[109]

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).

---

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

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

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

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.

16.31 Win512 Tools menu

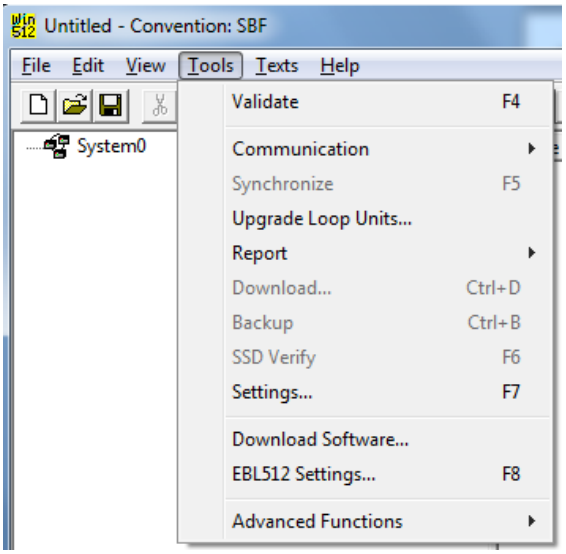


Figure 24 . Win512 version 2.7.x "Tools" menu. Some commands can be disabled (e.g. if you are not connected or not logged on).

The "Tools" menu is used, when the PC is connected to an EBL512 version 2.7.x control unit for e.g. download / backup of SSD.

NOTE! The PC **cannot** be connected to an EBL512 G3 United version 2.7.x control unit.

Validate: The SSD is validated (EN54 violations, warnings and system errors).

Communication: Log on / Log off to the EBL512 unit.

Synchronize: (When connected and logged on to an EBL512.) Synchronization of control units (same data in all control units) and Win512 version 2.7.x.

Upgrade Loop Units: To upgrade 33xx detectors to NORMAL mode (one at a time or all on one COM loop at the same time). **NOTE!** This is **not** valid for an EBL512 G3 United version 2.7.x control unit.

Report: Prints out a "Zone-Address → Output" list or a "Time channel → Zone-Address" list.

Download: (When connected and logged on to an EBL512 unit.) For download of SSD to one or more EBL512 and EBL512 G3 units in a mixed system.

Backup: (When connected and logged on to an EBL512 unit.) For backup (upload) of SSD from all the EBL512 units.

SSD verify: (When connected and logged on to an EBL512.) The Win512 version 2.7 SSD is compared to the EBL512 SSD.

Settings: Some settings (e.g. for communication), convention, etc.

Download software: (When connected and not logged on to an EBL512.) For download of S/W (+ S/W text file) to the EBL512 unit.

EBL512 settings: (When connected and not logged on to an EBL512.) Read or download EBL512 settings to an EBL512 unit. The existing EBL512 SSD can be cleared (erased).

Advanced functions: No "Level" selected = No algorithm parameters can be changed. "Level 1" selected = Alarm algorithm parameters can be changed, but not for fire alarm. "Level 2" selected (a password is required) = Alarm algorithm parameters can be changed, also for fire alarm. Convention is possible to change (in "Settings").

17 Redundancy in distributed system

In a distributed system (i.e. two or more control units in a TLON network), with fire alarm routing equipment in only one of the control units, it is possible to indicate fire alarm and to activate the output for fire alarm routing equipment (fire brigade tx) even in case of a single open circuit (cut-off) or single short circuit in the TLON network.

EBL512 G3 units with the S/W EBL512 G3 United version 2.7.x makes it possible to use EBL512 G3 units (5000 / 5001) together with EBL512 units (1548 / 1549 / 1550), in a TLON Network, i.e. a **mixed system**.

NOTE!

This function is only valid for the non-programmable standard output for fire alarm routing equipment (fire brigade tx). The programmable outputs have no benefit of this function. The system planner (commissioner) should for any output, avoid such control expression (trigger conditions) that for the correct function is dependent on no fault on the TLON network.

There are two ways of system build-up:

- **Master and slaves** individually connected to the master.
- **Master and several control units** connected in parallel and connected to one input in the master.

NOTE! An EBL512 G3 control unit cannot be the master

17.1 Master and Slaves

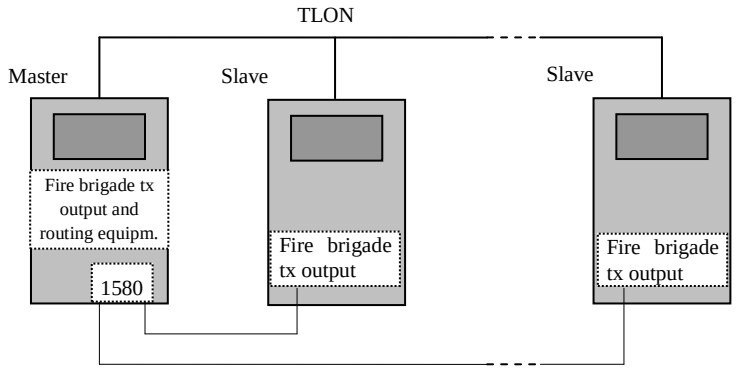


*Figure 25. **Master and slaves.** Each slave is individually connected to the master's 1580 board(s) and/or 3361 unit(s).*

17.1.1 Master unit

The control unit containing the fire alarm routing equipment is called the **"Master"** and has to be an EBL512 unit (cannot be an EBL512

G3 unit). Each one of the other control units in the system is called a "**Slave**".

The master has to be equipped with one or more 8 zones expansion board 1580. Each slave has to be connected to a zone line input. (One slave per zone line input.)

Each zone line input used for this purpose (on the 1580 board), has to be programmed as type "Alarm from CU".

17.1.2 Slave unit

Each "Slave", i.e. the non-programmable output for fire alarm routing equipment (fire brigade tx), has to be connected to an "Alarm from CU" input in the master. The output is connected like one alarm point with an end-of-line device:

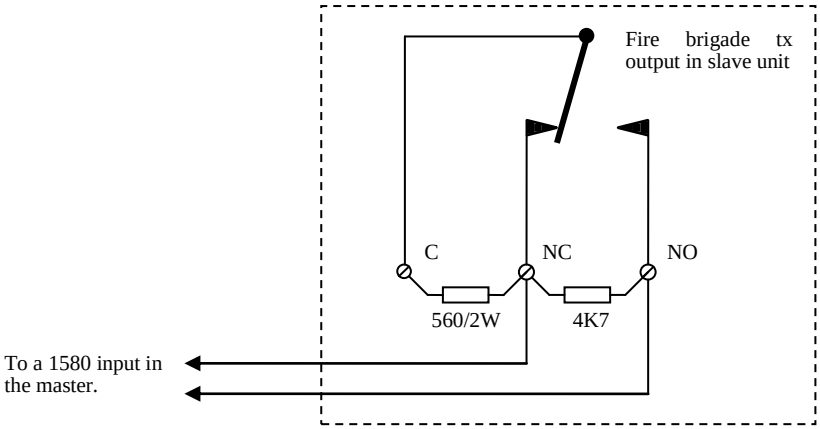


Figure 26. The output for fire alarm routing equipment (fire brigade tx) in each slave. Relay contacts shown in quiescent condition. One end-of-line device (a resistor 4K7 for a 1580 input) and one alarm resistor (560Ω / 2W) shall be connected according to the figure.

Slave

The output for fire alarm routing equipment (fire brigade tx) in a slave unit will be activated[110] as follows:

- **No fault** on the TLON network **AND** fire alarm in the system.

or

- **Fault** on the TLON network (a single open circuit (cut-off) or single short circuit) **AND** fire alarm activated by the slave itself.

Master

[110] Also normal fire alarm indication, activation of outputs, etc.

The output for fire alarm routing equipment (fire brigade tx) in the master will be activated[110] as follows:

- Fire alarm in the system.

or

- **Fault** on the TLON network **AND** fire alarm activated by any slave, which will be specially presented, see below.

or

- **No fault** on the TLON network **AND** fire alarm activated by any slave **AND** no other fire alarm in the system. (In this case also a fault will be generated, see below.)

The slave inputs in the master will be "blocked" as follows:

- **No fault** on the TLON network **AND** Fire alarm in the system.

Presentation of slave unit fire alarm

In the master, a fire alarm activated by a slave will be presented as in the following example:

```
POINT: 999-02                    No.:001
User definable text message
```

The zone number "999" indicates that the fire alarm is activated by a slave. The address "02" indicates the slave, in this example control unit number 02. The user definable text message may be used to indicate that the alarm originates from a CU (slave).

Presentation of slave unit fault

An open circuit (cut-off) or short circuit on the slave inputs in the master will generate a fault and a fault message as follows (depending on which unit is used):

```
FAULT:Cut-off input n,1580 board b, CU xx
```

```
FAULT:Sh-circ input n,1580 board b, CU xx
```

n = zone line input (0-7) on the 1580 board.

b = 1580 board no. (0-5) in the master

xx = control unit no. (00-29) of the master.

No fault on the TLON network **AND** fire alarm activated by any slave **AND** no other fire alarm in the system will, besides the fire alarm, generate a fault and a fault message as follows (depending on which unit is used):

```
FAULT: Alarm input n,1580 board b, CU xx
```

n = zone line input (0-7) on the 1580 board.

b = master 1580 board no. (0-5).

xx = master control unit no. (00-29).

17.2 Several control units

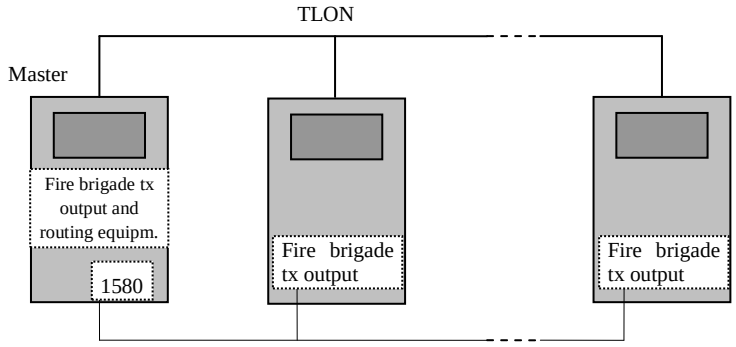


*Figure 27. **Master and slaves.** Several control units (slaves) connected in parallel and connected to one input in the master. One 1580 board input is used.*

17.2.1 Master unit

The control unit containing the fire alarm routing equipment is called the **"Master"**.

The master has to be equipped with one 8 zones expansion board 1580. All the other control units (slaves) in the system (connected in parallel) have to be connected to **one** zone line input.

One zone line input used for this purpose (on the 1580 board), has to be programmed as "Alarm from CU".

17.2.2 Several control units (slaves)

All control units (slaves), i.e. the non-programmable outputs for fire alarm routing equipment (fire brigade tx), have to be connected in parallel and connected to **one** "Alarm from CU" input in the master. The outputs are connected in parallel, like several alarm points, with an end-of-line resistor in the last unit:

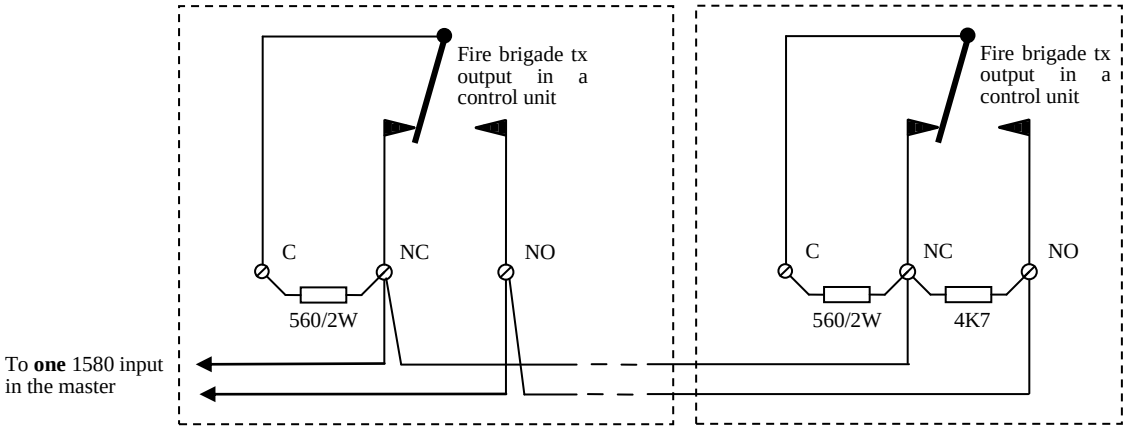


Figure 28. The output for fire alarm routing equipment (fire brigade tx) in several control units (slaves) connected in parallel. Relay contacts shown in quiescent condition. One alarm resistor (560Ω / 2W) shall be connected in each control unit and one end-of-line device (a resistor 4K7 for a 1580 input) shall be connected in the last control unit on the line, according to the figure.

Control unit (slave)

The output for fire alarm routing equipment (fire brigade tx) in any control unit (slave) will be activated[111] as follows:

- **No fault** on the TLON network **AND** fire alarm in the system.

or

- **Fault** on the TLON network (a single open circuit (cut-off) or single short circuit) **AND** fire alarm activated by the control unit itself.

Master

The output for fire alarm routing equipment (fire brigade tx) in the master will be activated[111] as follows:

- Fire alarm in the system.

or

- **Fault** on the TLON network **AND** fire alarm activated by any control unit (slave), which will be specially presented, see below.

or

- **No fault** on the TLON network **AND** fire alarm activated by any control unit (slave) **AND** no other fire alarm in the

[111] Also normal fire alarm indication, activation of outputs etc.

system. (In this case also a fault will be generated, see below.)

The input in the master will be "blocked" as follows:

- **No fault** on the TLON network **AND** Fire alarm in the system.

Presentation of fire alarm from several control units (slaves)

In the master, a fire alarm activated by any of the other control units (slaves) will be presented as in the following example:

```
POINT: 999-99                    No.:001
User definable text message
```

The zone number "999" indicates that the fire alarm is activated by a control unit. The address "99" indicates several control units (slaves) connected in parallel. The user definable text message may be used to indicate that the alarm originates from one or more CUs (slaves).

Presentation of fault from several control units (slaves)

An open circuit (cut-off) or short circuit on the input in the master will generate a fault and a fault message as follows (depending on which unit is used):

```
FAULT:Cut-off input n,1580 board b, CU xx
```

```
FAULT:Sh-circ input n,1580 board b, CU xx
```

n = zone line input (0-7) on the 1580 board.

b = 1580 board no. (0-5) in the master.

xx = control unit no. (00-29) of the master.

No fault on the TLON network **AND** fire alarm activated by any control unit (slave) **AND** no other fire alarm in the system will, besides the fire alarm, generate a fault and a fault message as follows (depending on which unit is used):

```
FAULT: Alarm input n,1580 board b, CU xx
```

n = zone line input (0-7) on the 1580 board.

b = 1580 board no. (0-5) in the master.

xx = control unit no. (00-29) of the master.

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 EBL512 G3 United version 2.7.x Operating Instructions MEW01473, 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).

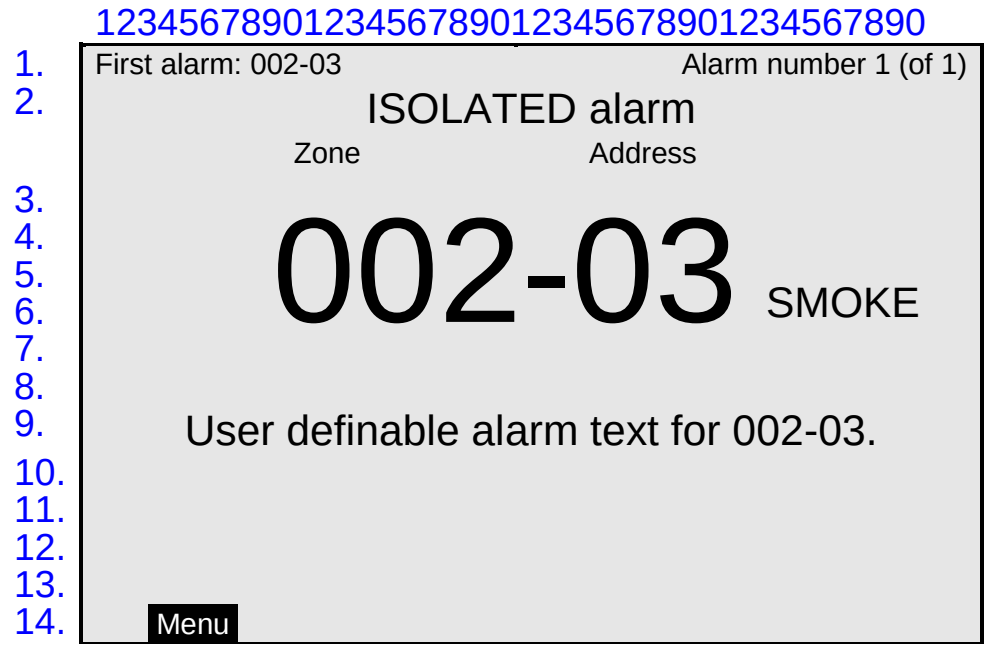
- All programmable outputs of type "Alarm devices" are disabled[112], i.e. they cannot be activated. The "inside switch" (see above) has no function.
- The c.i.e. built-in buzzer is silenced.
- A fault is generated[113]: "**`FAULT: FB Silence switch active, control unit xx`**"

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

[113] 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**.[114]
- 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:



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.

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

- Output for routing equipment (Fire brigade tx) not activated.

18.2 Battery faults

For other conventions, see chapter "Security functions", page 153.

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)

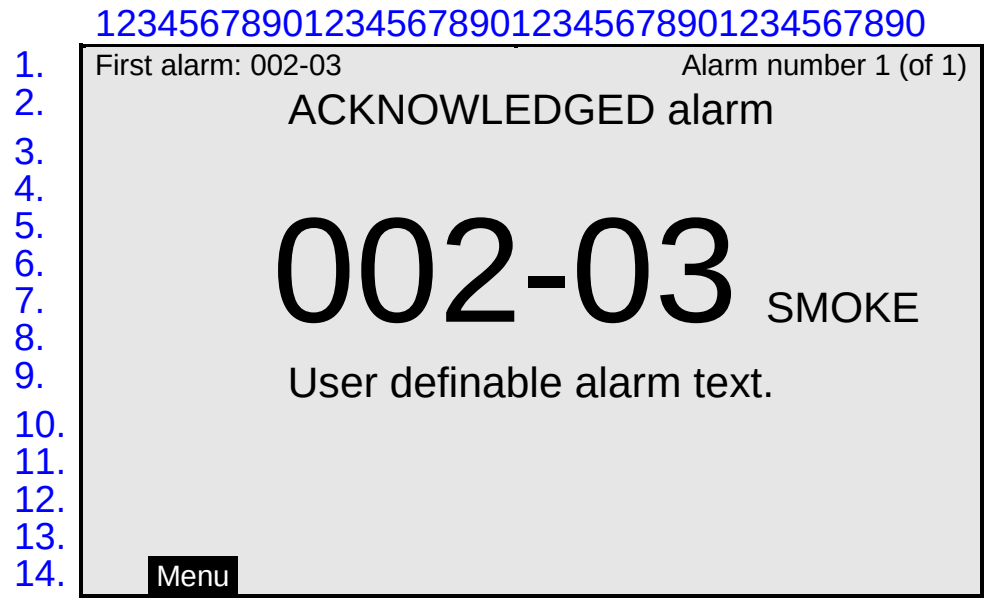
If any Fire alarm output for routing equipment (Fire brigade tx or Fault tx) is disabled and you are closing the c.i.e. door, the built-in buzzer will beep for two seconds. In the display will be shown: **`"Routing equipment left disabled"`**. This message has lower priority than fire alarms but higher 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 Cyber sensor functions

The latest generation of detectors are called "Cyber sensors".

The Cyber sensor "family" consists of the following detectors:

- Conventional photoelectric smoke detector 4352
- Conventional multi detector 4350
- Analog photoelectric smoke detector 4301
- Analog multi detector 4300

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

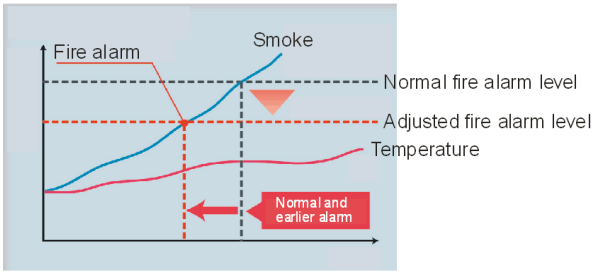
The analog detectors **4301** and **4300** can via the address setting tool 3314 be set in different modes. **In EBL512 G3** can **NORMAL mode** be used for both types but the 2312 mode only for 4301. See chapters "COM loop units", page 37 and "Functions / Services / Features", page 84, i.e. the analog detectors **4301** and **4300** do **not** use the cyber sensor functions described below.

The conventional detectors **4352** and **4350** uses some of the cyber sensor functions. See the function respectively below.

The **AI function** is used to secure the real fire alarms but also to reduce the false (nuisance) alarms with up to 46 %. The AI function is depending on if the detector is a photoelectric smoke detector (4352 / 4301) or a multi detector (4350 / 4300):

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).

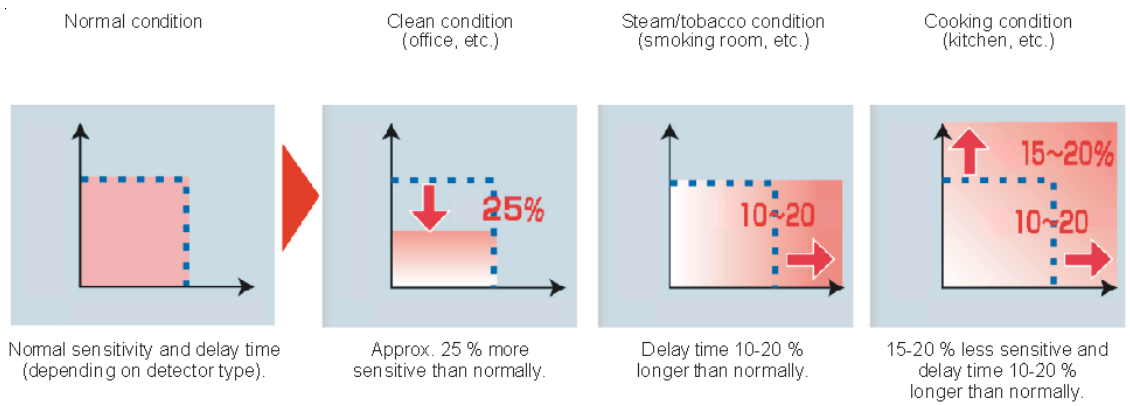
Fire alarm activation in conjunction with temperature rise.



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.

Learning function / conditions. The detector will adapt a learning condition depending on the long-time influence of smoke and/or the temperature where the detector is located.



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 different functions for the different detector types and if the cause of alarm is smoke **S**, temperature **T** or **deltaT** or a combination of smoke and temperature **2S+deltaT**.

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 following will happen:
4352: Fire alarm is activated.
4350: Depending on the AI function (learning condition, temperature condition, etc.) a delay time has to run out before fire alarm is

activated.
4301: Fire judgement is depending on other alarm and filtering algorithms (see chapter "Functions / Services / Features", page 84).
4300: Fire judgement is depending on other alarm and filtering algorithms (see chapter "Functions / Services / Features", page 84).

19.3 Alarm threshold levels

Depending on the detector type, mode and learning condition there are alarm threshold levels (**S**, **T**, **deltaT** and **2S+deltaT**) for pre-warning, fire alarm and heavy smoke / heat alarm.

The following fire alarm threshold levels are valid for the different type of detectors:

4352:

Learning condition	S[%/m]
	Fire alarm
Normal	4

4350:

Learning condition	S[%/m]	T[deg.]	deltaT [deg./168sec]	2S+deltaT #2
	Fire alarm	Fire alarm	Fire alarm	Fire alarm
Normal	5	57	18	12
Steam/tobacco	5	57	18	12
Clean	3.7	57	18	10
Heating	5	57	no use	12
Cooking	5	57	18	14

#2 **NOTE! S ≥ 2.5** (%/m) and **deltaT ≥ 3** (°C/168 seconds).

4301: Fire alarm threshold level is depending on other alarm and filtering algorithms (see chapter "Functions / Services / Features", page 84).
4300: Fire alarm threshold level is depending on other alarm and filtering algorithms (see chapter "Functions / Services / Features", page 84).

19.4 Learning function / Learning conditions

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 normal one, a **learning condition**. See also page 123.

19.4.1 Learning conditions

Each detector starts in the Normal condition. There are four **learning conditions** that can be adapted:

- Steam / tobacco condition, depending on the occurrence of smoke, i.e. **level 1** = **S** [%/m] ≥ half the fire alarm threshold level (S).
- Heating condition, depending on rise of temperature, i.e. **level 2** = **deltaT** [°C/168 sec.] ≥ 12 (approx. 4.3°C/min.).

- Cooking condition, depending on the 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 condition, the most sensitive condition requiring very clean and stable environment, i.e. the values for all the other conditions (level 1, 2 and 3) must not be exceeded.

19.4.1.1 Steam / tobacco condition, 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

In a **learning period** there are 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).

If three or more of the **36h-periods** during the **learning period** have a check-mark, the Steam / tobacco condition will be adapted. In the example this happens in the **36h-period** no. 10 (i.e. after 10 x 36h = 360h).

After the **36h period** no. 20, the next **learning period** starts again in the **36h period** no. 1. The check-marks are inherited from the previous **learning period**. Depending on if **level 1** is exceeded during the **36h period** respectively or not, there will be a check-mark or no check-mark.

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 Steam / tobacco condition will be ended after the **36h period** no. 3, since there are left only two **36h periods** with check-marks in the **learning period** now. (If later, one or more **36h periods** will get a check-mark, the Steam / tobacco condition will be adapted again as long as three or more of the **36h-periods** during the learning period have a check-mark.)

19.4.1.2 Heating condition, level 2

The learning function is the same as for the Steam / tobacco condition, **level 1**.

19.4.1.3 Cooking mode, level 3

The learning function is the same as for the Steam / tobacco condition, **level 1**.

19.4.1.4 Clean condition, level 1, 2 & 3

For this learning condition 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 condition** will be ended 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.

19.4.1.5 Learning condition summary

A detector can adapt the following **learning conditions**, depending on if and when **level 1**, **level 2** and **level 3** are exceeded or not:

Normal condition (default)

or

Clean condition

or

Steam / tobacco condition and/or **Heating condition** and/or **Cooking condition**

The following is valid for the different type of detectors:

4352: This detector uses not the Learning function.
4350: This detector uses the Learning function (for different alarm threshold levels and alarm delay times, depending on smoke & temp.).
4301: This detector uses not the Learning function.
4300: This detector uses not the Learning function.

19.5 Alarm delay time

Depending on the detector type, mode and learning condition the delay times before fire alarm threshold level was exceeded, are for the different type of detectors:

4352: Normally 9 seconds.

4350:

The cause of alarm / Learning condition	Delay time[sec]				
	S		T	deltaT	2S+deltaT
	data1[%/m]				
Normal	< 0.6	39	15	15	data2'/2 #3
	0.6 <=, < 0.8	30			
	0.8 <=, < 2.5	18			
	2.5 <=	9			
Steam/tobacco	< 0.6	39+data2/2 #3	15	15	data2'/2 #3
	0.6 <=, < 0.8	30+data2/2 #3			
	0.8 <=, < 2.5	18+data2/2 #3			
	2.5 <=	9+data2/2 #3			
Clean	< 0.3	39	15	15	data2'/2 #3
	0.3 <=, < 0.4	30			
	0.4 <=, < 1.3	18			
	1.3 <=	9			
Heating	< 0.6	39	15	no use	data2'/2 #3
	0.6 <=, < 0.8	30			
	0.8 <=, < 2.5	18			
	2.5 <=	9			
Cooking	< 0.6	39	15	15	data2' #3
	0.6 <=, < 0.8	30			
	0.8 <=, < 2.5	18			
	2.5 <=	9			

#3 **NOTE!** Max. alarm delay time is 60 seconds.

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".**4301**: Alarm delay time is depending on other alarm and filtering algorithms (see chapter "Functions / Services / Features", page 84).
4300: Alarm delay time is depending on other alarm and filtering algorithms (see chapter "Functions / Services / Features", page 84).

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:

4352: This detector has no analog output.
4350: This detector has no analog output.
4301: This detector has a smoke obscuration value output in the NORMAL mode.
4300: This detector has a smoke obscuration value output and a temperature value output in the NORMAL mode.

19.7 Sensitivity compensation

In order to maintain a constant sensitivity regardless of the contamination of the detector, a Contamination Compensation Factor (CCF) is calculated during a 36 hours period as follows:

During 13 minutes, all smoke obscuration values are saved and an average value is calculated. The CCF will be changed if it is lower than the actual CCF, else no change.

After 18 hours, the CCF will be changed if it is lower or higher than the actual CCF. (It will normally be higher by contamination.)

After 18 hours more (totally 36 hours) the CCF will be changed if it is lower or higher than the actual CCF and it will be saved in the detector's EEPROM, so it can be used e.g. after the detector has been without power supply. A new 36 hours period starts.

Max. compensation is 2 %/m. A service signal will then be activated and shown in the c.i.e.

The following is valid for the different type of detectors:

4352: This detector has no sensitivity compensation.
4350: This detector has sensitivity compensation (but no service signal output).
4301: Sensitivity compensation is depending on other alarm and filtering algorithms (see chapter "Functions / Services / Features", page 84).
4300: Sensitivity compensation is depending on other alarm and

filtering algorithms (see chapter "Functions / Services / Features", page 84).

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:

4352: This detector has no self diagnosis of internal devices.
4350: This detector has self diagnosis of internal devices (but no separate fault output).
4301: This detector has self diagnosis of internal devices.
4300: This detector has self diagnosis of internal devices.

19.9 Address setting check

The indication LED in the detectors **4301** and **4300** will in all modes blink every second when the detector is powered and the COM loop address is not set with the Address setting tool 3314, i.e. as long as the address is "000". The address should be set in the interval 001-127.

20 Control unit properties (settings)

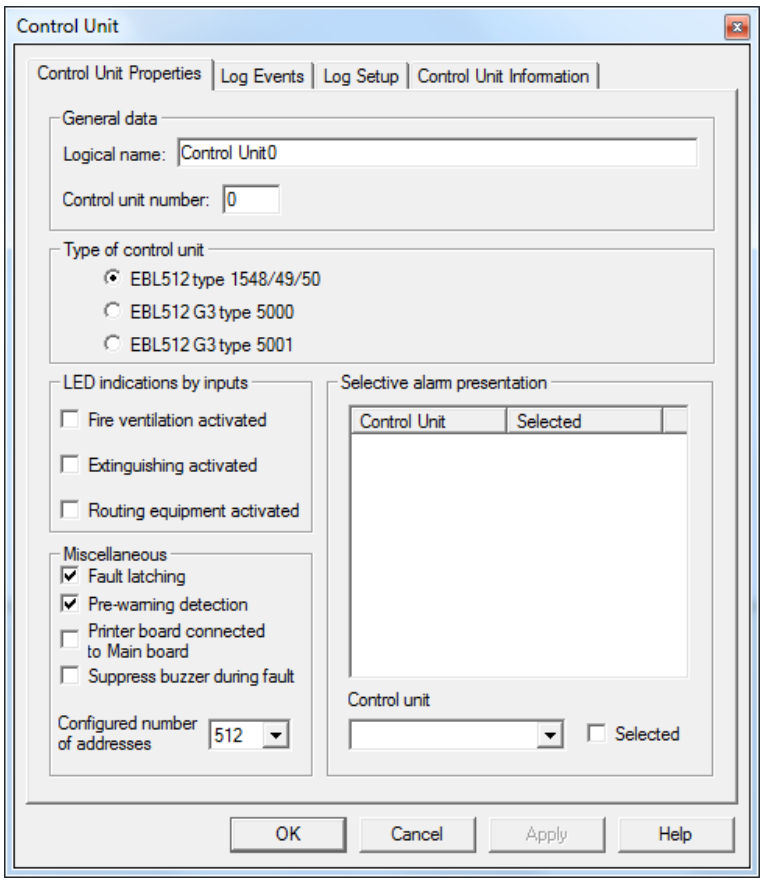


Figure 29. Win512 (version 2.7.x) "Control unit" dialog box.

NOTE! Default settings in Win512 version 2.7.x are shown but might vary depending on convention.

20.1 Control unit properties

20.1.1 General data

Logical name: Normally not changed (but can be changed when necessary).

Control unit number: A stand-alone control unit has no. 00. In a system the control units are numbered 00 to 29.

20.1.2 Type of control unit

EBL512 type 1548 / 1549 / 1550: (Default) Used for an EBL512 version 2.7.x control unit.

EBL512 G3 type 5000: Used for an **EBL512 G3 United version 2.7.x** control unit type 5000.

EBL512 G3 type 5001: Used for an **EBL512 G3 United version 2.7.x** control unit type 5001 (i.e. without a front).

20.1.3 LED indications by inputs

Normally the LED indicators listed below will be lit when a corresponding output is activated[115]. When selected, the LED will be turned on when a programmable input is activated instead, e.g. a feed-back from a fire brigade tx output can activate a programmable input to turn on the LED "Fire brigade tx".

- ❑ **Fire ventilation activated**: LED "Ventilation"
- ❑ **Extinguishing activated**: LED "Extinguishing"
- ❑ **Routing equipment activated**: LED "Fire brigade tx"

20.1.4 Miscellaneous

- ☒ **Fault latching** (default): all faults, also corrected faults, have to be acknowledged. No fault latching = not corrected faults have to be acknowledged but corrected faults have not to be acknowledged. **NOTE!** In a mixed system (see chapter "Mixed system, page 14) all control units have to be set to the same.
- ☒ **Pre-warning detection**: The pre-warning detection in a control unit is enabled as default. When disabled, pre-warnings activated in other control units in the system will always be presented in all control units and all programmable outputs in the system, with trigger condition pre-warning, will be activated (if not disabled). Fire alarm will always activate all programmable outputs in the system, with trigger condition pre-warning.
- ❑ **Printer board connected to Main board**: This check box shall be marked when the c.i.e. has a built-in printer (i.e. an EBL512 G3 unit 5000 with a printer connected to the MMI board).
- ❑ **Suppress buzzer during fault**: This check box shall be marked when faults generated in other control units shall be suppressed in this control unit, i.e. the buzzer will only be turned ON for faults generated in this control unit.

Configured number of addresses: 128, 256 or 512. Shall be set to the same as the control unit is configured for. **NOTE!** In a mixed system (see chapter "Mixed system, page 14) the EBL512 G3 control unit is configured for max. number of addresses, instead of max. number of alarm points.

This setting is used when programming alarm points in Win512 version 2.7.x. When doing a validation check you will get a message if too many alarm points have been programmed in relation to the settings/configured number of addresses. (This check is automatically performed when downloading the SSD to the c.i.e.)

[115] Type of output = Extinguishing, Fire ventilation and Routing equipment respectively.

20.1.5 Selective alarm presentation

In a system (i.e. two or more control units in a TLON network) it is possible to choose which control units' fire alarms[116] that shall be presented in the control unit respectively.

Default = All fire alarms will be presented in all control units. In each "Control unit" dialog box, the control units that shall not be presented in that control unit have to be **de-selected**.

Example: A system with four **C**ontrol **U**nits (C.U. 0, 1, 2 and 3). In C.U. 0 shall only fire alarms from C.U. no. 0 be presented and in C.U. 1, 2 and 3 shall all fire alarms be presented.

How to de-select a control unit: Select a control unit in the "Control unit" drop down list box (e.g. 1) and empty the "Selected" check box (on the right side). Click the "Apply" button and Selected = 1 changes to Selected = 0.

This has to be done for control units 2 and 3 also.

"Control unit" dialog box for control unit 0. Control units 1,2 and 3 are de-selected:

Control unit	Selected
0	1
1	0
2	0
3	0

"Control unit" dialog box for control unit 1, 2 and 3 respectively. No control unit is de-selected:

Control unit	Selected
0	1
1	1
2	1
3	1

NOTE!

The control unit relay output "Fire brigade tx" will be activated for the fire alarms that will be presented in the control unit respectively, i.e. all alarms or alarms from selected control units only.

[116] Activated by alarm points, etc. connected to a control unit.

20.2 Log events

Not valid for EBL512 G3 since all events always will be logged in three different type of logs.

The **general event log** can be shown / printed out via menu H4/U6.

The **fire alarm log** can be shown / printed out via menu H4/U6.

The **interlocking log** can be shown / printed out via menu H4/U6.

All three logs are circular and can show up to 999 events each.

20.3 Log setup

Not valid for EBL512 G3. See above.

20.4 Control unit information

In this tab you can **read** the following information:

Logical name
Control unit (number)
No. of expansion cards
No. of addresses
No. of alarm points (detectors in conventional zones excluded)
No. of alarm points (detectors in conventional zones included)
No. of zones

When a name / number / unit is changed, added or removed, this information will be updated.

21 System properties (settings)

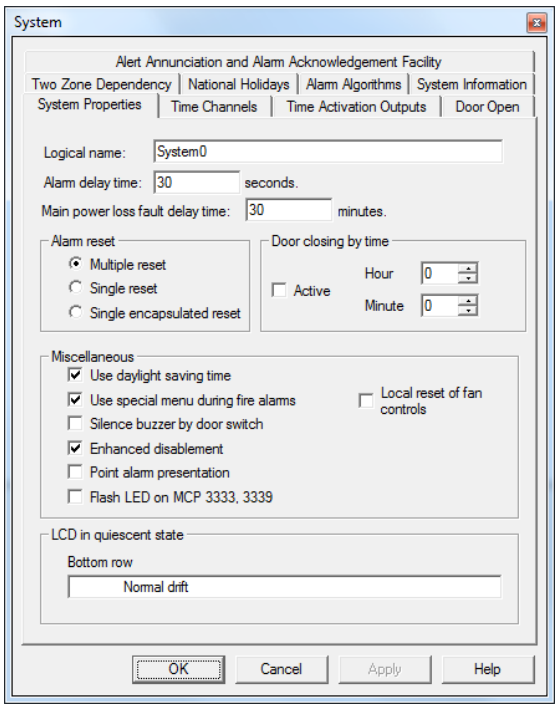


Figure 30. Win512 version 2.7.x "System" dialog box.

NOTE! Default settings in Win512 version 2.7.x are shown but might vary depending on convention.

21.1 System data

21.1.1 Logical name

Normally not changed but each system can have a unique name.

21.1.2 Alarm delay time

The fire alarm delay time is set here for the detectors with this option selected via Win512. Default is "0" and up to 127 seconds can be set. **NOTE!** This delay starts when the alarm normally should have been activated, i.e. it will be added to all other delay times (e.g. after an L-/N-/H-35 algorithm).

In the Australian and New Zealand conventions will the "Alarm Verification Facility be valid when "Delayed alarm" is selected for a conventional zone line input. See chapter "Alarm Verification Facility", page 96.

21.1.3 Main power loss fault delay time

A fault will be activated 30 minutes (default) after loss of mains (230 V AC). 0 – 300 minutes can be set.

21.1.4 Alarm reset

One of the following alternatives can / shall be selected.

- ⊙ **Multiple reset** (default): All activated fire alarms in the system will be reset simultaneously by pressing the "Reset" button.
- ○ **Single reset**: One activated fire alarm in the system, shown in the control unit's alphanumeric display on the first row to the left, will be reset by pressing the "Reset" button, i.e. all activated fire alarms have to be reset one by one. This function is a violation to the EN54-2 standard.
- ○ **Single encapsulated reset**: Encapsulation function. This function is a violation to the EN54-2 standard.

Encapsulation function: If an alarm point / zone is reset while still 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 not to activate a new fire alarm within 20 seconds. It will stay disabled until re-enabled via menu H2/B5.

LED "General disablements" is indicating one or more disablement in the system.

21.1.5 Door closing by time

- ☐ **Active**: If all fire doors shall be closed at a definite time every day, this checkbox shall be marked.
  Hour: 00 – 23
  Minute: 00 - 59

21.1.6 Miscellaneous

- ☒ **Use daylight saving time**: According to the current EU or country regulations, see chapter "Daylight saving time", page 109.
- ☒ **Use special menu during fire alarms**: Not valid for EBL512 G3.
- ☐ **Silence buzzer by door switch**: If the buzzer in the c.i.e. shall be silenced when the door is opened, this checkbox shall be marked but this is a violation to the EN54-2 standard.
- ☒ **Enhanced disablements**: Checkbox marked = Disabled alarm points will not activate pre-warning, fire alarm or fault.
  Checkbox not marked = Disabled alarm points will not activate pre-warning or fire alarm but fault can be activated. This is a violation to the EN54-2 standard.
  NOTE! Sensor values for a disabled detector will not be saved, i.e. only the sensor values stored before and after the disablement will be used for the week average calculation.
- ☐ **Point alarm presentation**: This checkbox shall be marked for an EBL512 G3 United version 2.7.x in a mixed network.
- ☒ **Flash LED on MCP 3333, 3339**: The manual call point's built-in LED will flash each time the c.i.e. communicates with the call point If this option is disabled the LED is switched off until the call point is operated.
- ☐ **Local reset of fan controls**: Checkbox marked = Reset of fan control system is **local**, i.e. all fan control systems in the c.i.e. where the switch is located will be reset.

Checkbox not marked = Reset of fan control system is **global**, i.e. all fan control systems in the system will be reset. (Fan control, see page 33.)

21.1.7 LCD in quiescent state

Bottom row: The text to be shown on in the LCD in all control units in the system, when the system is in quiescent state, e.g. the name of the installation. Max. 40 characters. (In EBL512 G3 United version 2.7.x the text will be automatically centred.)

21.2 Time channels

The control unit RTC (real time clock) controls time channels 1-14.

Time channels can be used to:

- disable and re-enable alarm points
- set alert annunciation ON / OFF
- activate programmable control outputs
- set alternative alarm algorithm for analog detector types 33xx /430x ON / OFF
- set 2-unit dependence function ON / OFF

The properties for each **Time channel** (1-14) and each **Day of the week** (1-8) have to be set for the channels that shall be used.

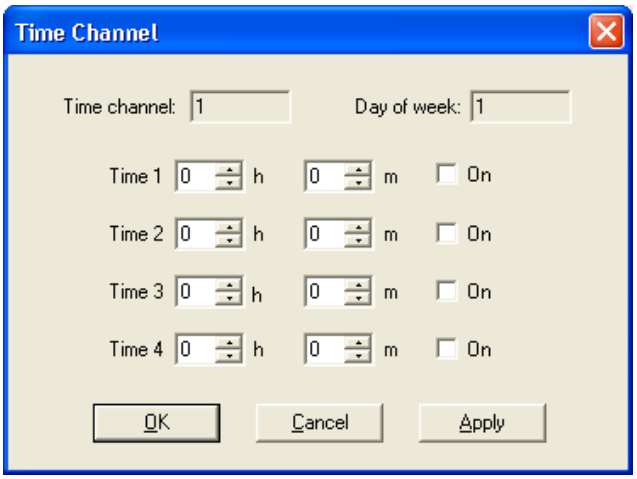
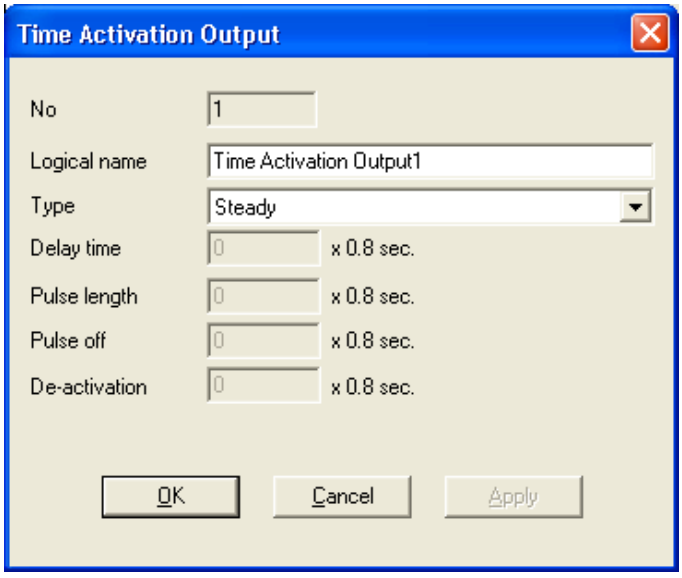


Figure 31. Properties for one time channel and one day. Day of week 1 = Monday. Day of week 8 = National holiday.
☑ = On. ☐ On = Off.

All (52) weeks of a year have the same settings. When a national holiday appears in the middle of a week, separate ON/OFF times can be set for that holiday, i.e. the day of the week = 8. The National holiday dates have to be set separately in the "National holidays" tab.

21.3 Time activation output

See also chapter "Time Activation Output", page 68.



"Time Activation Output" 1-10 can be programmed. For each Time Activation Output the properties have to be set:

No.: X = The number of the Time Activation Output, 1-10. Information only, cannot be changed.

Logical name: Normally not changed but each Time Activation Output can have a name indicating what it is meant for, e.g. "Alarm devices".

Type: Steady (continuous), Intermittent, One pulse, Steady – delayed activation, Intermittent - delayed activation, One pulse - delayed activation **or** Steady – delayed de-activation.

Delay time: Can be set, when required, to 0-255 **x 0.8 sec.**

Pulse length: Can be set, when required, to 0-255 **x 0.8 sec.**

Pulse off: Can be set, when required, to 0-255 **x 0.8 sec.**

De-activation: Can be set, when required, to 0-255 **x 0.8 sec.**

Min. = 1 x 0.8 = 0.8 sec. Max. = 255 x 0.8 = 204 sec. = 3 min. 24 sec.

21.4 Door open

21.4.1 Indication door open affected by

Not valid for EBL512 G3 United version 2.7.x control units. The "Open door" symbol shown in the display is always indicating "any door open in the system".

21.4.2 Disablement of routing equipment

- ⦿ **No disablement** (default): Door open in a C.U. or an ext. FBP will **not** disable the outputs for routing equipment (Fire brigade and fault tx).
- ○ **Disable by door in any control unit**: Door open in any C.U. will disable the outputs for routing equipment (Fire brigade and fault tx) in all C.U:s.

- **Disable by door in any control unit or any external FBP**: Door open in any C.U. or any ext. FBP will disable the outputs for routing equipment (Fire brigade and fault tx) 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)`

21.5 National holidays

Up to twenty national holidays can be set for the whole system.[117] For each national holiday the **Year** (2001-2038)**, Month** (01-12) and **Day of the Month** (01-31) has to be set. "Add" to or "Delete" from the **Date** list. "Annual repetition" can be set if a holiday returns the same date every year. (The year will be deleted for these days.)

Function: Normally the Day of week 1-7 ON/OFF times are valid. A national holiday has higher priority, i.e. the Day of week 8 ON/OFF times are valid for this day instead of the normal times.

21.6 Alarm algorithms

For each analog detector programmed (via Win512 version 2.7.x) is an alarm algorithm selected (and when required an alternative alarm algorithm).
A number of algorithm "Properties" are displayed under this tab. Detector type, Logical and Short names can be changed. The Short name (≤ six characters) is shown in menu H4/U4. Level 1 or Level 2 can be selected (see chapter "Win512 Tools menu", page 110):

In **Level 1** it is also possible to change: The pre-warning and the heavy smoke / heat alarm algorithm parameters for smoke and heat detectors.
In **Level 2** (a special password is required) it's also possible to change: The fire alarm algorithm parameters for smoke and heat detectors.

21.6.1 Classic smoke detectors' properties

NOTE! 2200+2210, 2202+2210 & AUT cannot be used in EBL512 G3 United version 2.7.x.

Detector: 2300(ION)
~~2210(ION2) = ION2200~~
2304(OPT)
~~2210(OPT2) = OPT2202~~
~~AUT~~

Logical name: Classic
Short name: Class
Algorithm parameters: Default values, see table:

[117] **NOTE!** ON/OFF times for each time channel (1-14) and day of week = 8 (national holiday) have to be set in the "Time channels" tab.

	2300 (ION)	~~2210 (ION2)~~	2304 (OPT)	~~2210 (OPT2)~~	~~AUT~~
Offset, Pre-warning	10	~~20~~	10	~~20~~	~~45~~
Offset, Fire alarm	18	~~35~~	13	~~25~~	~~60~~
Offset, Heavy smoke	22	~~45~~	22	~~45~~	~~100~~
Sampling interval	2	~~2~~	3	~~3~~	~~1~~

NOTE! If any of these values are changed it might be a violation to the EN54-2 standard.

Sampling interval:
1 = 3 values over alarm level to activate alarm.
2 = 5 values over alarm level to activate alarm.
3 = 7 values over alarm level to activate alarm.

21.6.2 Heat detectors' (3308, 3309, 3316 and 4300) properties

Detector: 3308(AHD), also valid for 3309
3316 / 4300 HEAT (AMD), i.e. the heat detector part when decision algorithm is not selected.

Logical name: Class A1, Class A2 (S) or Class B (S).

Short name: A1, A2 or B

Algorithm parameters: Default values, see table:

	3308 (3309) (AHD)			3316 / 4300 HEAT (AMD)			For 3308 (3309)
	A1	A2	B	A1	A2	B	
Level, Pre-warning	92	100	128	46	50	64	x 0.5° C
Level, Fire alarm	112	120	148	56	60	74	x 0.5° C
Level, Heavy alarm	180	180	180	90	90	90	x 0.5° C
Rise time [A]	8			4			x 0.5° C per min.
Step down [A]	20			10			x 0.5° C

NOTE! If any of these values are changed it might be a violation to the EN54-2 standard.

[A] Rate-of-rise > 8 x 0.5 = 4° C per minute gives an alarm level temperature step down of 20 x 0.5 = 10° C

21.6.3 Smoke detectors' (3304, 4301, 3316 and 4300) properties

Detector: 3304 / 4301(OPT)
3316 / 4300 SMOKE (AMD), i.e. the smoke detector part when decision algorithm is not selected.

Logical name: L-15 Low sens. 15s, L-35 Low sens. 35s, N-15 Normal sens. 15s, N-35 Normal sens. 35s, H-15 High sens. 15s and H-35 High sens. 35s.

Short name: L-15- L35, N-15, N-35, H-15 and H-35.

Algorithm parameters: Default values, see table:

	3304 / 4301 (OPT)						3316 / 4300 SMOKE (AMD)					
	L-15	L-35	N-15	N-35	H-15	H-35	L-15	L-35	N-15	N-35	H-15	H-35
Offset, Smouldering	18	18	15	15	12	12	18	18	15	15	12	12
Offset, Pre-warning	26	26	22	22	18	18	26	26	22	22	18	18
Offset, Fire alarm	36	36	30	30	24	24	36	36	30	30	24	24
Level, Heavy alarm	150	150	150	150	150	150	120	120	120	120	120	120
Step value [A]	6	2	5	2	4	2	12	4	10	4	8	4

NOTE! If any of these values are changed, it might be a violation to the EN54-2 standard.

[A] The "Step value" is used in the alarm algorithm.

21.6.4 Multi detectors' (3316 and 4300 + decision algorithm) properties

Detector: 3316 / 4300 SMOKE (AMD), i.e. the 3316 detector when decision algorithm is selected.

Logical name: Decision algorithm

Short name: Dec (Shown in menu H4/U5.

Algorithm parameters: Default values, see table:

	3316 / 4300 SMOKE
Offset, Smoke Pre-	50
Offset, Smoke alarm	58
Level, Heat Pre-warning	50
Level, Heat alarm	58

NOTE! If any of these values are changed, it might fasten or delay the alarm activation.

21.7 System information

In this tab you can **read** the following information:

Logical name
Number of Control units
Number of addresses
Number of expansion cards

When some name is changed, added or removed units, this information is updated.

21.8 Alert Annunciation and Alarm Acknowledgement Facility

21.8.1 Alert Annunciation

See also chapter "Alert Annunciation", page 97.

Acknowledgement time: **30 sec.**
30 is default. 5, 10, 15, - -300 (= 5 min.) is possible.

Investigation time: 3 **min.**
3 is default. 1-40 is possible

Number of zones: 1
1 is default. 1-4 is possible

- ☐ **Multiple alarms allowed within same zone**
  If only one alarm point within the zone is allowed to activate alert annunciation, this checkbox shall be unmarked.

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

21.8.2 Alarm Acknowledgement Facility

Used in conjunction with the AAF Control, which is available on the Australian market only.

See also chapter "Alarm Acknowledgement Facility (AAF)", page 99.

Acknowledge period (AP) time: **60 sec.**
60 is default. 10-60 is possible.

Investigation period (IP) time: **3 min.**
3 is default. 1-3 is possible.

21.9 Two zone dependence

See also chapter "2-zone / 2-address dependence (Co-incidence alarm)", page 94.

Group Zone: A list box displays **all** the so far programmed zones in the system, i.e. the zones have to be programmed in Win512

version 2.7.x before they can be programmed to a two-zone dependence group.

NOTE!
Only conventional zones (i.e. zone lines with conventional detectors) should be used in the two-zone dependence function.
For analog / addressable detectors the two-address (unit) dependence function should be used.

Default for all zones is Group 0 (= no two zone dependence).
Click the current group number (0) for the zone to be programmed.

The zone number displays in the **Zone** box (down to the right in the dialog box).

Type the new group number in the **Group** box.

Click "Apply" to accept and update the **Group** **Zone** list box.

The group number for the zone is now changed which is displayed in the **Group** **Zone** list box.

NOTE!
When all changes have been done, 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 Compatibility

Regarding backwards compatibility:

- Addressable short circuit isolator 4370 is compatible with Addressable short circuit isolator 4313.
  NOTE! In system **EBL512 G3 United version 2.7.x** shall all Addressable short circuit isolators be set to **2330 mode**.

23 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.

23.1 TLON Network cables

An unshielded Belden cable with twisted pair should be used, e.g. 85102 or 8471.

See also separate TLON Technical description.

23.2 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 145 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.

23.3 Ext. FBP / Display Units cables

RS485. Max. cable length ≤ 1200 m to the furthest away D.U.
Cable type LIHCH-TP 2 x 2 x0.75 mm^2 or equivalent (twisted pair).

23.4 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).

---

[119] Control unit – backup battery powered. COM loops and ext. equipment current consumption not included.

23.5 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.

23.6 Other cables

External indicator (LED), door release magnets, etc. E.g:

ELQRB 2 x 0.6 mm (0.3 mm^2) or equivalent.

24 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 146 and 147 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 and Graph 2.

1. Graph with circular dots.

Has to be used when at least one 2335 or 3361 unit with the monitored input 0 used as a zone line input (Z) is used with conventional detectors (e.g. 4350 / 4352) and end-of-line capacitor.

NOTE! No "old" conventional smoke detectors of type 231x/2321 (i.e. requiring ≥ 15 V) must be used.

Has to be used for the analog smoke detectors 2300 and 2304.

2. Graph with no dots

Shall normally be used, i.e. if the graph 1 (see above) not has to be used.

The following two figures are showing graphs for maximum conductor (wire) resistance and maximum cable length respectively.

Excel sheet

An Excel sheet is available for an easy check of the current consumption, cable length, etc.

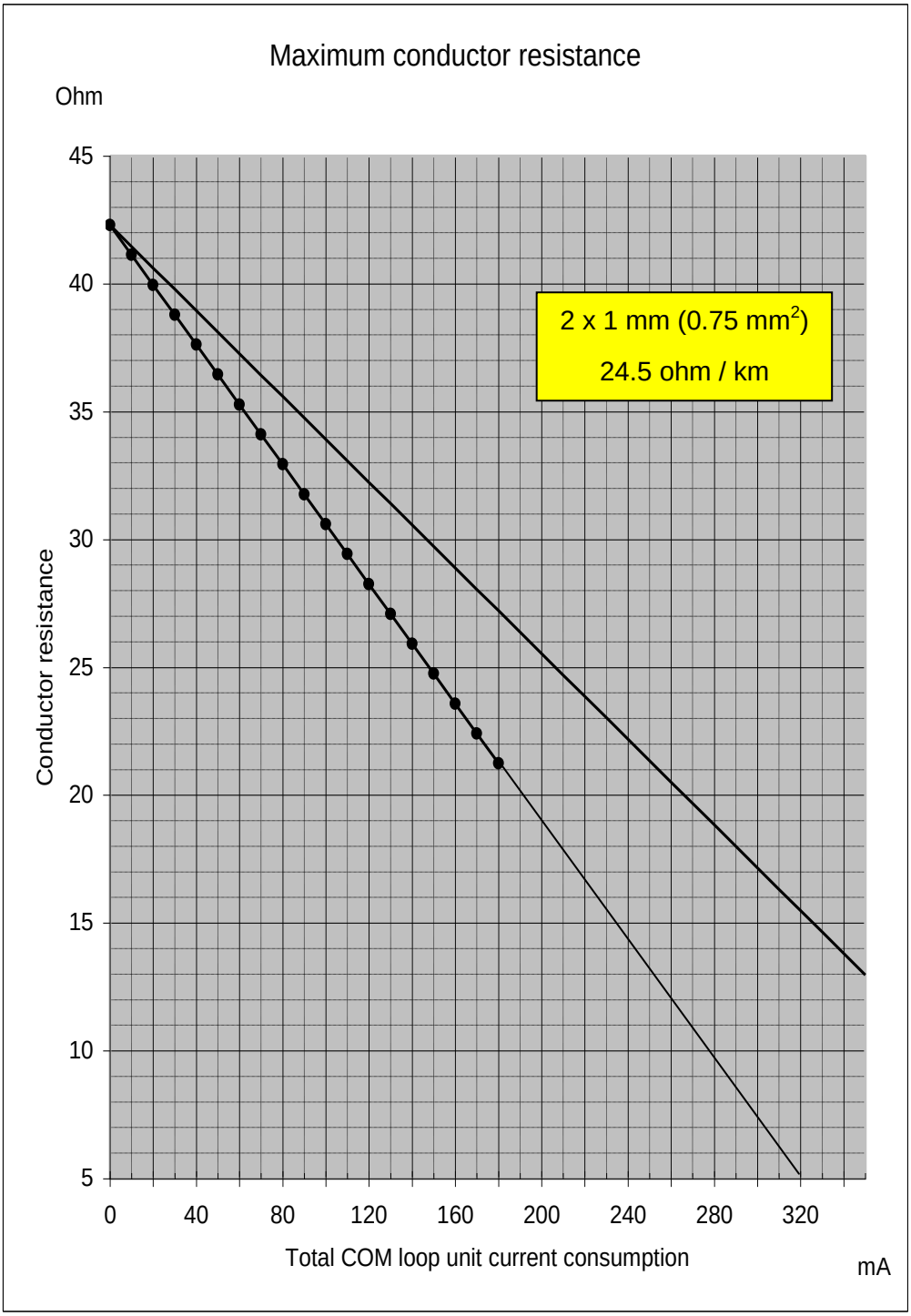


Figure 32. Graphs showing the total conductor resistance in relation to the COM loop units' total current consumption. ***NOTE!*** *The graphs start at "0 mA" but graph 1 ends at "320 mA" and graph 2 ends at "350 mA". End of graph = max. allowed loop current. (42.3 ohm = 863 m cable length.)*

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).

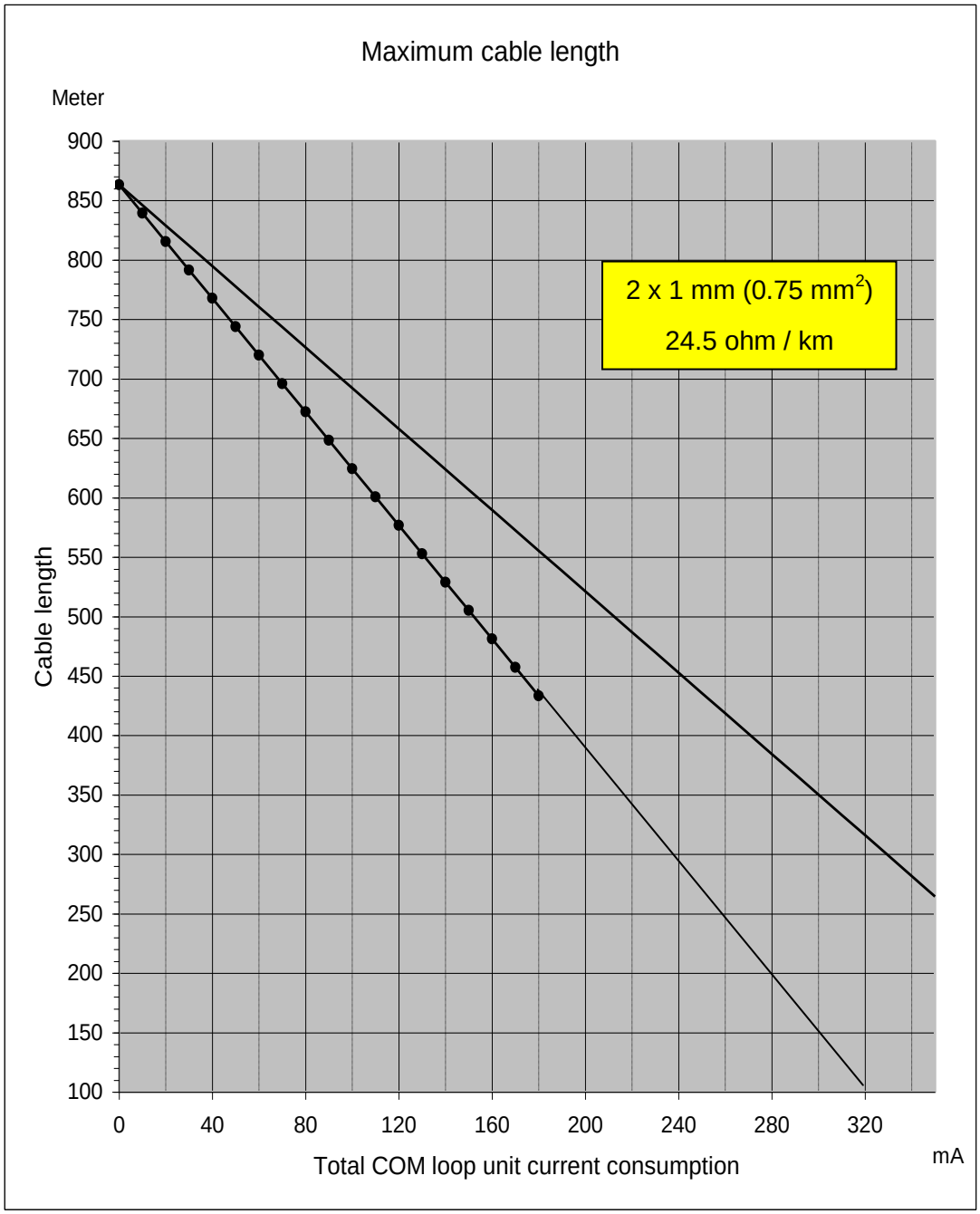


Figure 33. Graphs showing the cable length in relation to the COM loop units' total current consumption. ***NOTE!*** *The graphs start at "0 mA" and 863 m cable length respectively but graph 1 ends at "320 mA" and graph 2 ends at "350 mA". End of graph = max. allowed loop current. (863 m cable length = 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).

25 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 G3 - 41 and chapter "COM loop cable length", page 145. 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 152.

C.i.e. units	**Normal state** (quiescent) (mA)	**Alarm state** (active) (mA)
Control unit 5000 (**without** printer) [119]	230	290
Control unit 5000 (**with** printer) [119]	253	312[120]
Control unit 5001 ("grey box without front, printer, etc.) [119]	179	214
Printer in 5000	23	350
8 zones expansion board 4580	15[121]	15[122]
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).

COM loop units (input / display units)	**Normal state** (quiescent) (mA)	**Alarm state** (activated) (mA)

[119] Control unit – backup battery powered. COM loops and ext. equipment current consumption not included.

[120] When the printer is active the current consumption is 667 mA momentarily.

[121] 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).

[122] Add 30 mA per input (zone) activated. (Each input has a 30 mA current limitation, i.e. also for short-circuit on the line.)

Analog smoke detector 2300/2304 + analog base 2312 [123]	1.7 / 1.8	3.7 / 3.8
Analog smoke detector 3304 + analog base 3312 [123]	0.3	2.3
Analog heat detector 3308 + analog base 3312xx [123]	0.3	2.3
Analog heat detector, enclosed 3309 [123]	0.2	1.7
Addressable heat detector, enclosed 2340 / 2341 [123]	2	5
Analog multi detector 3316 + analog base 3312 [123]	0.55	2.55
Analog multi detector 4300 + analog base 3312xx [123]	0.3	2.3
Analog smoke detector 4301 + analog base 3312xx [123]	0.3	2.3
Addressable manual call point 2333 / 3333 / 3339	2	5
Alarm Acknowledge Facility Control (AAFC) [124]	2	5

NOTE! On each COM loop, up to 5 sensors / detectors can have their LEDs lit at the same time.

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 [125]	≤ 1.3	≤ 1.3
Addressable zone interface 2335	5	20
Addressable multipurpose I/O unit 3361	2.2	max. 12[126]
Addressable 2 voltage outputs unit 3364 [127]	≤6	≤6
(Addressable) External power supply 3366	≤15	≤15
Addressable siren 3377	1	max. 13
Addressable sounder base 3379	0.75	max 3
Addressable beacon 4380	1.7	4-5
I/O matrix board 4582	max. 6	max. 6
Fan control application board 4594 [128]	4-6	4-6

[123] Extern 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.

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

[125] Detector not included.

[126] Only if the input In 0 is used as a zone line input, else approx. 2.2 mA.

[127] External 24 V DC power supply also required, e.g. the 3366 unit.

[128] 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) [129]	**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.

[129] 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[130], 1828[130] & no printers 1835**	**Units 1728, 1735, 1736, 1826, 1828 & one[131] printer 1835**
8	8 / 160	3 / 60	-
7	11 / 220	4 / 80	-
6	17 / 340	10 / 200	-
5	20 / 400	16 / 320	-
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: 8 (ohm) ÷ 25 (ohm wire resistance per 1000 m) = 320 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 = 320 (m) ÷ 2 = 160 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.

[130] Max. six 1826 / 1828 units.

[131] 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.

26 Power supply

Main power source

Normally the EBL512 G3 control unit is powered by the built-in 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[132], i.e. two Sealed Lead-Acid batteries, 12 V, 17 – 65 Ah (see tables on page 156 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 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.

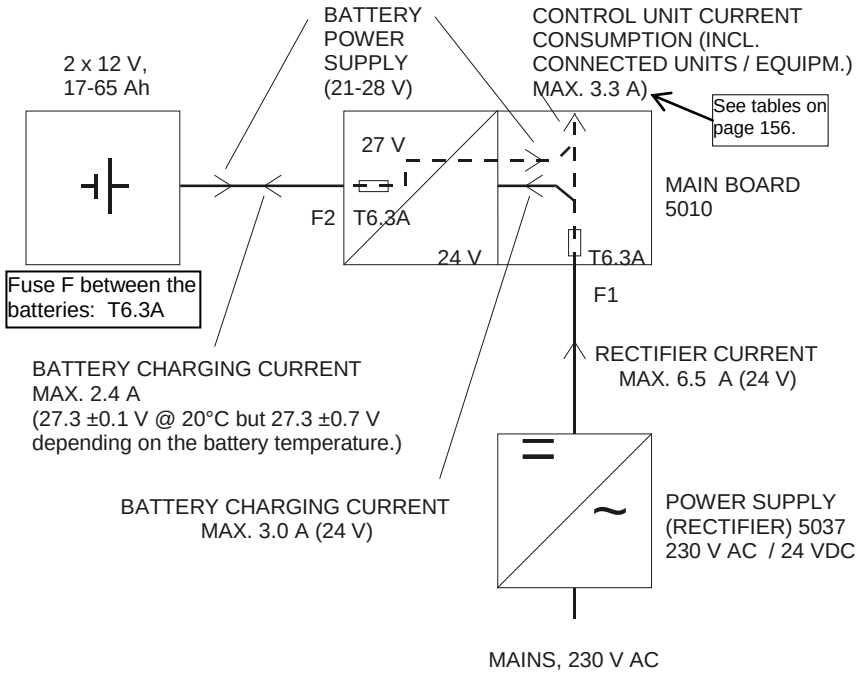


Figure 34. EBL512 G3 power supply block diagram.
Fuses F, F1 & F2: T6.3A H 250 V (5x20 mm Ceramic).
Batteries inside the c.i.e.: Max. 28 Ah.

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.

[132] **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).

26.1 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*.

26.1.1 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[133], 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.

26.1.2 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.

26.1.3 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`

[133] 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 Win512 version 2.7.x but max. 30 min. according to the EN54-2 standard), the following fault message will be shown:

  FAULT: Mains, control unit xx

26.2 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 148, to calculate the following current consumptions:

- $\mathbf{I^{CN}}$ = current consumption for the control unit[134] in normal state.
- $\mathbf{I^{RN}}$ = current consumption for all other equipment[135] in normal state.
- $\mathbf{I^{CA}}$ = current consumption for the control unit[134] in alarm state.
- $\mathbf{I^{RA}}$ = current consumption for all other equipment[136] 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 ($\mathbf{I^{TN}}$):

[134] Including the COM loop units but excl. the battery charging current.

[135] External equipment connected to the control unit (e.g. ext. FBPs, door release magnets, relays, routing equipment, etc.).

[136] External equipment connected to the control unit (e.g. ext. FBPs, sounders, relays, routing equipment, etc.).

$\mathbf{I^{TN}}$ shall be ≤ **0.93 A** if the built-in battery is a 28 Ah battery, because this results (theoretically) in 30 hours battery backup time.

$\mathbf{I^{TN}}$ is max. 3.3 A but if the required battery backup time is 30 hours $\mathbf{I^{TN}}$ can be max. **0.93 A**.

Comments regarding ($\mathbf{I^{TA}}$):

$\mathbf{I^{TA}}$ 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 155.

26.3 Rectifier (main power source)

The rectifier (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%. [137]

26.4 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 ($\mathbf{Q^N}$) and the battery capacity required in alarm state ($\mathbf{Q^A}$) respectively.

- $\mathbf{Q^N}$ (Ah) = I^{TN} (A) x battery backup time in normal state (h)
- $\mathbf{Q^A}$ (Ah) = I^{TA} (A) x battery backup time in alarm state (h)

The total battery capacity $\mathbf{Q} = \mathbf{Q^N} + \mathbf{Q^A}$ (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 ($\mathbf{I^{TN}}$) 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[138] can be placed inside the control unit.

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[137] 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.

[138] The battery's physical size is 175 x 165 x 125 mm.

A battery > (24) 28 Ah has to be placed outside the control unit.

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

26.5 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.

26.6 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 current consumption.

An approx. value is displayed via menu H5/A4.

27 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).

NOTE!
The table is valid for an EBL512 G3 control unit connected in a mixed network, i.e. both EBL512 G3 control unit(s) and EBL512 control unit(s) in the same TLON Network.

S/W for:	Latest version	Required version
5000 / 5001; EBL512 G3 United	2.7.0	2.7.0
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
1590/5090; TLON connection board	1.2	1.1
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
Win512	2.7.0	2.7.0
TLON Manager	2.0.0	1.2
1598 Web-server II (Web512 II Config tool) [139]	2.7.0	2.7.0

[139] The Web server is used in other systems as well. The web-server S/W will be downloaded via the PC program "Web512 II Config tool version 2.7.x. **NOTE!** The Web512 II Config Tool version and the EBL512 G3 United S/W version have to be the same (i.e. the first two digits; **2.7**.x -- **2.7**.x).

28 Technical data

Voltage

Primary (V AC): **230** (176-264) -- 1.6 A

System (V DC): **24**[140]

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 148

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.

[140] 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.

29 Limitations

See also "Control Unit / TLON Network", page 18.

29.1 User definable texts

At least 617[141] "User definable texts" can be programmed per c.i.e. The texts are to be distributed amongst the following:

- Alarm points (Zone / Address)
- Alarm Zones
- Interlocking Combinations
- Ext. faults

At least 617 "User definable texts" can be programmed per 1728, 1735, 1736, 1826 and 1828 unit.[142]

29.2 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...

[141] The 90 most common words will be stored in a special list, which gives more memory available for the rest of the texts, i.e. the **exact** number of texts is impossible to specify.

[142] 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	250	
External fault via progr. input		50
Programmable outputs (= control expressions)[143]	200	
Addressable 2 voltage outputs unit 3364	40	
Interlocking Combinations	200	1000[144]
Presentation numbers / alarm points[145] that can be presented in the display(s) in case of fire alarm	512	512
Presentation numbers[145] that can be programmed	512	30 x 512 = 15 360
Zones[146] that can be programmed	512	512[147]
Faults		300
Disabled zones		512
Disabled alarm points (zone/address) + Disabled COM loops		200[148]
Disabled outputs		200[149]
Disabled interlocking outputs		200[150]
Sensors activating SERVICE signal	100	
Max. number of AAF zones (Max. 5 detectors per AAF zone.)[151]	100	

[143] Approx. 1000 trigger conditions can be used in these control expressions.

[144] Max. 100 user definable texts can be displayed "at the same time".

[145] Presentation number is a ZONE only or ZONE – ADDRESS.

[146] Any zone number between 001 and 999 can be used for the 512 zones.

[147] Theoretically 999 zones can be programmed but according to EN54-2 it shall be possible to present all "fire alarms" in the display, i.e. max. 512.

[148] Zone/address disabled via time channel not included.

[149] Control outputs disabled via menu H2/B7 and Alarm devices disabled via menu H2/B8 not included.

[150] Interlocking outputs disabled via 000/00 in menu H9/C4 not included.

[151] Used in conjunction with the AAF Control, which is available on the Australian market only.

30 National regulations

When planning a fire alarm installation, national regulations, customer demands, etc. have to be followed.

EBL512 G3 United version 2.7.x is very flexible. Many functions / facilities are built-in the system, e.g. in the S/W and Win512 version 2.7.x.

When downloading S/W and SSD, different settings, conventions, languages, etc. can be set to fulfil national regulations.

31 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.

32 Revision history

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