Matsushita Electric Works
Fire & Security Technology AB

Planning Instructions

MEW00443

Revision -

Fire Alarm System EBL512
V1.44.x

Author: Jan Pettersson	Date: 2003-09-08	Rev. date:
Checked by: Mikael Östergren	S-class: Public	Rev. by:
Approved by: Rutger Pålsson		Number of pages: 89

This page has deliberately been left blank.

Table of contents

Enclosed:

Drawings according to the valid Table of drawings.

1 Introduction

EBL512 Planning Instructions, is a document intended to be used by planning engineers as well as service / commissioning engineer.

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. these are matters for the planning engineers and are not described in this document.

Due to continual development and improvement, different SW versions are to be found. This document is valid for **SW version 1.44.x**.

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

Products

A product consists of one or more parts (HW). A product has an article number (often incl. a country code), a product name and a type number.

HW

A HW (e.g. a **p**rinted **c**ircuit **b**oard; p.c.b.) has an article number (sometimes incl. a country code), a product name and a type number. A p.c.b. also have a p.c.b. number and could have a configuration (country / language), revision and SW.

SW

A SW has a version number and could have additional information, such as:

Convention (different functions / facilities)

Language

Number of addresses, etc.

2 Definitions / Explanations

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

2.1 MFSTech

Matsushita Electric Works **F**ire & **S**ecurity **Tech**nology AB

2.2 Alarm points

Units which can generate fire alarm (in the control unit), i.e. a sensor, a conventional detector, a manual call point, etc.

2.2.1 Smoke detector

Two types of analog and conventional smoke detectors are available: photo electric (optical) and ionization.

2.2.2 Sensor

Sensor = Analog detector

2.2.3 Analog detector

Contains an A/D-converter. The **C**ontrol **U**nit pick up the digital values ("sensor values") for each detector individually. All evaluations and "decisions" are then made in the C.U. Detector types **3**xxx are addressable. An analog detector has to be plugged in an **ASB** (see below).

2.2.4 (Analog) Sensor Base (ASB)

A sensor is plugged in an ASB, which is connected to a COM loop (see below). Base types **2**xxx are addressable.

2.2.5 Conventional detector

Detector with two statuses, normal or fire alarm. The detector contains a closing contact and a series alarm resistor. Some types are plugged in an **ADB** (see below) or a **CDB** (see below). Some types are also available as addressable, to be connected to a COM loop (see below).

(Normally plugged in a **CDB** (see below), connected to a conventional zone line with end-of-line resistor.)

2.2.6 Conventional Detector Base (CDB)

A conventional detector is plugged in a CDB, connected to an external line, an addressable zone interface, conventional zone line, etc.

2.2.7 Addressable Detector Base (ADB)

A conventional detector is plugged in an ADB, connected to a COM loop (see below).

2.2.8 Addressable

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

(The unit can consequently be an addressable zone interface, to which one or more conventional "alarm points" can be connected.).

2.2.9 Old detector

Conventional detector with a closing contact (short circuit; no alarm resistor), or detector with two breaking contacts.

2.2.10 External line / Conventional zone line

Input (to an ADB / an addressable zone interface or expansion board), intended for one or more conventional alarm points. End-of-line resistor in the last alarm point.

2.2.11 ADB input / Addressable zone interface

Unit with an input (ext. line / conventional zone line) intended for one or more conventional alarm points. End-of-line resistor in the last alarm point.

2.3 Output unit

Addressable unit with programmable control outputs. To be connected to a COM loop (see below).

2.4 Output / Control output

Defined or programmable function. Relay or (supervised / monitored) voltage output, in the C.U. or an output unit.

2.5 Short circuit isolator

Addressable unit for automatic disconnection of a part of a COM loop (see below) in case of a short circuit on the loop.

2.6 Display unit

Addressable unit for fire alarm presentation (incl. user definable text messages, if programmed). Connected to a COM loop (see below).

2.7 COM loop

Loop = a cable, with two wires, to which all the addressable MFSTech units can be connected. It starts in the C.U. and it returns back to the C.U.

2.8 BS4 loop

Loop = a cable, with two wires, to which all the addressable Autronica (BS100) units can be connected. It starts in the C.U. (EBL512) and it returns back to the C.U.

2.9 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. Indicates fire alarm, fault condition, etc. Fire Brigade Panel & Control Panel (see below) included or not included. Printer included or not included.

2.10 Fire Brigade Panel (FBP)

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

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

2.11 Control panel (CP)

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

2.12 System

Several control units connected via a TLON network (co-operating control units).

2.13 Network / TLON® / LonWorks® / Echelon / Node / TLON Conn. board / Gateway / Sub net / 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[1] for communication between several units/nodes. The protocol is 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 is plugged in the control unit. (Some old types of control units, not prepared for network connection, have to be connected via a serial interface and a Gateway).

A network can be one sub net (FTT-10) or several sub nets, connected via routers.

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

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

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

2.14 LED

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

2.15 External Indicator (LED)

A unit with an LED. Connected to an ASB, ADB, CDB or a detector, with a built-in LED. Lit when the built-in LED is lit.

2.16 Display / LCD

LCD (**L**iquid **C**rystal **D**isplay) = Display for presentation of fire alarms, fault messages, etc. Normally alphanumeric characters and backlight.

2.17 Door open / Key switch

In most EBL512 configurations there is a door switch which is activated when the control unit door is opened. In some configurations does a key switch replace this door switch.

The LED "Key switch" is indicating "door open" / key switch in position "access".

2.18 SSD / Site Specific Data

This data is unique for each installation. All alarm points, presentation numbers, user definable text messages, programmable outputs, etc. are programmed (configured) in the PC program **Win512** and has to be downloaded in EBL512.

2.19 SW / Software / System program

The SW makes the control unit (the microprocessor) work. It is factory downloaded but a new version can be downloaded in EBL512 on site.

3 Overview

3.1 The EBL512 system

EBL512 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. Up to 512 addresses can be connected to each control unit (c.i.e.).
Regarding alarm points, outputs, display units, etc. see chapter "Definitions / Explanations", page 6.

EBL512 is available in several types, versions and configurations. It can be connected to a TLON network, a "system", with up to 30 independent control units. Each control unit has total access to all information.

EBL512 is designed according to the European standards EN 54, part 2 and 4.

3.1.1 Expansion boards

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

1580 8 zones expansion board

1581 8 relays expansion board

1582 External FBP interface board[2]

1583 German FBP interface board[3]

1584 Autronica interface board (four BS4 loops)[4]

3.1.2 Printer

Control unit 1549 is equipped with a printer.
In control unit 1548 it is possible to mount a printer 1558.

3.2 SW Versions

Due to continual development and improvement, different SW versions could be found.
When installing a new control unit in a system with "older" control units, you may have to update the SW in the old control units.
It is highly recommended to have the same SW version in all control units

---

[2] Max. two 1582 boards per control unit.

[3] Max. one 1583 board per C.U. 1583 board is **not** possible to use in Swedish convention.

[4] Max. four 1584 boards per control unit.

3.3 Documents

The following documents are available:

- Planning instructions (incl. drawings)
- Operating instructions

Normally information that is found in one document is not to be found in another document, i.e. the documents complements each other.

3.4 Applications

The EBL512 system is intended for small, medium and large installations. The intelligent control units offer the system designer and end user a technically sophisticated range of facilities and functions. Programming (PC SW Win512) and commissioning of the control unit / system is very easy. Start with one control unit and then, when 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 SW

Win512 is used for programming and commissioning one or more control units:

- downloading / backup of site specific data (SSD)
- downloading of SW / settings / convention / configurations / C.U. & system data / etc.
- create and download the user definable text messages shown in the alphanumeric display in the C.U. / ext. FBP and in the Display units.

TLON Manager is used for programming of network data / addresses / etc.

NEWTEXT (DOS based "older" program) could be used to create / download the user definable text messages shown in the display units connected to the COM loops.

4 Control Unit / TLON Network

An installation could be **one control unit (c.i.e.)** or up to 30 control units in a system, i.e. a **TLON network**.

In a TLON network each control unit works independent and has still total access to all information in the system.

The alarm points and their "belonging" outputs should normally, for safety reasons, be connected to the same control unit.

5 Control Units 1548 - 1550

Figure 1. EBL512 Control Unit (1548 / 1549). The look may vary according to configuration.

Depending on country (language), convention (functions), configuration, etc. the look may vary and also the max. number of loop units (addresses).

Each control unit has in the basic configuration:

- 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).
- Two 24 V DC outputs (e.g. power supply of routing equipment and external equipment respectively). Connections and more information, see dwg. 512-44.
- Two not programmable relay outputs for routing equipment (Fire brigade tx and Fault tx respectively). Connections and more information, see dwg. 512-44.
- Built-in power supply (rectifier and batteries). Connections and more information, see dwg. 512-32.

The control unit could also be equipped with expansion boards, TLON network connection board, printer board, etc.

Three types of control units are available:

Type no.	Product[5]	Front adhesive (FBP & CP)	Printer
1548	EBL512 Control unit. No expansion boards.	Yes	No[6]
1549	EBL512 Control unit. No expansion boards.	Yes	Yes
1550	EBL512 Control unit. No expansion boards.	No	No

The control unit is housed in a grey metal cabinet. The door has a Plexiglas ahead of the FBP, see Figure 1. When the door is open, you fully see the front adhesive (the **F**ire **B**rigade **P**anel, **FBP**, and **C**ontrol **P**anel, **CP**), see Figure 2.

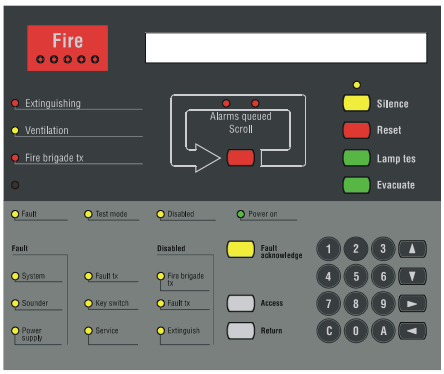

Figure 2. Front adhesive; FBP (upper black part) and CP (lower grey part) in EBL512. The look may vary according to configuration. (English config. in figure).

The fire brigade personnel use the FBP to see which alarm point(s) having generated fire alarm. In the display (LCD, 2x40 alphanumeric characters), is on the first row displayed the zone number and the address within the zone. On the second row is shown a user definable text message, if programmed. Required fire brigade personnel manoeuvres can be performed from the FBP.

The CP is used to "communicate" with the system, e.g. for commissioning, monthly tests or maintenance. 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 different manoeuvres. The CP has several system status LEDs.

NOTE! Regarding LED indicators, keypad / push buttons and access levels, see EBL512 Operating Instructions.

---

[5] Basic configuration could be max. 128, 256 **or** 512 loop units (addresses).

[6] Afterwards printer board 1558 could be mounted in control unit 1548.

5.1 COM loops

The control unit has four COM loops (0-3), to which loop units are connected.

Connections according to dwg 512-41, -51 - -55 and –61 - -62.

On each COM loop can a number of COM loop units be connected. Regarding the types and number of COM loop units in relation to the cable length, see dwg 512-01 and -02.

Each COM loop unit has a technical number and each alarm point and zone line input has a presentation number. See EBL512 Operating Instructions for more information.

Break or short circuit on a COM loop

Normally the control unit communicates with the units in one direction, which is automatically changed every 12 hours.

NOTE! If the break appears between the last unit and the control unit it might take up to 12 hours until it is detected.

By a single break on a loop, between the control unit and the last unit, the following will happen:

- Communication will start in both directions.
- Since it is a single break all units will now be "found" by the control unit. A fault is generated and a fault message is shown:
  FAULT: `Cut-off COM-loop x, CU x`
- Each 10 minutes an attempt is made to communicate in one direction again. When the break is repaired the communication in one direction starts again.
- Regarding Fault acknowledge, see EBL512 Operating Instructions.

By two or more breaks on a loop, between the control unit and the last unit, the following will happen:

- Communication will start in both directions.
- Since it is not a single break all units will not be "found" by the control unit. A fault is generated for each unit not found and fault messages are shown:
  `FAULT: No reply techn. no. xxxxxx`
- Each 10 minutes an attempt is made to communicate in one direction again. When the breaks are repaired the communication in one direction starts again.
- Regarding Fault acknowledge, see EBL512 Operating Instructions.

By a short circuit on a loop, the following will happen:

- Communication will stop. The loop is disabled.
- A fault is generated and a fault message is shown:
  FAULT: `Short-circuit loop x, CU xx`
- Each 10 minutes an attempt is made to re-enable the loop. When the short circuit is repaired the communication starts again.
- Regarding Fault acknowledge, see EBL512 Operating Instructions.

NOTE! If one or more short circuit isolators are used, the loop will be divided into "segments" (the part between two short circuit isolators or between the control unit and one short circuit isolator). This will minimise the number of units disabled by a short circuit.

5.2 Programmable voltage outputs (S0-S3)

These outputs are supervised (monitored)[7]. Connections according to dwg 512-42. When connections are done a calibration has to be done. See EBL512 Operating Instructions chapt. "Calibration of monitored outputs (menu H5/A1)".

Each output has to be programmed (Win512) regarding:

- Type
- Logic, i.e. normally high (24 V DC) **or** normally low.
- Activation time and type (steady, pulse delay, etc.)
- Control expression

For more information, see Win512 help or chapt. "Programmable outputs", page 47.

5.3 Programmable relay outputs (R0-R1)

Connections according to dwg 512-42.

Each output has to be programmed (Win512) regarding:

- Type
- Logic, i.e. normally open (NO) **or** normally closed (NC) contacts
- Activation time and type (steady, pulse delay, etc.)
- Control expression

For more information, see Win512 help or chapt. "Programmable outputs", page 47.

---

[7] This is default, but via Win512 it is possible to set each output (S0-S3) individually to be not supervised.

5.4 Programmable inputs (I0-I3)

Connections according to dwg 512-43.

Each input has to be programmed (Win512) regarding:

- Trigger condition (Triggered by)
- Logic, i.e. normally open (NO) **or** normally closed (NC) contacts
- Additional information when required: Fault no., Zone, Address and Fault message (Error text)

For more information, see Win512 help or chapt. "Programmable inputs", page 43.

5.5 Relay outputs for routing equipment (tx)

Not programmable outputs.

5.5.1 Fire alarm output

This output is normally used for routing equipment (Fire brigade tx). It is a change-over relay contact that will be activated when fire alarm is generated in the control unit (c.i.e.)[8].

Activated output is (normally) indicated by the LED " Fire brigade tx".[9]

5.5.2 Fault output

This output is normally used for routing equipment (Fault tx).

It is a change-over relay contact that is normally activated and will be de-activated when fault is generated[10] in the control unit (c.i.e.)[11].

Activated output is indicated by the LED "Fault tx".

---

[8] The output must not be disabled via "door open" or via menu H8/S1.

[9] This output and programmable outputs, type of output 4 = Routing equipment, will normally turn on the LED but it is possible to use a programmable input, trigger cond. 15 = Activated routing equipment, to turn on the LED instead.

[10] Also when there is no power supply (e.g. rectifier and battery out of work) and "Watch-dog fault.

[11] The output must not be disabled via "door open" or via menu H8/S1.

6 Expansion boards 1580 – 1584

In each control unit can be mounted up to six expansion boards. See drawings 512-15 & -16.

- Board no. **one** is connected directly to the connection board SBUS connector J5 ("D" type).
- Between board no. one and **two**, a connection cable 1585 (male/ male) is required.
- Board no. **three** is connected directly to board no. two.
- Between board no. three and **four**, a connection cable 1586 (female / female) is required.
- Board no. **five** is connected directly to board no. four.
- Between board no. five and **six**, a connection cable 1585 (male/ male) is required.

Win 512 is used for the expansion board programming. For more information see the Win512 help.

6.1 Expansion board address setting

On each board there are address setting jumpers (BY1-BY3).
For **each type** of the boards 1580, 1581, 1582 and 1584, an address has to be set. Each type is descibed in the following chapters.
There can only be one 1583 board connected and because of that no jumpers should be set on this board.
On the 1584 board, BY3 is used for other functions.

Each type of board	Board no.	BY1	BY2	BY3
First board	0			
Second board	1	**X**		
Third board	2		**X**	
Fourth board	3	**X**	**X**	
Fifth board	4			**X**
Sixth board	5	**X**		**X**

X = Jumper set.
(If only one board of each type is used, check that they all have the address . no jumpers set.)

Figure 3. Expansion boards 1580 – 1584. Address setting table.

6.2 8 zones expansion board 1580

Up to six 1580 boards can be used.

This board has eight inputs for conventional zone lines (i.e. for conventional detectors). In the last unit on each zone line an end-of-line resistor (4K7) has to be connected.

Connections according to dwg 512-46.

Each zone line input has to be programmed (Win512) regarding:

- Type of detectors (i.e. if a short circuit on the line should generate a fault or a fire alarm)
- Zone number (plus address within the zone when required)
- User definable text message (when required)
- Alert annunciation, steady ON or ON/OFF via a time channel
- Disablement via a time channel
- Fire alarm delay
- 2-zone-dependent fire alarm (set in the Win512 System dialog box)

6.3 8 relays expansion board 1581

Up to six 1581 boards can be used.

This board has eight programmable relay outputs (0-7).

Connections according to dwg 512-47.

Each output has to be programmed (Win512) regarding:

- Type
- Logic, i.e. normally open (NO) **or** normally closed (NC) contacts
- Activation time and type (steady, pulse delay, etc.)
- Control expression

For more information, see Win512 help or chapt. "Programmable outputs", page 47.

6.4 External Fire Brigade Panel (FBP) interface board 1582

Up to two 1582 boards can be used. Because of high components on the board, a 1582 board always has to be mounted "on top".[12]

This board has an interface for up to eight external FBPs (or data converters)[13].

All fire alarm information shown in the c.i.e.'s FBP will also be shown in the ext. FBP(s).
NOTE! Only the ten latest fire alarms will be sent out to the ext. FBPs / Data converters. When **only Data converters** are connected to a 1582 board, jumper BY4 on that board could be set ("on place"), in order to send out all fire alarms to the Data converters.

Connections according to dwg 512-47.

Each board has to be programmed (Win512) regarding:

- Number of ext. FBPs (or data converters)

6.5 German FBP interface board 1583

Only one 1583 board can be used.[14] (BY1-3 must not be used for address setting).

This board has inputs and outputs for one German FBP (Feuerwehr Bedienfeld).

This board also has inputs and outputs for one German extinguishing equipment (VdS Standard Schnittstelle "Löschen").

Connections according to dwg 512-50.

Each board has to be programmed (Win512) regarding:

- Activation (Time Activation Output x; Output type 0=steady only), see chapter "Time activation", page 51.
- Control expression (For more information, see Win512 help or chapt. "Programmable outputs", page 47.)

6.6 Autronica interface board 1584

Up to four 1584 boards can be used. (BY3 must not be used for address setting).

---

[12] I.e. when no other boards are used, only one 1582 board can be used.

[13] Ext. FBP incl. printer has a high current requirement. See chapt. "Current consumption", page 78 for more information. Regarding ext. FBPs and Data converters see also chapt. "Other units", page 39.

[14] Can not be used in Swedish (RUS) convention.

This board has four BS4 loops (0-3), to which Autronica (BS-100) loop units are connected.

Each board is to be programmed (Win512).

On each BS4 loop up to 99 BS4 loop units can be connected. Regarding the BS4 loop units, se separate Autronica documents.

Each BS4 loop unit has a technical number and each alarm point and zone line input has a presentation number. See EBL512 Operating Instructions for more information.

Each BS4 loop unit is to be programmed (Win512) regarding:

- Alarm algorithm (some units only)
- Zone number plus address within the zone
- User definable text message (when required)
- Alert annunciation, steady ON or ON/OFF via a time channel (some units only)
- Disablement via a time channel (some units only)
- Fire alarm delay (some units only)
- 2-zone-/unit-dependent fire alarm (some units only)

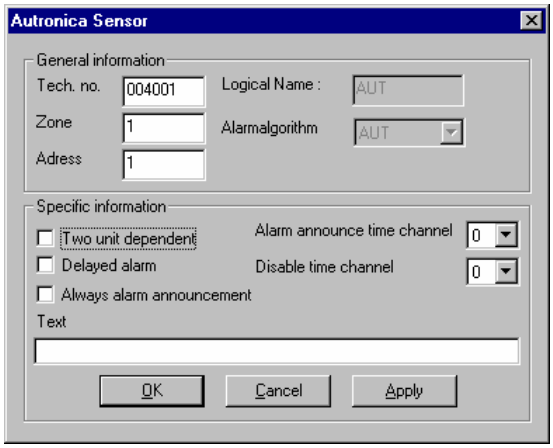

Figure 4. Autronica Sensor dialog box in Win512.

For more information see Win512 help or separate Autronica documents.

Connections according to dwg 512-48.

Break or short circuit on a BS4 loop

Normally the control unit communicate with the units in one direction, which is automatically changed every 12 hours.

NOTE! If the break appears between the last unit and the control unit it might take up to 12 hours until it is detected.

By a single break on a loop, between the control unit and the last unit, the following will happen:

- Communication will start in both directions.
- Since it is a single break all units will now be "found" by the control unit. A fault is generated and a fault message is shown:
  `No connection loop x, BS4-Board x, CU xx`
- Each 10 minutes an attempt is made to communicate in one direction again. When the break is repaired the communication in one direction starts again.
- Regarding Fault acknowledge, see EBL512 Operating Instructions.

By two or more breaks on a loop, between the control unit and the last unit, the following will happen:

- Communication will start in both directions.
- Since it is not a single break all units will not be "found" by the control unit. A fault is generated for each unit not found and fault messages are shown:
  `FAULT: No reply techn. no. xxxxxx`
- Each 10 minutes an attempt is made to communicate in one direction again. When the breaks are repaired the communication in one direction starts again.
- Regarding Fault acknowledge, see EBL512 Operating Instructions.

By a short circuit on a loop, the following will happen:

- Communication will stop. The loop is disabled.
- A fault is generated and a fault message is shown:
  `Short circuit loop x, BS4-Board x, CU xx`
- Each 10 minutes an attempt is made to re-enable the loop. When the short circuit is repaired the communication starts again.
- Regarding Fault acknowledge, see EBL512 Operating Instructions.

NOTE! If one or more short circuit isolators are used, the loop will be divided into "segments" (the part between two short circuit isolators or between the control unit and one short circuit isolator). This will minimise the number of units disabled by a short circuit.

7 Printer board 1558

The control unit type 1549 has a factory mounted printer board 1558.

The control unit type 1548 can be provided with a printer board 1558. It is mounted on the inner door backside and is at the same time connected to the main board 1556.

Via Win512 (Control Unit dialog box) it is programmed that a printer is added.

8 TLON connection board 1590

One 1590 board is used in each control unit connected to a TLON network.

This board is mounted on the main board 1556 and the network is connected to the connection board 1555 according to dwg 512-44.

The PC program TLON Manager is used for the required TLON network programming.

9 Peripheral devices

Alarm points are connected to COM loops[15], 8 zones expansion boards (1580), Autronica interface boards (1584) and programmable inputs (I0-I3) in the control unit.

Short circuit isolators are connected to COM loops (and BS4 loops).

Sounders, door release magnets, etc. are connected to output units (conn. to the COM loops) and/or in the control unit (to programmable outputs S0-S3 and/or R0-R1 and/or 8 relays expansion boards 1581).

Input devices as key cabinet, timers, external faults, etc. are connected to programmable inputs (input units conn. to the COM loops and/or in the control unit).

Display units are connected to COM loops.

Routing equipment (Fire brigade tx / Fault tx) is normally connected to outputs in the control unit (and when required to programmable outputs).

External Fire Brigade Panels (and Data Converters) are connected via Ext. FBP interface board(s) (1582).

German external Fire Brigade Panel (*Feuerwehr-Bedienfeld*) is connected to German FBP interface board 1583, which also has a connector for a German Extinguishing equipment (*Schnittstelle "Löschen"*).

Regarding abbreviations, se chapt. "Definitions / Explanations", page 6.

9.1 COM loop units

On each COM loop can up to 128 addressable units be connected, i.e. this is the maximum number of addresses. Depending on the type of units connected and the number of units the total current consumption will vary and this will affect the cable length. See chapt. "Current consumption", page 78 and drawings 512-01 & -02.

NOTE! The control unit can be configured for up to 128, 256 or 512 addresses (loop units). Normally this is factory set but can be changed on site (via Win512)[16]. In menu H4/U9 is the current configuration shown.

[15] Directly or via input units connected to the COM loops.

[16] This action require a separate download password, see EBL512 Operating Instructions.

Address setting

Each unit on one COM loop has to have a unique address. This is normally set on a DIL switch in each unit (**A** in the Figure 5, page 26) but an Address Setting Tool (3314) has to be used for some units (see **AST** in the Figure 5, page 26).

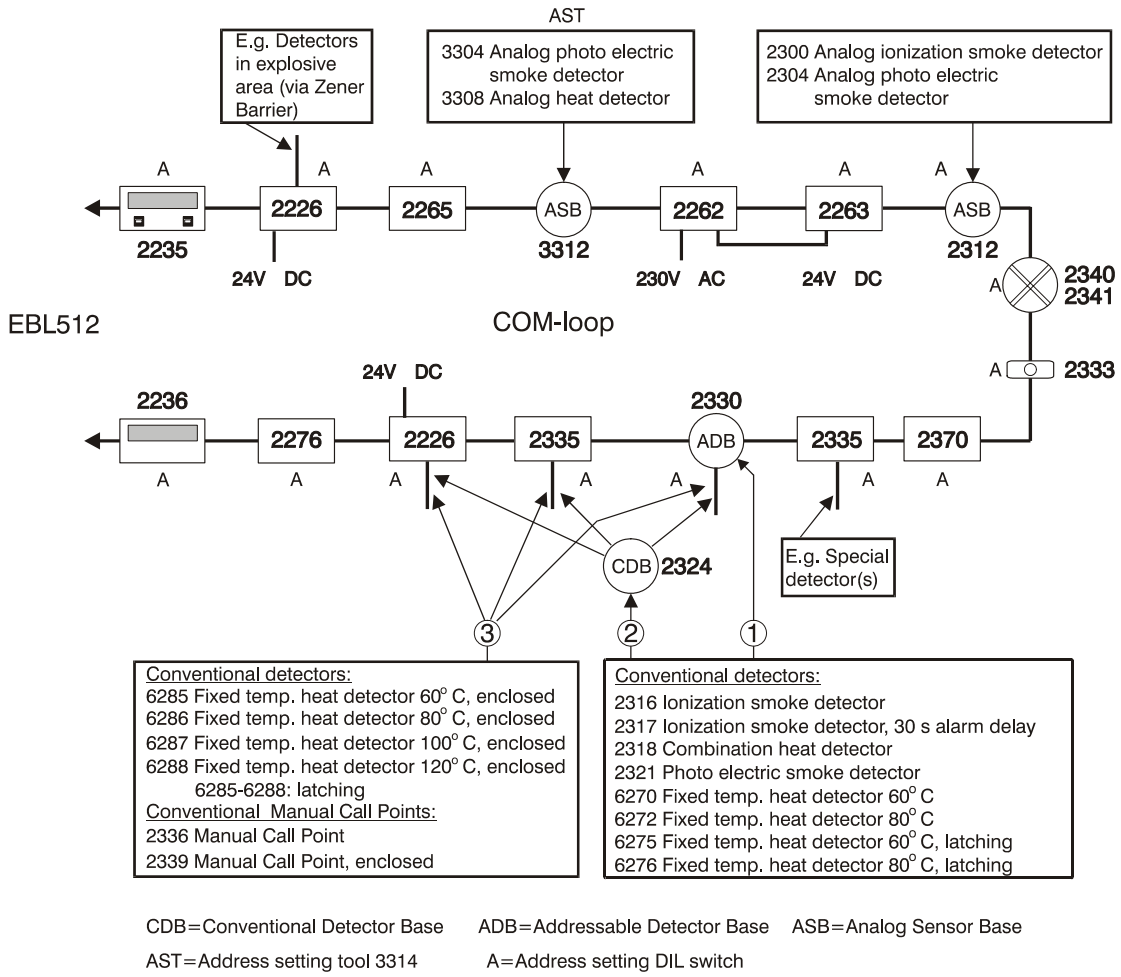

Figure 5. Units that can be connected to the COM loops. More explanations to the figure in the following chapters.

① = Conventional MFSTech detectors to be plugged in an Addressable Detector Base connected to a COM loop.

② = Conventional MFSTech detectors to be plugged in an Conventional Detector Base connected to a conventional zone line input.

③ = Conventional MFSTech detectors to be connected to a conventional zone line input.

Conventional MFSTech detectors can also be connected to an 8 zones expansion board (1580) zone line input.

Other conventional detectors, e.g. with a closing contact and no alarm resistor, can be connected to a 2226, 2335, 2330 zone line input or to an 8 zones expansion board (1580) zone line input.

Older conventional detectors, with breaking contacts, can be connected to a 2226 zone line input loop.

9.1.1 Input units

Each COM loop input unit is to be programmed (Win512), depending on type, regarding:

- Alarm algorithm (some units only)
- Zone number plus Address within the zone
- User definable text message (when required)
- Alert annunciation, steady ON or ON/OFF via a time channel (some units only)
- Disablement via a time channel (some units only)
- Fire alarm delay (some units only)
- 2-zone-/-unit-dependent fire alarm (some units only)

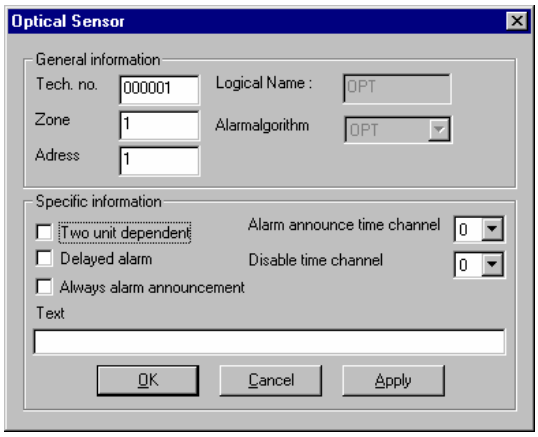

Figure 6. Optical Sensor (Analog photo electric smoke detector 2304) dialog box in Win512.

For more information, see Win512 help.

Connections, see dwg. 512-41, -46, -51 - -55.

9.1.1.1 Analog Sensor Bases

3312 Analog Sensor Base (ASB). For analog detectors (Sensors) to be plugged in 3312, see Figure 5, page 26. Terminals for ext. LED 2216.

2312 Analog Sensor Base (ASB). For analog detectors (Sensors) to be plugged in 2312, see Figure 5, page 26. Built-in LED that is lit to indicate that the plugged sensor has generated fire alarm. Terminals for ext. LED 2216. DIL-switch for address setting.

9.1.1.2 Addressable Detector Base

2330 Addressable Detector Base (ADB).[17] For conventional detectors to be plugged in 2330, see Figure 5, page 26. Built-in LED which is lit to indicate that the plugged detector has generated fire alarm. Terminals for ext. LED 2216 **or** zone line input ("Ext. line"). DIL-switch for address setting.
For conventional detectors to be connected to the zone line input ("Ext. line"), see Figure 5, page 26. End-of-line resistor (10K) is to be connected in the last unit on the zone line.

9.1.1.3 Addressable Input Units

2335 Addressable zone interface.[18] For conventional detectors to be connected to the zone line input ("Zone"), see Figure 5, page 26. End-of-line resistor (10K) is to be connected in the last unit on the zone line. DIL-switch for address setting.
To be mounted in an E1-box / frame (min. 30mm) or a Swedish 65mm circular mounting box.

2226 Addressable zone interface, isolated.[19] For conventional detectors to be connected to the zone line input ("Zone"), see Figure 5, page 26. End-of-line resistor (10K or 3K3) is to be connected in the last unit on the zone line. Old detector types with breaking contacts can also be connected ("Zone Loop"). For more information see dwg 512-54. 2226 require external power supply 24V DC (20mA). DIL-switch for address setting.
To be mounted in an E1-box / frame (min. 50mm) or a Swedish 65mm circular mounting box.

2276 Addressable 8 inputs unit. Programmable opto-inputs. Bi-polarized opto couplers, 24V DC (6mA), normally high or low. Regarding trigging conditions see chapt. "Programmable inputs", page 43. For more information see dwg 512-52.
DIL-switch for address setting. To be mounted in an E1-box / frame (min. 30mm).

---

[17] In convention "British Standard (Marine Application)", the detector plugged in a base 2330, has a response time ≤ 5 seconds.

[18] In convention "British Standard (Marine Application)", a fire alarm generated via the 2335 unit, has a response time ≤ 5 seconds.

[19] In convention "British Standard (Marine Application)", a fire alarm generated via the 2226 unit, has a response time ≤ 5 seconds.

9.1.1.4 Addressable Manual Call Point

2333 Addressable Manual Call Point[20]. A built-in LED[21] will indicate that fire alarm is generated, i.e. the glass is broken. Functional test can be performed with a special test key[22] without breaking the glass. A hinged polycarbonate flap is protecting the glass. DIL-switch for address setting. 2333 is to be surface mounted in the enclosed red box or flush mounted in a Swedish 65mm circular mounting box.

9.1.1.5 Addressable Conventional Detectors

2340 Addressable fixed temperature heat detector, 60°C, enclosed. Built-in LED that is lit to indicate that the detector has generated fire alarm. Terminals for ext. LED 2216. DIL-switch for address setting.

2341 Addressable fixed temperature heat detector, 80°C, enclosed. Built-in LED that is lit to indicate that the detector has generated fire alarm. Terminals for ext. LED 2216. DIL-switch for address setting.

9.1.1.6 Analog Detectors

2300 Analog ionization smoke detector. To be plugged in an ASB 2312.

2304 Analog photo electric smoke detector.[23] To be plugged in an ASB 2312.

3304 Analog photo electric smoke detector.[23] To be plugged in an ASB base 3312. Built-in LED that is lit to indicate that the detector has generated fire alarm. Address is set with an Address setting tool (AST) 3314.
NOTE!
3304+3312 in **NORMAL mode** (set on 3314): This is for a future SW version, 2.x, and can not be used in this SW version.
3304+3312 in **2312 mode** (set on 3314): This is the same as 2304+2312. (3304+3312 is a spare part for 2304+2312)

---

[20] In conventions "British Standard" and "British Standard (Marine Application)", the manual call points have a response time ≤ 5 seconds.

[21] If switch no. 8 on the address setting DIL-switch is set to ON, the LED will blink each time the control unit communicates with the m.c.p.

[22] Delivered together with the m.c.p.

[23] In convention "British Standard (Marine Application)", the detector has a response time ≤ 10 seconds.

3304+3312 in **2330 mode** (set on 3314): This is the same as 2321[24]+2330[25]. (3304+3312 is a spare part for 2321+2330)

3308 Analog heat detector. To be plugged in an ASB base 3312. Built-in LED that is lit to indicate that the detector has generated fire alarm. Address is set with an Address setting tool (AST) 3314.
NOTE!
3308+3312 in **NORMAL mode** (set on 3314): This is for a future SW version, 2.x, and can not be used in this SW version.
3308+3312 in **2312 mode** (set on 3314): This mode can not be used for 3308.
3308+3312 in **2330 mode** (set on 3314): This is the same as 6270[26]+2330[25], i.e. 3308 works as a fixed temperature heat detector, 60°C. (3308+3312 is a spare part for 6270+2330)

9.1.1.7 Address Setting Tool

3314 Address setting tool. Is used to set or read the 3304 and 3308 detectors' address (000-127) on the COM loop. It is also used to set or read the detector mode, **NORMAL**, **2330** or **2312** (see 3304 and 3308 resp.). Put the ON/OFF switch in pos. ON and wait for a beep. "Plug" the detector in the tool (SA & SB terminals). Press "READ" and read the address and mode **or** press "WRITE" and "READ" at the same time to select the mode, write the address and press "WRITE" to program the detector.

9.1.1.8 Conventional Detector Base

2324 Conventional Detector Base (CDB). For conventional detectors to be plugged in 2324, see Figure 5, page 26. Built-in LED that is lit to indicate that the plugged detector has generated fire alarm. Terminals for ext. LED 2216.

9.1.1.9 Conventional Detectors

2316 Ionization smoke detector. To be plugged in an ADB 2330 or a CDB 2324.

2317 Ionization smoke detector, 30 sec. alarm delay. To be plugged in an ADB 2330 or a CDB 2324.

---

[24] 2321, 2320 or 6217.

[25] NOTE! 2330 has a conventional zone line input ("Ext. Line"). This type of input is not to be found in 3312.

[26] 6270 or 6275.

2318 Combination heat detector. Rate-of-rise **and** fixed temperature, 58°C, heat detector. To be plugged in an ADB 2330 or a CDB 2324.

2321 Photo electric smoke detector. To be plugged in an ADB 2330 or a CDB 2324.

6270 Heat detector. Fixed temperature heat detector, 60°C. To be plugged in an ADB 2330 or a CDB 2324.

6272 Heat detector. Fixed temperature heat detector, 80°C. To be plugged in an ADB 2330 or a CDB 2324.

6275 Heat detector. Fixed temperature heat detector, 60°C, latching. To be plugged in an ADB 2330 or a CDB 2324.

6276 Heat detector. Fixed temperature heat detector, 80°C, latching. To be plugged in an ADB 2330 or a CDB 2324.

6285 Heat detector. Fixed temperature heat detector, 60°C, latching, enclosed. Built-in LED that is lit to indicate that the detector has generated fire alarm. Terminals for ext. LED 2216.

6286 Heat detector. Fixed temperature heat detector, 80°C, latching, enclosed. Built-in LED that is lit to indicate that the detector has generated fire alarm. Terminals for ext. LED 2216.

6287 Heat detector. Fixed temperature heat detector, 100°C, latching, enclosed. Built-in LED that is lit to indicate that the detector has generated fire alarm. Terminals for ext. LED 2216.

6288 Heat detector. Fixed temperature heat detector, 120°C, latching, enclosed. Built-in LED that is lit to indicate that the detector has generated fire alarm. Terminals for ext. LED 2216.

9.1.1.10 Conventional Manual Call Points

2336 Manual call point. A built-in LED will indicate that fire alarm is generated (i.e. the glass is broken). Functional test can be performed with a special test key[27] without breaking the glass. A hinged polycarbonate flap is protecting the glass. 2336 is to be surface mounted in the enclosed red box or flush mounted in a Swedish 65mm circular mounting box.

2339 Manual call point. Enclosed (IP55). A built-in LED will indicate that fire alarm is generated (i.e. the glass is broken). Functional test can be performed with a special test key[27] without breaking the glass. A hinged polycarbonate flap is protecting the glass. 2339 is to be surface mounted in the enclosed red box.

[27] Delivered together with the m.c.p.

9.1.2 Output units (addressable)

Each COM loop output unit is to be programmed (Win512) regarding:

- Type
- Logic, i.e. relay outputs normally open (NO) **or** normally closed (NC) contacts
  alt.
  voltage outputs (24V DC) normally high **or** normally low.
- Activation time and type (steady, pulse delay, etc.)
- Control expression

For more information, see Win512 help or chapt. "Programmable outputs", page 47.

Connections, see dwg. 512-61.

2262 Addressable 4 outputs unit with power supply. The unit has four programmable, supervised 24V DC outputs (0-3) intended for e.g. sounders, etc. It also has two relay **or** 24V DC outputs (HOLD 1 & 2)[28] intended for door release magnets, etc.
2262 is to be connected to 230V AC. It has a built-in battery (2x12V, 6.5Ah) and a 24V DC output for power supply of one 2263. When two or more 2262 / 2263 units are used, a wire could be connected between the units to synchronise intermittent outputs. DIL-switch for address setting. Metal housing, size (HxWxD) 357 x 370 x 150mm. For more information, see chapt. "The 2262 / 2263 unit's Output 0 – Output 3", page 48, dwg 512-61 and the Product Leaflet.

2263 Addressable 4 outputs unit without power supply. The unit is exactly as 2262, only it has no built-in power supply. One 2263 could be power supplied from a 2262[29] (or from an external 24V DC, 4A power supply with battery backup).

2265 Addressable 4 relays output unit. The unit has four programmable outputs, i.e. four change-over relay contacts for max. 30V, 1A. DIL-switch for address setting. To be mounted in an E1-box / frame (min. 50mm).

[28] NOTE! These outputs will be de-activated 10 min. after loss of 230V AC.

[29] 2262 + 2263: BY13 shall be removed from both units.

9.1.3 Display units (addressable)

Each COM loop **Display unit** ("alphanumeric display") is to be programmed via Win512 ("Add Loop Unit").

Win512 is also used to create and download, in each unit separately, the user definable text messages that are to be shown in each Display unit respectively. (An "older" DOS based PC program, NEWTEXT, could also be used).

2235 Display unit with alert annunciation. The unit has an alphanumeric display (LCD with two lines à 20 characters[30]) for presentation of fire alarms. The display could have backlight, which require an external power supply. To reduce the current consumption on the COM loop, the display unit could have an external power supply, see chapter "Current consumption", page 78. Alert annunciation push buttons "ACKNOWLEDGE" (+LED) and "RESET". Built-in buzzer sounds before each text message. MODULAR-contact (6 pole.), used when connecting a PC for downloading the texts to be displayed. EEPROM for storing the texts (8Kb as standard and replaceable to 32Kb). DIL-switch for address setting. 2235 is to be mounted in an E2-box / frame (min. 50mm).

2236 Display unit without alert annunciation. The unit is exactly as 2235, only it has no alert annunciation push buttons (and no LED).

Connections, see dwg. 512-62.

9.1.3.1 Display of the user definable text messages

When a fire alarm is activated, an individual user definable text message will be displayed in each display unit. If a fire alarm should not be displayed in any display unit, it should be set to selective / local function (global is default), see below.

Ten texts can be displayed, via automatic scrolling, every 5th second. Before displaying each text, the buzzer sounds (0.5 sec.). The backlight[31] is lit at the first alarm and stays lit until all displayed alarms are reset.

9.1.3.2 Creating the user definable text messages

Texts are created and downloaded via **Win512**, see chapter "User definable text messages", page 69.

When the "older" DOS based PC program, **NEWTEXT** is used, the following is valid:

---

[30] A-Z, a-z (in Swedish config. Å, Ä, Ö, å, ä, ö as well), 0-9, space and !"#$%&´()*+,-./:;<=>?@^_`

[31] If external power supply is connected.

There are three types of texts:

- Free text
- Parameter text
- General alarm text ("Fixed text")

Free text

A list with the free texts is programmed. Each text consist of two rows à 20 alphanumeric characters. Each presentation number is programmed with a free text from the list. Up to 194 texts can be programmed. When more texts are required, the 8 Kb EEPROM can be exchanged to a 32 Kb, which gives a maximum of 816 texts.

Example of a free text:

Fire in the lab.
Please vacate the room.

Parameter text

One, two or three basic texts can be programmed. Each basic text can consist of two rows à 20 alphanumeric characters. Each basic text can contain a number of parameter fields. Only the digits 0-9 can be used as parameters. Each presentation number programmed together with one of the basic texts (one, two or three) and the parameters to be shown in the parameter field resp. = one parameter text. Up to 1807 parameter texts can be programmed. When more parameter texts are required, the 8 Kb EEPROM can be exchanged to a 32 Kb, which gives a maximum of 7589 parameter texts.

Example of a parameter text:
The basic text is represented by: FIRE, BUILDING, FLOOR, ROOM. The parameter fields are represented by #, $$, %%%.

FIRE BUILDING #
FLOOR $$ ROOM %%%

Free text and parameter text

When both free texts and parameter texts are required, the following formula can be used to calculate/check the number of texts resp.:

$$(F \times 35) + (A \times 4.25) \leq E - 512$$

F = Number of free texts (in the free texts list).

A = Total number of presentation numbers that activates free text and parameter text.

E = EEPROM-size, i.e. standard 8Kb = 8192,
or exchanged to 32Kb = 32768

Example: 220 detectors, 20 addressable manual call points and 10 zones are to activate texts, i.e. A=220+20+10=250. Standard EEPROM (8Kb) gives E=8192. In the formula:

$(F \times 35) + (250 \times 4.25) \leq 8192 - 512$ i.e. $F \leq 189$ free texts.

Conclusion: Up to 189 free texts may be used. The rest, 250 - 189 = 61, will be parameter texts. If there is need for more parameter texts you either have to reduce the number of free texts or exchange the 8Kb EEPROM to a 32Kb.

General alarm text ("Fixed text")

General alarm text is a (programmable) basic text with or without parameter fields.
Note! Only parameter fields = presentation number (zone-address) could be used and only in this order.

Example of general alarm text:
Basic text is represented by: FIRE, ZONE and ADDRESS. The parameter fields are represented by: ###, $$.

FIRE ZONE ###
ADDRESS $$

9.1.3.3 Global or Selective / Local function

Global function

Each fire alarm (presentation number), programmed together with a text, will be displayed. All remaining fire alarms will be displayed with the General alarm text.

Selective / Local function

This function is programmed for each fire alarm (presentation number) that should not be displayed.

Each fire alarm (presentation number), programmed together with a text, will be displayed. All remaining fire alarms will **not** be displayed.

9.1.4 Short circuit isolator (addressable)

Each COM loop short circuit isolator is to be programmed (Win512) regarding:

- Number

Connections, see dwg. 512-53. (See especially about the **L** wire!)

2370 Addressable short circuit isolator. The unit is used to minimise the number of disabled units in case of a short circuit on a COM loop. DIL-switch for address setting. To be mounted in an E1-box / frame (min. 30mm) or a Swedish 65mm circular mounting box.

Up to four 2370 can be used on each COM loop, which gives five loop segments. Each isolator has to be given a number, 0-3, and they have to be connected consecutively (0-1-2-3) on the loop.

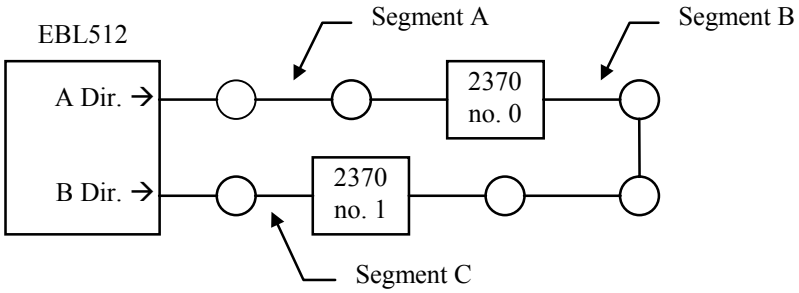

Figure 7. Two 2370 isolators connected to a COM loop gives three loop segments (Segment A, B and C). If one more 2370 is to be connected between no. 0 and no. 1 in the figure, the new one will be no. 1 and the old no. 1 will be no. 2. This require programming (Win512).

Short circuit

A short circuit[32] between the **L** and **C** wires on a COM loop with one or more 2370 isolators connected, will activate one or two 2370 isolators, a fault in the control unit and one of the following messages:

```
FAULT:Sh-circ loop x, CU xx, CU <->ASF0
FAULT:Sh-circ loop x, CU xx,ASF0<->ASF1
FAULT:Sh-circ loop x, CU xx,ASF1<->ASF2
FAULT:Sh-circ loop x, CU xx,ASF2<->ASF3
FAULT:Sh-circ. loop x, CU xx, ASF3<->CU
FAULT:Sh-circ. loop x, CU xx, ASF2<->CU
FAULT:Sh-circ. loop x, CU xx, ASF1<->CU
FAULT:Sh-circ. loop x, CU xx, ASF0<->CU
```

[32] Short circuit ≥ 1-10 seconds (depending on the cable length and where on the loop the short circuit is located).

CU = Control Unit. **ASF** = Short circuit isolator 2370.
<-> = between (i.e. that segment is disabled).

Each 10 minutes an attempt is made to de-activate the 2370 isolator(s), i.e. when the short circuit is gone, the segment will be re-enabled again and the isolated units will work normal again.

Break

A single break on a loop will result in a two way communication on the loop, a fault in the control unit and one of the following messages:

```
FAULT:Cut-off loop x,CU xx, CU <->ASF0
FAULT:Cut-off loop x, CU xx,ASF 0<->ASF 1
FAULT:Cut-off loop x, CU xx,ASF 1<->ASF 2
FAULT:Cut-off loop x, CU xx,ASF 2<->ASF 3
FAULT:Cut-off loop x, CU xx,ASF 3<->CU
FAULT:Cut-off loop x, CU xx,ASF 2<->CU
FAULT:Cut-off loop x, CU xx,ASF 1<->CU
FAULT:Cut-off loop x, CU xx,ASF 0<->CU
```

CU = Control Unit. **ASF** = Short circuit isolator 2370.
<-> = between (i.e. the break is in that segment). Cut-off = break.

Each 10 minutes an attempt is made to communicate in one direction again. When the break is repaired the communication in one direction starts again.

By two or more breaks on a loop, the same is valid as for a single break plus a fault message for each unit not found by the control unit:

```
FAULT: No reply techn.no. xxxxxx
```

Each 10 minutes an attempt is made to communicate in one direction again. When the breaks are repaired the communication in one direction starts again.

9.2 BS4 loop units

On each BS4 loop can up to 99 addressable units be connected. Regarding the BS4 loop units (Autronica sensors, zone interfaces, manual call points, etc.), se separate Autronica documents.

NOTE! The control unit can be configured for up to 128, 256 or 512 addresses (loop units). Normally this is factory set but can be changed on site (via Win512)[33]. In menu H4/U9 is the current configuration shown.

Address setting

Each unit on one BS4 loop has to have a unique address. This is set on a DIL switch in each unit.

[33] This action require a separate download password, see EBL512 Operating Instructions.

9.3 Units for Hazardous (Ex) areas

In hazardous (Ex) areas, **I**ntrinsically **S**afe (IS) and approved products are required. Connected to the COM loop is an Addressable IS zone interface. The IS alarm points are connected to a detector interface, i.e. a Galvanic isolator, which is connected to the Addressable IS zone interface. See also dwg. 512-55.

9.3.1 Addressable IS zone interface (AIS)

2821 Addressable IS zone interface. The interface is connected to a COM loop. It has a zone line input. An end-of-line resistor (10K) is to be connected in the last unit on the zone line. It has a DIL-switch for the COM loop address setting. External power supply 24 V DC (30mA) is required. The interface is mounted in a Waterproof box (IP66/67) that also has four compression glands for the cable entries. Box dimensions (L x W x H): 175 x 125 x 75 mm.

9.3.2 Galvanic isolator

MTL5061 Galvanic isolator. The isolator is used to connect IS detectors and manual call points to the Addressable IS zone interface's zone line input. The isolator has two 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.

9.3.3 Intrinsically Safe mounting base

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

9.3.4 Intrinsically Safe photoelectric smoke detector

SLR-E-IS Intrinsically Safe photoelectric smoke detector.
A conventional photoelectric (optical) smoke detector, to be plugged in the intrinsically safe mounting base. The detector has two built-in LEDs that are lit to indicate that the detector has generated fire alarm. Zone classification: 0, 1 or 2. BASEEFA classification: EEx ia IIC T5, t (amb.)=50°C. Max 20 per zone.

9.3.5 Intrinsically Safe heat detector

DCD-1E-IS Intrinsically Safe heat detector. A conventional Rate of Rise heat detector, fixed temperature 60°C (class A1), to 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: Category 1 (incl. lower categories).

BASEEFA classification: II 1 G EEx ia IIC T5, t (amb.)=55°C. Max 20 per zone.

9.3.6 Intrinsically Safe manual call point

WRZ2 / 4072-470 Intrinsically Safe manual call point. A conventional outdoor manual call point (NO contact and alarm resistor 470 ohms). The call point is connected to an Addressable IS zone interface's zone line input, via a Galvanic isolator. The call point should be surface mounted with the supplied backbox (IP67) and has two compression glands for the cable entries. BASEEFA classification: Ex N II T6. Max 20 per zone.

9.4 Other units

External LED 2216

Ext. LED 2216 (ext. indicator) is used when a detector is placed out of view or out of reach. The LED is lit at the same time as the built-in LED on a detector / base is lit. Jumpers JP1-JP3 are used to suit different types of detectors. To be mounted in an E1-box / frame (min. 25mm) or a Swedish 65mm circular mounting box.

Connections and jumper settings, see drawings 512-51 - -53.

Two inputs / one output unit 2222

Unit 2222 has two non-polarised optocoupler inputs, one relay output (two change-over contacts) and require an ext. 24V DC power supply. Jumpers BY1-BY2 are used to suit different types of "External LED outputs" (on detectors / bases).
Unit 2222 could be used for example when you want fire alarm generated by one or two detectors to activate a relay output. To be mounted in an E1-box / frame (min. 30mm) or a Swedish 65mm circular mounting box.

NOTE! Max. five ext. LED outputs will be activated on a COM loop. A detector may activate fire alarm but the LED / ext. LED may not be turned on, i.e. the 2222 unit's inputs may not be activated.

Connections and jumper settings, see drawings 512-56.

Alarm devices (sounders, etc.)

In MFSTech's product range are no alarm devices. Regarding alarm devices connected to supervised (monitored) voltage outputs in the control unit and/or COM loop output units (2262 / 2263), see dwg. 512-42 and -61.

Door release magnets

In MFSTech's product range are no Door release magnets. It is recommended to connect such magnets to the special outputs HOLD 1 & HOLD 2 on the COM loop output units 2262 / 2263, see dwg.

512-61 and chapt. "Output units (addressable)", page 32. Door release magnets should always be provided with a "protection diode" parallel with the coil, see dwg. 512-42.

External Fire Brigade Panel / External Presentation Display / Data converter

Ext. FBPs, ext. presentation displays and data converters are connected to an Ext. FBP interface board 1582 (expansion board) in the control unit (c.i.e.). Regarding the 1582 board, see dwg 512-47 and chapt. "External Fire Brigade Panel (FBP) interface board 1582", page 20.

The units have a DIL-switch for address setting. The first unit should have the address 01, the second unit address 02 and so on[34]. The DIL-switch has four switches (1-2-3-4). Follow the address setting instructions for the ADB 2330 DIL-switch (addresses 00-15), see dwg. 512-71. The number of connected ext. FBPs (ext. presentation displays and data converters) has to be programmed in Win512.

The fire brigade panel is a part of the control unit (front adhesive), see Figure 2, page 14. An external fire brigade panel (ext. FBP) is a separate unit intended to be used by the fire brigade personnel. Required fire brigade personnel manoeuvres can be performed from the FBP. Depending on country (language), convention (functions), configuration, etc. the look may vary.

The external presentation display is a unit for presentation of fire alarms, i.e zone number, address and a user definable text message (if programmed). Depending on country (language), convention (functions), configuration, etc. the look may vary.

A data converter is used to transmit and present fire alarm information in another computerised system. All data converters have open collector outputs, which get activated (low) at the same time as the following LEDs: Fire, Key switch, Fault, Disturbance[35], Silence, Fire brigade tx, Extinguishing, Ventilation, Zone/Detector not reset, Control off[36], Fire brigade tx Disabled and Extinguish Disabled respectively. See EBL512 Operating Instructions for more information regarding the LEDs.
To avoid earth fault in the EBL512 control unit when connecting

[34] A data converter could have address 00 if another unit has address 01. The address 00 data converter is only a receiver ("listener"), i.e. no Silence or Reset signals or data converter fault can be transmitted back to the control unit.

[35] This is not an LED. The output is activated when a fault or a disablement occurs in the system.

[36] This is not an LED. The output is activated when "Control off" is performed via menu H2/B8:

equipment to a data converter, fully isolated (incl. the power supply) short distance modems (RS232 Line Drivers) can be used.

External Fire Brigade Panels

2425 External Fire Brigade Panel with printer. A metal housing (HxWxD) 335 x 550 x 145mm. Colours: (housing / door) "sand" / "ivory". The door has a plexiglass ahead of the FBP. LED indicators and push buttons like the FBP part (upper black part) of the control unit (front adhesive), see Figure 2, page 14. Below the FBP part are an LED "Key switch" and an LED "Power on" situated. Regarding the LED indicators and push buttons, see EBL512 Operating Instructions. Normal fire alarm information in the display. The ten first fire alarms can be displayed / scrolled. (After reset of one of the ten alarms, another alarm can be displayed, if there are more alarms in the system). Built-in printer. Room for orientation drawings.

2426 External Fire Brigade Panel without printer. The unit is exactly as 2425, only it has no printer.

External Presentation Display

2428 External Presentation Display. A housing made of wood (HxWxD) 172 x 342 x 50mm. LED indicators "Fire", "Alarms queued" and "Power on". Push buttons "Alarms queued Scroll" and "Internal Buzzer Silence". Regarding the LED indicators and push buttons, see also EBL512 Operating Instructions. Normal fire alarm information in the display.

Data converters

To have all fire alarms sent out to the Data converter(s), see chapt. "External Fire Brigade Panel (FBP) interface board 1582", page 20, jumper BY4.

2290 Data converter "BEST". Is used to transmit and present fire alarm information in BEST nurse call system[37] (current loop, 4 wires, 20mA to the BEST unit 9573). The data converter p.c.b. and a connection board are mounted in a metal housing (colour "sand"), (HxWxD) 357 x 370 x 150mm.

2291 Data converter "TATECO". Is used to transmit and present fire alarm information in Ascom Tateco Paging system (RS232 to the Ascom Tateco unit 940PT/AI[38]). **BRxxx-yy** (xxx=Zone no. and yy=Address) will be shown in **all** pagers and the sound type is **Siren**. If Configuration EPROM is used, also an eight character text could be shown for each Zone no. **or** for each

[37] Normally only used in Sweden. Zone and Address will be interpreted to Ward & Room.

[38] Connections are made on the 940EMC2-module.

Zone – Address also the programmed user definable text message (shown in the FBP display). Up to sixteen address groups for pagers[39] could be used. Sound type (0=siren, 1=1 beep, - - 9=9 beeps) could be used. When a Configuration EPROM is required, programming information sheet is required). Housing, dimensions, etc. like 2290.

2292 Data converter "EBL Talk". Is used to transmit and present fire alarm information in another computerised system, e.g. a presentation system. The 2292 converter offers an open protocol; EBL Talk (RS232). A diskette with instructions and examples could be ordered (free of charge) from MFSTech. The information sent from the control unit is **Fire alarm** (Zone no. and Address, time and user definable text message when programmed), **Fire alarm Reset** and **Status information** (i.e. like the driver outputs plus the following LEDs: Fault tx, Fault tx Disabled, Disabled, Service, Test mode, Power supply Fault, Sounder Fault and System Fault respectively. See EBL512 Operating Instructions for more information regarding the LEDs.

When more than one standalone EBL512 control unit / system are to be connected to one presentation system (PC), one PC COM port has to be used for each EBL512 control unit / system.
Housing, dimensions, etc. like 2290.

[39] Address group = one specific pager, e.g. no. 123 or a group e.g. no. 12X (=120-129) or no. 1XX (=100-199).

10 Programmable inputs

In each control unit are four programmable inputs (I0-I3) available. On the COM loops can Addressable 8 input units 2276[40] be connected, i.e. eight programmable inputs (Input 0-Input 7) per 2276 unit.

Each input is programmed (Win512) regarding:

- Trigger condition ("Triggered by")
- Logic
- Fault number (only trigger cond. no.19)
- Zone no. and Address (only trigger cond. no.14)
- Fault message ("Error text"; only trigger cond. no.19)
- Text (only trigger cond. no.14)

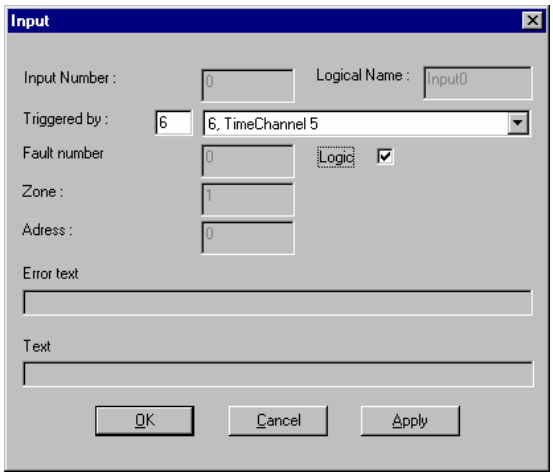

Figure 8. Input dialog box in Win512. The different trigger conditions require different additional information.

10.1 Control unit Inputs I0 - I3

Connections, see dwg. 512-43.

10.2 The 2276 unit's Input0 - Input7

Connections, see dwg. 512-52.

[40] Also called Unit for programmable inputs.

11 Input programming

Input programming is done in Win512. For more information see Win512 help. Each input has to have an individual Trigger condition and a Logic. It is not recommended 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 Box** (one input per control unit)
2. **Alert Announcement Acknowledge**
3. **Alert Announcement 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 5** (one input per system)
7. **Time Channel 6** (one input per system)
8. **Time Channel 7** (one input per system)
9. **Time Channel 8** (one input per system)
10. **Time Channel 9** (one input per system)
11. **Time Channel 10** (one input per system)
12. **Time Channel 11** (one input per system)
13. **Time Channel 12** (one input per system)
14. **General Fire**
15. **Activated Routing Equipment** (one input per C.U.)
16. **Activated Extinguishing** (one input per C.U.)
17. **Activated Automatic Door Closing** (Danish ABDL function).
18. **Activated Fire Ventilation** (one input per C.U.)
19. **External Fault** (6 inputs per C.U. / 50 per system)
20. **Disabled Extinguishing**
21. **Extinguishing start**
22. **Extinguishing stop**

Regarding cond. 17 and 20, see comments below.

Comments to the trigger conditions:

0. Default. The input do 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: Supply external equipment, 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. could disable / re-enable alarm points / zones / control outputs. The function Alert annunciation could be set on / off by a time channel. Control outputs could be set on / off by a time channel.

7 – 13 like 6.

14. A special detector, push button, etc. can activate a fire alarm in EBL512. Zone no. and Address (+ user definable text). (Max. 127 / C.U.
15. Activated Fire brigade tx feedback to the EBL512 control unit to light up the LED "Fire brigade tx".
16. Activated Extinguishing equipment feedback to the EBL512 control unit to light up the LED "Extinguishing".
17. **Today not implemented.** (Future function)
18. Activated Ventilation equipment feedback to the EBL512 control unit to light up the LED "Ventilation".
19. Ext. fault will activate a fault in EBL512. An user definable fault message ("Error text") up to 40 characters, will be shown.
20. **Today not implemented.** (Future function)
21. Used to start a new "countdown", see 22 below.
    Push button: NO, momentary action. One or more push buttons can be used.
22. 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 22 is activated. To start a new "countdown", see 21 above.
    Push button info: NO, latching action. One or more push buttons can be used. Manual reset of push button(s).

11.2 Logic

0. Normally open contact (normally low optocoupler input)[41]
1. Normally closed contact (normally high optocoupler input)[42]

[41] Check mark in the check box "Logic" in the Win512 dialog box "Input".

[42] No check mark in the check box (empty check box) "Logic" in the Win512 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. Up to six 8 relays expansion boards 1581 can be mounted in each control unit. On the COM loops can Addressable 4 output units 2262 / 2263 and Addressable 4 relay outputs units 2265 be connected, i.e. four programmable outputs (Output 0-Output 3) per unit.

Each output is programmed (Win512) regarding:

- Type
- Logic
- Activation (time, delay, pulse, etc.)
- Control expression

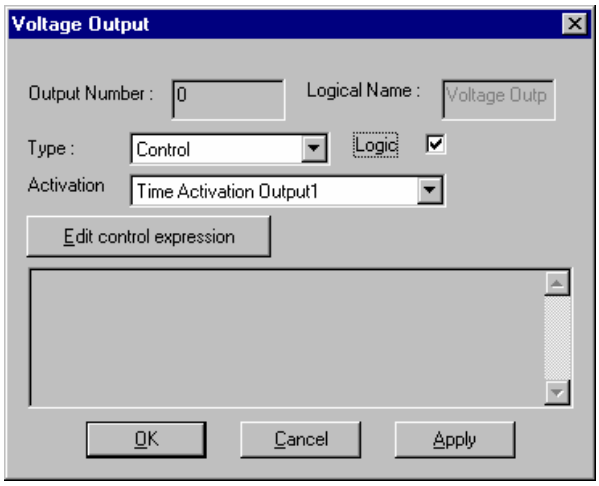

Figure 9. Voltage / Relay Output dialog box in Win512.

12.1 Control unit outputs S0 – S3

Each control unit has four programmable, supervised[43] voltage outputs:

S0 Supervised (monitored) voltage output, 24V DC

S1 Supervised (monitored) voltage output, 24V DC

S2 Supervised (monitored) voltage output, 24V DC

S3[44] Supervised (monitored) voltage output, 24V DC

[43] This is default, but via Win512 it is possible to set each output (S0-S3) individually to be not supervised.

[44] The supervised outputs normally have reversed polarity when not activated. In some configurations / conv. S3 has the same polarity activated as supervised, i.e. it should not be used for alarm devices (sounders).

Connections and more information, see dwg. 512-42.

12.2 Control unit outputs R0 – R1

Each control unit has two programmable relay outputs:

R0 Relay output, NO or NC contacts programmable

R1 Relay output, NO or NC contacts programmable

Connections and more information, see dwg. 512-42.

12.3 8 relays expansion board 1581 Output 0 – Output 7

Each 1581 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

Connections and more information, see dwg. 512-47.

12.4 German FBP interface board 1583 Output for extinguishing equipment

The 1583 board (max. one in each control unit) has one programmable output for activation of German extinguishing equipment. (VdS Standard-Schnittstelle "Löschen"; Löschbefehl).

Connections and more information, see dwg. 512-50.

12.5 The 2262 / 2263 unit's Output 0 – Output 3

Each 2262 / 2263 unit has four programmable voltage outputs:

Output 0 Supervised (monitored) voltage output, 24V DC

Output 1 Supervised (monitored) voltage output, 24V DC

Output 2 Supervised (monitored) voltage output, 24V DC

Output 3 Supervised (monitored) voltage output, 24V DC

Each 2262 / 2263 unit also has two special outputs[45]:

[45] Designed for door release magnets, etc.

HOLD 1 Relay **or** voltage output, 24 V DC

HOLD 2 Relay **or** voltage output, 24 V DC

Connections and more information, see dwg. 512-61. See also chapt. "Output units (addressable)", page 32.

12.6 The 2265 unit's Output 0 – Output 3

Each 2265 unit has four programmable relay outputs:

Output 0 Relay output, NO-C-NC contacts

Output 1 Relay output, NO-C-NC contacts

Output 2 Relay output, NO-C-NC contacts

Output 3 Relay output, NO-C-NC contacts

Connections and more information, see dwg. 512-61.

13 Output programming

Output programming is done in Win512. For more information see Win512 help. Each output has to have a Type, Logic, Time activation and Control expression (incl. trigger conditions).

13.1 Type of output

Some types can be collective disabled and when activated, an LED will indicate it.

The following types are available:

0. **Control**
1. **Fire Ventilation**
2. **Extinguishing**
3. **Alarm Device**
4. **Routing Equipment**
5. **Control, neutral**
6. **Door Closing (Danish ABDL function)**

Comments to the types:

0. Default. General (normal) control output[46]
1. Used to activate fire ventilation equipment[47]
2. Used to activate extinguishing equipment[48]
3. Used for sounders, etc.[49]
4. Used for Fire brigade tx[50]
5. This output will not be collective disabled and not indicated by any LED.
6. **Today not implemented.** (Future function)

---

[46] Controlled by menu H2/B8 Controls ON / Controls OFF.

[47] Controlled by menu H2/B8 Controls ON / Controls OFF. When activated, the LED "Ventilation" indicates it. (Feedback from the fire ventilation equipment to a programmable input can light up the LED instead).

[48] Controlled by menu H2/B8 Controls ON / Controls OFF. When activated, the LED "Extinguishing" indicates it. (Feedback from the extinguishing equipment to a programmable input can light up the LED instead).

[49] Controlled by menu H2/B9 Alarm device ON / Alarm device OFF and by push button "Silence". Output fault will light up the LED "**Fault** Sounder".

[50] Activated according to its control expression. Disabled like the standard control unit "Fire brigade tx" relay output. When activated, the LED "Fire brigade tx" indicates it. (Feedback from the Fire brigade tx to a programmable input can light up the LED instead).

13.2 Logic

0 Normally open relay contact **alt.** normally low voltage output.[51]

1 Normally closed relay contact **alt.** normally high voltage output (24V DC).[52]

13.3 Time activation

"Time Activation Output" is used when programming the outputs.

Ten "Time Activation Output" types (1-10) can be programmed regarding:

- Type (0-6)
- Delay time (when required)
- Pulse length (when required)
- Pulse off (when required)
- De-activation (when required)

The following Time activation output types are available:

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

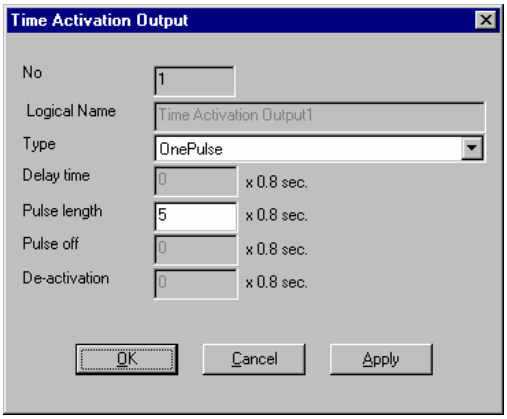

Figure 10. Time Activation Output dialog box in Win512. One pulse, 4 seconds (5x0.8=4) is set.

[51] Check mark in the check box "Logic" in the Win512 dialog box "Voltage / Relayed Output".

[52] No check mark in the check box (empty check box) "Logic" in the Win512 dialog box "Voltage / Relayed Output".

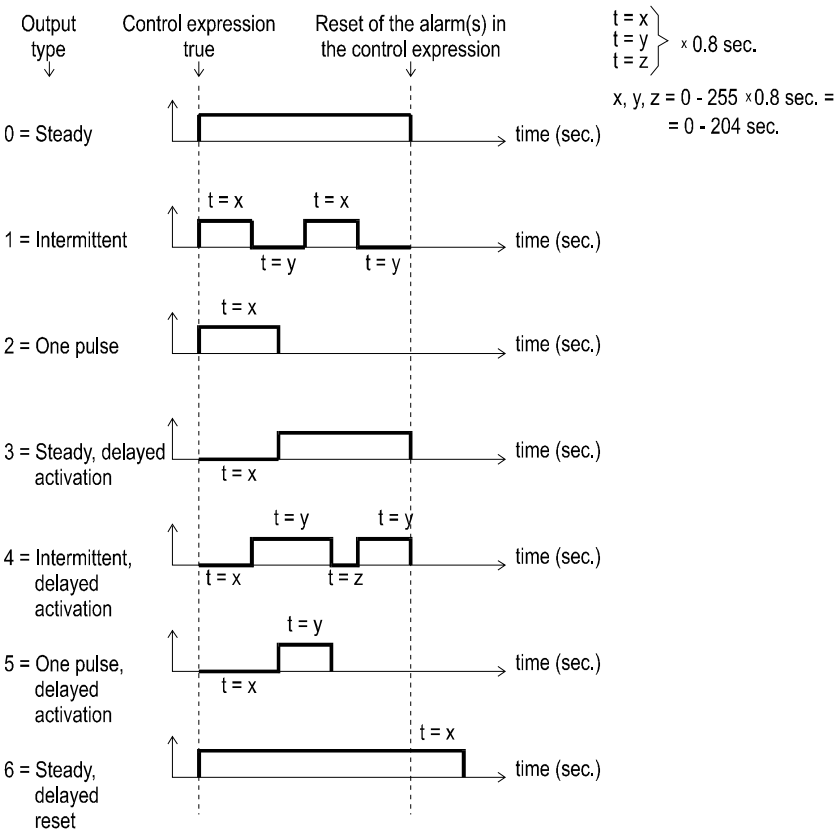

Figure 11. Delay time, Pulse length, Pulse off and/or De-Activation, have to be set for the type respectively.

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

	In the Control Unit				On a COM loop	
Output Type	S0 - S3	R0 - R1	1581 Board	1583 Board	2265 Unit	2262 2263 Unit
0	X	X	X	X	X	X
1	X	X	--	--	--	XX
2	X	X	--	--	--	--
3	X	X	X	--	X	X
4	X	X	--	--	--	XX
5	X	X	--	--	--	--
6	X	X	X	--	X	X

*Figure 12. Programmable outputs in relation to Time Activation Output type. **X** = Output type is selectable. **XX** = Output type is selectable but only for **0.8 / 0.8 sec**. NOTE! 1583 board not in Swedish (RUS) convention.*

13.4 Control expression

Each programmable output has to be given a control expression. It is made by so called Boolean algebra.

Trigger conditions ("Available functions") and logical "Operators" (**AND**, **OR, NOT**) are used to make a "control expression". For more information, see below, chapt. "Control expression examples" page 56, and Win512 help.

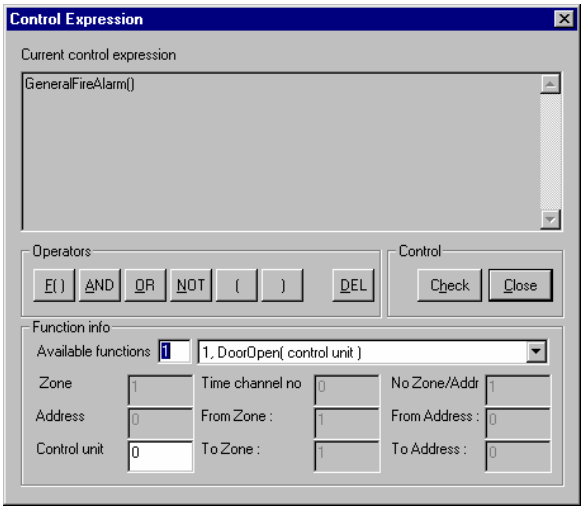

Figure 13. Control Expression dialog box in Win512.

13.4.1 Trigger conditions

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

Some trigger conditions include a sequence. "Quantity" shows the number of alarm points within the sequence that have to be activated to generate an alarm.

The following trigger conditions are available:

1 **Door Open** (+Control unit)
2 **General Door Open**
3 **General Encapsulated**
4 **General Control Off**
5 **General Alarm Point Blocked**
6 **Alarm Transmitter Fire**
7 **Alarm Transmitter Fault**
8 **Alarm Transmitter Disconnected**
9 **Alert Announcement Activated**
10 **General Fault**
11 **General Charge Fault**
12 **Pre Fire Alarm Zone** (+Zone no.)

13 **Pre Fire Alarm Address** (+Zone no.+Address)

14 **General Pre Fire Alarm**

15 **Consecutive Pre Fire Alarm** (+start Zone no. and address +stop Zone no. and address +Quantity)

16 **Fire Alarm Zone** (+Zone no.)

17 **Fire Alarm Address** (+Zone no.+Address)

18 **General Fire Alarm**

19 **Consecutive Fire Alarm** (sequence) (+start Zone no. and address +stop Zone no. and address +Quantity)

20 **Smoke Fire Alarm Zone** (+Zone no.)

21 **Smoke Fire Alarm Address** (+Zone no.+Address)

22 **General Smoke Fire Alarm**

23 **Consecutive Smoke Fire Alarm** (sequence) (+start Zone no. and address +stop Zone no. and address +Quantity)

24 **General Service Signal**

25 **Key Cabinet Open**

26 **Time Channel Activated** (+Time channel no.)

27 **Two Detector Dependency Fire Alarm** (+Zone no. +Address)

28 **Two Zone Dependency Fire Alarm** (+Zone no.)

Comments to the trigger conditions (functions):

1 Door open (key switch) in the specific control unit.[53]

2 Door open in any control unit in the system (TLON network).[53]

3 Zone/Detector not reset.[54] Normally used only in Swedish convention.

4 Controls OFF (via menu H2/B8).[55]

5 Zone no. and address disabled.[55]

6 Routing equipment (Fire brigade tx) activated.[56]

7 Routing equipment (Fault tx) activated.[57]

8 Routing equipment (Fire brigade tx) disabled.[58]

9 Alert annunciation activated (by any alarm point set to activate this function). For more information, see EBL512 Operating Instructions.

---

[53] Also indicated by LED "Key switch".

[54] Also indicated by LED "Zone/Detector not reset".

[55] Also indicated by LED " Disabled".

[56] Also indicated by LED "Fire brigade tx".

[57] Also indicated by LED "Fault tx".

[58] Also indicated by LED "Fire brigade tx **Disabled**".

10 One or more faults are generated in the system.[59]

11 Some part(s) of the power supply have generated fault.[60]

12 Pre-alarm. For more information, see EBL512 Operating Instructions.

13 See 12.

14 See 12.

15 See 12.

16 Fire alarm. For more information, see EBL512 Operating Instructions.

17 See 16.

18 See 16.

19 See 16.

20 Heavy smoke alarm. For more information, see EBL512 Operating Instructions.

21 See 20.

22 See 20.

23 See 20.

24 Service signal is activated (by any sensor).[61]

25 Key cabinet alarm. For more information, see EBL512 Operating Instructions.

26 The programmed time channel (1-12) is activated.

27 2-zone / address dependence. Only one zone / address in a 2-zone / address dependence is in "fire alarm state", i.e. fire alarm is not activated yet. For more information, see EBL512 Operating Instructions.

28 See 27.

13.4.2 Logical operators

The logical operators available in Win512 are in priority order:

( ) parentheses, changes priority order

NOT not-function (inverts), is written **!** in Win512

AND and-function, is written **&&** in Win512

OR or-function, is written | | in Win512

[59] Also indicated by LED "Fault tx" and/or LED "Fault".

[60] Also indicated by LED "Power supply **Fault**", LED "Fault tx" and/or LED "Fault".

[61] Also indicated by LED "Service".

13.4.3 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.

13.4.3.1 AND

a**&&**b**&&**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:

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

13.4.3.2 OR

a| |b| |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

13.4.3.3 NOT

Inverts a condition, e.g. !b=!0=1.

a| |**!**b**&&**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

13.4.3.4 Parentheses

Changes priority order.

a| |**!(**b**&&**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

13.4.3.5 Control expressions

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

Example 1

Output: Voltage output **S0**

Control expression: Pre Fire Alarm (90)

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

Example 2

Output: Relay output **R1**

Control expression: General Control Off ( ) **&& !**Door Open (01)

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

Example 3

Output: Relay output **R0**

Control expression: Fire Alarm Zone (145) **&&** Fire Alarm Zone (045) **&&** 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) || 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 Functions / Services / Features

Many of these Functions / Services / Features require programming in Win512, see chapt. "PC SW", page 11. For more information see also EBL512 Operating Instructions and Win512 help.

How to connect the PC and more information, see EBL512 Operating Instructions chapt. "Programming (SSD download)", "New system program (SW) version download" and "EBL512 settings download".

14.1 Alarm algorithms / Detection levels

Regarding the analog smoke detector types 2300 (ION in Win512), 2304 (OPT in Win512), 3304 in 2312 mode (= OPT in Win512) and Autronica analog smoke detectors[62] (AUT in Win512):

Each detector type has its algorithm for alarm detection and three different detection levels:

1. **fire alarm** is activated at a fire alarm level[63]
2. **pre-alarm** (if selected in Win512, for each control unit) is activated at a lower level (smaller offset) than fire alarm
3. **heavy smoke alarm** is activated at a higher (bigger offset) level than fire alarm

The pre-alarm and heavy smoke alarm levels, i.e. the offsets, can be set in Win512 (for the whole system), see Win512 help.

The fire alarm, i.e. the offset, can be set in Win512 (for the whole system), see Win512 help. **NOTE!** This is not a normal action and a special code is required.

"Pre Fire Alarm", "Fire Alarm" and "Smoke Fire Alarm" can activate programmable outputs respectively.

See EBL512 Operating Instructions for more information.

14.2 2-zone / address dependence

In some premises 2-zone / address dependence could be used to avoid unwanted false alarms.

---

[62] Connected to a BS4 loop.

[63] The fire alarm level for each analog detector (sensor) = the current week average sensor value plus a fixed fire alarm offset (value), i.e. when the current week average sensor value is re-calculated (and changed) the fire alarm level will be adjusted. The detector's sensitivity is accordingly constant.

14.2.1 2-zone dependence

Each zone in the system could be programmed (in Win512) to a "2-zone dependent" fire alarm activation. The zone has to belong to one of nine "2-zone dependent groups" (1-9).[64]

Function: Two or more zones in the same group have to be in "fire alarm state" 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 by the LEDs "Fire" (blinking). No information in the display(s). The zone no. is shown in menu H4/U4. Programmable outputs can be activated by "Two Zone Dependency Fire Alarm".

14.2.2 2-address dependence

Each analog or addressable smoke detector, each Addressable zone interface (2226 / 2335) and 8 zones expansion board (1580) input in the system could be programmed (in Win512) to a "2-unit dependent" fire alarm activation. (Heat detectors should not and manual call points must not be 2-unit dependent).

Function: Two or more units in the same zone have to be in "fire alarm state" 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 by the LEDs "Fire" (blinking). No information in the display(s). The zone no. and address is shown in menu H4/U4. Programmable outputs can be activated by "Two Detector Dependency Fire Alarm".

14.3 Delayed alarm

In some premises delayed fire alarm activation could be used to avoid unwanted false alarms.

Each analog or addressable smoke detector, each Addressable zone interface (2226 / 2335) and 8 zones expansion board (1580) input in the system could be programmed (in Win512) to delayed fire alarm activation. (Heat detectors should not and manual call points must not have delayed fire alarm activation). The delay time can be set to 1-127 seconds.[65]

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

Function for an addressable zone interface (2226 / 2335) and 8 zones expansion board (1580) input: An zone in "fire alarm state" will be recorded in the control unit but fire alarm will not be activated. When

[64] Default for all zones is group no. 0 = **no** 2-zone dependence.

[65] Default is 0 seconds and a normal delay time is 30 seconds.

the delay time is out the zone will be reset and if it still is in "fire alarm state", fire alarm will be activated in the control unit.

14.4 Alert annunciation

In some installations alert annunciation could be used to avoid unwanted false alarms to the fire brigade. Trained personnel on site are required to locate the fire (sometimes no fire) to take the correct measures.

Normally analog or addressable smoke detectors and zones with smoke detectors only, come in question to be programmed (in Win512) for alert annunciation. (Heat detectors should not and manual call points must not come in question for alert annunciation)

Alert annunciation is normally ON during the daytime working hours only. The time channels 1-4 or the external time channels 5-12 could be used to turn ON and OFF the alert annunciation function.

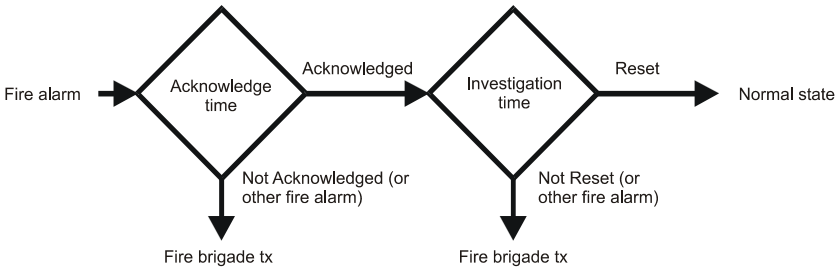

Figure 14. Alert annunciation principle.

Function: Indications, print-outs, actions, etc. as for a normal fire alarm **except output(s) for routing equipment (fire brigade tx) which will not be activated.**

The fire alarm has to be acknowledged within an acknowledge time and then, the fire alarm has to be reset within an investigation time, else will the output(s) for routing equipment (fire brigade tx) be activated.

During the acknowledge and investigation times:

- If another 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 another fire alarm is activated by a detector / zone which is programmed for alert annunciation, it is depending on if "Multiple alarms allowed within same zone" is set[66] in Win512 (for the

[66] Default the Check box is checked = Multiple alarms allowed within same zone.

system). The number of zones[67] allowed activating fire alarm, before the output(s) for routing equipment (fire brigade tx) will be activated, is also set in Win512 (for the system).

Acknowledge and Reset is done on the Display unit 2235. Programmable output ("Alert Announcement Activated" for indication and programmable inputs ("Alert Announcement Acknowledge" and "Alert Announcement Reset") can also be used.

The Acknowledge time can be set to 5-495 seconds.[68]

The Investigation time can be set to 1-40 minutes.[69]

14.5 Disable alarm points and outputs

Temporary disablements are made via the menus. For more information see EBL512 Operating Instructions, chapt. "Disable or re-enable (H2)".

Regular disablements are made via time channels, see chapt. "Time channels", page 64.

Disabled alarm points and outputs are indicated by LED "Disabled" and listed in menu H4/U1:

14.5.1 Disable zone

A whole zone (all addresses within a zone) could be disabled via menu H2/B1. Re-enable via menu H2/B4.

14.5.2 Disable zone / address

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

14.5.3 Disable control output

Individual control outputs could be disabled via menu H2/B3. Re-enable via menu H2/B6.

14.6 Disable outputs for routing equipment

Disable and Re-enable via menu H8/S1. For more information see EBL512 Operating Instructions.

---

[67] Default is one zone. Up to four zones could be set.

[68] (1-99) x 5 = 5-495 seconds (8 minutes and 15 seconds).

[69] (1-40) x 1 = 1-40 minutes.

14.7 Disconnect COM-loops

Disconnect via menu H8/S2 and Re-connect via menu H8/S3:

0. COM loops
1. BS4 loops
2. 8 zones expansion board 1580 input (zone line)
3. Addressable zone interface 2226 / 2335 input (zone line)

For more information see EBL512 Operating Instructions.

14.8 Time channels

Time channels can be used to:

- disable and re-enable alarm points
- set alert annunciation ON / OFF
- activate programmable control outputs

14.8.1 Time channels 1-4

The control unit RTC (real time clock) controls time channels 1-4. Time channel programming is done via Win512 for the whole system.

Each time channel is programmed for:

Day of week	**Time 1** hh=0-23 mm=0-59	**ON OFF** √ = ON	**Time 2**	**ON OFF** √ = ON	**Time 3**	**ON OFF** √ = ON	**Time 4**	**ON OFF** √ = ON
1	hh : mm	□	hh : mm	□	hh : mm	□	hh : mm	□
2	hh : mm	□	hh : mm	□	hh : mm	□	hh : mm	□
3	hh : mm	□	hh : mm	□	hh : mm	□	hh : mm	□
4	hh : mm	□	hh : mm	□	hh : mm	□	hh : mm	□
5	hh : mm	□	hh : mm	□	hh : mm	□	hh : mm	□
6	hh : mm	□	hh : mm	□	hh : mm	□	hh : mm	□
7	hh : mm	□	hh : mm	□	hh : mm	□	hh : mm	□
8	hh : mm	□	hh : mm	□	hh : mm	□	hh : mm	□

Day of week 1 = Monday Day of week 8 = National holiday

Figure 15. Programming table for one time channel.

All (52) weeks of a year have the same settings. When national holidays are in the middle of a week, separate ON/OFF times can be set for these holidays, i.e. day of the week 8 in the table. National holiday's dates are to be set separately.

14.8.1.1 National holidays

Up to twenty national holidays could be set in Win512 for the whole system. For each national holiday the **Month** (1-12) and **Day of the Month** (1-31) have to be set. ON/OFF times are set for each time channel (1-4), day of week = 8.

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.

14.8.2 External time channels 5-12

External time channels 5-12 are controlled by external equipment. A programmable input ("Time Channel N") is used for each time channel. The external equipment could be 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!
Do not use more than one input per time channel. (This is checked in the "Validity check" in Win512).

14.9 Test mode

Up to four zones can be set in Test mode at the same time. Alarm points / zones could be tested during the Monthly test (via menu H1) or separately (via menu H7). For more information see EBL512 Operating Instructions.

LED "Test mode" indicates one or more zones in test mode.

14.10 Service signal

All smoke detectors gets contaminated no matter its environment. In some environments it goes faster than in others.

A conventional smoke detector[70] will be more sensitive in some environments and less sensitive in others. This could result in unwanted false alarms or no alarms at all.

An analog smoke detector[71] is supervised at all times and when required a service signal will be activated.

For more information, see EBL512 Operating Instructions chapt. "Sensors activating Service signal (H4/U7)" and "Acknowledge Service signal (H8/S4)".

[70] A conventional smoke detector has a fixed fire alarm level.

[71] An analog smoke detector adapt its fire alarm level, see chapt. "Analog smoke detector", page 66.

14.11 Analog smoke detector

An analog smoke detector is like a "sensor". It detects the environment and the analog values are converted to digital values, "sensor values", which are continuously picked up and evaluated by the control unit (c.i.e.) for each detector individually. In Figure 16 the (analog) sensor values are represented by the graph "Working level".

Each hour, one sensor value is stored (in the c.i.e.) and each week a new "week average sensor value" is calculated[72]. In Figure 16 the (digital) week average sensor values are represented by the graph "Week average". Note, the graph can be adjusted up or downwards!

Each type of analog smoke detector has a specific default sensor value ("Working level" & "Week average" at "Time 0"). A fire alarm offset (value) is added to get the detector's fire alarm level. The fire alarm level will be adjusted in relation to each new week average sensor value, i.e. the detector's fire alarm sensitivity is constant. The fire alarm level is in Figure 16 represented by the graph "Fire alarm level".

Service signal will be given for a high and a low level, see "Service level" in Figure 16.

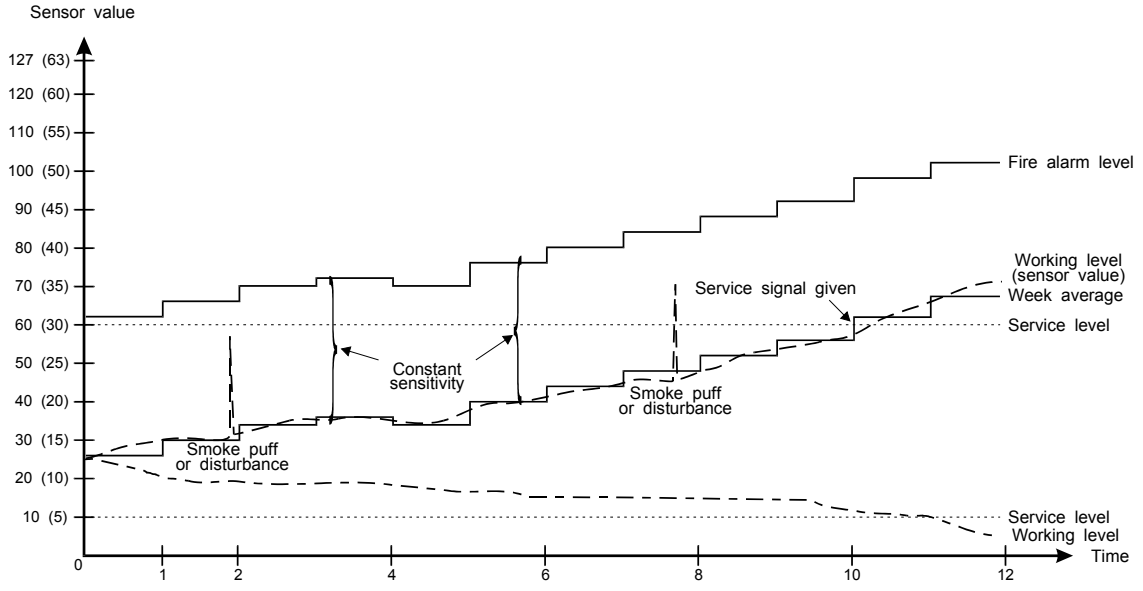

*Figure 16. Working **principle** for an analog smoke detector. If the working level goes far too low (to zero for most sensor types) fault signal will be activated.*

[72] The old week average sensor value and the values stored during the week are used to calculate a new week average sensor value.
The very first week average sensor value will be calculated within 2 minutes after SSD download & restart. (During this "2 min. period" no fire alarm can be activated.)

Via Win512 and a PC connected to a control unit, you can see the following for each sensor:

- Continuously: the current sensor value is shown each 2-10 seconds (set in Win512)
- Current Average: the current sensor value is shown
- Current Week Average: the current week average value is shown

14.12 Fault signal

Fault signal, fault messages, fault acknowledge, etc. are described in EBL512 Operating Instructions, chapt. "Fault".

Programmable inputs could be used to activate fault signal in the EBL512 control unit, see chapt. "Programmable inputs", page 43.

14.13 Event logs

All event log setups are made via Win512.

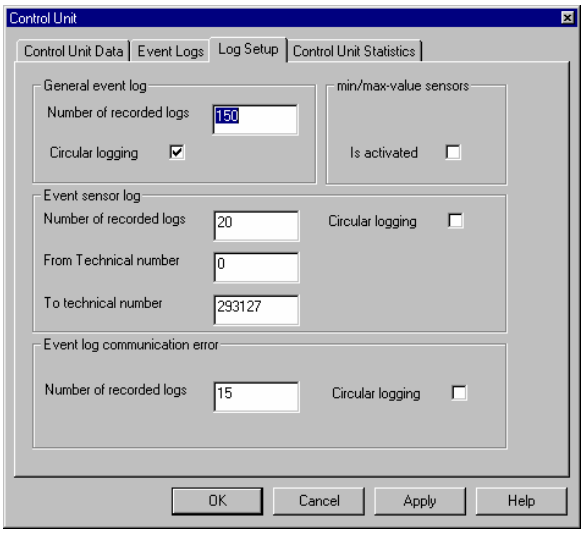

Figure 17. Control Unit Log Setup dialog box in Win512. Default settings are shown.

Note! A fixed memory area is dedicated for all logs. Depending on type of log(s), how many / which events are to be logged, etc. you might get a "Limits exceeded" warning in Win512.

Date & Time are stored together with every event.

For more information, see Win512 help.

Circular logging

Circular logging = the log re-starts when it is "full". The first events will be overwritten, i.e. a circular log shows the xx latest events.

Not circular logging = straight logging = the log stops when it is full and has to be erased before the logging can start again, i.e. a straight log shows the xx earliest events.

General event log

What will be logged is selected in Win512 Control Unit Event Logs dialog box, i.e:

- Alarm (All fire alarms)
- Reset alarm (All fire alarm resets)
- Encapsulations (All "Zone/Detector not reset")[73]
- All disconnected (All disablements except those via time channels)
- Re-enablements (All re-enablements except those via time channels)
- Fault (All faults)
- Acknowledge fault (All acknowledged faults
- Fault serviced (All corrected faults)
- Service signal (All analog smoke detectors having activated service signal)
- Acknowledge service signal (All service signal acknowledges)
- Test mode activation and de-activation (Test mode ON / OFF)
- Programming misc. (Actions done via menu H5)
- Open/Closed door (All opened / closed doors)
- Activated outputs (All activated outputs)
- Downloading SSD (Download of site specific data via Win512)

The general event log can be shown / printed out via menu H4/U8.

Number of recorded logs

Default is 150 events. 0-214 is possible.

14.13.1 Event sensor log

Only analog smoke detectors (sensors) having reached the pre-alarm level or the sensor value zero will be logged. This information is useful when commissioning an installation or is used by service engineer for troubleshooting.

Note! The Event sensor log can be shown in a future Win512 version only.

Number of recorded logs

Default is 20 events. 0-20 is possible.

From technical number

Interval start number. Normally (default) number 000000.

To technical number

Interval stop number. Normally (default) number 293127 (i.e. the highest possible technical number for a COM loop unit in a system).

[73] Only some conventions / configurations.

As an **alternative** to "Event sensor log" the "Min/max value sensors" log can be used.

14.13.2 Min/max value sensors

The lowest and highest sensor values will be logged for each sensor in the system.

Note! The Min/max value sensors log can be shown in a future Win512 version only.

As an **alternative** to "Min/max value sensors" log the "Event sensor log" can be used.

14.13.3 Event log communication error

Communication error occurring on the COM loops will be logged together with Date, Time and Technical number.

Note! The Event log communication error log can be shown in a future Win512 version only.

Number of recorded logs

Default is 15 events. 0-15 is possible.

14.14 User definable text messages

When a fire alarm is activated, the presentation number (Zone & Address) will be shown on the first row in the control unit's and the ext. FBP's alphanumeric display. On the second row will be shown a user definable text message if programmed.
The user definable text message will also be printed out when a printer is available.

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

User definable text messages can also be shown in Display units connected on the COM loops.

The texts, up to 40 alphanumeric characters[74], are created and downloaded via Win512. (An "older" DOS based PC program NEWTEXT could also be used, see chapter "Display units (addressable)", page 33.)
Each addressable alarm point can have one user definable text message displayed in the control units and ext. FBPs and one user definable text message displayed in each Display unit on the COM loops. See also Win512 help.

14.14.1 Creating the user definable text messages via Win512

For more information, see also Win512 help.

[74] In Chinese convention up to 30 European characters or 15 kanji characters or a combination. (1 kanji character = 2 European characters)

In the "Texts" menu select "Edit" and a "Win512 Texts" window will be displayed. This is a table ("Excel") with one **Tech No** column, one **Zone-Addr** column and one **Text** column.

	Tech No	Zone-Addr	Text
1		001-01	Fire in Laboratory |2 Floor
2	003123	001-01	Fire in Laboratory |
3	C00	default	FIRE ALARM |
4	003123	default	FIRE ALARM |Zone: # Addr: #

Figure 18. Examples of user definable text messages.
The | character (shown only in this table) indicates the end of the first 20 characters and the start of the next 20 characters.
(Select a text and click "Preview" for a preview of that text in different alphanumeric displays).

Tech No column

1. When creating a text for a specific addressable alarm point, to be shown in the control unit's / ext. FBP alphanumeric display, this column should not be filled in.

2. When creating a text for a specific addressable alarm point, to be shown in a Display unit, the Display unit's technical number should be written here.

3. When creating a "default" text (see below), to be shown in the control unit's / ext. FBP alphanumeric display, the control unit's number (e.g. C00) should be written here.

4. When creating a "default" text (see below), to be shown in a Display unit, the Display unit's technical number should be written here.

Zone-Addr column

When creating a text for a specific addressable alarm point, the alarm point's presentation number (Zone-Addr) should be written here.
When creating a "default" text (see below), "default" should be written here.

Text column

When creating a text, remember that the Display unit's alphanumeric display has two rows à 20 characters (see Figure 18.).

In a "default" text (see below), the first parameter symbol # will be replaced with the zone number (up to three digits) and the second parameter symbol # will be replaced with the address number (up to two digits) when presented in the alphanumeric display.

NOTE! When programming a specific addressable alarm point (e.g. an analog smoke detector), there is a "Text" field in the dialog box. The user definable text message could be written directly in this field. It will automatically be added, together with the presentation number, in the table described above.

Default text

1. Global function (default):

A "default" text could be created for each control unit and each Display unit respectively. All addressable alarm points, which have no individual text, will be presented with the "default" text.
In the Display units, a zone number parameter (#) and an address number parameter (#) could be added. (In the control units / ext. FBPs, the Zone-Address is automatically presented).

2. Local function (set in the "Downloading Texts To Display Unit" dialog box):

Local function is only valid for a Display unit. All addressable alarm points, which have no individual text, will **not** be presented in the Display unit.

Downloading texts to Display Unit

A PC has to be connected to the Display unit. Start up Win512 and select the file to be used. In the tree view, select a Display unit[75] and click on the right mouse button. In the "Display unit" (Alphanumeric display) pop-up menu, select "Download Texts" and a "Downloading texts To Display Unit" dialog box will be displayed.

In the "Status" field, an information text will be shown if a 32 Kb EEPROM is required in the Display unit.

In this dialog box is also a check box for Local function (see "Default text" above).

Display Unit Properties

In the "Display unit" (Alphanumeric display) pop-up menu, select "Loop Unit Properties" and an "AD, Alphanumeric Display" (Display unit) dialog box will be displayed.

The Display unit's technical number is shown.
The "Number of texts" created for the Display unit is displayed and an information text regarding the Display unit's EEPROM is shown:

"8 Kb (max. 200 texts) or a 32 Kb (max. 810 texts)".

[75] To add a Display unit, select a COM loop icon, click on the right mouse button. In the Loop X pop-up menu, select "Add Loop Unit" and an "AD, Alphanumeric Display" (Display unit) dialog box will be displayed.

14.15 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 1-4.

In a system (two or more control units in a TLON network) all control units are synchronised.

14.15.1 Daylight-saving time (summer time)

Daylight-saving time according to the present EU regulations; start last Sunday in March (one hour ahead) and stop last Sunday in October (one hour backwards).

Automatic changeover to Daylight-saving time / Normal time, can be selected via Win512 in the System dialog box. Default is this function selected (ON).

14.16 Control unit data

Are set in the Win512 Control Unit dialog box, Control Unit Data tab.

14.16.1 General data

Regarding control unit name and number, see Win512 help.

A stand-alone control unit has no. 00.

A control unit with a built-in printer should have a mark in the "Printer on main board" check box.

14.16.2 LED indications

Normally the LED indicators below will be lit when a corresponding output is activated. When selected, the LED will be lit when a programmable input is activated, e.g. feed-back from a fire brigade tx output will activate a programmable input to light up the LED "Fire brigade tx".

- "Extinguishing"
- "Ventilation"
- "Fire brigade tx"

14.16.3 Indications (Selective presentation of alarm)

In a system (two or more control units in a TLON network) it is possible to choose which control units' fire alarms are to be presented in each control unit.

Example: A system with four **c**ontrol **u**nits (C.U. no. 00, 01, 02 and 03). In C.U. no. 00 are only fire alarms from C.U. no. 00 to be presented and in C.U. 01, 02 and 03 are all fire alarms to be presented.

Default = All fire alarms are presented in all control units, i.e. for each control unit has to be selected, which control units that should not be presented.

14.16.4 Fault latching

Fault latching = all faults have to be acknowledged.

No fault latching = not corrected faults have to be acknowledged but corrected faults have not to be acknowledged.

14.16.5 Indication pre-alarm

Pre-alarms will not be activated in the control unit until this check box is marked.

14.17 Door open indication / activation

In the Win512 System dialog box, Door open tab, the following could be selected:

Indication open door (LED "Key switch")

Door in any control unit in the system, i.e. door open in any control unit will be indicated by LED "Key switch" in all control units.

or

Door in control unit, i.e. door open in a control unit will be indicated by LED "Key switch" only in that control unit.

Disconnect routing equipment

No disabling, i.e. the output(s) for routing equipment (Fire brigade tx) will not be disabled by the door open / key switch.

Disable if any door in the system is open, i.e. the output(s) for routing equipment (Fire brigade tx) will be disabled by the door open / key switch.

Indication open door external FBT

Selected options above, "Indication open door" and "Disconnect routing equipment" are valid for the door in external Fire Brigade Panel(s) as well.

14.18 Win512 menu Tools

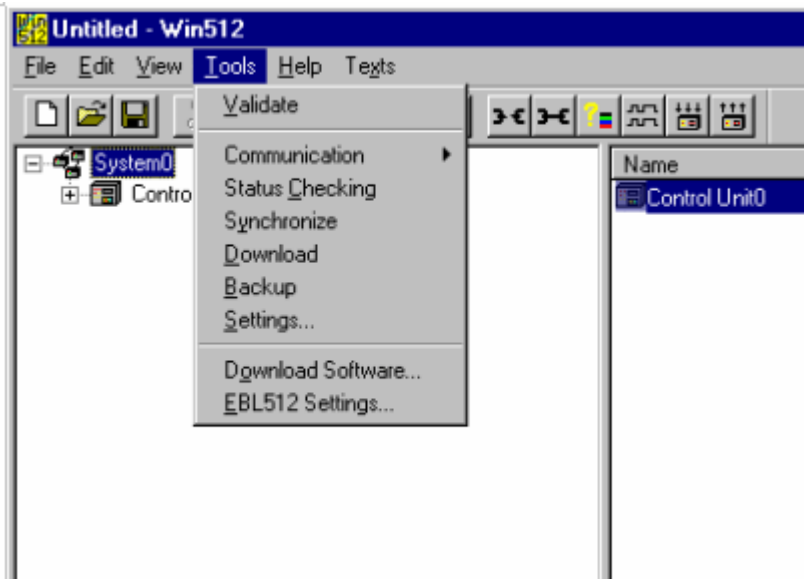

Figure 19 . Win512 menu Tools.

Win512, menu Tools, is used when backup, downloading, etc. should take place. Regarding this menu, see Win512 help for more information.

14.19 Encapsulation (Zone/Detector not reset)

In some conventions / configurations this function is enabled.

Function: If an alarm point / zone is reset while still in alarm state (e.g. smoke in a smoke detector) this unit will be encapsulated, i.e. it has to be re-enabled via menu H2/B7 before it can activate fire alarm again. It should not be re-enabled until not in alarm state (e.g. no smoke in a smoke detector).

LED "Zone/Detector not reset" indicates one or more encapsulated zones / detectors.

15 Compatibility

Analog smoke detector (sensor) types 2200 and 2202 plugged in analog base 2210, can be connected to the COM loops.

See also chapter "Analog Detectors" (types 33xx), page 29.

Regarding "older" EBL systems (EBL2000 / 1000), contact MFSTech for advice.

16 Cable types

A fire alarm installation is a safety installation and it is important that the cables used, are correct types and according to national regulations. Fire alarm cables should, when possible, be installed away from other cables, to avoid disturbances from these.

16.1 TLON Network cables

See dwg. 512-49 and separate TLON Technical description.

16.2 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. 512-41, -51, -52 -53, -61 and –62.

Cable length is depending on number and type of loop units, etc. See dwg. 512-01 and –02.

ELKY 2 x 1 mm (0.75 mm^2) or equivalent (twisted pair).

ELKY 10 x 2 x 1 mm or equivalent, when feeder line is required.

If screened cable is used, the screen should be connected close to each loop unit and only incoming (or outgoing) screen to earth in the control unit.

16.3 BS4 loop cables

Loop topology is used, see dwg. 512-48.

Normally, you connect an existing installation to the EBL512 control unit (Autronica interface board 1584). If new cables are to be installed, see Autronica BS 100 documentation.

16.4 Ext. FBP / Data converter cables

RS-485. See dwg. 512-47.

Cable length $\leq$ 1200 m to the furthest away situated ext. FBP / Data converter.

LiYCY (TP) 2 x 2 x 0.75 mm^2 or equivalent (twisted pairs).

16.5 Conventional zone line cables

Inputs to 8 zones expansion board 1580, Addressable zone interface 2226 / 2335 and Addressable base 2330 external line, see dwg. 512-46, -54 and –55.

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

16.6 Alarm device cables

Alarm devices (sounders, etc.), see dwg. 512-42 and 61.

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

EKKR 10 x 2 x 1 mm (0.75 mm^2) or equivalent, when feeder line is required.

16.7 Other cables

External indicator (LED), 2 inputs / 1 output unit 2222, door release magnets, etc., e.g:

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

17 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 (≤ 180 mA), cable lengths, etc., the tables below could be used. See also dwg. 512-01 and –02.

Also, to get a total current consumption overview and to check if the battery capacity is enough, the tables below could be used.

The current consumption is shown in **Normal state** (quiescent) and in **Alarm state** (active).

See also chapter "Power supply", page 82.

Unit	**Normal state** (quiescent) (mA)	**Alarm state** (active) (mA)
Control unit (without printer)1548	140	310
Control unit (with printer) 1549	160	340
Control unit (without front and without printer) 1550	120	150
Battery charging current	max. 2000[76]	0 / 2000[77]
8 zones expansion board 1580	50	50[78]
8 relays expansion board 1581	15	15
Ext. FBP interface board 1582, no units connected	15	15
German FBP interface board 1583, no units connected	15	15
Autronica interface board 1584 (+ four BS4 loops)[79]	55+(4x30)=175	55+(4x60)=295
TLON connection board 1590	approx. 20	approx. 20

[76] Battery charging current, at approx. 27 V, is max. 1.2 A. This results in a battery charging current, at 24 V, of max. **2 A**. (lower voltage results in higher current, i.e. 1.2 A + 70% = 2 A)

[77] In case of a fire alarm the battery charging is turned off.

[78] When conv. detectors (with alarm resistor) are used, add 65 mA per zone activated. When detectors with a closing contact (short circuit results in a fire alarm) are used, add 86 mA per zone activated.

[79] The board has four BS4 loops. Current consumption is depending on the number and types of units connected to each loop. The values in the table shows the **max.** values, i.e. 99 units connected to each loop.

Unit		**Normal state** (quiescent) (mA)	**Alarm state** (activated) (mA)
Sensor 2300 / 2304 + analog base 2312	[80]	1.7 / 1.8	3.7 / 3.8
Sensor 3304 + analog base 3312	[81]	0.3	2.3
Analog heat detector 3308 + analog base 3312	[81]	0.3	2.3
Addressable base 2330 + detector. Incl. external line.	[80]	1.7 3.5	3.9 13.2[82]
Addressable heat detector 2340 / 2341	[80]	2	5
Addressable zone interface, isolated 2226	[83]	3	6
Addressable zone interface 2335		5	20
Addressable 8 inputs unit 2276		2	6
Addressable manual call point 2333		2	5
Display unit 2235 By ext. power supply of the display unit	[84]	12 3	20 3
Display unit 2236 By ext. power supply of the display unit	[85]	12 3	12 3

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

[80] Extern LED current consumption: add 1 mA.

[81] Extern LED current consumption: add 2 mA.

[82] Alarm state on detector and external line: 15.4 mA

[83] 2226 also require external power supply, 24V DC, 20 mA.

[84] The values in the table shows current consumption from COM loop. (Active: 12 mA + LED "Acknowledge" lit 8 mA = 20 mA). Display backlight require external 15-28 V, 110 mA (at 15 V).
By external power supply (15-28 V) of the display unit: 12 / 120 mA (at 15 V). LED "Acknowledge" lit: add 8 mA.

[85] The values in the table shows current consumption from COM loop. Display backlight require external 15-28 V, 110 mA (at 15 V).
By external power supply (15-28 V) of the display unit: 12 / 120 mA (at 15 V).

Unit	**Normal state** (quiescent) (mA)	**Alarm state** (activated) (mA)
Addressable short circuit isolator 2370	15	5[86]
Addressable 4 relay outputs unit 2265	2	2
Addressable 4 outputs unit (with power supply) 2262 [87]	6	6
Addressable 4 outputs unit (without power supply) (2263).[88]	6	6

[86] By a short circuit approx. 5 mA (that insignificant in this state).

[87] The values in the table shows current consumption from COM loop. Current consumption (q / a) by battery power supply (24 V): ≤ 350 (≤ 50 after 10 min.) / ≤ 3070 mA (depending on connected equipment, e.g. door release magnets in **q**uiscent state and alarm devices in **a**larm state).

[88] The values in the table shows current consumption from COM loop. Current consumption (q / a) by 2262 or external power supply (24 V): ≤ 330 (≤ 50 after 10 min.) / ≤ 3070 mA (depending on connected equipment, e.g. door release magnets in **q**uiscent state and alarm devices in **a**larm state).

Unit	**Normal state** (quiescent) (mA)	**Alarm state** (activated) (mA)
Routing equipment (Fire brigade tx / Fault tx)	Acc. to the producer	Acc. to the producer
External FBP 2425 (with printer) [89] [90] [91] [92]	85	100
External FBP 2426 (without printer) [89] [91] [92]	85	100
~~External FBP 2427 (without printer) [89] [91]~~	~~85~~	~~100~~
External Presentation Display 2428 [91] [93]	36	116
Data converter BEST (Nurse call system) 2290 [91]	70	70[94]
Data converter Tateco (Ascom paging system) 2291 [91]	70	70[94]
Data converter EBL-talk 2292 [91]	70	70[94]
~~Data converter Multicom 2293 [91]~~	~~70~~	~~70[94]~~
~~Data converter FBP status information 2294 [91]~~	~~70~~	~~70[94]~~
Alarm devices (sounders, etc.)	0	Acc. to the producer
Door release magnets	Acc. to the producer	0
2 inputs / 1 output unit 2222	0	1
~~Timer 6339)~~	~~32~~	~~90~~
GW512[95]	100	100
~~Alert annunciation controller 2232).~~	~~6~~	~~75~~[96]

[89] FBP display backlight add 100 mA.

[90] Active printer add 200 mA.

[91] Normally power supplied from Ext. FBP interface board 1582. When required ext. power supply could be used.

[92] Regarding External FBP 2425 / 2426: A "new version" (p.c.b. number 2425-3A, CFG: 1) has approx. the same current consumption as External Presentation Display 2428.

[93] The values in the table are valid by 24 V. By 22 V: 37 / 124 mA. By 20 V: 38 / 132 mA. By 18 V: 40 / 145 mA. By 16 V: 42 / 160 mA.

[94] Add max. 50 mA per driver output used.

[95] Should be power supplied from the EBL1000 / 2000 main control unit.

[96] Output for ext. indicator max. 500 mA.

18 Power supply

Normally the EBL512 control unit is powered by the built-in rectifier (230 V AC / 24 V, 4.5 A).

By mains (230 V AC) failure the control unit is powered by the built in battery (2 pcs of Sealed Lead Acid batteries, 12 V, 24 Ah).

The batteries and the rectifier are connected to the Charger board 1557, which also handles the battery charging.

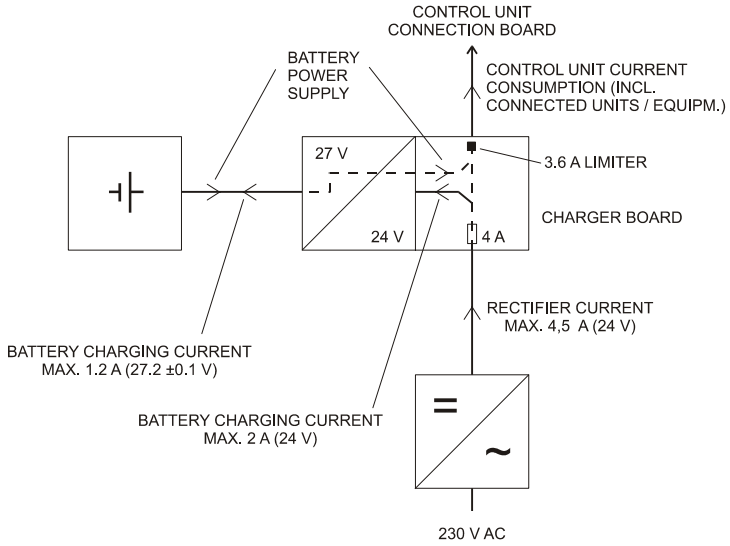

Figure 20. EBL512 power supply block diagram.

EBL512 is a very flexible system, i.e. number and types of loop units, number and types of expansion boards, ext. FBPs, ext. equipment, etc. can vary from one control unit to another.

For each control unit, the current consumption in **Normal state** (quiescent) and in **Alarm state** (activated) have to be calculated to get a total current consumption overview and to check that the rectifier will not be overloaded and if the battery capacity is enough.

NOTE!

According to EN 54-4, 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*.

If this section is to be followed, only the 24 Ah battery can be used (because of the max. 1.2 A charging current) and $\mathbf{I^{TN}} \leq 0.8$ A.

Use the values in chapter "Current consumption", page 78 to calculate the following current consumption alternatives:

- $\mathbf{I^{CN}}$ = current consumption for the control unit (C) in normal state (N).
- $\mathbf{I^{RN}}$ = current consumption for the remaining equipment[97] (R) in normal state (N).
- $\mathbf{I^{CA}}$ = current consumption for the control unit (C) in alarm state (A).
- $\mathbf{I^{RA}}$ = current consumption for the remaining equipment[98] (R) in alarm state (A).

18.1 Rectifier

The rectifier technical data are 24 V DC and max. 4.5 A but the charger board input has a **4 A** fuse and the output is limited to **3.6 A**. See also Figure 20, page 82.

Calculate and check the total (T) current consumption for the control unit (C) and remaining equipment (R) in normal state (N) and in alarm state (A).

- $\mathbf{I^{TN}} = I^{CN} + I^{RN}$
- $\mathbf{I^{TA}} = I^{CA} + I^{RA}$

Explanations regarding the normal state ($\mathbf{I^{TN}}$):

$\mathbf{I^{TN}}$ should normally be $\leq$ 2 A (4 A – 2 A batt. charg. = 2A).

$\mathbf{I^{TN}}$ is recommended to be $\leq$ 0.8 A because this results in 30 hours battery backup time (theoretical value) with 24 Ah battery.

If $\mathbf{I^{TN}}$ > 2.5 A (even for a short time) fault is activated and the following fault message is shown:

```
FAULT: CU xx too high current consumption
```

The battery charging is turned off until $\mathbf{I^{TN}} \leq$ 2.5 A.[99]

Explanations regarding the alarm state ($\mathbf{I^{TA}}$):

---

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

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

[99] A fault will be activated after 5 hours (in Swedish convention, other times in other conventions) and the following fault message will be shown:
`FAULT: Charging, control unit xx`

$\mathbf{I^{TA}}$ should be ≤ 3.6 A. When fire alarm is activated the battery charging is turned off. Fault will not be activated in this case.

18.2 Battery

Find out the required battery backup time[100], both in normal state and in alarm state.

To calculate the battery capacity, the total current consumption in normal state, $\mathbf{I^{TN}}$, and in alarm state, $\mathbf{I^{TA}}$, should be multiplied with the battery backup time.

- $\mathbf{Q^N}$ (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)

Q = Calculated battery capacity (Ah) = $\mathbf{Q^N} + \mathbf{Q^A}$

Normally you should round off the calculated capacity (upwards) and add 10% because the battery voltage at the end of a discharging period is not the same as at the start.

A table showing the relation between the total current consumption for the control unit in normal state ($\mathbf{I^{TN}}$) and the backup time with a 24 Ah battery. Note! The values are calculated and gives only a rough idea of the backup time.

$\mathbf{I^{TN}}$ (A)	**Backup time** (hours)
1.0	24
0.8	30
0.6	40
0.4	60
0.2	120

18.3 Form / Table of current consumption

Some national regulations require different forms / tables regarding current consumption, to be filled in. In such cases should an ampere meter be used instead of calculating the current consumption.

[100] According to national regulations, customer demands, etc.

19 SW versions

Due to continual development and improvement, different SW versions are to be found.

Different SW versions could be found on different markets.

The SW versions listed below were the valid ones when this document was written (the date of this document or date of revision).

SW for:	Latest version	Required version
1548 / 1549 / 1550; EBL512	1.43.x[101]	1.43.0
1580; 8 zones expansion board	3.0	2.1
1581; 8 relays expansion board	3.0	1.2
1582; Ext. FBP interface board	3.0	3.0
1583; German FBP interface board	3.0	3.0
1584; Autronica interface board	3.0	3.0
1590; TLON connection board	1.2	1.1
2235 / 2236 (2237 / 2238); Display unit	2.30 (2.30)	2.21 (2.30)
2262 / 2263; Addr. 4 outputs unit	3.1[102]	3.1
2425 / 2426; Ext. FBP	2.03	2.03
~~2427; Ext. FBP~~	~~2.04~~	~~2.04~~
2428; Ext. Presentation Display	2.05	2.05
Win512	1.43.0	1.43.0
TLON Manager	1.11	1.11
TLON DDE	1.43.0[103]	1.43.0

[101] x = 2. Note! Latest version can vary depending on the market / country.

[102] HOLD1 & 2 are not getting low 10 min. after mains failure.

[103] EBL512 version 1.43.x (or higher) required.

20 Technical data

Voltage

Primary (V AC): 230

System (V DC): 24[104]

Current consumption

Quiescent / active: Depending on type (1548-1550), etc. See chapter "Current consumption", page 78

Ambient temperature (°C)

Operating: 0 to +40

Storage: -40 to +70

Ambient humidity (%RH)

max. 90, non condensing

Ingress protection rating

IP 22 (estimated)

Size H x W x D (mm)

610 x 400 x 175. See also drawing 512-11

Weight (kg)

1548: 17.6

1549: 18

1550: 17.4

Colour

Metal cabinet: light grey (NCS S 1500-N / PMS Cool Gary 2 / RAL 7047)

Approvals

Conforms with EN 54-2 and EN 54-4

[104] 24 V is the rated voltage. The operating voltage can be higher / lower.

21 National regulations

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

EBL512 is very flexible. Many functions / facilities are built-in the system, e.g. in the SW.

When downloading SW, different settings, conventions, languages, etc. can be set to fulfil national regulations.

22 Drawings / connection diagrams

All dimensions quoted are approximate only and subject to change without notice, as are other technical features and data, resulting from continual development and improvement.

23 Revision history

Revision -

This page has deliberately been left blank.

This page has deliberately been left blank.

NAiS Matsushita Electric Works
Fire & Security Technology AB

Citadellsvägen 23, SE-211 18 Malmö, Sweden. Tel: +46 (0)40 697 70 00 Fax: +46 (0)40 697 70 99
Home page: www.mfstech.com