Delta DA

User's Guide

Detection and
Alarm Module

NS-ISO 9001 Certificate No.244 and 319
The certificate does not cover manufactured products.

This product is CE labelled and satisfies all requirements applicable to relevant standards and directives:

EMC

Immunity Standard

- EN50130-4 Product Family Std. Immunity Alarm Systems

Generic Emission Standard:

- EN50081-1 Residential, Commercial and Light Industry
- EN50081-2 Industrial Environment

LVD

- LVD73/23/EEC Low Voltage Directive

Please contact our Head Office at the following addresses:

Novar AS

P.O. Box 3514
N-3007 DRAMMEN
Norway

Tel.: +47 32 24 48 00
Fax: +47 32 24 48 01
E-mail : nordic.support@novar.com
Visit our Web site on the Internet at:
Home page: www.novar.no
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251245, *DELTA DA* analogue marine (English)

Table of contents

1. Welcome

Congratulations on your purchase of the *DELTA DA* module, — a new and cost-effective detection and alarm module developed to facilitate the decentralisation of the fire alarm installation across the protected area.

The *DELTA DA* module now gives you the possibility of splitting up the conventional 'large fire cabinets' — with loop cards, batteries, terminal blocks, etc. — into several small, easily concealed, decentralised modules. At the same time, you can operate the whole fire alarm system from the attractive *DELTA OP* panel.

About this Manual

This manual has been written with the intention of giving users of *DELTA DA* the technical information required for using the new module.

User manual
(this manual)

Installation Guide

✓ **Installation of *DELTA DA* :**
For information on how to install *DELTA DA*, see the manual '*Installation Guide DELTA DA',* which accompanies the module.
Also refer to 'Documentation Chart for *DELTA Technology*', page 17.

✓ **Set-up of *DELTA DA*** :
For safety reasons, the configuration of *DELTA DA* should be regarded as *Access Level 3* (in accordance with EN 54). Only authorised and qualified personnel should have access to the set-up. Please contact *Novar's* Service Department.

Take a look at the table of contents to familiarise yourself with the booklet.

We have also emphasised the use of images and graphics to make the book easy and interesting to read.

Glossary and Abbreviations

If you wonder what certain words, expressions or abbreviations in our publications mean (technical terms), please, visit our site on the Internet to download the freshest version of booklets such as "*Glossary Base, Terminology Fire Alarm Systems*" and similar publications. The booklets explain technical terms used in *Novar*'s systems for fire alarm, voice alarm, emergency lighting, etc.

The easiest way to find products and other information on our Internet site is by using the site's *search engine*. Just type a key word in the search field, select the area you want to search within and click on the <*Search*> button.

Do following:

- Visit us at www.Novar-fs.no
- Type, for instance, the word «*terminology*» in the *search field*
- Click on the «*Search*» button
- Read the actual page, or download the booklet
  (follow the on-screen instructions)

2. Brief Description of *DELTA DA*

DELTA DA is a micro processor-based fire detection and alarm module designed for connection to the *DELTA* and *ANX95* families of fire alarm systems.

Every *DELTA DA* module has programmable inputs and outputs which can be configured for connection of detector loops and/or alarm outputs. The detector loops can be addressable- analogue and/or conventional. Some alarm outputs are monitored and others are potential-free.

The *DELTA DA* module incorporates an advanced multi-voltage power supply, which powers the detector loops and alarm outputs, and charges the accumulator batteries. It can also supply other operating panels in the network.

The *DELTA DA* module has a port for direct *eBus* connection[1] for communication with other units in the fire alarm network. The module also incorporates a communication port for connecting computers via the RS232C interface.

You can operate the *DELTA DA* system from one of the *DELTA OP* panels connected to the fire alarm network. These panels are the main interface between you and the system, while the *DELTA DA* modules operate in the background.

Adjustment of the advanced functions in *Discovery* detectors — the new range of Apollo fire monitors — can be performed directly from *DELTA OP*.

Applications

The *DELTA DA* unit can be used as a detection and alarm module in a large fire alarm network or it can be an integrated part of a stand-alone fire alarm panel, for example the *DELTA Compact* – see also the chapter, 'Typical Configurations', on page 11.

Configuration

The *DELTA DA* does not require any adjustment or configuration of DIP-switches or jumpers on the circuit card. However, commissioning does consist of configuring the software in *DELTA DA* to communicate in a network with the *DELTA OP* panel and with other modules or control panels.

Configuration is performed using *FireWin Explorer* — a Windows-based program that runs on a connected PC. Simple functions can also be configured via the keypad on connected *DELTA OP* panels by selecting commands from *set-up menus* in a hierarchical menu system. The *DELTA DA* module stores the configuration data — serial and system number, number of systems, etc. — in the module's EEPROM.

For more detailed information on the configuration of the *DELTA DA,* see the manual, 'User Guide *FireWin Explorer*' or other relevant literature.

[1] The use of plug-in "*Kit for OP, DA: eBus Communication Board*" is required.

Main Features

- ☆ **Small, cost-effective fire detection and alarm module**
  adapted for decentralisation of the fire alarm system across the protected area
- ☆ **Compatible with the *ANX95* family of control panels**
  this allows direct connection to existing *master/slave*[2] and *multi-master* fire alarm networks
- ☆ **Compliance with *European Standard EN 54 Part 2***
  regarding monitoring and alarm equipment
- ☆ **Advanced cutting-edge technology**
  which uses micro-processor based electronics with many programming possibilities
- ☆ **Support for the new intelligent *Discovery* detectors**
  with environment-adjusted sensitivity in 5 levels, automatic change of day-and-night setting, automatic warning when cleaning is required, etc.
- ☆ **Reliable and flexible control and monitoring system**
  with low power consumption and sophisticated monitoring of all critical components
- ☆ **Advanced, multi-voltage power supply**
  for automatic charging of the batteries and to drive the detector loops, alarm outputs and other panels
- ☆ **Advanced downloading of the configuration's parameters**
  direct from a PC running the *FireWin Explorer* application
- ☆ **Also available as an integral part of the *DELTA Compact* fire alarm panel**
  with built-in *DELTA OP* operating panel and standard accumulator batteries

Block Diagram

This block diagram shows the main functions of the *DELTA DA* module. For further information, se 'Technical Specification', on page 12.

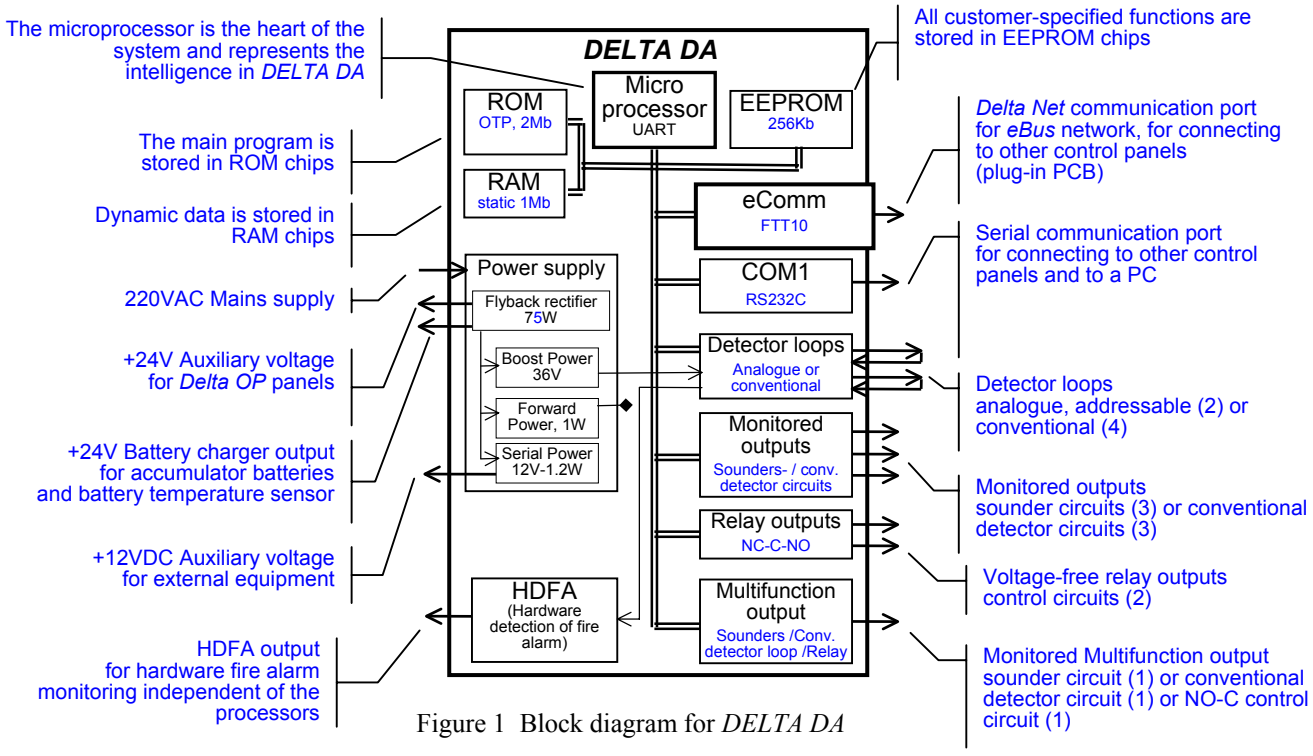


Figure 1 Block diagram for *DELTA DA*

[2] Connection to *mater/salve* networks via connected *DELTA OP* panels.

Inputs, Outputs & Communication Ports

The *DELTA DA* module can be connected as a node in a fire alarm network, which allows you to decentralise the terminal blocks for detector loops, sounder circuits and control circuits.

The module has built-in following individually programmable inputs and outputs — no jumpers required:

- ◊ 2 analogue, addressable detector loops
- ◊ 3 monitored voltage outputs
- ◊ 2 voltage-free NC-C-NO relay outputs
- ◊ 1 Multifunction output
- ◊ 1 *eBus* communication port
- ◊ 1 serial communication port

Detector Loops — TB1, TB2

The *DELTA DA* module has two inputs (TB1 and TB2) for connecting two analogue addressable two-wire ring detector loops as shown in Figure 2.

The loops are continually monitored for breaks and short circuits. The *DELTA DA* module also monitors all the detectors and units connected to the loops and sends the communication pulses through the other side of the loop if it detects a break in the loop. By connecting isolators at strategic points on the loop, you can reduce the number of detectors that will stop functioning if a short circuit occurs.

The terminal block inputs TB1 and TB2 can also be configured for connecting four conventional two-wire detector loops; see Figure 3. In this case the loops are monitored for breaks and short circuits with the aid of 6k8 *end-of-line resistors*.

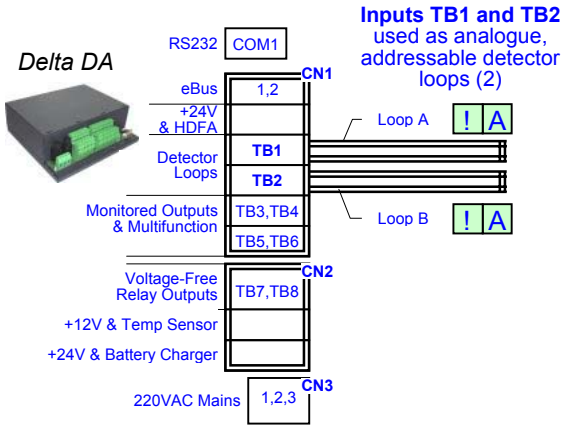


Figure 2 Analogue addressable detector loops

OR

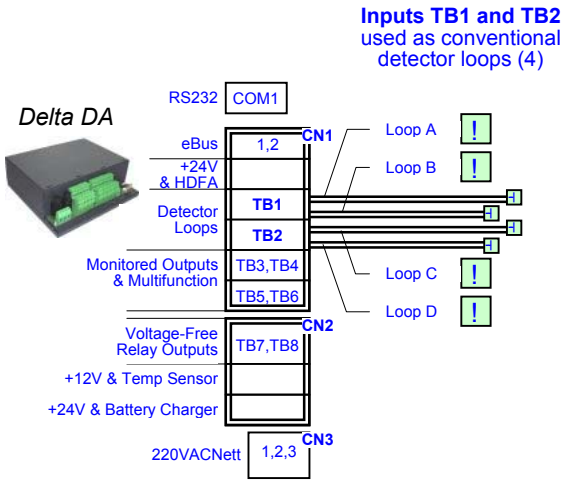


Figure 3 Conventional detector loops

The loop components that are connected to these loops must be series S60, S90, XP95 or Discovery, all Apollo series.

For detailed technical information on loop inputs TB1 and TB2, see chapter, ‘Technical Specification’, page 12.

Alarm & Control Circuits

The *DELTA DA* module has three different types of outputs for connection of alarm and control circuits:

- ◊ Three monitored voltage outputs (TB3, TB4 and TB6)
- ◊ Two voltage-free relay outputs (TB7 and TB8)
- ◊ A monitored Multifunction output (TB5)

Monitored Voltage Outputs — TB3, TB4, TB6

The three monitored voltage outputs TB3, TB4 and TB6 are intended for connection to standard sounder circuits; see Figure 4.

The circuits are monitored for breaks and short circuits by using a 6k8 *end-of-line resistor* and by internal electronic fuses. In the module's normal mode, the circuit is monitored and has an output voltage of -24VDC. When the *DELTA DA* is in alarm mode, this output voltage switches to +24VDC.

You can also configure these three voltage outputs for connection of conventional detector loops, Figure 5.

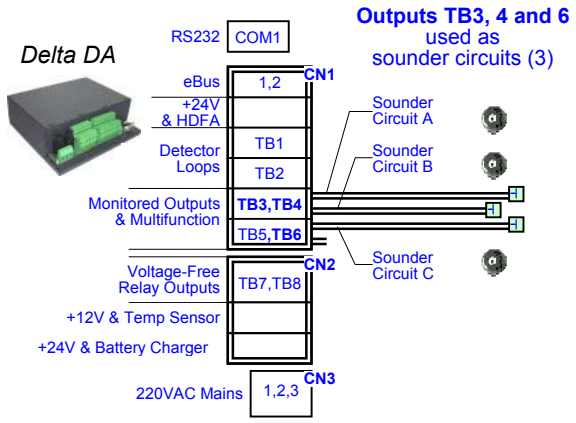


Figure 4 Monitored voltage outputs drive sounder circuits

OR

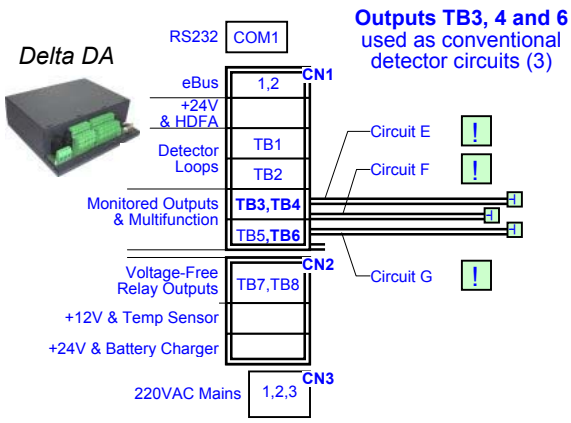
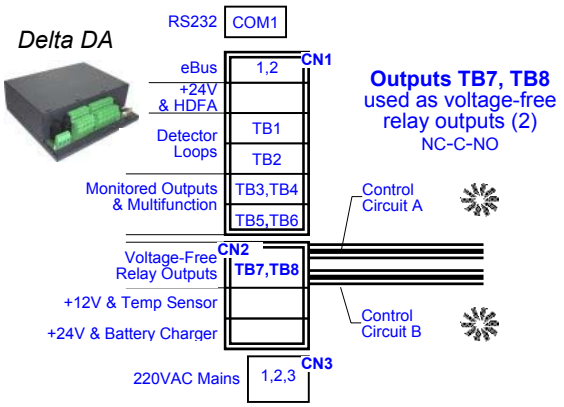


Figure 5 Monitored voltage outputs configured to drive conventional detector loops

For detailed technical information on voltage outputs TB3, TB4 and TB6, see the chapter, 'Technical Specification', page 12.

Voltage-Free Relay Outputs — TB7, TB8



The *DELTA DA* module is equipped with two voltage-free relay outputs, TB7 and TB8, of the NC-C-NO type, for connecting circuits used for controlling external equipment such as door-hold magnets, ventilation fans, motors, etc., see Figure 6.

For control of 220V equipment, you must always use an external auxiliary relay.

Figure 6 Voltage-free relay outputs

Monitored Multifunction Output — TB5

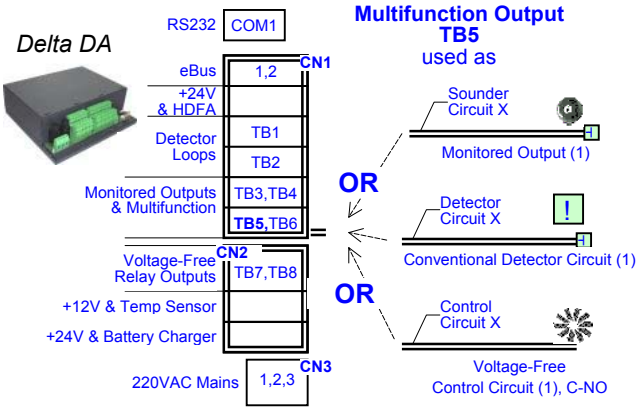


Figure 7 Monitored Multifunction Output

The *DELTA DA* module is also equipped with a monitored Multifunction output, TB5, which you can configure for connecting:

- A monitored alarm circuit, usually used for sounder circuits, or
- A conventional detector loop, or
- A C-NO voltage-free control circuit

The sounder and the detector circuits are monitored for breaks and short circuits using a 6k8 *end-of-line resistor* and internal electronic fuses.

For further information, see the chapter, 'Technical Specification', page 12.

HDFA:
Hardware **D**etection
of **F**ire **A**larm

HDFA Input & Output— Fire Brigade Output

The *DELTA DA* module's HDFA detection line input — terminal block CN1-13,14 — and the line output — terminal block CN1-15,16 — are used to connect the module to other system units in the *DELTA Net*.

The HDFA detection line connects all system units and the line is monitored using a 6k8 *end-of-line resistor*, which is connected to the last module.

In order to make it possible for a *DELTA Net* fire alarm system to be able to report a fire alarm when a communication fault occurs or the micro processors stop, the *DELTA DA* module has built-in galvanically isolated electronics for hardware detection of fire alarms.

If such a fault occurs, the hardware detection and alarm function in *DELTA DA* will automatically be activated to monitor the analogue *Discovery* detectors connected to the module.

If one of these detectors reports a fire alarm (even though the standard loop communication is not functioning), the module's HDFA function will send on the fire report through the HDFA detection line to the main *DELTA OP* panel. HDFA alarms are shown as a fire alarm indication and will activate the fire brigade remote output in the main *DELTA OP* panel.

See also the description in the chapter, 'HDFA Detection Line — Fire Brigade Output', on page 18.

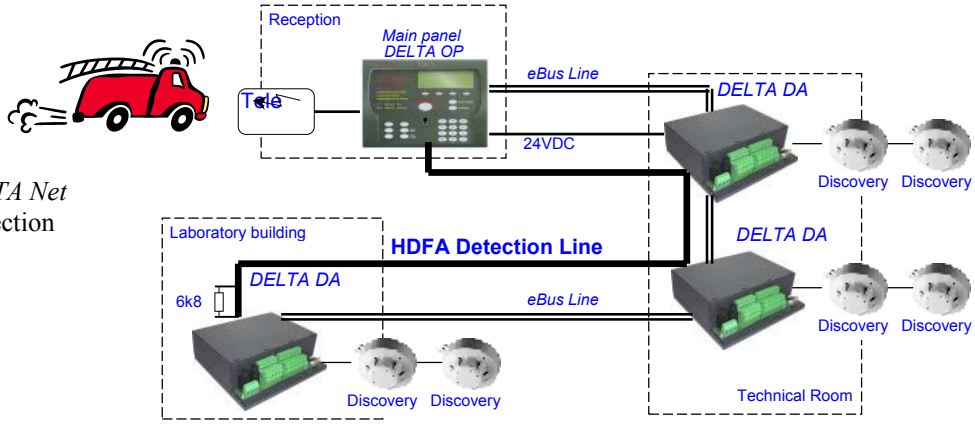
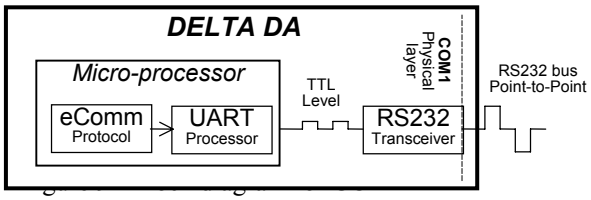


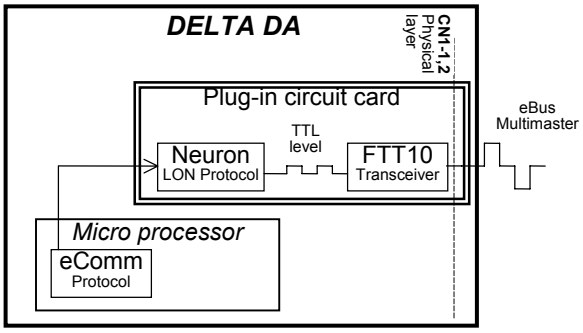
Figure 8 Example: *DELTA Net* with HDFA Detection Line.

DELTA net

Communication Ports



The *DELTA DA* module communicates with computers, *DELTA OP* panels and other *DELTA DA* modules using the *eComm* protocol. Short distance communication can be implemented via the standard serial bus RS232C.

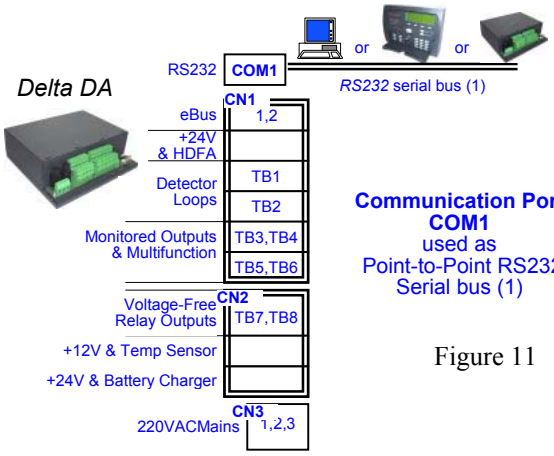


For longer distance communication, the *eBus* Multimaster (FTT10) is used.

Support for the *eBus* communication is implemented using the plug-in '*Kit for OP,DA: eBus Communication Board*'. See also the kit's documentation.

Figure 10 Block diagram for the CN1-1,2 port (based on plug-in circuit card)

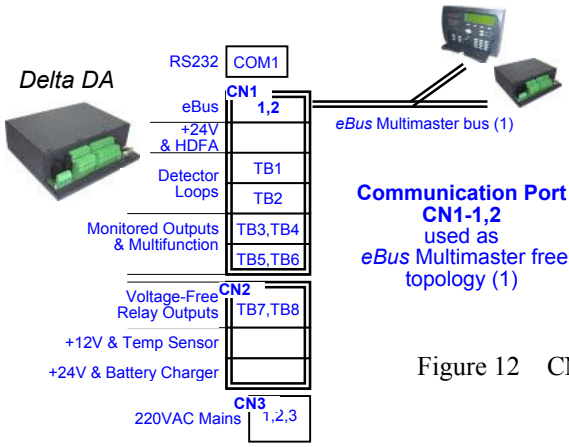
Communication Port COM1



The *DELTA DA* module is equipped with a D-Sub 9-pin communication port — COM1, see Figure 11 — which is used to connect computers, *DELTA OP* and *DELTA DA* modules via the standard *RS232 Point-to-Point serial bus*.

Figure 11 Port COM1, D-Sub 9-pin communication port

Communication Port CN1-1,2



The CN1-1,2 communication port is located on terminal blocks and is used for connecting *eBus* (free topology, Multimaster bus, see Figure 12), which allows long distance communication with other *DELTA DA* modules, *DELTA OP* panels, ANX95 fire alarm panels (*eNode* required) and other equipment and nodes connected to the bus.

Figure 12 CN1-1,2, terminal block; communication port

Typical Configurations

The *DELTA DA* module can be used in both compact and distributed solutions.

In the compact solution — all-in-one cabinet — the *DELTA OP* and *DELTA DA* modules form a complete centralised fire alarm system: *DELTA Compact*.

In distributed solutions, the *DELTA DA* module is connected to a network of fire alarm panels that can be of types: *DELTA DA*, *DELTA Compact* and *ANX95*. The module can then be used to split up the 'large fire cabinets', with loop cards, batteries, terminal blocks, etc., into several small, easily concealed decentralised modules.

The figures in this chapter show two examples of typical *DELTA DA* configurations.

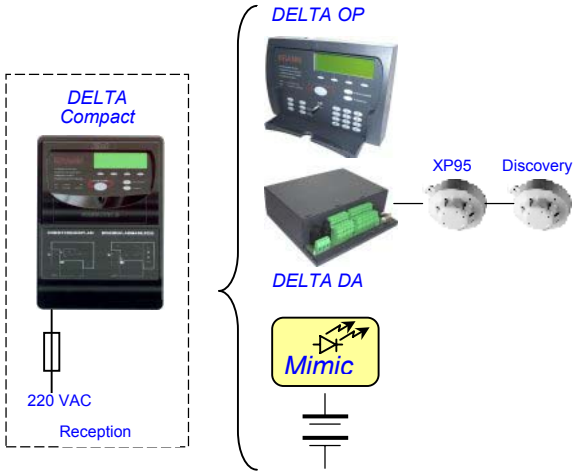


Figure 13 **Standard *DELTA Compact* cabinet** (the cabinet can contain all the modules shown)

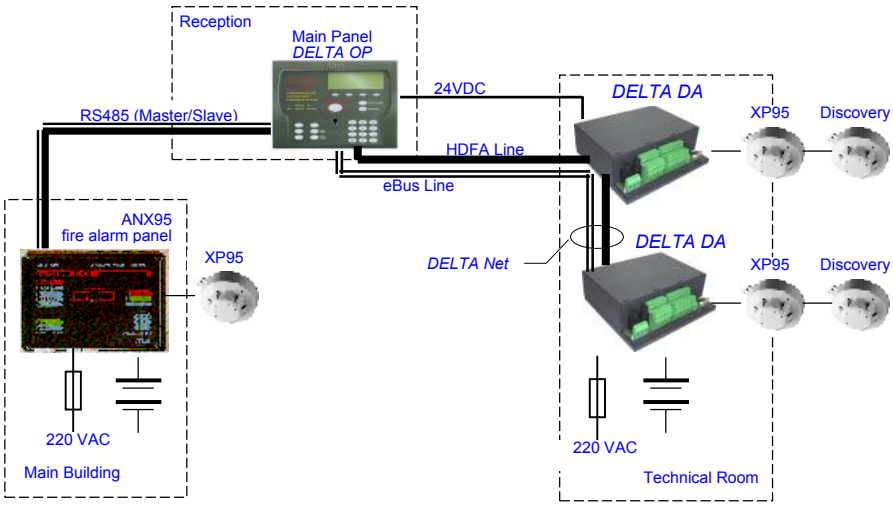


Figure 14 **Distributed solution with *DELTA DA*** and *DELTA OP* modules and ANX95 fire alarm panel

3. Technical Specification

In this chapter you will find the most important technical data for the *DELTA DA* module.

Electrical Data

Power Supply		
TYPE	ELECTRICAL DATA	COMMENTS
Mains input		
Voltage area:	185-265VAC / VDC, 1 phase	Four rectifiers: 3 switched (SMPS) and 1 serial regulator
Input current:	1.0A	At full power
Frequency:	50Hz	
Mains fuse:	230VAC, 1A (monitored)	Glass fuse 5*20mm, Quick-Blow
Outputs		
MAIN		
+24V internal main supply:	17 - 30VDC 3A 75W	Main rectifiers, Flyback type, used to supply all outputs.
Output battery terminals:	24VDC 3A max.	While mains off
MULTI-OUTPUTS		
Output battery charger, fuse:	24V, 4A (monitored)	Slow-Blow glass fuse, 5*20mm and 22V electronic fuse
Output +24V supply:	24V, 300mA, electronic fuse	For *Delta OP*
Output +24V auxiliary voltage:	24V, 1A, electronic fuse	For external 24V equipment
Output +12V auxiliary voltage:	+12V ±20% 100mA 1.2W, electronic fuse	For external 12V equipment
Internal +5V supply:	+5V ±10% 200mA 1W	For internal electronics
Internal 36V supply:	36V ±5% 1A 36W	For loop communication
Current consumption		
Internal consumption:	50mA	Only mains input connected
Normal mode:	70mA	Only mains input and *terminating resistor* on the terminal blocks
Current consumption for connected equipment		(examples)
DELTA OP panel:	50-60mA (normal mode) 300mA (alarm mode)	per panel
Discovery detector	0.5mA	and 3.5mA alarm LED
XP95 detector	0.3mA	and 2mA alarm LED
Alarm bell	50mA	
GPT door magnet	40mA	
Detector buzzer 235307-08:	4mA 6.5mA	when connecting to R+ and R- when connecting to SL+ and R-
Other properties		
Short-circuit proof:		Over-voltage protection, current limiting.
Temperature-compensated charging:		Temperature sensor for battery
Monitoring of power consumption:		
Electro-magnetic interference		
Radiation:	VDE0871, class B	In accordance with
Immunity:	IEC801 1-5	In accordance with

Communication Channels			
	PROGRAMMABLE	TYPE	APPLICATION
COM1	Yes	**Series RS232C** 9-pin D-Sub male Protocol: *eComm*⇨UART Physical layer: RS232 transceiver	Communication with *DELTA OP*, *DELTA DA* or PC with *eComm* protocol
CN1-1,2	yes	**Series FTT10, (eBus)** Terminal block Protocol: eComm⇨LON Physical layer: FTT-10 transceiver	Communication with control panels and other nodes in *eBus* network. (Requires use of '*Kit for OP,DA: eBus Communication Board'*

Inputs — for Detector Circuits			
TYPE	QTY.	ELECTRICAL DATA	COMMENTS
Detector Circuits:	2	Terminal blocks: CN1-5,6,17,18 and CN1-7,8,19,20 Logic reference: TB1 and TB2	Individually programmable. Used as follows:
Analogue addressable detector circuits	2	Two-wire ring loops 24VDC ±10%, 66.5mA 24VDC ±10%, 140mA 24VDC ±10%, 280mA 24V+8V ±15%, 30mA 0.5µF max. Break-proof Short circuit-proof	Loops with return to the *DA* module Max. Normal mode Max. Alarm mode, 50Ω loop resistance Max. Alarm mode, 25Ω loop resistance; loop voltage must always be >17V Pulse voltage, current Loop capacitance Also loop communication from return side Protected by internal electronic fuses. Recommended use of isolators for every 32 loop components.
OR			
		S90, XP95, Discovery 126 addressable	Communication Protocol: Apollo Max. no. of loop components
Conventional detector circuits	4	Two-wire lines S30, S60 (electrical data)	Two-wire circuits without return. Terminated with a 6k8 *terminating resistor* Apollo type detectors connected to the loops Same specification as for conventional loops in the table 'Outputs — for alarm and control circuits'

Outputs — for Alarm and Control Circuits			
TYPE	QTY.	ELECTRICAL DATA	COMMENTS
Monitored voltage outputs	3	Terminal blocks: CN1-9,10, CN1-21,22 and CN1-23,24 Logic reference: TB3, TB4 and TB6	Individually programmable. Used as follows:
Sounder Circuits OR	3	Two-wire circuits 17-30VDC, max. 5mA 17-30VDC, max. 1A Break-proof Short circuit-proof Max. 20 bells	No return. Terminated with a 6k8 *terminating resistor* In normal mode, -24V In alarm mode, +24V (reversed polarity) Monitored by *terminating resistor* Protected by internal electronic fuses Per circuit (Inductive loads must be protected by reverse-current diodes)
Conventional detector circuits	3	Two-wire circuits 17-30VDC, max.5.2mA 17-30VDC, 140mA 17-30VDC, 280mA 150nF Break-proof Short circuit-proof Max. 32 detectors S30, S60	Circuits without return. Terminated with a 6k8 *terminating resistor* 24VDC in normal mode, 0V-reset Max. Alarm mode, 50Ω line resistance Max. Alarm mode, 25Ω line resistance; loop voltage must always be >17V Loop capacitance Monitored by *terminating resistor* Protected by internal electronic fuses Per loop, according to FG regulations Apollo type detectors connected to the loops
Monitored Multifunction output	1	Terminal block: CN1-11,12 Logic reference: TB5	Individually programmable. Used as follows:
Sounder Circuits OR	1	Two-wire circuits (electrical data)	No return. Terminated with a 6k8 *terminating resistor* Same specification as for sounder circuits above
Conventional detector circuits OR	1	Two-wire circuits (electrical data)	No return. Terminated with a 6k8 *terminating resistor* Same specification as for conventional detector circuits above
Voltage-free control circuits	1	Type: C-NO Max. 30V, 2A	Double-pole voltage-free relay contact Common—Normally Open Permitted to be connected to the relay contacts. Connecting 230VAC load is not permitted
Voltage-free relay outputs	2	Terminal blocks: CN2-1,2,3 CN2-8,9,10 Type: NC-C-NO Max. 30V, 2A Logic reference: TB7, TB8	Used as control circuits Three-pole voltage-free relay contacts Normally Close— Common—Normally Open Connecting 230VAC load is not permitted

Input and Output — for HDFA Detection Line			
TYPE	QTY.	ELECTRICAL DATA	COMMENTS
HDFA input and output HDFA (Hardware Detection of Fire Alarm)	1	Terminal blocks: CN1-13,14 CN1-15,16 Two-wire circuits 24VDC, ±20%, 10mA <150Ω 150Ω><3000Ω 3000Ω><8000Ω >8000Ω	Used for processors independent fire detection from Discovery detectors HDFA detection line (in) HDFA detection line (out) No return. Terminated with a 6k8 *terminating resistor* Voltage and current Short-circuit resistance Alarm resistance Normal resistance Break resistance

Storage Capacity			
PROGRAMMED IN →	EEPROM (256kb)	RAM (1Mb static)	ROM (2Mb OTP)
System's main code			stored in ROM
Number of system messages		1000	
Number of customer-specified functions and system parameters ◊ Alarm texts ◊ Assignments, detector zones ◊ Assignments, alarm and control outputs ◊ Analogue detector limits	 400 256 256 800		

Dimensions		
WIDTH	HEIGHT	DEPTH
172.5mm	196mm	60 mm

Other Data		
		COMMENTS
Weight	1.54 kg	
Storage temperature	-15 ºC to +85 ºC	
Operating temperature	-0 ºC to +55 ºC	
Humidity	0% to 95%	Relative humidity without condensation
IEC Protection Class	IP30	
Article Numbers:	251245 251246	*DELTA DA* Analogue, Marine, English *DELTA DA* Analogue, English

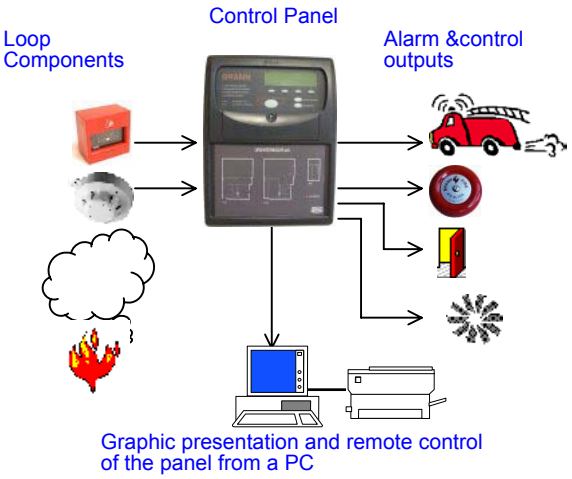
4. Appendix

What's a Fire Alarm System?

Eltek's fire alarm system principally consists of an *intelligent* control panel (or several panels in a network) which provides visual warnings of alarm situations in various ways and activates the control panel's *alarm and control outputs*. This is done on the basis of information about the development of smoke, heat, flames, etc., from *components* on the loops.

The system communicates with the following types of *components* on the detector loops:

- **Conventional** detectors
- **Analogue, addressable** detectors
- **Ancillary addressable devices**
  (e.g. addressable digital and analogue inputs on I/O units — ***DIO***)



Example of the principles of a fire alarm system

Each of the system's *alarm and control outputs* — terminal blocks in the control panels or modules and in ancillary devices — can be programmed individually and can be of the following types:

- Voltage Outputs
- Voltage-free outputs

The control panel may be configured to activate — based on information from *sub zones* — every *output group* in the system in many different ways[3].

More information on chapter "Fire Zones & Output Groups — Definition", page 22.

DELTA Technology — definition

DELTA Technology is the collective term for the *Novar* fire alarm system, which uses new, user-friendly logic for network engineering, control panel operation and fire alarm evaluation.

The *DELTA Technology* concept has the following principal features:

- Complies with EN 54, Parts 2 and 4
- Modular construction
- Decentralised or centralised
- Flexible and user friendly
- Fully scaleable
- Extensive signal processing
- Compatible with ANX95
- High noise immunity

[3] The ANX95 and ANX95E fire alarm panels uses neither sub zones or output groups. Their outputs must be configured based on information from the loop components.

Documentation Chart for *DELTA Technology*

The documentation chart below is a summary of the types of manuals, guides, instructions, etc. that are available for products in the *DELTA* family.

Distributed via Internet & included with the DELTA products

Internet, TechZone

DELTA net

◊ **Engineering Design Guide *DELTA Technology***
(Standard functionality, reverse compatibility, special functions, etc.)

Manuals, A4

Delta Compact

◊ **Assembly Guide *DELTA Compact***
◊ **Kit for *Compact:* Assembly Cables**
◊ **Installation Guide *DELTA OP***
◊ **User's Guide *DELTA OP***
◊ **Installation Guide *DELTA DA***
◊ **User's Guide *DELTA DA***

Delta OP

◊ **Installation Guide *DELTA OP***
◊ **User's Guide *DELTA OP***

Delta DA

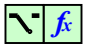
◊ **Installation Guide *DELTA DA***
◊ **User's Guide *DELTA DA***

Manuals and folders, A5

Data sheets, A4

FireWin Explorer

◊ **User's Guide *FireWin Explorer***
(Windows-based PC application for main configuration and set-up of *DELTA* modules)



Programmable Functionality

◊ **Configuration Guides for *Software modules***
(Instructions for configuring *DELTA* modules with special control functions, protocols, etc.)

KITs

Installation Guides for:
◊ Fire Brigade Termination Card, *Compact*
◊ Printer, PC Interface Connection, *Compact*
◊ Fire Brigade Termination Card, *OP*
◊ eBus Communication Board, *OP-DA*

HDFA Detection Line — Fire Brigade Output

HDFA:
Hardware **D**etection
of **F**ire **A**larm

In today's modern, software-based systems, if the microprocessor stops and the internal *watchdog* electronics do not manage to start it again, the system will not function satisfactorily.

In order to avoid this — and other communication faults on the network or detector loops — the *DELTA* modules have built-in galvanically insulated electronics for hardware detection of fire alarms. Thus the *DELTA* modules conform to the *European Standard EN54 Part 2*.

DELTA Net

DELTA Net communication — between *DELTA OP* and *DELTA DA* modules — consists of two twin cables, where one of them is used as HDFA detection line and the other twin cable as *eBus* communication line.

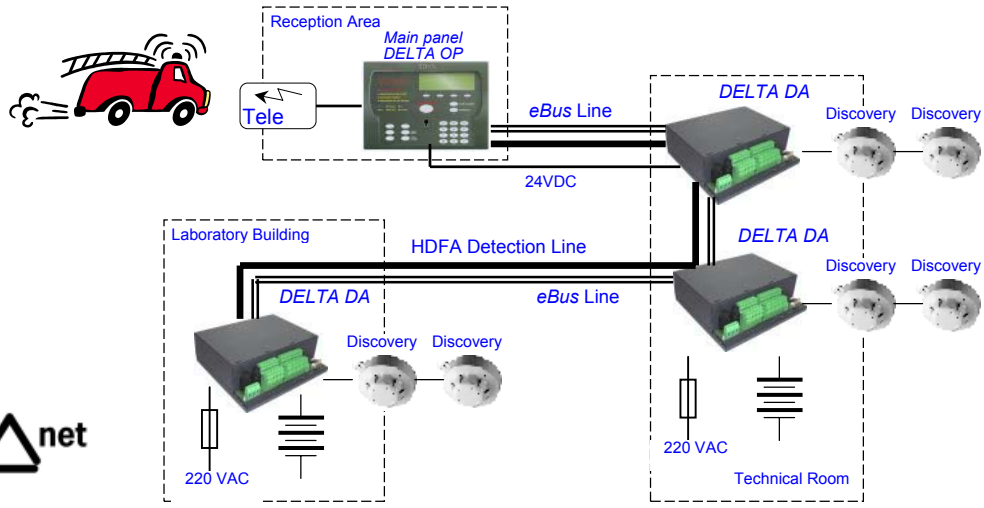
The HDFA function will be able to report a fire alarm from the *DELTA DA* modules even if:

- The microprocessor in *DELTA OP* stops
- The microprocessor in *DELTA DA* stops (*Discovery* detectors only)
- Communication on the *DELTA DA* detector loops does not work (*Discovery* detectors only)
- There is a break or short circuit in network communications (all types of detectors)

In such situations the HDFA function in the relevant *DELTA DA* module will be activated. Any fire alarm signals will be detected by the *DA* module's HDFA function, which will send the message on to the main *DELTA OP* panel via the HDFA detection line.

HDFA *alarms* will be shown as a fire alarm indication[4] and will activate the fire brigade remote output in the main *DELTA OP* panel.

Example: *DELTA Net* with HDFA Detection Line



DELTA net

[4] A HDFA alarm is indicated by LED and buzzer, it is not displayed on the graphic display.

Intelligent DELTA *Logic+*

In order to make secure and stable operation of fire alarm installation easier and to prevent undesired alarms, even in difficult environments, *Novar* has developed *DELTA Logic+*, a further development of our *Fireguard Logic* system. *DELTA Logic+* is collective expression used to cover the environmental adaptation features on offer with the DELTA concept, and incorporates the three main functions set out below.

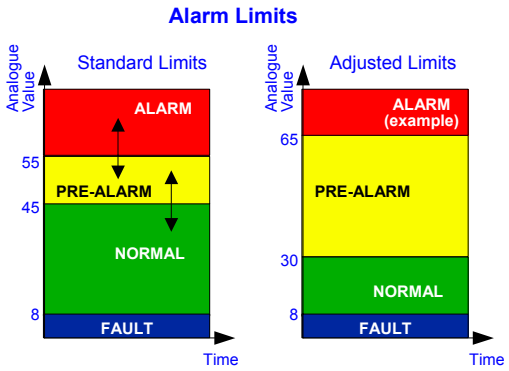
A key feature of *DELTA Logic+* is the option it gives you of adjusting areas of the protected premises to provide greater sensitivity so that you achieve the benefits of early warning (greater security in sensitive areas). Another great feature is the automatic environmental compensation built-in the *Discovery* range of detectors.

DELTA Logic+ has the following main properties:

Individual Adjustment of Alarm Limits

Pre-alarm and fire alarm detection levels can be adjusted individually at the control panel, within acceptable limits, for each analogue detector.

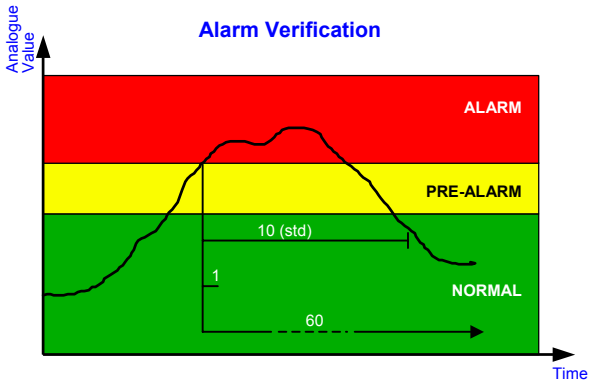
This property makes it possible to use smoke detectors in areas where some smoke may be present.



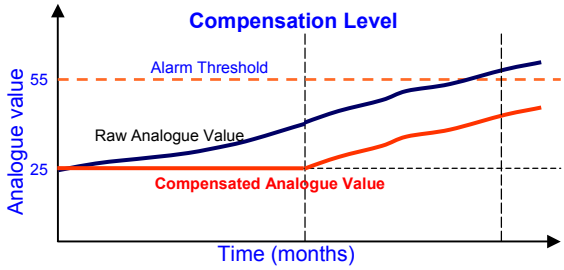
Alarm Verification

This function allows you to individually adjust at the control panel how long an analogue detector may report a pre-alarm or fire alarm before the fire alarm panel raises the alarm.

This property makes it possible for some areas to have high temporary concentrations of smoke without notifying an alarm. The fire alarm panel stores the highest and lowest smoke concentration levels for any detector.



Automatic Environmental Compensation



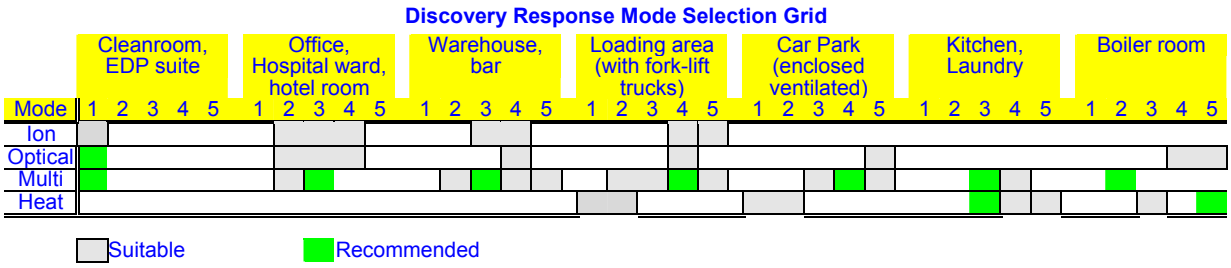
This detector function automatically compensates for environmental influences, e.g. dust, pollution.

All *Discovery* smoke detectors include compensation for sensor drift as part of the internal signal-processing algorithm. The algorithm will compensate for changes in sensor output caused, for example by dust in the chamber, and will therefor hold the sensitivity at a constant level even with severe chamber contamination.

Compensation values are stored in non-volatile memory and will be retained even if detectors are disconnected.

Response Modes

Each detector in the *Discovery* range can operate in one of five response modes, any of which can be selected from the control panel. Each mode corresponds to a unique response behaviour, which can be broadly related to sensitivity to fire. Whatever the type of detector, Mode 1 will give a higher sensitivity to fire than Mode 5. The selection of the most suitable mode depends on the application. Guidance on detector and mode selection is given in the selection grid below:



For ionisation and optical smoke detectors, the modes relate to different combinations of smoke response threshold and response time. For the heat detector, the mode relates to the fixed temperature setting and the sensitivity to rate-of-rise of temperature. For the multisensor, the mode relates to the levels of smoke and heat sensitivity and to the way in which the responses of the two sensors are combined.

The response characteristics of the detectors have been carefully set so that detectors will comply with the requirements of the relevant part of EN54 in all response modes.

To program the system, please contact *Novar's* Service Department. For security reasons, the configuration of the system should be regarded as access level 3 (in terms of EN 54). Only authorised and qualified personnel should have access to the set-up.

Addressing Rules for Networked Systems

Network — Address Ranges

Example of *system units' numbers*

Eltek's distributed fire alarm system usually consists of a network of *intelligent* fire alarm panels, operating panels and other modules — *DELTA DA, OP, ANX95, ANX95E*, etc. — which communicate with each other via the fire-alarm network. Every panel and module is a *system unit* in the network. In order to identify each of them, they must configured with a unique *system unit number*.

You can configure the *DELTA* module's *system unit number* from the keypad of any *DELTA OP* panels connected to the *eBus* network or from the *FireWin Explorer* application running on a PC.

Note that the configuration of the *system unit number* on an ANX95 and ANX95E control panel is only to be done from its own keypad.

Eltek's fire alarm system has the following address range for *system units* in networks:

Address Range for System Units

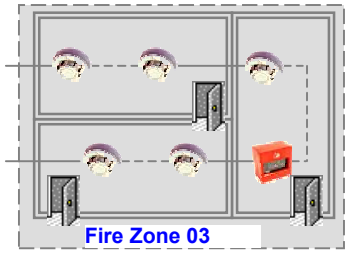
Control Panel	Connected to Novar Network	
	eBus	RS485 Master / Slave
DELTA Compact	01 — 256	01 — 99
DELTA OP	01 — 256	01 — 99
DELTA DA	01 — 256	—
DELTA Repeater	01 — 256	01 — 99
Fireguard DELTA	01 — 99	01 — 99
ANX95	01 — 99	01 — 99
ANX95E	01 — 99	01 — 99

- Note that eBus networks require **consecutive** *system unit numbers* starting with number "01". Also, to conform to the *European Standard EN 54 Part 2,* the main operating *DELTA OP* panel is to be configured with *system unit number* "**01**".
- RS485 Master / Slave networks **do not** require **consecutive** *system unit numbers*, but do not conform to the EN54 standard.
- The address ranges above are **also limited by the wiring topology** of the *eBus* (FTT10) network. The maximum number of nodes allowed is:
  128 nodes in STAR, LOOP and FREE topologies and 64 nodes in BUS topology.

Fire Zones & Output Groups — Definition

In order to make fire alarm system engineering more functional — and the *DELTA DA* modules easier to configure — you have to distribute the modules' input units (detectors) by zones and their outputs by groups.

Fire Zone

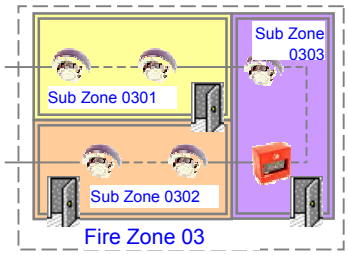


A *fire zone* — or operation zone — is the defined area of a building or property to be fire protected. All the fire detectors monitoring this area are assigned to the *fire zone*. A *fire zone* maybe monitored by one or more detectors or by all the detectors on a loop.

Fire zone definition enables you following features:

- **On the display**
  alarms or pre-alarms from detectors will be referred to their ***fire zone***
- **During operation**
  you can test, isolate or de-isolate ***fire zones*** in one operation

Sub Zones



While fire zones mainly define natural fire cells in the building, they are divided into *sub zones* in order to be able to implement various control requirements within the same fire zone.

Sub zone definition enables you to specify which *sub zones* will activate which *output groups*. Note that a specific detector may only be assigned to one sub zone (1 detector → 1 sub zone).

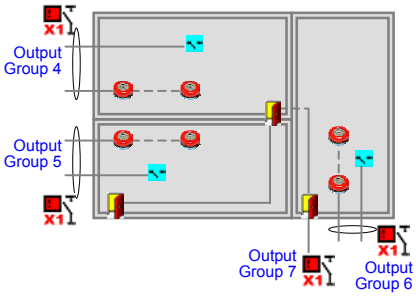
There are two types of sub zones:

- **Continuous** Sub Zones
  all the detector address numbers assigned to the sub zone are consecutive (may activate all types of *output groups*)
- **Discontinuous** Sub Zones
  the assigned detector address numbers are not consecutive (may only activate *single-knock output groups*)

Output Groups

All the *DELTA DA* alarm and control outputs are to be assigned to *output groups*. Normally, outputs that always have the same activation are assigned to the same *output group.*

There are three types of output groups:



- **Single-knock** output group (Fire)
  all the outputs assigned to the group are activated when at least one detectors (single-knock) in the assigned sub zone reports a fire alarm
- **Double-knock** output group (2-Detector Dependency)
  all the outputs assigned to the group are activated when at least two detectors (double-knock) in the assigned sub zone reports a fire alarm
- **Isolation** output group
  all the outputs assigned to the group are activated when at least one detector in the assigned sub zone is isolated

Note that a specific output may only be assigned to one *output group* of the same type, but may also be assigned to other types; e.g. output TB03 may be assigned both to a *single-knock* and to a *double-knock* output group at the same time.

Output Groups to Sub Zones Assignments	
Sub Zone No.	Output Group No.
0101	1
0201	2
0202	3
0301	4 and 7
0302	5 and 7
0303	6 and 7

Input Assignments		
Fire Zone No. (max. 256)	Sub Zone No. (max. 256)	Detector Addresses
01	0101	0101 — 0160
02	0201	0261 — 0270
02	0202	0271 — 0295
03	0301	0201 — 0212
03	0302	0213 — 0220
03	0303	0221 — 0260

Output Assignments	
Output Groups	Output Numbers
Output Group 1	Sounder Output 01 Control Output 01
Output Group 2	Sounder Output 02 Control Output 02
Output Group 3	Sounder Output 03 Control Output 03
Output Group 4	Sounder Output 04 Control Output 04
Output Group 5	Sounder Output 05 Control Output 05
Output Group 6	Sounder Output 06 Control Output 06
Output Group 7	Control Output 07 (door retainers)

Fire Alarm System Configuration — Example

The fire alarm system main configuration is performed graphically via *FireWin Explorer* — a Windows based application — and consists of following steps:

Functional Configuration

- *Fire Zone* definition;
  areas to be tested or isolated separately
- *Sub Zone* definition;
  partial areas with specific control requirements
- *Output Group* definition;
  alarm & control outputs with similar activation
- *Output Groups* to *Sub Zones* assignment

Input & Output Configuration

- Assigning the fire detectors to *sub zones*
- Assigning the alarm & control outputs to *output groups*

Functional Configuration

The functional configuration of the fire alarm system is not related to any specific fire detector or control output; on the contrary, is based on the functionality (operation & control requirements) of the premises to fire protect, as the following example will show.

As we need to test and isolate the fire detectors in the protected premises — se diagram below — as required by the building activities, we define 3 specific *fire zones*.

Fire Zone 01 has no specific control requirements other than all the detectors in the zone will activate the local sounders and ventilation. Then we only define *sub zone 0101* and *output group 1*.

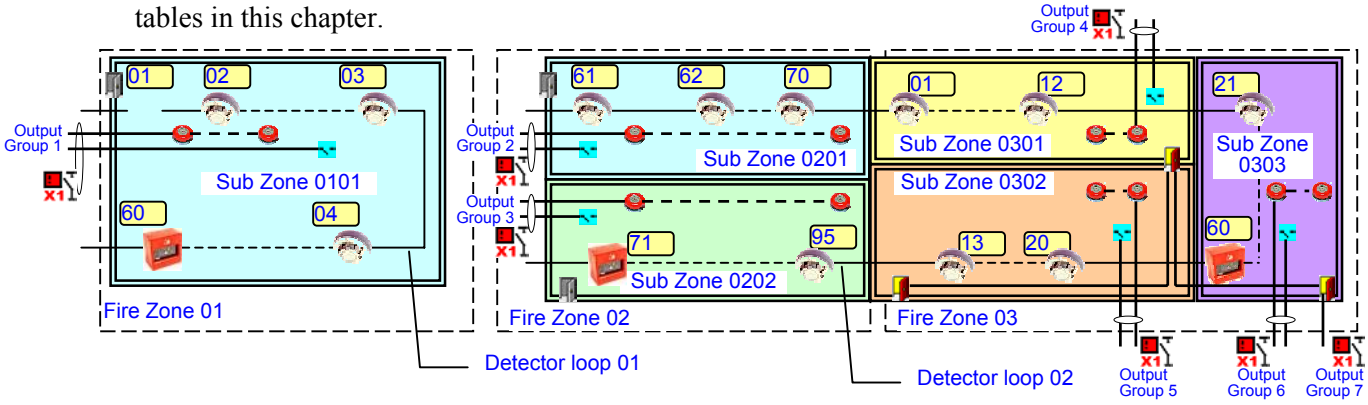
Fire Zone 02 protects two different areas and requires that the fire detectors in one area only activate the sounders and ventilation of the respective area. Then we must define *sub zones 0201* and *0202,* as well as *output groups 2* and *3*.

Fire Zone 03 protects three different areas and also requires that the fire detectors in one area only activate the sounders and ventilation of the respective area. Then we must define *sub zones 0301, 0302* and *0303,* as well as *output groups 4, 5* and *6*. But this zone has an additional control requirement: all the fire detectors in fire zone must activate the door retainers in the zone. Then we also have to define *output group 7*.

Now we can assign the *output groups* to the respective *sub zones*, as indicated in the table.

Input & Output Configuration

The input & output configuration is in fact a detailed assignment of all the fire detectors to the predefined *sub zones*, and the assignment of all the alarm & control outputs to predefined *output groups*. Following our example, we have to assign the fire detectors on loop 01 and 02, and the required sounder & control outputs 01 through 07 as indicated in the diagram and tables in this chapter.



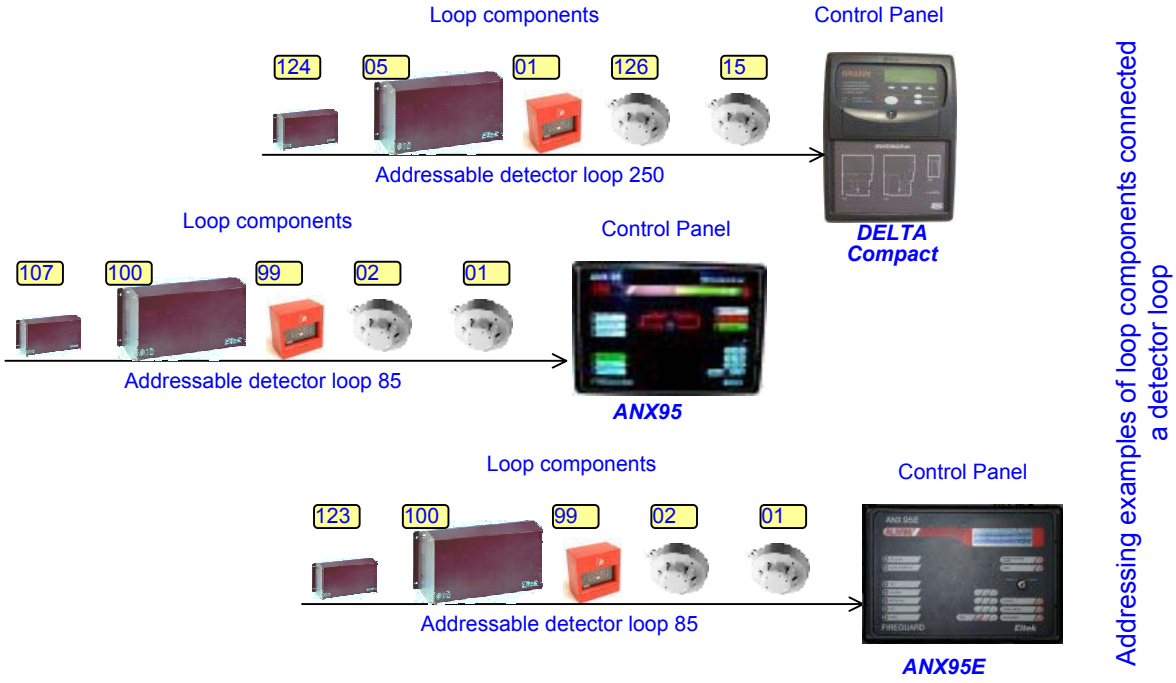
Loop Components — Address Ranges

In *Eltek's* fire alarm system all *loop components* (detectors, manual call points, Zone Monitors, DIO units, etc.) are connected to the control panel's detector loops. Every *addressable loop component* in a fire alarm network must be coded with a unique address in a random sequence. The control panel must be configured with the total number of loop components connected each detector loop and the address numbers not used in the sequence (*not present*).

For example, say that you have coded 5 detectors with addresses 06, 01, 02, 04 and 03 and connected them to loop 20. Then you will have to configure the control panel so that loop 20 has a total of 5 detectors and then configure address 05 on loop 20 as "*not present*".

Eltek's fire alarm system has the following address ranges for the *loop components* on the detector loop:

Number of *Components* on Detector Loops (max.)			
	DELTA DA & Compact	**ANX95**	**ANX95E**
Number of loops in the network	255	255	255
Detector loop's address range for detectors and manual call points	01 — 126	01 → 99	01 → 99
Detector loop's address area for DIO- and other *loop components*	01 — 126	100 → 107	100 → 123



The unique address of a *loop component* consists of an address number in which the first two digits indicate the loop number *the component* is connected to and the remaining digits are *the component's* address number on the loop.

For example: address number '0526' is the complete address of a *loop component* coded with address '26' and connected to detector loop '05'.

Another example: the complete address of output no. 3 on a DIO unit can be '210.125.3' if the unit is coded with the address '125' and is linked to detector loop '210'.

Key-Entry for Numbers Above 99

Some of *Eltek's* fire alarm systems use hexadecimal figures (just two digits) to show and refer to the *system unit's numbers*, *loop component's numbers* and *fire zone numbers*.[5]

If you have to program one of these fire systems[6] with numbers higher than 99, for example 'system unit 140' or 'detector address 120' or 'fire zone 200', you have to use hexadecimal digits from '01' to 'FE', (corresponding to '01' to '254' in the decimal system).

Conversion table: decimal to hexadecimal figures

Dec	Hex	Dec	Hex	Dec	Hex	Dec	Hex	Dec	Hex	Dec	Hex	Dec	Hex	Dec	Hex	Dec	Hex	Dec	Hex
00	00	26	1A	52	34	78	4E	104	68	130	82	156	9C	182	B6	208	D0	234	EA
01	01	27	1B	53	35	79	4F	105	69	131	83	157	9D	183	B7	209	D1	235	EB
02	02	28	1C	54	36	80	50	106	6A	132	84	158	9E	184	B8	210	D2	236	EC
03	03	29	1D	55	37	81	51	107	6B	133	85	159	9F	185	B9	211	D3	237	ED
04	04	30	1E	56	38	82	52	108	6C	134	86	160	A0	186	BA	212	D4	238	EE
05	05	31	1F	57	39	83	53	109	6D	135	87	161	A1	187	BB	213	D5	239	EF
06	06	32	20	58	3A	84	54	110	6E	136	88	162	A2	188	BC	214	D6	240	F0
07	07	33	21	59	3B	85	55	111	6F	137	89	163	A3	189	BD	215	D7	241	F1
08	08	34	22	60	3C	86	56	112	70	138	8A	164	A4	190	BE	216	D8	242	F2
09	09	35	23	61	3D	87	57	113	71	139	8B	165	A5	191	BF	217	D9	243	F3
10	0A	36	24	62	3E	88	58	114	72	140	8C	166	A6	192	C0	218	DA	244	F4
11	0B	37	25	63	3F	89	59	115	73	141	8D	167	A7	193	C1	219	DB	245	F5
12	0C	38	26	64	40	90	5A	116	74	142	8E	168	A8	194	C2	220	DC	246	F6
13	0D	39	27	65	41	91	5B	117	75	143	8F	169	A9	195	C3	221	DD	247	F7
14	0E	40	28	66	42	92	5C	118	76	144	90	170	AA	196	C4	222	DE	248	F8
15	0F	41	29	67	43	93	5D	119	77	145	91	171	AB	197	C5	223	DF	249	F9
16	10	42	2A	68	44	94	5E	120	78	146	92	172	AC	198	C6	224	E0	250	FA
17	11	43	2B	69	45	95	5F	121	79	147	93	173	AD	199	C7	225	E1	251	FB
18	12	44	2C	70	46	96	60	122	7A	148	94	174	AE	200	C8	226	E2	252	FC
19	13	45	2D	71	47	97	61	123	7B	149	95	175	AF	201	C9	227	E3	253	FD
20	14	46	2E	72	48	98	62	124	7C	150	96	176	B0	202	CA	228	E4	254	FE
21	15	47	2F	73	49	99	63	125	7D	151	97	177	B1	203	CB	229	E5	255	FF
22	16	48	30	74	4A	100	64	126	7E	152	98	178	B2	204	CC	230	E6		
23	17	49	31	75	4B	101	65	127	7F	153	99	179	B3	205	CD	231	E7		
24	18	50	32	76	4C	102	66	128	80	154	9A	180	B4	206	CE	232	E8		
25	19	51	33	77	4D	103	67	129	81	155	9B	181	B5	207	CF	233	E9		

To enter the letter:	First press the key:	then, on the numeric keypad, the key:
A	*Hex key*	0
B	*Hex key*	1
C	*Hex key*	2
D	*Hex key*	3
E	*Hex key*	4
F	*Hex key*	5

To enter the letters in hexadecimal figures using the numeric keypad on the panel you must first press the '*hex key*'[7] on the panel and then one of the digits on the numeric keypad. Use the conversion table.

For example: to enter fire zone number '200', which corresponds to 'C8', press the following keys:

Hex key ②⑧

[5] Windows program *FireWin Explorer* uses decimal digits: for example, fire zone 215 is displayed as '215'.
[6] This applies when the control panel is configured (set up) via the panel's keypad, not by *FireWin Explorer*.
[7] The location of the '*Hex key'* is not the same for all control panels: On *DELTA OP,* it is located above the SCROLL DISPLAY key; ANX95 used its '*hidden key*', while ANX95E used its EVACUATE key

5. Feedback to *Novar*

It is the policy of *Novar AS* to work actively to ensure that our products are in accordance with our customer's expectations and requirements.

In order to achieve this goal at any time, we wish to follow up our products throughout their lifetime. We therefore request your kind assistance.

Your Comments about *Delta DA*

You can contact us via our Internet pages, www.Novar.no, if you have any comments about this product regarding technical specifications, design, maintenance or service. Also whether this manual and other documents live up to your wishes and expectations.

✓ Our addresses (mail, Internet) and telephone and fax numbers are on page 2, as well as on the cover pages of this booklet.

We will acknowledge your comments and inform you about eventual changes that we perform based on your feedback.

We thank you for your cooperation!

Make a Note

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Novar AS

Lierstranda Industrial Estate, P.O. Box 3514, 3007 Drammen, Norway		Phone: +47 32 24 48 00
E-mail: nordic.support@novar.com	Bank Giro Acc.: 6138 0630140	Fax: +47 32 24 48 01
Internet: www.novar.com	Registered No: NO 981 336 305 MVA	