

# CM+

Conventional fire alarm control panel EN54-2 EN54-4

## **Installation instructions**

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**Argina.com**

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# 1 Introduction

These installation instructions describe the hardware connection facilities of the CM+ fire alarm control panel, in detail and with specifications, wiring requirements, tips and EN54-2 requirements.

Once the control panel has been fully connected, it has to be told what hardware connections will be used. The relay functions have to be chosen and various general settings made. The CMPlus.exe program is used for this, preferably before or during set-up.

The CM+ fire alarm control panel complies with European standard EN 54 Parts 2 and 4. In Belgium the installation must also comply with the regulations in accordance with the NBN S21-100 standard. (NEN 2535 for the Netherlands)

## 2 Installation

### 2.1 Removing the cover

The cover can be removed without using tools.

Place your fingers under the housing between the clips and the housing and pull the lower edge away from the housing. Gently push the cover upwards so that it comes away from the top pivots. Carefully pull the operating panel connector out of the main PCB.

(Replacement of the cover: in reverse order; do not forget to place the screw)

### 2.2 Installing the housing

Install the housing at eye level and in an easily-accessible location.

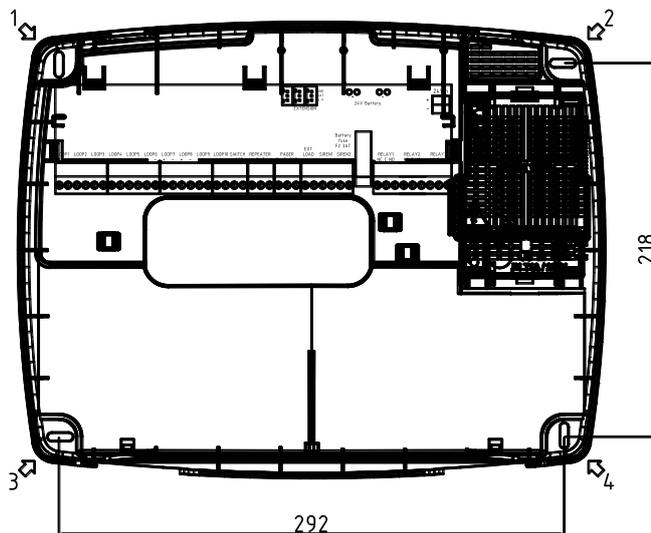
The housing must not be installed where there is a risk of it being splashed or soaked with water. The ambient temperature in the location must be between  $-5\text{ }^{\circ}\text{C}$  and  $40\text{ }^{\circ}\text{C}$ , with a relative humidity of between 0 and 95% (non-condensing).

The housing must be attached to a wall that is as flat as possible, in order to prevent distortion. Use spacers at the attachment points if the unevenness of the wall is greater than 3 mm. It will be difficult to fit the cover to a distorted housing and the operating panel could be damaged.

Ensure there is at least 10 cm clearance around the housing to allow proper air circulation.

There is a gap of 12 mm on the wall side and an internal gap of 22 mm, allowing wiring to enter the housing from any direction. The breakout edges at the top or bottom can be cut away before installation if necessary, to enlarge the cable entry by 5 mm and 10 mm respectively.

Mark the positions of the holes and attach the box, using  $\varnothing 4.5$  or 5 mm screws.



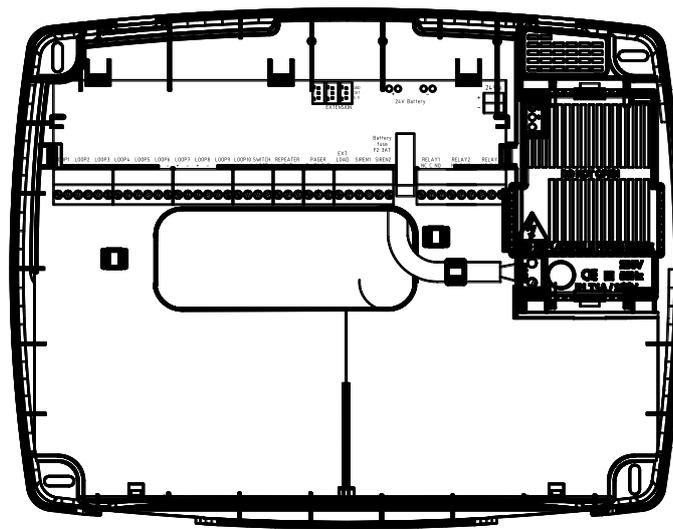
Housing dimensions: 340mm x 266mm

### 3 Connecting the mains power

The fire alarm control panel must be connected to the 230 V AC mains via a double-pole circuit breaker in the electrical distribution cabinet.

The cable must be at least  $2 \times 1.5 \text{ mm}^2$ , and must be separated from the rest of the control panel wiring as much as possible. Strip the outer sheath of the cable as little as possible, so that should one of the conductors become loose it cannot touch the control panel's 5 V or 24 V parts. Fasten the cable in the place provided.

**The installation may only be switched on during its commissioning.**



### 4 Connecting the batteries

The batteries are sealed lead-acid batteries rated at 1.2, 3 or 7 Ah. Two 12 V batteries are connected in series to provide 24 V.

The control panel has an integral automatic battery charger. The charging current is limited to 0.86 A and the charging voltage is regulated according to the temperature in order to maximise battery life. The battery fuse is F2 on the main PCB: 3AT

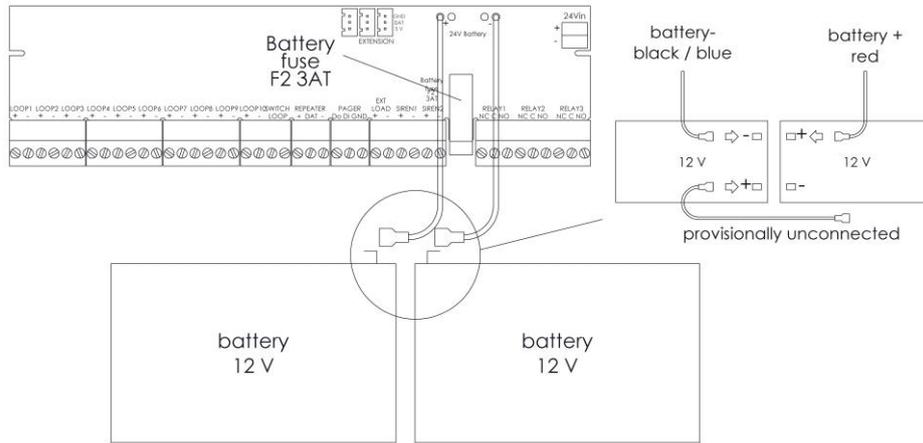
The charging current is cut off in the event of an alarm, as allowed by EN54-4, which means that there is more power available for the external devices.

The batteries are tested every 8 minutes. If a battery can no longer be charged or its connection is loose, or if its internal resistance is very high, then a battery fault is indicated automatically. Battery testing is also performed 30 seconds after every reset.

Sealed lead-acid batteries have an average service life of 5 years in this application, after which their capacity falls drastically or they become faulty. It is therefore best to replace them within this period. Write the date on a battery when it is installed as a replacement.

**Batteries may only be connected during the commissioning of the installation.**

If no batteries have been connected, the battery charger will switch on briefly at regular intervals. If the batteries are nearly discharged and there is a high current demand, the charger will switch to an on/off regime in order to limit internal heating.



## Calculating autonomy

The battery capacity is chosen as a function of the desired autonomy of the fire alarm system in the event of a mains failure, for example 24 or 72 hours.

First calculate the total power consumption.

main PCB:	7.5 mA +10 mA per activated relay
zone in operation:	5 mA
relay PCB:	6 mA per activated relay
integral operating panel:	3.5 mA
External operating panel:	3.5 mA
current for external devices: e.g. door magnet	75 mA

Example: CM+ with 10 zones, 1 integrated and 1 external operating panel, 1 door magnet = 56 mA + 3.5 mA + 3.5 mA + 75 mA = 148 mA = 0.14 A

Assuming that autonomy has to be for 24 hours: this means that the capacity required is 0.14 A x 24 hours, which is 3.4 Ah.

The batteries must furthermore be capable of supplying power for 30 minutes in the event of an alarm:

for example with 10 sirens rated at 40 mA: 10 x 0.040 A x 0.5 hours = 0.2 Ah

A safety factor of at least 1.2 is applied to arrive at the capacity required:

$1.2 \times (3.4 \text{ Ah} + 0.2 \text{ Ah}) = 4.3 \text{ Ah}$ . A 7 Ah battery set would therefore be a good choice.

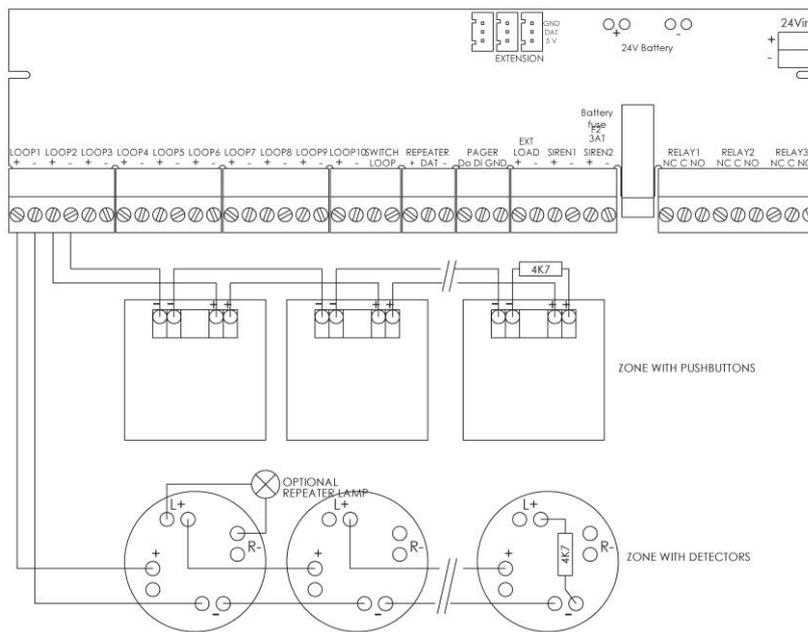
## 5 Zone connections

A maximum of 32 alarms can be connected on each zone.

The NBN S21-100 installation standard does not permit manual alarms (push-buttons) to be connected to the same zone as automatic alarms (detectors).

Each zone has only one beginning and one end. The last detector or the last push-button must be fitted with a 4k7 end of line resistor (supplied with the control panel). Branching of the line is not permitted.

The end of line resistor must only be connected directly to the main PCB if the zone is not used. Zones that are not used can be switched off completely using the CMPlus.exe program, in which case the end of line resistor does not have to be used.



## 6 Sirens

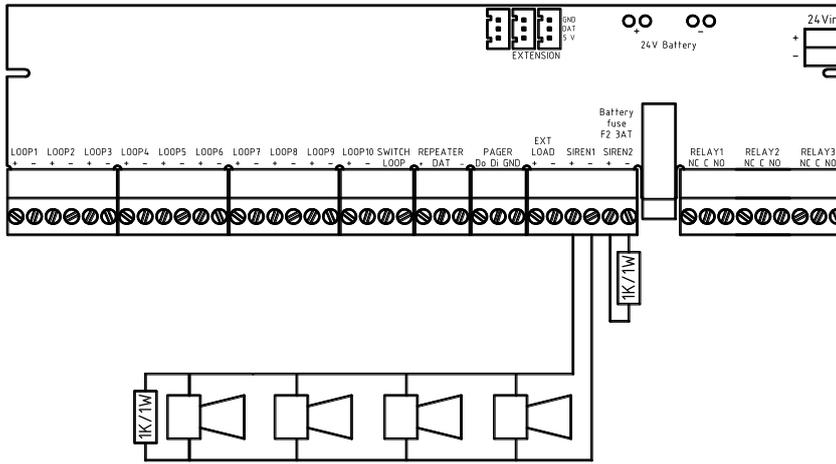
Use fireproof type Rf cable.

Connect the sirens to the 'siren1' and/or 'siren2' monitored outputs. Note that each siren circuit must be completed with a 1 kohm resistor (supplied with the control panel).

The end of line resistor must be connected directly to the main PCB if the siren circuit is not used.

The output is electronically secured and the maximum permitted current is 0.7 A per siren circuit.

It is assumed that each siren has at least two built-in series diodes so that the sirens do not interfere with the line break measurements and they do not begin to sound. This requirement is met automatically when Argina sirens are used. With other sirens it can sometimes be necessary to fit a diode (type 1N4007) in series with them.

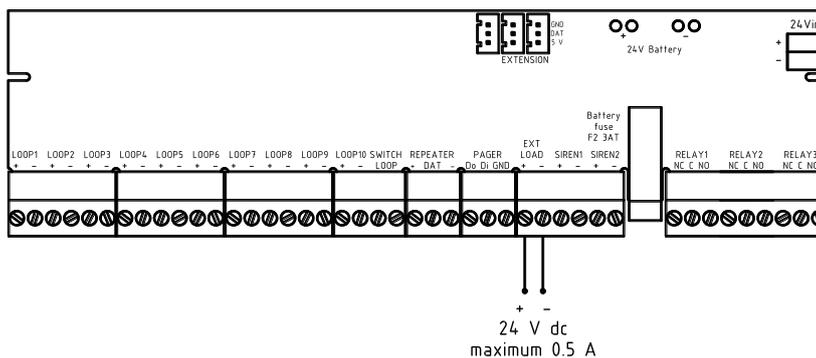


## 7 24 V output

External devices can be connected to this output.

The output is electronically secured and the maximum permitted current is 500 mA.

The precise way the output operates can be altered by using the CMPlus.exe program. For example, it can be arranged that the 24 V output is interrupted when the fire alarm control panel is reset, e.g. for supplying and resetting beam detectors.

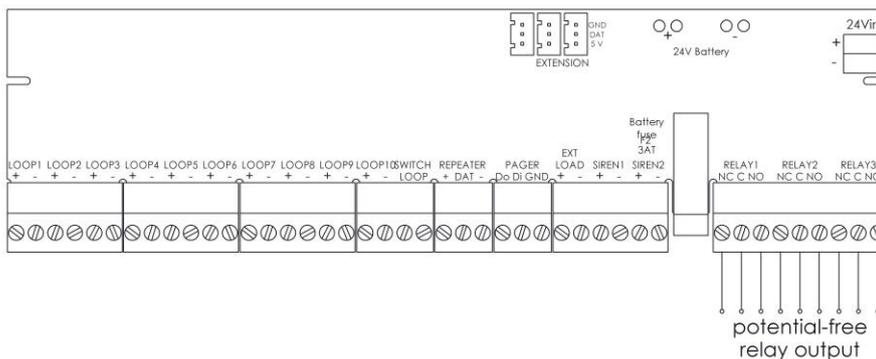


## 8 Relay output

The standard configuration is 3 potential-free relays, each of which can switch 30 V / 1A.

They are freely configurable using the CMPlus.exe program.

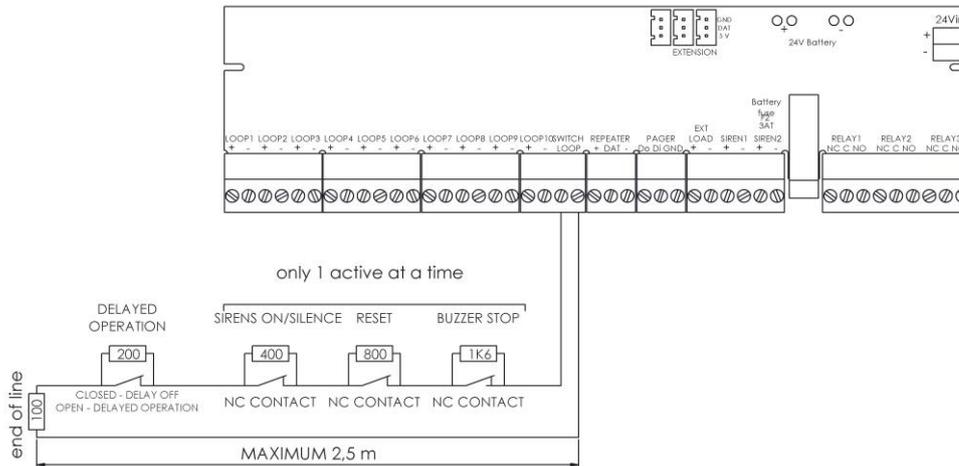
Caution: a relay programmed as a fault output is normally always closed. If a fault occurs or the control panel fails completely, then the relay is de-energised.



## 9 Switch loop

Up to 4 contacts can be connected to the fire alarm control panel. Each operating panel and the fire alarm control panel itself has a monitored input loop to accommodate them, and can be used for example for reading a reset switch with a triangle key as used in the Netherlands, or an external buzzer stop switch. The loop is fully monitored for short circuits and line breaks.

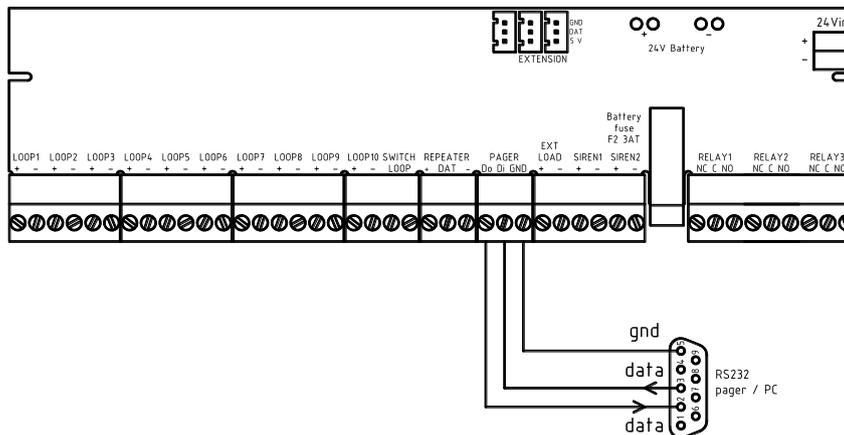
The end of line resistor must be connected directly to the main PCB if the input loop is not used.



## 10 Pager output / serial connection with the PC

PC connection for setting up the control panel using the CMPlus.exe program or for use as a pager output. The CM+ selects the correct mode automatically.

**!! Use screened cable; maximum cable length is 2.5 m (RS232 5 V levels)**



female sub D - 9p  
do not use a crossover cable!

### 10.1 Pager settings

Only data is output in this mode – connect the pager to the Do and GND terminals. The Di terminal is used for automatic selection of the mode; it is safer not to connect this to a pager system.

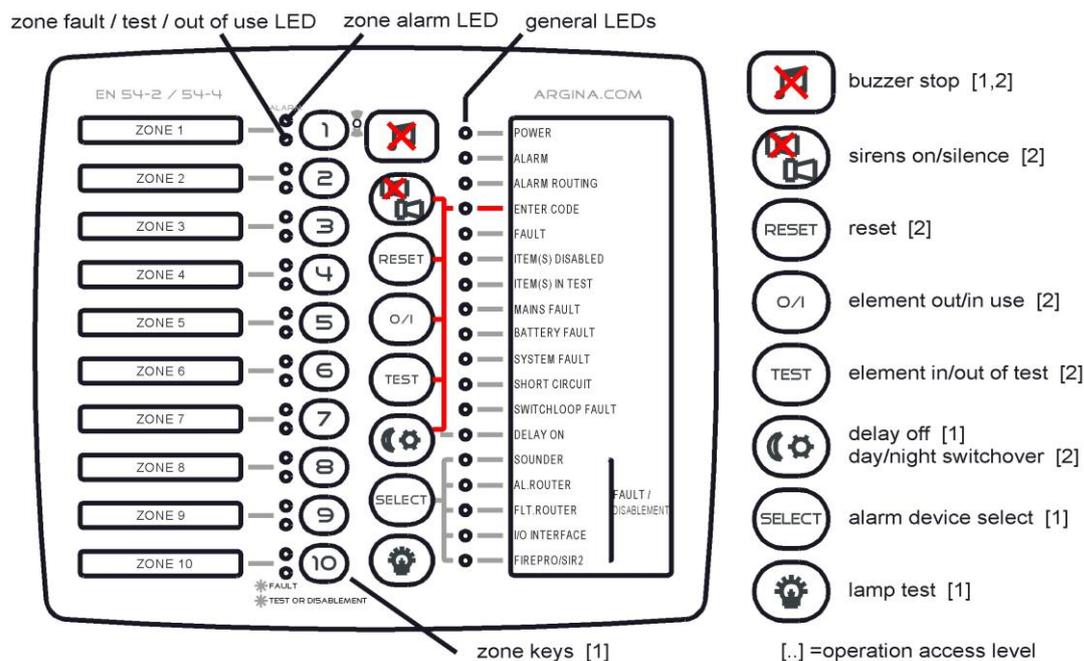
RS232 settings: 9600 baud, 8 data bits, 1 stop bit, no parity.

The strings the pager sends always begin with '#' and end with '\r' (0D hex).

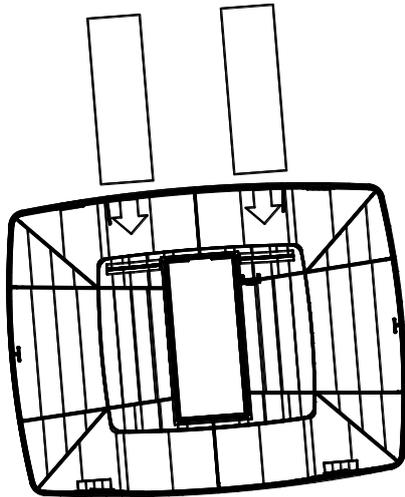
Evacuation: #FAL,EVA  
 Alarm on loop 1: #FAL,L01  
 Alarm on loop 2: #FAL,L02  
 Alarm on loop ...: #FAL,L..  
 Alarm on loop 10: #FAL,L10  
 Mains fault: #FLT,MNS (a mains fault also sends #FLT)  
 Battery fault: #FLT,BAT (a battery fault also sends #FLT)  
 Fault: #FLT  
 Reset: #RES  
 Test position on: #TPO (also after rest if at least 1 loop is in the test position)  
 Out of use: #OOU (also after reset if at least 1 loop is out of use)  
 T1 starting: #T1A  
 T1 stopping: #T1E  
 T3 starting: #T3A  
 T3 stopping: #T3E

## 11 Operating panel

The operating panel can be used for the complete operation of the control panel. Simple settings such as delay times can be entered from the operating panel. The CMPlus.exe program is used for more advanced settings.

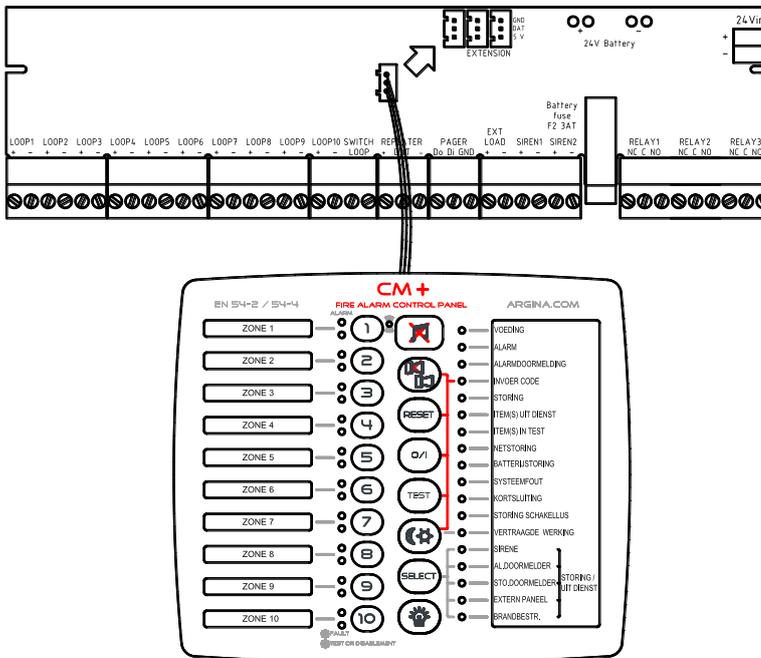


The labels in the label pockets can be changed, for example for indications in another language. See the end of this manual for labels in other languages.



## 11.1 Connecting the integral operating panel

Hang the fire alarm control panel cover on the housing's lower pivot points.  
Next plug the operating panel connector into one of the 3-pin connectors on the main PCB.



Ensure when closing the cover that the connecting cable is not trapped between the cover and the housing.

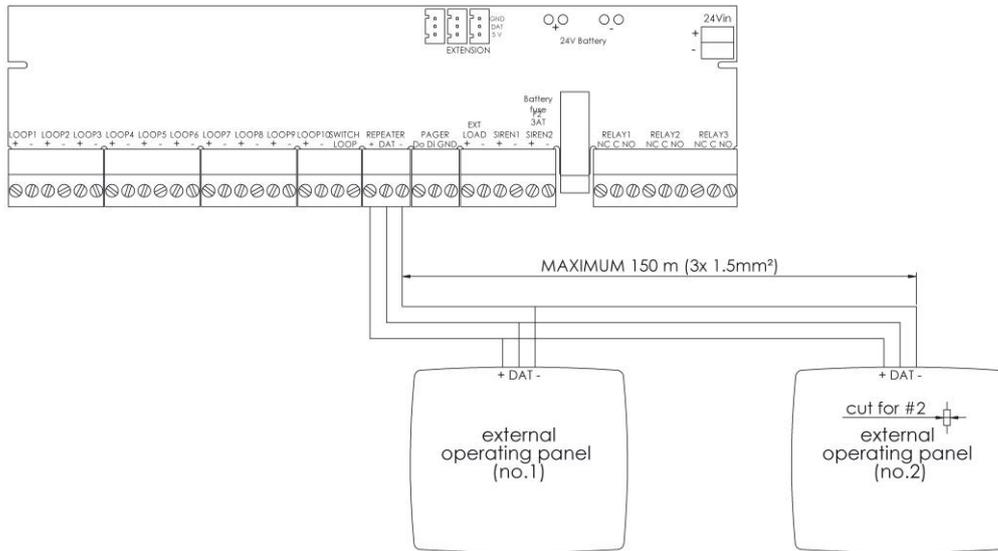
## 11.2 Connecting external operating panels

Up to 2 external operating panels can be connected.

The wiring for external operating panels is 3-core.

The maximum length of 0.8 mm wiring is 50 m, and the maximum length of 1.5 mm<sup>2</sup> is 150 m.

External operating panels are connected to the REPEATER terminals.



**Addressing external operating panels:** is only necessary if there are 2 external operating panels:

Scratch away the etched track on the place indicated on operating panel 2 in order to change its address from 1 to 2.

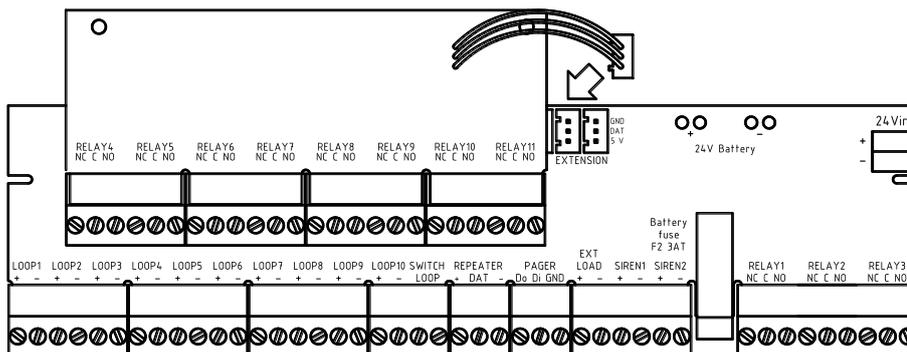
## 12 Connecting the optional module

### 12.1 Relay PCB

An optional PCB with 8 freely-configurable relays can be plugged into the control panel. The relay PCB is attached to the main PCB with 2 self-adhesive spacers.

The relay contacts are 30 V / 1 A.

The PCB is connected to the main PCB at the Extension connectors.



The functions of the additional relays are programmed via the CMPlus.exe program. See CMPlus.exe Help for full configuration instructions.

# 13 Configuring using the operating panel

The fire alarm control panel is configured according to local needs during commissioning. The basic configuration can be set up using the operating panel.

**!! This may only be done by specialist technicians.  
The CMPlus.exe program is required for full configuration.**

## 13.1 Available functions

function 1	First delay time T1 (Operator Response Time)
function 2	Second delay time T2 (Inspection Walk Time)
function 3	Siren Operating Time T3
function 4	Zone set-up: immediate / delayed alarm
function 5	Show alarm counter
function 6	User Code
function 7	Installer Code

## 13.2 Selecting the desired function

Press the 'lamp test' key and hold it in for 5 seconds to open the selection menu for the available functions.

The alarm LEDs for all the available functions flash in this selection menu. Each alarm LED corresponds to a function: zone 1 alarm LED = function 1, zone 2 alarm LED = function 2, etc.

Press the zone key to select the desired function.

The Installer Code has to be entered after the desired function has been selected. (the Enter Code LED flashes). The function becomes active only when the correct code has been entered.

The functions can be accessed for 2 minutes after the code has been entered. If no key is pressed for 20 seconds, the normal indications are displayed again.

## 13.3 Delay times T1, T2, T3 (Functions 1, 2, 3)

### Delay time operation in the day scheme

The Delayed Operation LED is on in this operation mode.

delay time T1: ... minutes = Operator Response Time

delay time T2: ... minutes = Inspection Walk Time

siren operating time T3: ... minutes

In the event of an alarm, the general alarm LED and the LED for the zone in which the alarm was detected come on. The control panel buzzer sounds a continuous tone. Operator Response Time T1 starts running at this point.

If no action is carried out on the operating panel, all alarm devices will be activated after a delay time of T1. The siren operating time T3 starts running at this point. This condition is shown on the operating panel by the Alarm Routing LED lighting. The alarm devices stop automatically when this delay time has elapsed See time diagram a: no operator response.

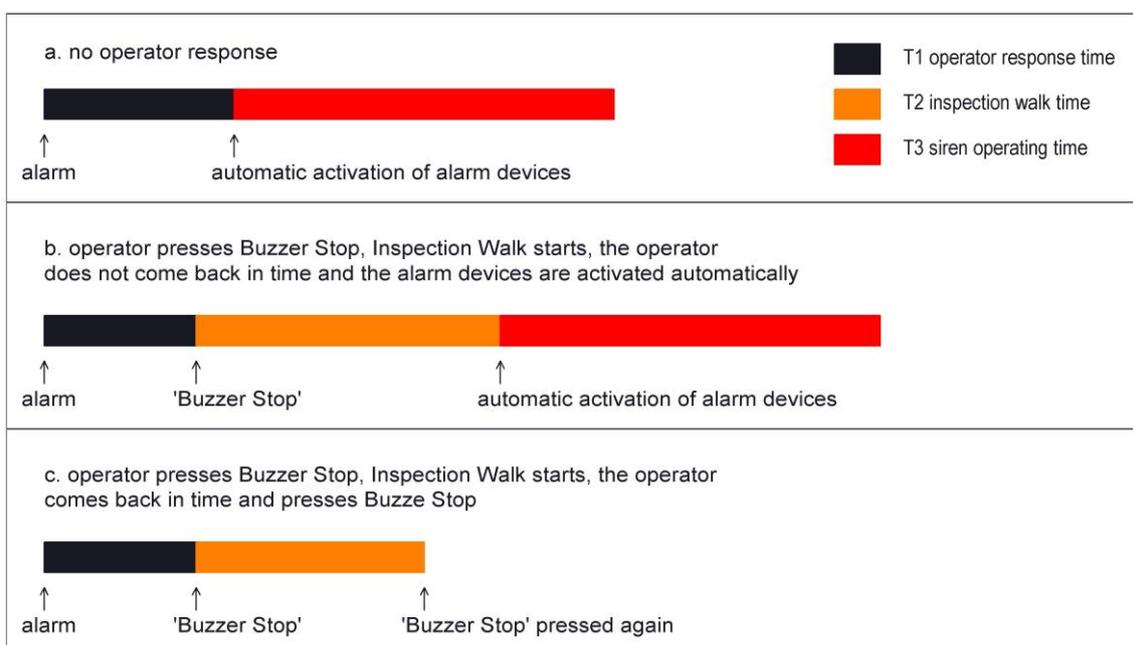
If the Buzzer Stop key on the operating panel is pressed within delay time T1, time T1 stops and inspection walk time T2 starts. This is the time allowed to investigate whether evacuation is necessary.

If evacuation is necessary, it can be signalled by pressing the Sirens On key on the operating panel or by activating one of the alarm pushbuttons (which are distributed throughout the building).

If the operating panel is not operated within this time (T2), the alarm devices will be activated automatically. The alarm devices will remain activated for the siren operating time, T3. See time diagram b: operator presses Buzzer Stop, Inspection Walk starts, the operator does not come back in time and the alarm devices are activated automatically.

If evacuation is not necessary but the alarms that are already on the operating panel need to remain there (optical indications), press the Buzzer Stop key again. See time diagram c: operator presses Buzzer Stop, Inspection Walk starts, the operator comes back in time. The alarm devices will not be activated and all messages that were on the operating panel will stay there. The fire alarm control panel will be in monitoring mode, however. If a new alarm condition occurs, the control panel will activate all alarm devices immediately.

If evacuation is found not to be necessary because the cause of the alarm is known but has gone away in the meantime, the Reset key on the operating panel can be pressed. The control panel will return to its normal state. If an alarm pushbutton is pressed again or a fire detector remains in an alarm state, the control panel will return to the alarm state within a few seconds.



**Note:** if 0 minutes 0 seconds is entered for:

- T1: there is no Operator Response Time. All alarm devices will always be activated immediately in this case. If that is what is actually wanted, it is better to place the control panel in the night scheme.

- T2: there is no Inspection Walk Time. If in the case of an alarm the Buzzer Stop key on the operating panel is pressed within the Operator Response Time, the Inspection Walk Time will NOT be started. This means that the alarm devices will no longer be activated automatically as a result of an alarm condition. The fire alarm control panel will be in monitoring mode, however. If a new alarm condition occurs, the control panel will activate all alarm devices immediately.

- T3: the alarm devices will not be switched off automatically. All alarm devices will then continue to operate until they are stopped from the operating panel.

Times T1 and T2 can be set to a maximum of 9 minutes.

In order to comply with EN54-2 Item 7.11.d it is necessary to install at least one pushbutton that can activate the alarm devices without delay, even if delays are active at the time.

## Operation without delay (night scheme)

The Delayed Operation LED is extinguished.

In this mode the delay times are NOT active and all alarms will operate immediately.

## Switching between day/night

The operating mode of the control panel can be switched using the Day/Night key (operating level 2).

The yellow LED next to the key shows the status:

- LED off: night scheme: no delay, all alarms operate immediately in the event of an alarm.
- LED on: day scheme: delay times in effect, sirens start after a delay in the event of an alarm.

## Adjusting times T1, T2, T3

Select the desired delay time: function 1, 2 or 3 (see [Selecting the desired function](#)).

The selected time can now be adjusted using the zone keys. Keys 1 to 9 correspond to 1 to 9 minutes. Key 10 has a value of 0, except for T3, where it means that the alarm devices will not be switched off automatically.

## 13.4 Zone set-up: immediate / delayed alarm (Function 4)

Each zone can be set up for immediate or delayed activation. If a zone is set up for no delay, then delay times T1 and T2 will not be used for that zone, and the alarm devices will be activated immediately.

Select Function 5 (see [Selecting the desired function](#)).

The Installer Code is not entered for this function.

The Fault LEDs show the operational status of each zone: a flashing LED indicates delayed activation, an extinguished LED indicates activation with no delay.

Each zone's activation can be adjusted using the zone keys.

## 13.5 Show alarm counter (Function 5)

The alarm counter shows the number of times the control panel has entered the alarm condition. The alarm counter is not incremented by an alarm in a zone in the test position.

The counter has 3 digits (values 000 to 999) and can only be reset by using the CMPlus.exe program. Each digit is shown separately by the zone Fault LEDs.

The Fault LEDs for zones 1 to 9 correspond to the values 1 to 9, and the Fault LED for zone 10 represents 0.

Select Function 5 to show the alarm counter.

The Installer Code is not entered for this function.

After the function is selected, the first digit of the counter is shown by the zone's Fault LED; for example if the zone 10 Fault LED is lit then the first digit is 0.

Press the Zone 2 key to show the second digit; for example if the zone 10 Fault LED is lit then the second digit is 0.

Press the Zone 3 key to show the third digit; for example if the zone 2 Fault LED is lit then the third digit is 2.

The digits can easily be shown again by pressing the zone keys again; for example press the Zone 1 key the show the first digit again.

In this example the fire alarm control panel's alarm counter shows 002.



## Operating panels

Monitoring Repeater panel 1: No  
 Monitoring Repeater panel 2: No

Switch loop can turn Delayed activation on: No  
 Switch loop can turn Delayed activation off: No

## Relays

Siren 1: Immediate Siren: does not work if siren is Out of use.

Siren 2: Delayed Siren: does not work if siren is Out of use.

External load  
 Always active

Relay 1: Immediate Alarm, de-energises on reset

Relay 2: Alarm router: delayed alarm, de-energised on reset, does not work if alarm router is Out of use

Relay 3: Fault router: normally closed, open on fault, does not work if fault router is Out of use

	Siren 1	Siren 2	Ext.Load	Relay 1	Relay 2	Relay 3
Activates on						
Every alarm (not Test position)	X	X		X	X	
Every Fault						X
Every Out of use						
Active on Reset						
Activates in zone						
in Alarm or Alarm test position						
in Fault						
Out of use						
in Test position						
In						
Zone 1						
Zone 2						
Zone 3						
Zone 4						
Zone 5						
Zone 6						
Zone 7						
Zone 8						
Zone 9						
Zone 10						
Not active during Out of use of						
Siren	X	X				
Detector alarm					X	
Detector fault						X
Firefighting						
Delayed		X			X	
De-energises on Siren stop	X	X				
Inverse (active when quiescent)			X			X



# 15 Technical data

## Connections

Zones (max. 10 x): end of line 4k7; alarm resistor 1k; maximum 0.1 A

External operating panel (max. 2): 3-wire, maximum length 150 m for 1.5 mm<sup>2</sup>

Siren loop (2x): end of line 1k; maximum 0.7 A

Aux. output (1x): 18.5 V - 28.5 V; maximum 0.5 A

Relay contacts (3x): switch-over contact, maximum 30 V DC / 1 A

Optional relay contacts (8x): switch-over contact, maximum 30 V DC / 1 A

## Power

Fuse: T1A 250 V

Voltage: 18.5 V - 28.5 V

Current: 2 A including battery charging current – charging current is interrupted if the control panel is in alarm state

Battery capacity: 1.2 Ah to 7.2 Ah

## General

Power supply: 230 V~ ±10% 50 / 60 Hz

Power consumption: 7 W to 60 W

Dimensions: 340 x 266 x 93 mm (width/height/depth) including protruding parts

Housing: ABS V0

Protection rating: IP30

Colour: RAL 7004

Operating temperature: -5 °C to 40 °C

Relative humidity during operation: 0% to 95%

# 16 Pocket labels

