Crowcon Hydra
Addressable Gas Detection System

Installation and Operation Manual

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CROWCON
Gas Detection You Can Trust

INTRODUCTION

The Crowcon Hydra Addressable Gas Detection System is designed to monitor toxic and/or flammable gas hazards. The system must be installed and operated in accordance with these instructions. No components of this system are certified for use in a hazardous area.

WARNING

The equipment described in this instruction manual has mains voltages applied to it. Ensure correct safety procedures are adopted before working on the equipment.

The equipment described in this manual is designed for detection of flammable and/or toxic gases. Ensure local safety procedures are adopted before carrying out any maintenance or calibration work.

The equipment described in this manual may be connected to remote alarms and/or shutdown systems. Ensure that local operating procedures are adopted before carrying out any maintenance or calibration work.

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1. INTRODUCTION

1.1 CONTROL PANEL DESCRIPTION

The Crowcon Hydra gas detection control system has been designed to enable simple installation and expandability with minimum cost and installation times. Detectors are connected to the control panel via one to four RS-485 addressable loops, with up to 30 detectors on each. The control panel is thus able to control up to 120 gas detectors.

The control panel is also able to control up to 128 remote outputs (open-collector type), all of which are programmable. These outputs, combined with the four built-in relays can be used to indicate the system status remotely or provide control of auxiliary equipment.

An RS232C serial port is provided for connection to a Personal Computer, which permits programming of the control panel in minimum time. The system can be connected to a site management system via the same serial port which, when using appropriate software, can create graphic maps and permit the remote control of the system.

Real time printouts of alarms (or event log information) can be obtained from a printer connected to the Centronics parallel port.

1.2 SYSTEM CONFIGURATION

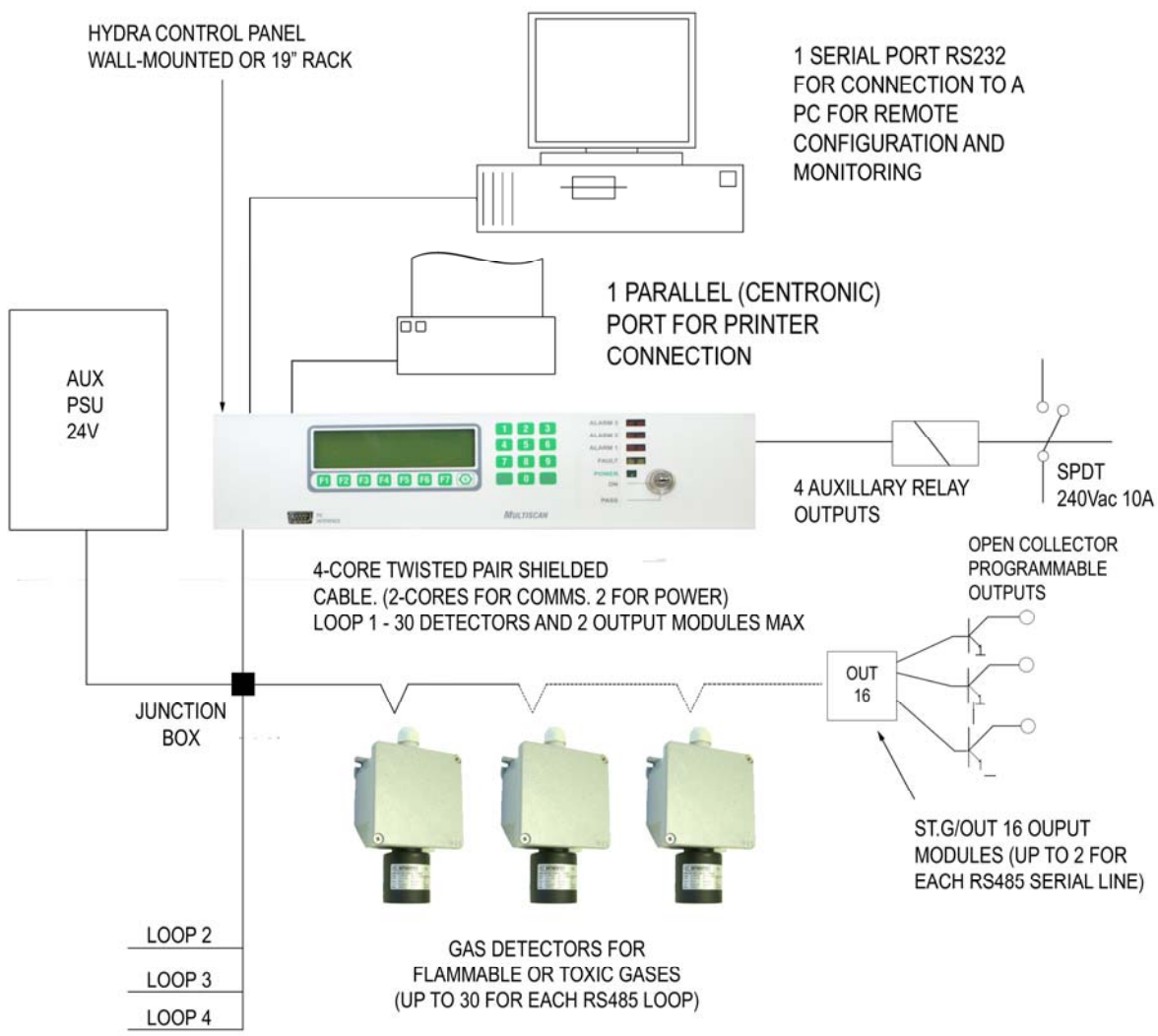


Figure 1 – System Block Diagram

1.3 TECHNICAL SPECIFICATION

Addressable Control Panel Specification

Size:	430mm x 410mm x 140mm (width x height x depth) wall mounted version. 19" 3U rack version available.
Inputs:	Maximum number of detectors: 120 arranged on 4 addressable RS-485 loops (30 detectors maximum per loop)
	1 Km maximum cable length*
Outputs:	4 output relays rated 220Vac 10A
	Optional 16-way output modules (maximum of 8 can be connected). Each module has 16 open-collector outputs each capable of sinking 50mA.
	RS-232 Modbus interface for data transfer to BMS/DCS/SCADA systems
	RS-232 port for local system configuration and log upload
	Parallel printer port (Centronics) for automatic event printing
	Event log function capable of storing up to 800 events
Panel Indication:	Back-lit LCD display. 256 x 64 pixels
	Red LED's for Alarm 1, Alarm 2, Alarm 3
	Yellow LED for Fault
	Panel sounder can be de-activated
	Green LED for Power Status (plus mains fail indication)
	Soft-keys for system configuration
Power:	230V ac 50-60Hz 5.5W (110Vac optional) or 12Vdc
	Battery back-up is available as an option
Operating Temperature:	0 to +40º C (storage temperature -15 to +55ºC)
Humidity:	15-85% non-condensing

Detector Specification

Construction:	Alloy
Size:	96mm (w) x 152mm (h) x 60mm (d)
Certification:	Not hazardous area certified; safe area use only
Operating Temperature:	-10 to +55^{o} C
Humidity:	20-90% RH non-condensing (@40°C)
Ingress Protection:	IP55
Voltage:	12-27V DC, 90mA max. (CO/NO_2 version 40mA)
Outputs:	RS-485 addressable communications
Calibration:	Requires hand-held keypad
Gases and Ranges:	0-300ppm CO (electrochemical sensor)
	0-25ppm NO_2 (electrochemical sensor)
	0-100% LEL LPG/Propane (catalytic bead)
Sensor Life:	3-years typical
T90 Response Time:	<60 secs*
Accuracy:	5% of range or 10% of display*
Accessories:	Hand-held calibration keypad
	Weather protection cone
	Calibration adaptor

*Specifications are typical and may vary dependant on site conditions

2. INSTALLATION

2.1 CONTROL PANEL

Note: The following instructions refer to the wall-mounting version of the Crowcon Hydra product. The 19" Rack mount version of the product will be supplied as separate modules, and an additional 12Vdc PSU will be required.

Mount the control unit using the four mounting holes as shown in Fig. 2.

Connect the three core mains supply cable to the power supply terminals (1.5 mm^2 per core minimum) and secure it with the appropriate cable grip.

Connect the detector loop cables to the Communication Cards following the diagrams shown in Fig. 3, before powering up the control panel.

After powering up the control panel connect the red and black battery cables (fitted with 6mm blade connectors) to the standby lead acid battery (12Vdc / 15 Ah max.). The battery should be carefully fitted into the space next to the power supply (battery compartment)

Due to the vast range of batteries available, it has not been possible to create a universal fixing system. It is therefore recommended that either double sided adhesive tape or tie wraps with an adhesive base be used to anchor the battery.

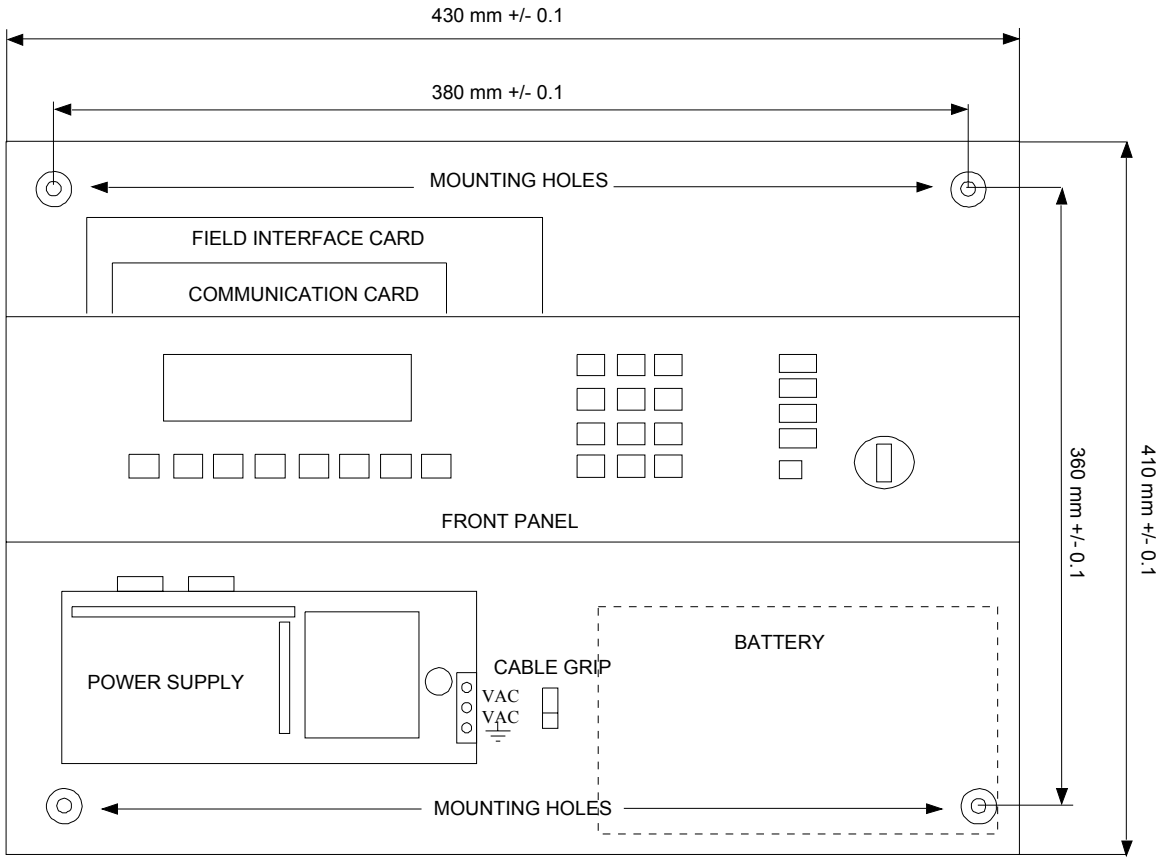


Figure 2 – Control Panel Mounting Arrangement

2.2 DETECTOR CONNECTIONS

Communication between the control panel and the detectors is achieved via an RS485 bus. The control panel constantly monitors the detector loops connected to it. A break in communication from any detector generates a fault alarm.

The cable used to connect the detectors and/or remote output modules must be screened and twisted 2-core cable for RS485 serial connection (the cable screen must be connected only to the earth of the control panel). The 24V & 0V supply to the detector must be carried either using two extra cores, or using a separate cable. Junction boxes local to each detector are recommended for 'marshalling' power and signal cables.

Crimp-type connectors should be used to ensure cables do not oxidise or loosen.

2.2.1 Detector Signal Cables

Wiring between the detectors and the control panel Serial Boards should be made by using connection cable EIA RS485: 2 core wires with section 0.22 / 0.35 mm2 and shield (twisted pair). Nominal capacity between the wires < 50pF/m, nominal impedance 120 ohm.

These features can be found in BELDEN 9542 cable or similar (data transmission cable in EIA RS485). Using this cable, the detector line total length should not exceed 1000 m.

Detectors and output modules are to be wired in daisy chain mode. We recommend avoiding star or tree mode connection as interference immunity would be reduced.

Should any cable junctions be necessary please make sure there is no interruption in the cable shield (screen). Please remember that the shield should be connected to the ground at the control panel end only; never connect the shield to the detectors.

Ensure that each 2-core detector bus cable wire includes just one RS485 (ie is not connected to another RS485 network).

Also ensure that a 120 Ohm end of line resistor is placed between the 'A' and 'B' terminals at the beginning and the end (on the last detector or output module) of each bus line.

2.2.2 Detector Power Cables

An appropriate cross-sectional area (csa) must be selected, suitable for transmission of the power to the detector loop. The following should be used as a guide for selecting appropriate cable:

A Hydra CO detector requires a DC supply of 12-27 volts, at up to 40mA, with up to 30 detectors available on a single cable. It is essential there is a minimum of 12V at each detector (or output module), taking into account the voltage drop due to cable resistance.

Example: a nominal 24Vdc detector power supply has a guaranteed minimum supply of 22 volts. The maximum voltage drop allowable is therefore 10V. Each Hydra CO detector can demand up to 40mA, and so for a 30 detector loop the maximum acceptable loop resistance is 8.33 ohms.

A 1.5 mm^2 cable will typically allow cable runs up to 300 metres. The table below shows maximum cable distances given typical cable parameters.

C.S.A.		Resistance (Ohms per km)		Maximum Distance
mm^2	Awg	Cable	Loop	(metres)
1.0	17	18.1	36.2	230
1.5	15	12.1	24.2	340
2.5	13	7.4	14.8	560

Note: power cable distances can be increased by using power supplies local to detectors.

Once the installation has been completed and the system is powered-on, check that each detector receives at least 12 Vdc.

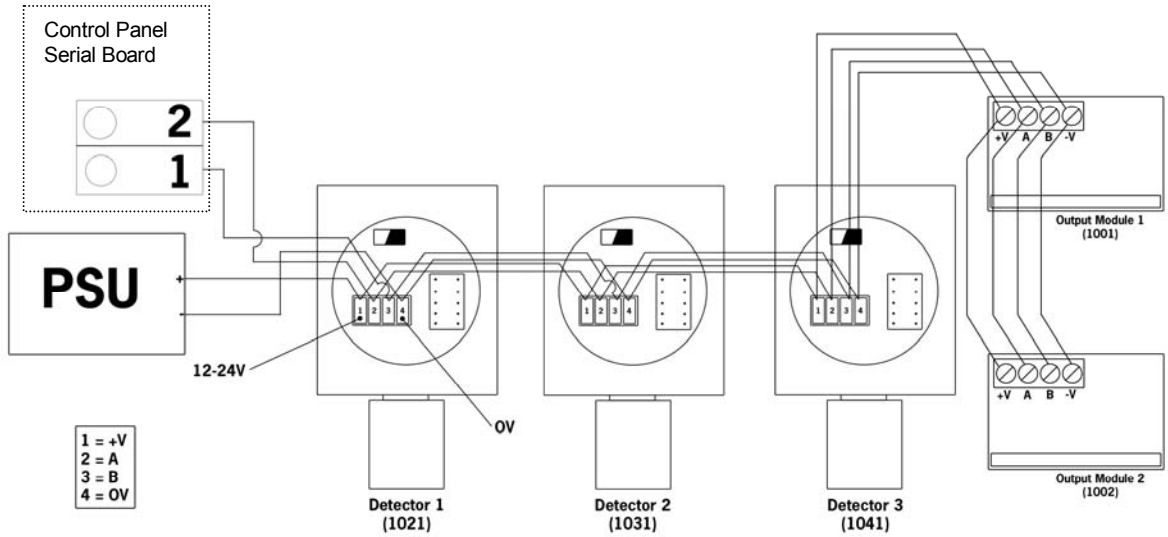


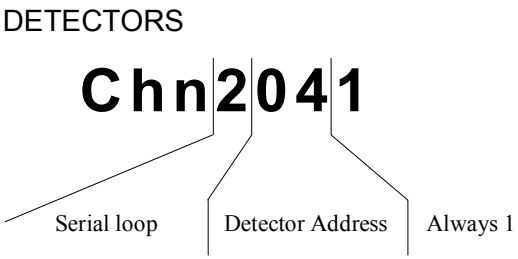
Figure 3 – Detector and Output Module Wiring

2.3 DETECTOR AND OUTPUT MODULE ADDRESSES

2.3.1 Detector address

Every detector connected to the control panel is identified through a code that enables communication and programming. The 4-digit code shown on the control panel display contains all the base specifications for physical identification.

Example:



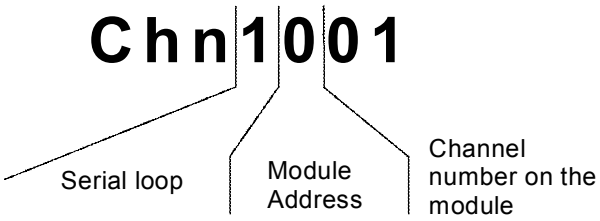
Serial Loop The number of the bus to which the identified detector is connected (ie Bus 1 to Bus 4). In this case Bus 2 is shown.

Detector Address Each serial loop can have up to 30 detectors. The address must be between 02 and 31 (addresses 0 and 1 are reserved for output modules). Each detector must have a unique address set using the Calibration Keypad. Refer to Hydra detector instruction for more detail. It is strongly recommended that the detector address is noted on each detector or cable-tag for future reference.

2.3.2 Output module address

Digital output modules also have a code which allows configuration and contains all the required data to physically identify it.

Example:



Serial Loop The number of the bus to which the identified module is connected (ie Bus 1 to Bus 4). In this case Bus 1 is shown.

Module Address Each serial loop (bus) can have up to 2 output modules. The address must be 0 or 1. The first 4 inputs in the control panel have the address 0. The first 4 outputs of the module with address 0 on the serial bus 1 operate in tandem with the four relays fitted in the control panel.

Channel Number Each module has 16 output channels numbered from 1 to 16.

2.4 CONTROL PANEL LAYOUT

The location of control panel modules and connections are shown below. Detector cables are connected to the Serial Boards as detailed (Bus 1, Bus 2 etc).

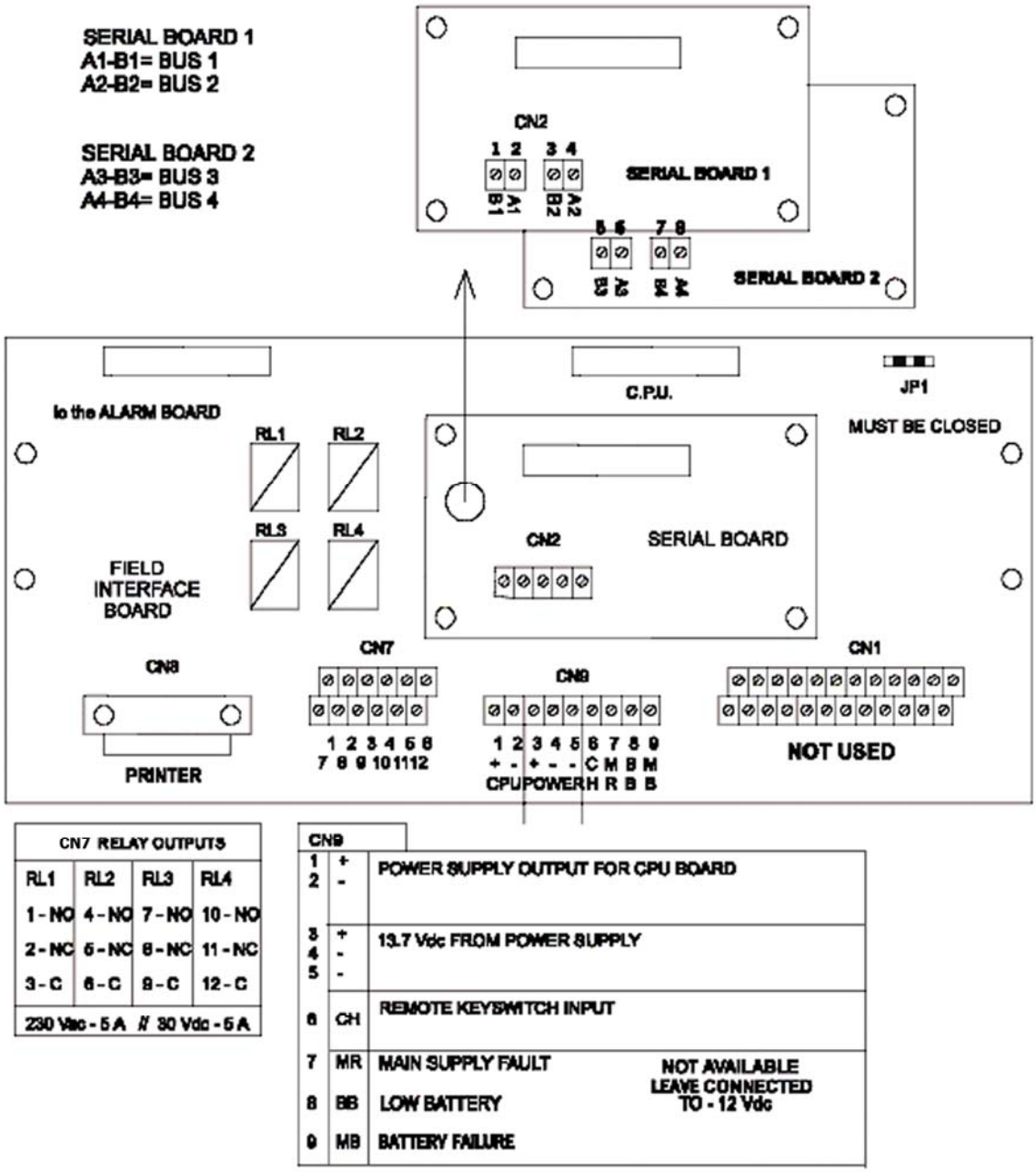


Figure 4 – Control Panel Module Arrangement

Ensure that terminals 7, 8 and 9 are connected to terminal 5 on the CN9 terminal block on the field interface board. This disables signals which are not available as standard on the control panel. Please contact Crowcon if these functions are required; additional equipment will be needed.

3. SYSTEM FEATURES

3.1 FRONT PANEL CONTROLS

The Crowcon Hydra control panel is made of an aluminium front panel on the back of which are mounted the CPU card and the alarm signals. Eight function pushbuttons (F1..F7, HELP), a numerical keypad containing the keys Esc. and Ent., a keyswitch and eight visual indicators are to be found on the front of the control panel

A 32 character x 8 row display is used to communicate with the operator both during system programming and when the control panel is in the normal operating condition.

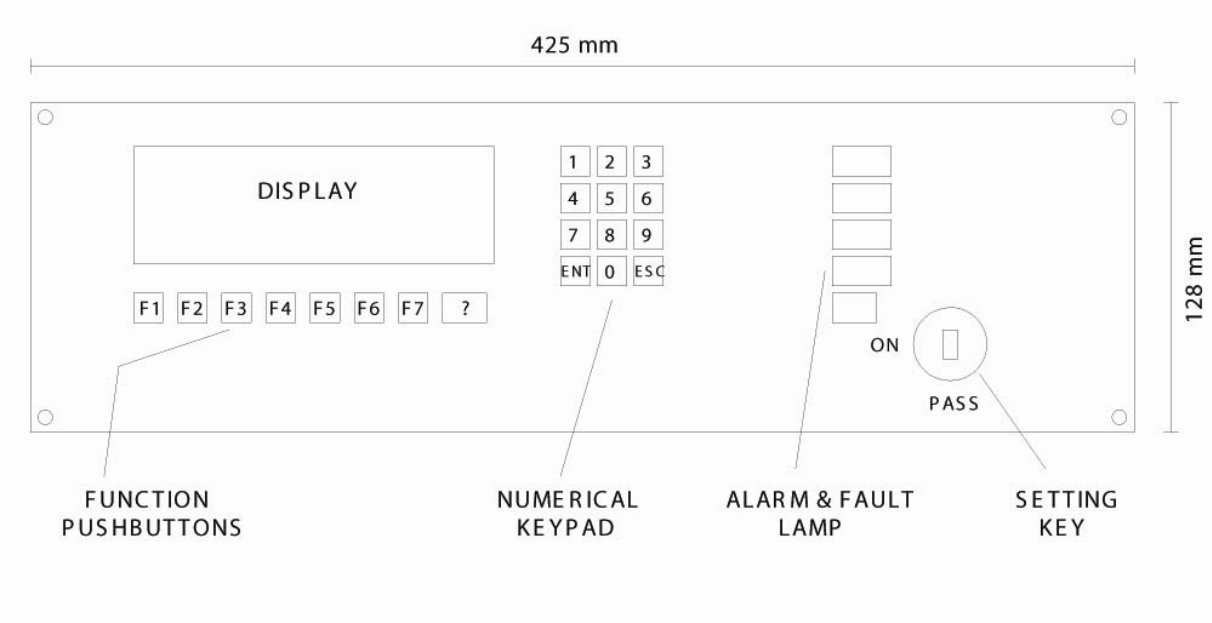


Figure 5 – Front Panel Arrangement

The control panel can control a maximum of:

120 Hydra detectors on four serial loops RS485 (max 30 for loop)

132 outputs: four of which are relay outputs within the control panel, and 128 are remote open collector outputs on four serial loops RS485 (max 2 modules with 16 outputs per loop)

The control panel can be programmed either via the front mounted keypad or using a personal computer and suitable configuration software (supplied on CD with the control panel). Some of the options, such as editing the display text can only be programmed from a personal computer.

The system configuration functions are password (or keyswitch) protected, thereby offering the maximum operating security.

The control panel has an event log, which memorises all the alarm, fault and operator operations. These can be printed out in real time using a Centronics™ printer connected to the control panel.

The control panel features a ModBus interface, permitting a host system (on request) to interrogate the status of the control panel inputs and outputs. Contact Crowcon for instructions on connecting to a ModBus 'master' controller.

Each input channel (detector) can be in one of the following five conditions: normal; fault; threshold 1 alarm; threshold 2 alarm; threshold 3 alarm.

Operating the key-switch on the front panel has the same effect as keying in a password, and allows an authorized user to access the system configuration settings.

3.2 CONNECTING A PC

The control panel can be connected to a Personal Computer (PC) using the RS232C serial port, to permit initial programming or system management with an appropriate management software (supplied with the system). Either of two serial ports may be used to connect a PC: the 9 pin male connector found on the front panel, or reverse side of the CPU card (CN8). The CPU card layout and interface lead wiring diagram are shown in Fig. 6

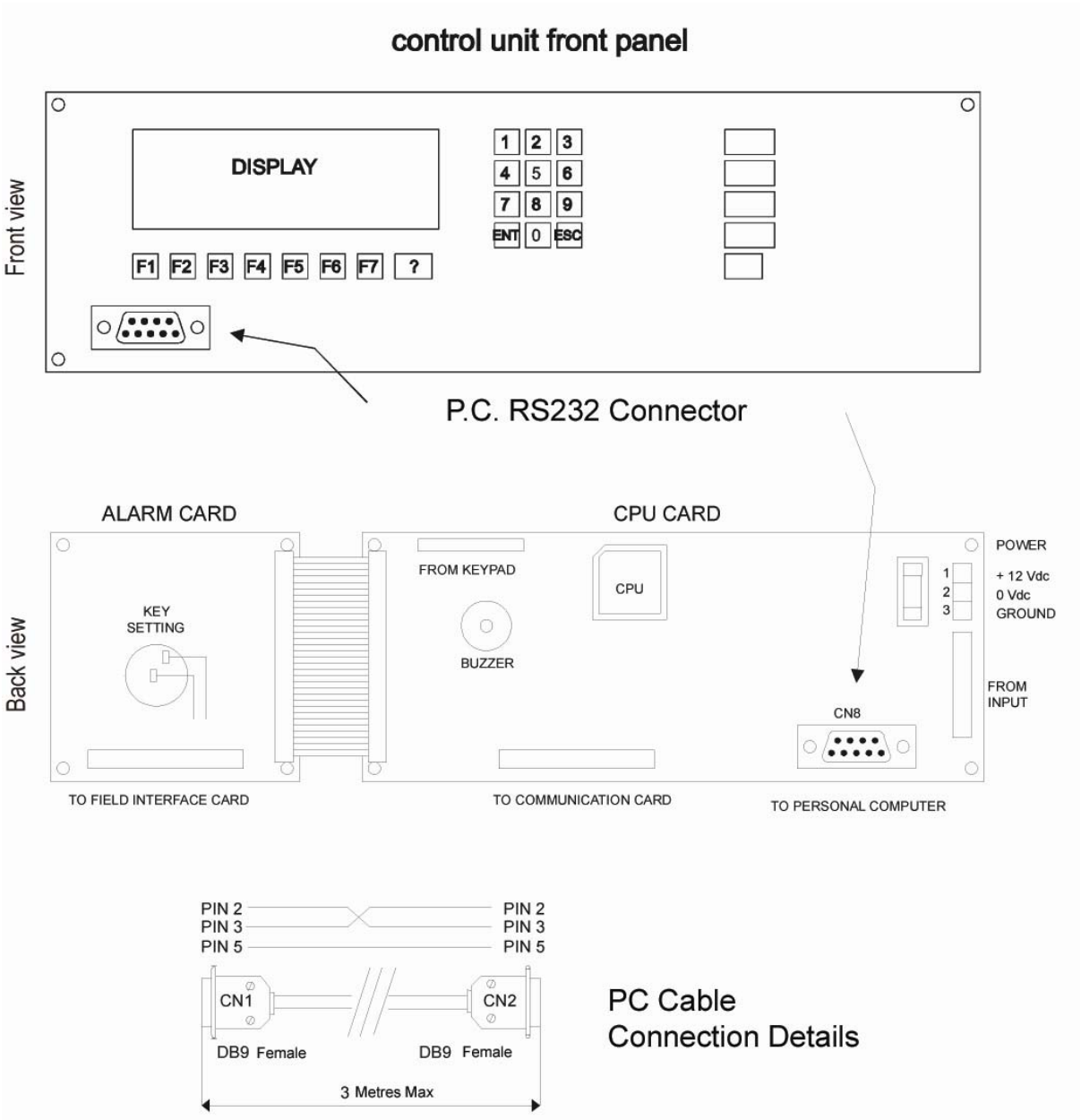


Figure 6 – PC Connection Details

4. SYSTEM OPERATION

Note: Crowcon Hydra systems are supplied un-configured; a new configuration file must be created before commissioning and operating the system (refer to Appx F).

4.1 SYSTEM OPERATING MODES

The control panel has three system operating modes:

- Set
- Unset
- Programming

The system can be in one of three operating conditions:

- Normal operation
- System alarm
- System Fault

The two main operations that can be carried out on the panel are:

- Silence the sounder (buzzer)
- Reset the system

On power-up the control panel will always default to System Set and System Fault.

The default user password is: **543210**.

4.2 SYSTEM STATUS

4.2.1 Normal Status

During normal operation and after start up, the control panel is in SYSTEM SET mode (as shown on display). In this mode, the control panel continually checks the status of each detector and stores the data. The status of detectors can be checked using the function buttons: for example the location of any detector registering a gas alarm can be identified.

4.2.2 Alarm status

When one or more detectors sense gas above a threshold value, the system enters alarm status. Three levels of alarm can be set for each detector.

4.2.3 Fault status

When one or more detectors are in fault, or there is a line fault (eg the cable has been disconnected), the system enters fault status. In this condition the control panel works normally, with the exception that the faulty detectors or cable loop are isolated.

The system remains in this state until the fault is corrected, or the affected detectors are UNSET from the system in programming mode (ie temporarily removed from the system configuration).

4.2.4 Acknowledge

When there is an alarm condition, the control panel sounder can be silenced by:

turning the key to PASS or entering the correct password, wait for display ACK message, turn the key to ON and push the function button as shown on display (‘SIL’).

The control panel performs a lamps test and silences the sounder.

4.2.5 Reset

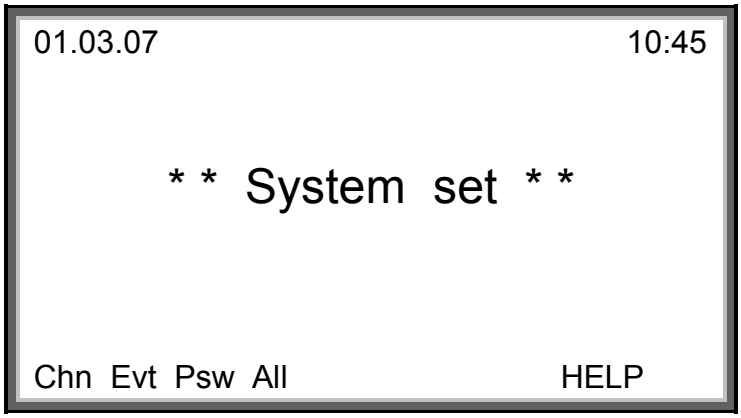
With the system SET, and in FAULT, the control panel sounder can be silenced (see above). The system remains in this state until the fault condition(s) have been eliminated, after which the system can be RESET (which resets the alarms and returns the control panel to a stable SET condition). Unlike an alarm condition, even if the fault condition persists it is possible to go from the SET & SILenced state to the PROGramming mode, from where it is possible to change the system configuration and if necessary isolate the faulty detector.

Turn the key to PASS or enter a password, wait for display ACK message, turn the key ON and push the function button as shown on display.

The control panel performs a lamps test of the LEDs and resets the system.

4.3 DISPLAY

A 256x64 pixel LCD graphic user display is used to keep the operator informed. The text is displayed on eight lines, the first of which is dedicated to displaying the time and date whilst the last line is used to identify the function buttons (F1 … F7).



The six lines in the middle are used to give information relating to the status of the channels (alarm status etc), and are an aid to programming when used together with the keypad.

4.4 SYSTEM STATES

During Normal Operation (Fig. 7) with the control panel in **SET** mode, keying in the correct password or turning the key to PASS will give the options to **UNSET** or **RESET** the system by pressing the appropriate function key. **PROG**ramming mode can be entered once the system is **UNSET**.

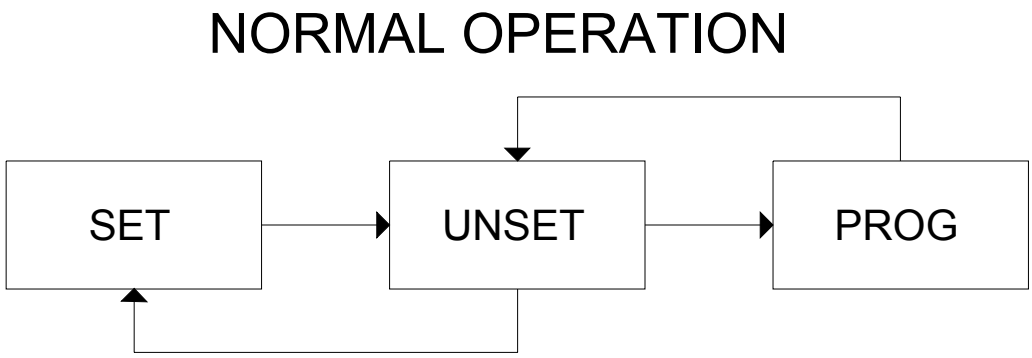


Figure 7

When the panel is **SET**, and in an **alarm** condition (Fig. 8), the control panel sounder can be silenced (see section 4.2.4), upon which the panel is in **SET** & **SIL**enced state. The system remains in this state until all the alarm conditions (ie gas) has cleared. The operator can then perform a **RESET** (which resets the alarms and returns the control panel to a stable **SET** condition), or **UNSET** the system (from which **PROG**ramming mode can be accessed).

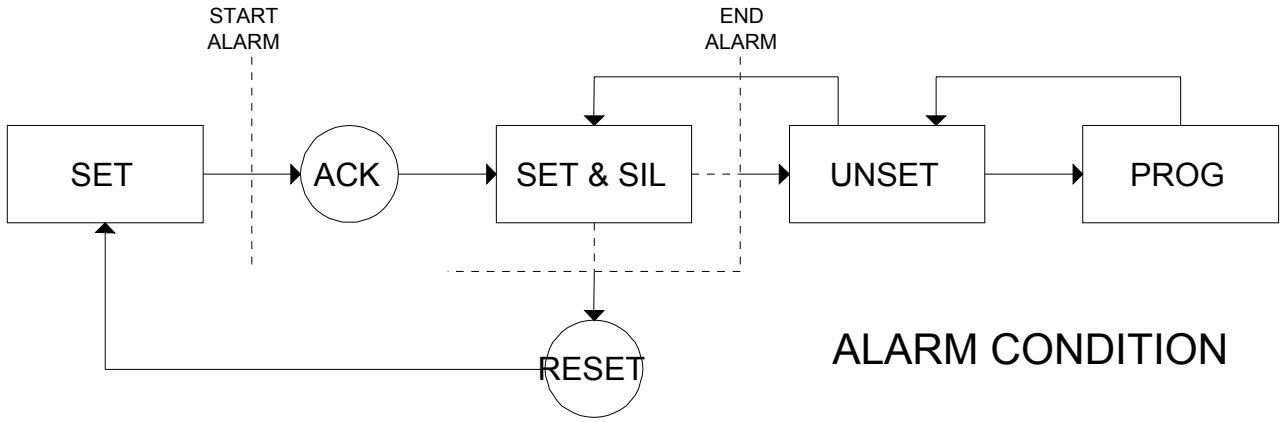


Figure 8

With the system **SET**, and in **FAULT** (Fig. 9), the control panel sounder can be silenced (see section 4.2.4), upon which the panel is in **SET** & **SIL**enced state.. The system remains in this state until all the fault conditions have been eliminated. The operator can then perform a **RESET** (which resets the faults and returns the control panel to a stable **SET** condition). Unlike the alarm condition, even if the fault condition persists it is possible to go from the **SET** & **SIL**enced state to the **PROG**ramming mode, from where it is possible to change the system configuration and if necessary isolate the faulty detector.

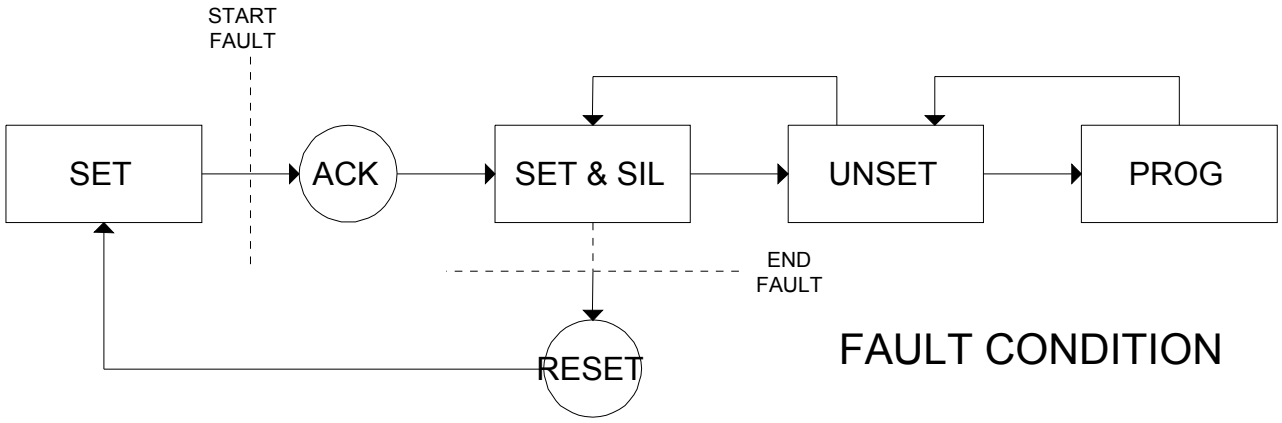


Figure 9

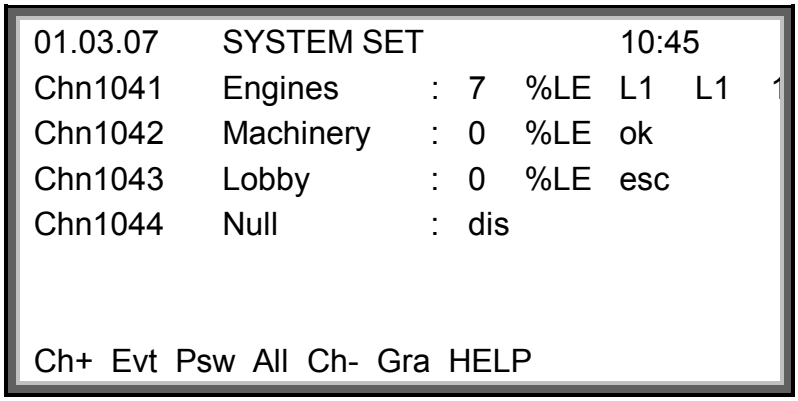
4.5 SYSTEM FUNCTION BUTTONS (SET MODE)

SYSTEM SET mode is for the large part the normal operating state of the system. The control panel enters this state on power.

During normal operation with the control panel in a quiescent state, the text **SYSTEM SET** will be displayed, together with the time and the date on the first line and the functions Chn, Evt, Psw and All, which are associated with the function buttons F1, F2, F3 and F4 on the last line.

4.5.1 Ch+ / Ch- Buttons

Pressing the **F1**-**Ch+** button repeatedly will show the all the first channels which are active in the control panel. Continuing to press the **F4**-**Ch-** displays all detectors in succession.



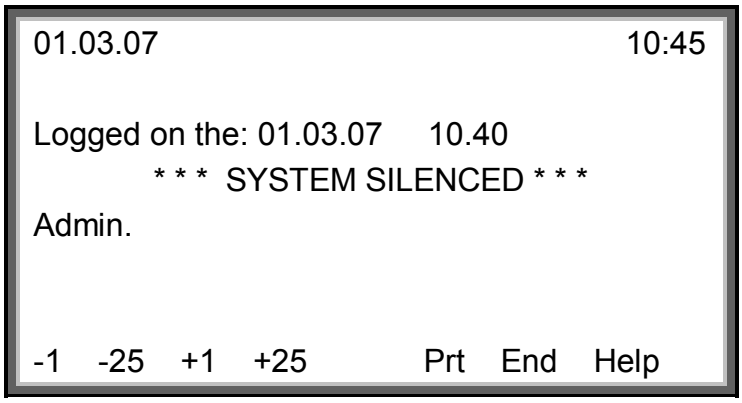
Each channel has the following supplementary information:

The address which identifies its physical location. The associated name (user set); The measured value; The unit of measure; The current status; The non silenced status.

e.g.:	Chn1041	Detector ID: in this example Detector 3 (address 4) on cable loop 1.
	Engines	User defined name for the detector
	7	Measured gas value (0 to full-scale of the detector)
	%LE	Percentage of the LEL (ppm will be displayed for a CO detector)
	L1	1st Alarm threshold
	L1	1st Alarm threshold not silenced
	1	Zone

4.5.2 Evt Button

Pressing the **F2**-Evt button accesses the event memory.



The active functions are:

F1 -1 view the previous event

F2 -25 view 25 events previous

F3 +1 view the next event

F4 +25 view next 25 events

F6 Prt print out the event log (only if the printer has been enabled)

F7 End return to viewing the channels

Together with the event the following additional information is displayed:

- the name of the event;
- the address of the channel in alarm or in fault
- the address of the detector/loop that has ceased to communicate
- the name of the active menu

4.5.3 Psw

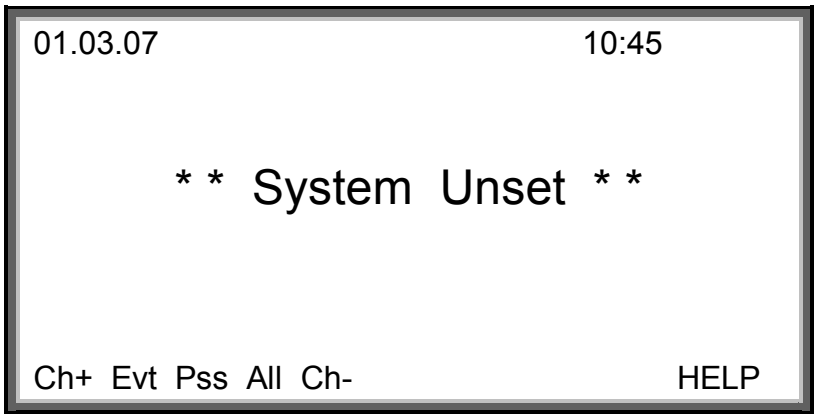
After pressing the **F3**-Psw the operator is required to enter his password, after that, authorized users can silence the sounders, reset or unset the system or enter into the programming mode.

The above operation can also be done via the key switch, which permits entry at a higher level.

4.5.4 All

Pressing the **F4**-**All** button shows the same channel information as pressing the F1-Chn button, with the exception that only the channels in alarm will be displayed. The channel's attributes remain unaltered.

4.6 UNSET MODE



In this state, all the inputs are operational as normal, as are the Alarm/Fault LED's, but both the buzzer and all the outputs will be deactivated (inhibted).

The system can be changed fro **SET** mode to **UNSET** mode by entering the password (having pressed the Psw button) or using the keyswitch. The display will show the day, the date and the text: SYSTEM UNSET.

The function buttons **F1** to **F5** offer the same functions as in **SET** mode.

In this mode the operator can only:

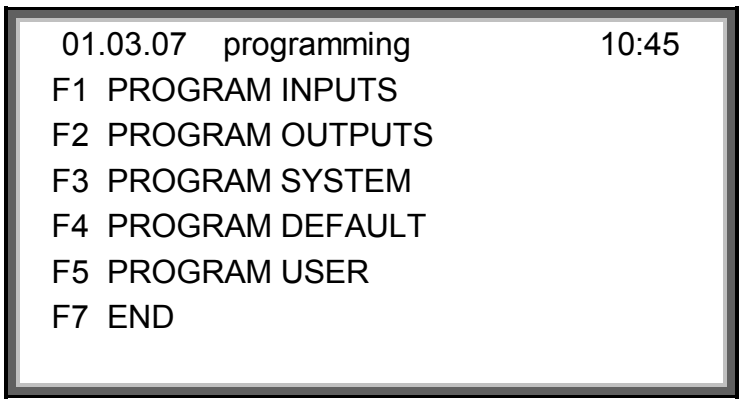
- Look at the event log

- Enter into the programming mode
- Set the system

4.7 PROGRAMMING MODE

Warning: the operations described in this section could be compromise the functionality of the system; only authorized and trained personnel should access this mode.

The main menu is displayed immediately after the system enters the programming mode (which is logged into event memory).



F1 INPUTS	allows the programming of the control panel input parameters
F2 OUTPUTS	allows the programming of the control panel output parameters
F3 SYSTEM	allows the system clock and printer mode of operation to be set
F4 DEFAULT	allows the default setting to be restored
F5 USER	allows new users and passwords to be programmed
F7 END	escape from the programming mode and enters into the system unset mode.

The control panel will automatically exit from any menu and go into an UNSET state, if no keys are pressed for one minute.

4.7.1 Inputs

Pressing the **F1** button whilst in the programming menu will call up the following display:

?	ZONE	F7 END

Using the **F5** and **F6** function buttons one can scroll up and down the channels.

Using the **?** and **S** buttons it is possible to apply a zone number for the input channel.

The second line shows the default settings or the last configuration of the input channel selected:

- The physical address of the channel from Chn1041 to Chn2158.
- Status of the channel (default Unset):

SET	channel SET	condition of normal operation: will trigger the outputs in event of an alarm or fault.
Dis	channel UNSET	detector operates normally but does not activate the outputs; the alarm indications on the display are shown as usual.
Spr	channel AVAILABLE	no detector connected; when the system is set there will be no indication from this channel.

- Unit of measure (default %LE):

%LE	LEL percentage of the lower explosive limit
%O2	percentage of oxygen in the air
%Vo	percentage by volume
ppm	parts per million
°C	degrees centigrade
°K	degrees Kelvin
Bar	pressure in Bar
MBa	pressure in mBar

- Signal direction (default UP):

Up	signal rising	the alarm thresholds are activated when the there is an increase in the measured value
Dn	signal falling	the alarm thresholds are activated when the there is an decrease in the measured value

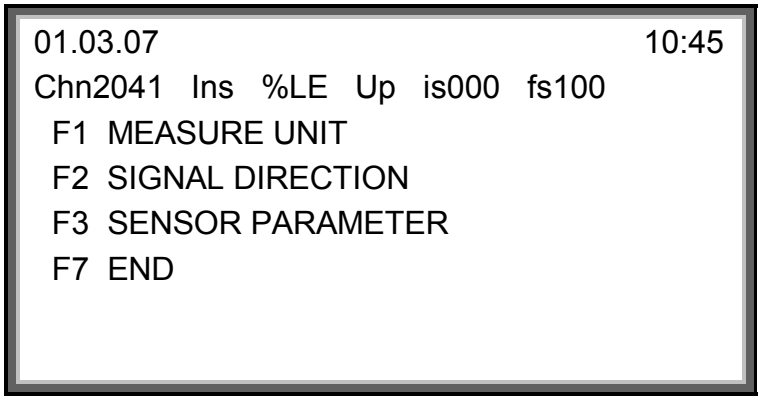
- Input scale (default depends on the unit of measure):

Isxxx	scale start value	0 per percentage unit of measure
Fsxxx	scale end value	100 per percentage unit of measure (30% for O_2)

Pressing the **F1** button enables the status of the channel to be set. The text string, Set, Unset, Spare, on the second line of the display will change.

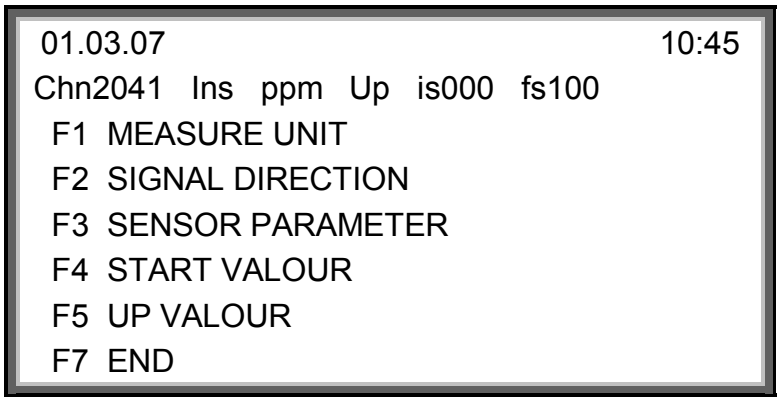
Inputs belonging to the non-inserted modules cannot be programmed and are considered spare.

Pressing the **F2** button, allows the various sensor parameters to be set:



Pressing the **F1** button changes the unit of measure of the channel showing all those allowed in succession.

If the required measured unit is not percentage, two new commands will be displayed: start valour (value) and end valour (value). These are the engineering values of the detector.



Pressing the **F2** button the permits the signal direction to be set: rising (Up) or falling (Dn)

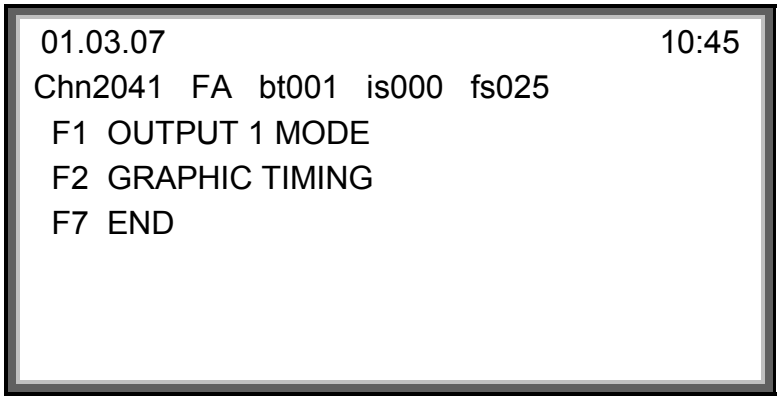
Pressing the **F4** button the scale start value is requested. If the unit of measure is a percentage then the scale start is always 0 and is not programmable.

Pressing the **DEL** button deletes the current value, key in the new value and confirm by pressing **ENT**. The maximum value must be between 0 and 999.

Pressing the **F5** button the scale end value is requested. If the unit of measure is a percentage then the scale end is always 100 and is not programmable.

Pressing the **DEL** button deletes the current value, key in the new value and confirm by pressing **ENT**. The maximum value must be between 0 and 999.

Pressing the **F3** button shows the sensor parameter menu:



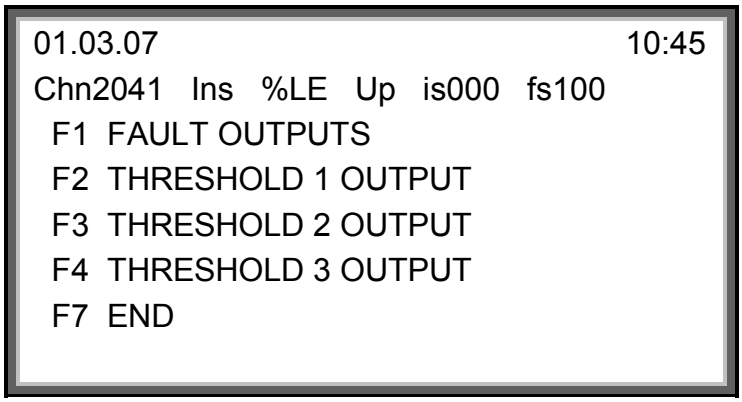
Pressing the **F1** button the permits the detector's output 1 mode;

(FA = Fault – S1 = Threshold 1)

Pressing the **F2** button the graphic timing value is requested. (default value: 1 second).

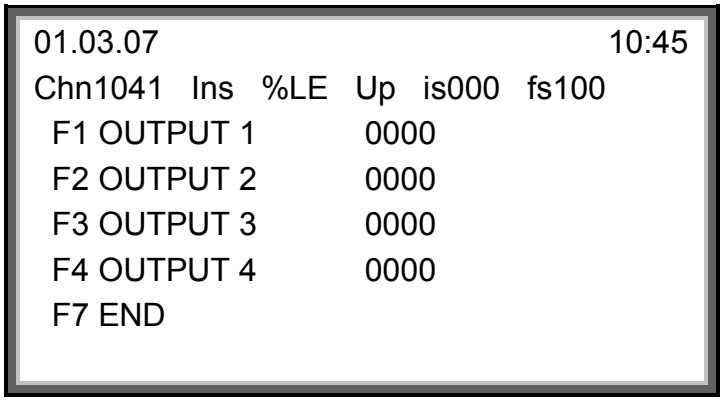
Pressing the **F7** button returns to the parameter input setting menu.

Pressing **F3** at this point permits the outputs to be linked to the input thresholds:



It is possible to link up to 4 outputs to each alarm level, including fault.

Pressing **F1** allows the outputs to be activated in the event of a fault condition:



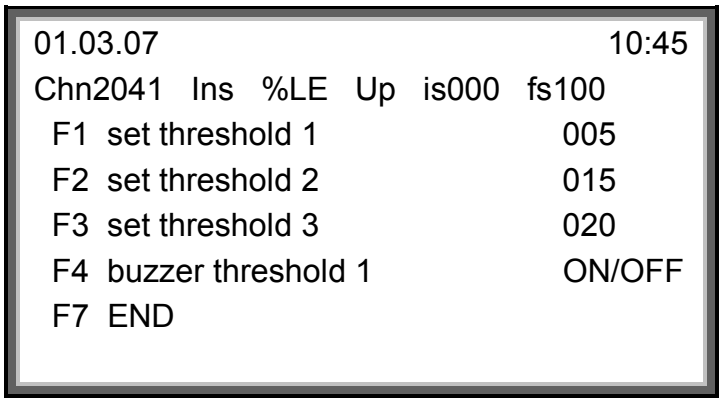
The four digit numbers represent the physical address of the outputs to be linked, in this case to the fault condition of the channel selected. The numeric code 0000 indicates that the output is not used.

Pressing **F1** allows the code of the first fault output to be set. Up to a maximum of 4 outputs can be set in a similar way. The same output can be used for a number of channels and a number of threshold values.

The same procedure is used to set the outputs linked to the three alarm thresholds.

Pressing **F7** returns to the main input settings menu

Pressing the **F4** button allows the three alarm thresholds to be programmed using the same units of measure as are associated with that channel.



The three digit numbers indicate that current threshold settings.

Pressing **F1** allows the 1st threshold level be set for the channel selected.

Pressing **DEL** deletes the threshold value , the new value is input and confirmed by pressing **ENT**.

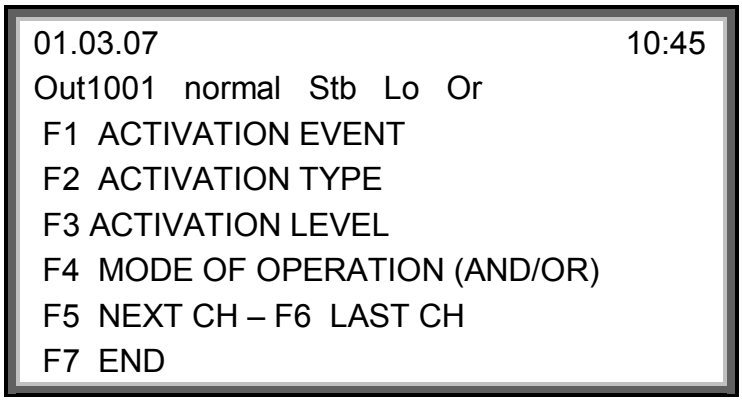
With **F2** the second threshold value is set, with **F3** the value of the third. Using **F4** the buzzer can be linked to threshold 1. Note that the second and third thresholds are always linked to the buzzer.

Pressing **F7** ends the procedure for programming threshold levels.

Pressing **F7** ends the input programming procedure and returns to the main programming menu.

4.7.2 Outputs

Pressing **F2** from the programming menu calls up the following display and permits programming of the control panel outputs:



The second line displays the settings of the output channel selected.

The **Activation *Event*** **F1** links the output to particular events as well as the input states: it can have the following values:

- physical address of the channel.
- status of the channel (default Normal):

Normal	the output is activated only after alarm or fault conditions associated with various inputs.
Set	the output is activated when the system is set.
Siren	the output is deactivated when the system is silenced
Line fault	the output is activated when the G-RIO serial loops are in a fault condition.

- the ***Type*** **F2** *of output* can have three values:

Stb	Stable	follows the course of the alarm; alarm activated, output activated after a possible activation time delay; alarm disabled, output low after a possible activation delay.
Imp	Pulsed	produces a pulsed output with a time dependent on the alarm start time and after any programmed delay.
Mem	Latched	as per the stable output, but becomes disabled only after the system has been reset.

- The *activation* ***Level*** **F3** (default Lo)

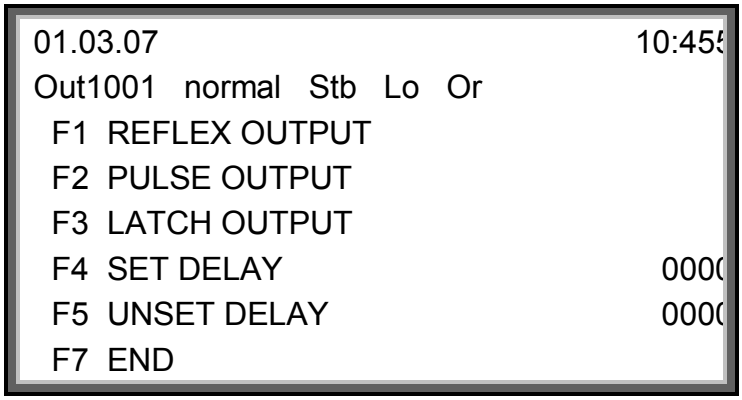
Lo	Low	The alarm deactivates the normally active relays (fail safe).
Hi	High	The alarm activates the normally off relays (normally-de-energised).

The Mode of Operation **F4** (default Or)

Or	One	the output is activated if one of the events linked to that output goes into alarm
And	All	the output is activated if all of the events linked to that output go into alarm

Pressing **F1** permits the activation event to be changed and the change will appear immediately in the first line next to the physical address of the channel.

Pressing **F2** (activation type) permits the respective parameters to be set for the output modes:



Pressing **F1** selects the “Stable” (Stb) type of output. When the linked alarm occurs the control panel activates the output after the activation delay. When the alarm condition resets the output resets after the deactivation delay.

Pressing **F2** selects the “Pulsed” (Imp) type of output. When the linked alarm occurs the control panel activates the output after the activation delay. The output resets after the activation time even if the alarm condition is still present

Pressing **F3** selects the “Latched” (Mem) type of output. When the linked alarm occurs the control panel activates the output after the activation delay. The output remains active until the control panel is reset, which can only occur once the alarm condition has reset.

Pressing **F4** sets the *activation* delay (in seconds) which applicable to all types of output.

Pressing **F5** sets the *deactivation* delay time (in seconds), if the output is a *stable* type or the pulse duration if the output is of a *pulsed* type. Pressing this key has no effect if the output is a *latched* type.

The **DEL** button deletes the current value, inserting the new value and pressing **ENT** confirms the operation which will be displayed in the menu next to the selected function.

The **F7** button returns to the main output menu in which the **F3** button allows the activation level of the output to be set.

The output can be programmed as active high (**Hi**), that is to say that in normal operation the output level is low and the relay is not energised. The associated alarm energises the relay.

Conversely it can be programmed as active low (**Lo**), that is to say that in normal operation the output is level high and the relay is energised. The associated alarm de-energises the relay. This type of operation is called fail safe and will activate the valves connected even if the control panel is un-powered.

Pressing **F4** allows the output to be configured as And or Or.

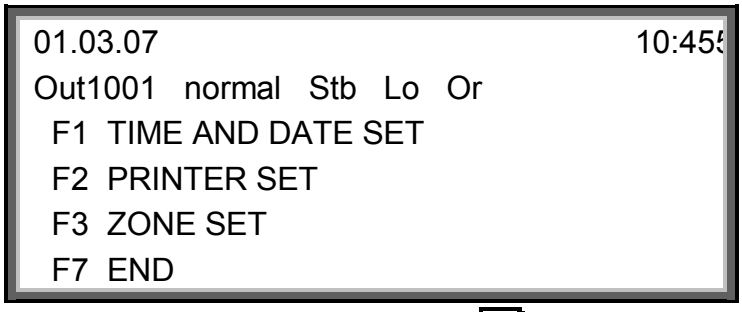
Only one alarm condition, linked to the output, will activate the output if configured as **Or**

All the alarm conditions, linked to the output, need to be active to activate the output if configured as **And**.

The **F7** button returns to the main programming menu

4.7.3 System

The system parameters can be changed in this part of the programming menu:



The clock settings are available by pressing the **F1** button and following the on screen instructions to set the hours and minutes.

The **DEL** button deletes the current value, after keying in the new value, pressing **ENT** confirms the change. The active function keys are as follows:

F1	hour	**F4**	month
F2	minutes	**F5**	year
F3	day	**F7**	End

Pressing **F7** escapes from this menu and updates the system.

The clock parameter changes are diregarded and the menu reverts to the main system set-up menu if no key is pressed within approximately one minute.

Pressing **F2** changes the menu to printer settings.

```
F7  END
```

Pressing **F1** disables the printer.

Pressing **F2** prints out the event log.

Pressing **F3** the events are printed as they happen.

It is best to disable event log printing if the printer is not present

The **F7** button returns to the main programming menu

Using **F3** it is possible configure the zone and link to a push-button (Signalling box):

```
01.03.07                                10:45
Zone    01 P00   P00   P00   P00
 F1  PUSH-BUTTON 1
 F2  PUSH-BUTTON 2
 F3  PUSH-BUTTON 3
 F4  PUSH-BUTTON 4
 F5  NEXT ZONE  -  F6  LAST ZONE
 F7  END
```

The second line shows the current zone that you can change with **F5** end **F6**.

Using **F1** is possible to link the first Push-Button to the current zone. The system will be asked the physical address of the push-button to be linked.

With **F2**, **F3** and **F4** you can link other three push-button to the current zone.

The **F7** button returns to the last menu

The **F7** button returns to the main programming menu

4.7.4 Default Settings

The procedure described resets the configuration to its factory default settings

Pressing **F4** from the main programming menu displays the *Reset Parameters* option.

The **F1** button resets the all the settings.

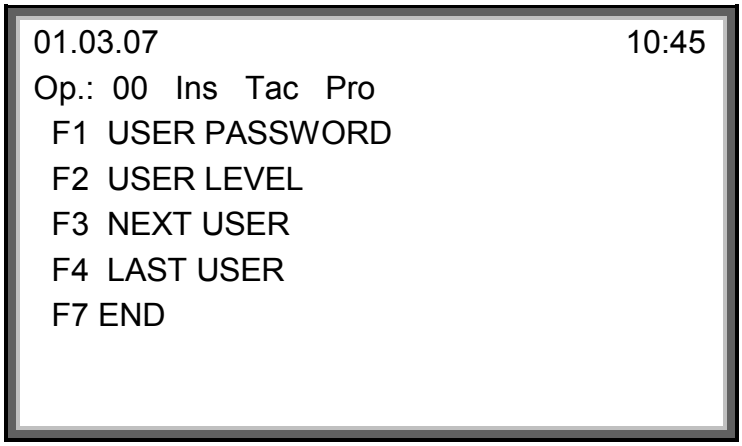
Warning: All the user configuration settings will be deleted.

4.7.5 Setting-up Users

The control panel has ten users and one manager. Each user has an individual password and it is possible to assign to each a selection of authority levels, for example:

- Activating the system
- Programming the system
- Silencing alarms

a menu with the following options is displayed:



The second line of the display shows the settings relative to the user selected:

Op.: 0	user code
Ins	setting the system allowed
Tac	silencing the system allowed
Pro	programming the system allowed.

Pressing **F1**, *Password* option allows the password of the user selected to be changed.

The **F2** button *Rights* allows the selected user to be assigned or denied system rights. The other three buttons are used to pass from one user to another and to escape.

No password is linked to the key switch, and permits entry into the system at the highest operator level, that is to say with all system rights. The system rights for the key switch are not programmable.

5. APPENDIX A – DETECTOR INSTRUCTIONS

5.1 INSTALLATION NOTES

Detectors are to be installed with consideration to the gas to be detected and in accordance with all national rules in force.

Detectors must be mounted close to any possible source of gas leaks or where any eventual gas stagnation can be foreseen.

To measure explosive gas with a specific weight heavier than air (eg petrol vapour or LPG), the detectors must be installed approximately 30-50cm. from floor. To measure toxic gas (eg CO or NO_2, we recommend to mount the detector at “nose height” approximately 150-160 cm. from floor.

Consideration should be given to the security of detectors installed in public areas such as car parks. It is advisable that a coarse-mesh cover be fitted over the whole of the detector to prevent deliberate damage by vandals. It is imperative that any cover fitted does not prevent gas from reaching the sensor.

As a guide, one detector can cover approximately 80-100 m^2 when considering a square area without obstacles. Application specific standards must be referred to when deciding on the quantity and coverage of detectors.

Ventilation patterns must be considered when locating gas detectors. Consideration must be given to the likely movement of a gas cloud due to draughts (doors, windows, ventilation, etc.). Avoid installing gas detectors close to air intakes or fans causing strong air currents.

Ensure detectors are attached to a firm base to prevent damage or spurious functionality due to vibration.

Although the electronics comply with EC electromagnetic compatibility rules, it is advised to keep the detectors at a distance from any radio frequency transmitters (such as radio links or similar).

The detector must always be mounted with the sensing element facing downwards. **The detector enclosure must not be drilled**; wall-mount the detectors using the mounting lugs provided. Detectors must be protected from direct contact, or immersion in water.

Detectors must be accessible for maintenance and calibration after installation. Maintenance must be regularly performed in compliance with these instructions.

There are some substances that, when present in the atmosphere being analysed, can considerably change the response of the sensor and even cause irrevocable damage. In particular silicones, silicon halides, tetraethyl lead, hydrogen sulphide, carbon tetrachloride, trichloroethylene. In applications where these compounds may be present it is recommended to check the detector's sensitivity (using test gas) at regular intervals, and always after an alarm occurrence.

Detectors are factory calibrated. Future calibration must be carried out by the ST.CKD calibration keypad (see Appendix C).

5.2 INTRODUCTION

The Crowcon Hydra gas detector has been designed for operation in commercial applications: non-classified areas. The detector is dust and water protected to IP55.
Hydra has been designed to detect gas concentrations in an atmosphere mainly composed of air. Versions are available to detect explosive vapours (%LEL), Carbon Monoxide (CO) or Nitrogen Dioxide (NO_2), with a concentration expressed in ppm (parts per million).

The type of catalytic sensor employed in flammable detectors, and the electrochemical cell employed in CO and NO_2 detectors both offer superior precision and selectivity, thus avoiding false alarms and assuring an excellent reliability over time.

5.3 CALIBRATION AND MAINTENANCE

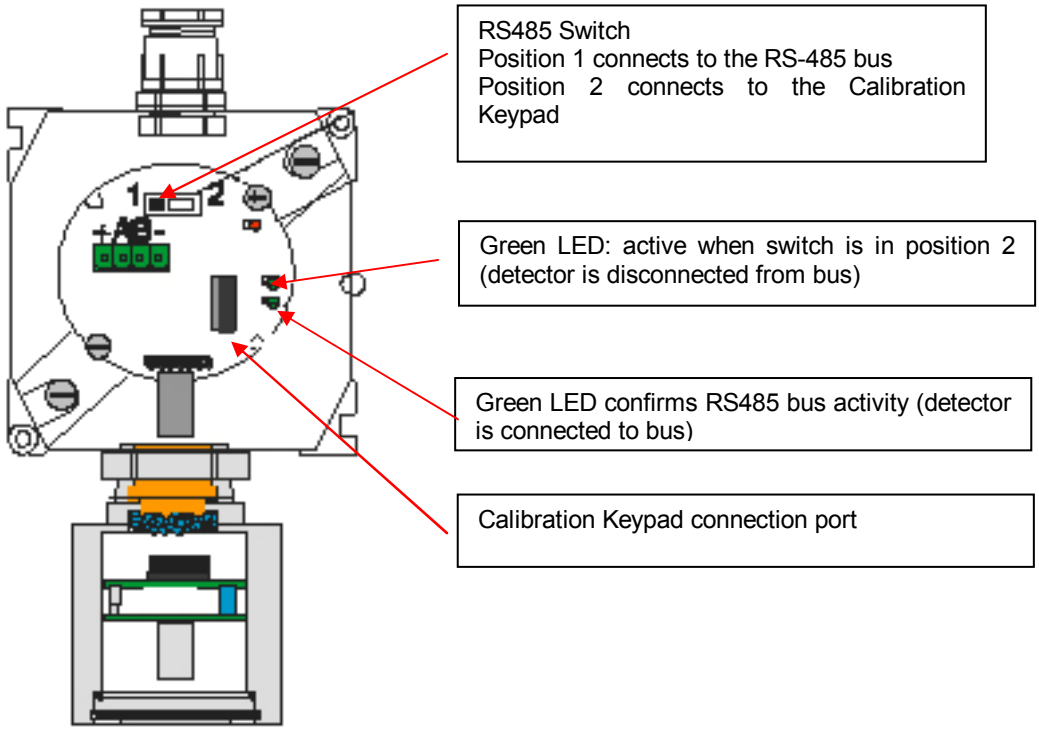
Once power has been applied to detectors, allow a minimum of 2 minutes for sensors to stabilise. Communications between the control panel and detectors is established automatically once detectors addresses have been set.

It is essential that detectors are routinely tested using calibration gas. Crowcon recommends detectors are tested every 6 months as a minimum, and calibrated as necessary.

Detectors should also be tested after any spurious gas alarms or faults to ensure correct operation.

Detectors must be zeroed in clean air prior to calibration.

Where a sensor fails to respond to gas, and cannot be calibrated using the instructions in Appendix C it must be replaced. Contact Crowcon for part number information.



Accessories required for calibration:

- Calibration Adaptor (part number: C02125)
- Calibration Keypad (part number: C02124)
- Calibration gas (contact Crowcon for part numbers)
- Calibration gas regulator (contact Crowcon for part numbers)

See Appendix D for calibration instructions.

If fitted, the back-up battery in the control panel and/or detector loop power supply should be checked regularly. Lead-acid type batteries should be replaced every 2-3 years on average.

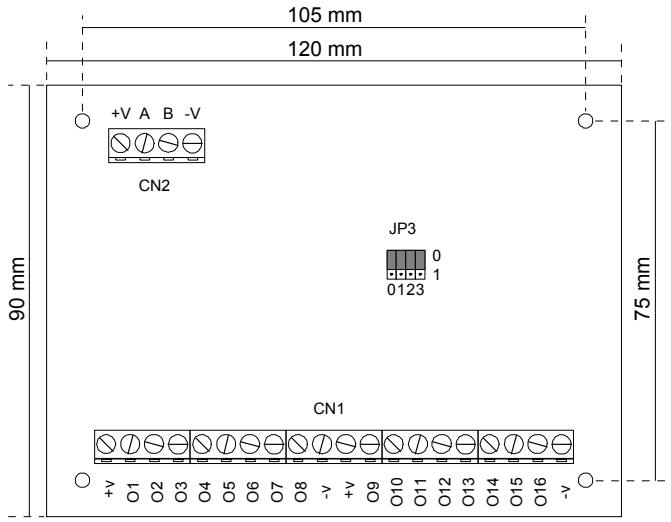
All functions of the control panel, detectors, output modules, alarm devices and control system interfaces must be checked and verified at the commissioning stage, and regularly afterwards during the operating life of the system

6. APPENDIX B – OUTPUT MODULE INSTRUCTIONS

The optional output module ST.G/OUT16 must be secured using the four 3mm holes located at the corners of the PCB. The module can either be installed inside the wall-mounted control panel enclosure, or anywhere on a detector bus within a suitable weather protected enclosure.

One or two output modules can be connected in serial mode (RS485) on any detector loop. Each output module must have a unique address on the communications bus. If the module is the last element on a loop, a 120Ω terminating resistor must be fitted across the RS-485 wires.

Power to the output module must be supplied separately (eg from the detector power supply cable loop). It is recommended that power required to drive audible/visual alarms etc is supplied from a separate source.



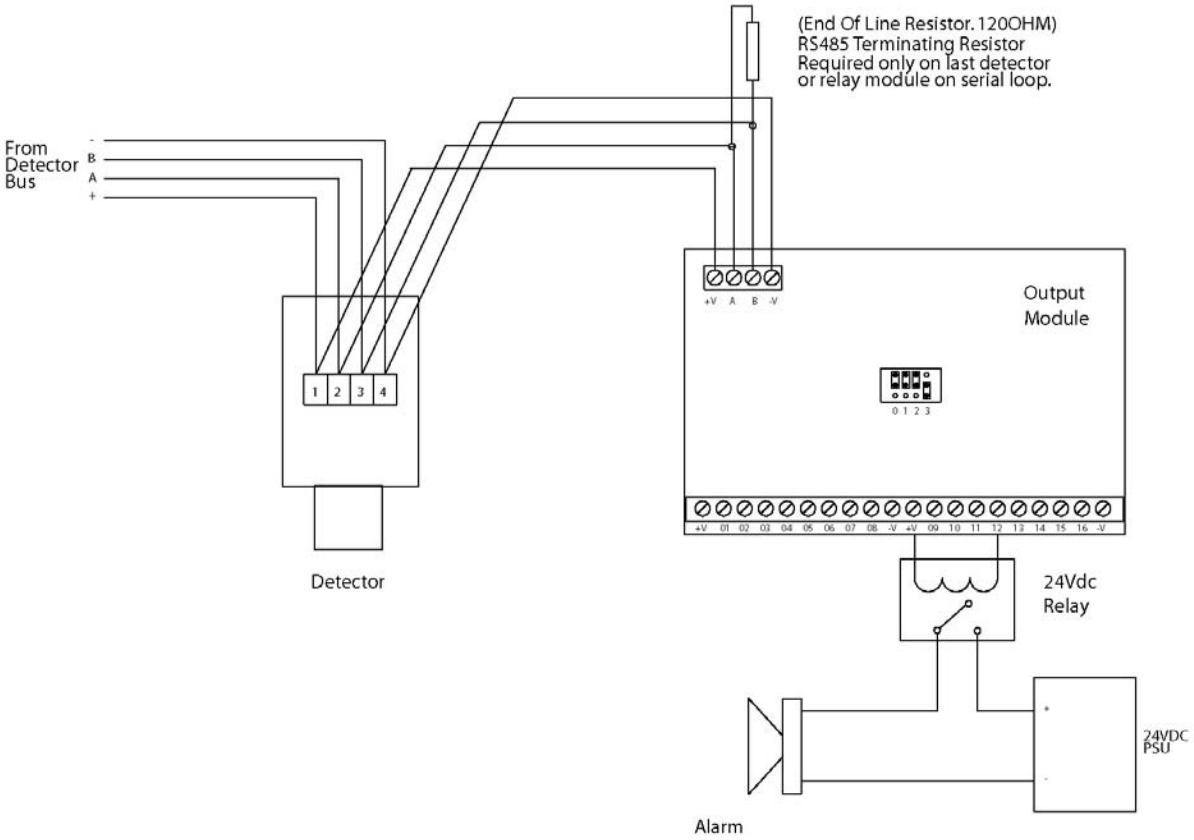
Each serial loop (detector loop) can accept up to 2 output cards with the following addresses:

Jumper / address	0	1	2	3
0	0	0	0	0
1	0	0	0	1

Set the address using links JP3 as shown.

All 16 outputs are open-collector type rated at 50mA maximum. The outputs are designed for driving relay coils, which in turn are used for signalling or activating alarm devices.

Output module connection details



7. APPENDIX C – CALIBRATION KEYPAD INSTRUCTIONS

The calibration keypad enables the detector address to be set, zero and calibration to be performed, and faults to be reset.

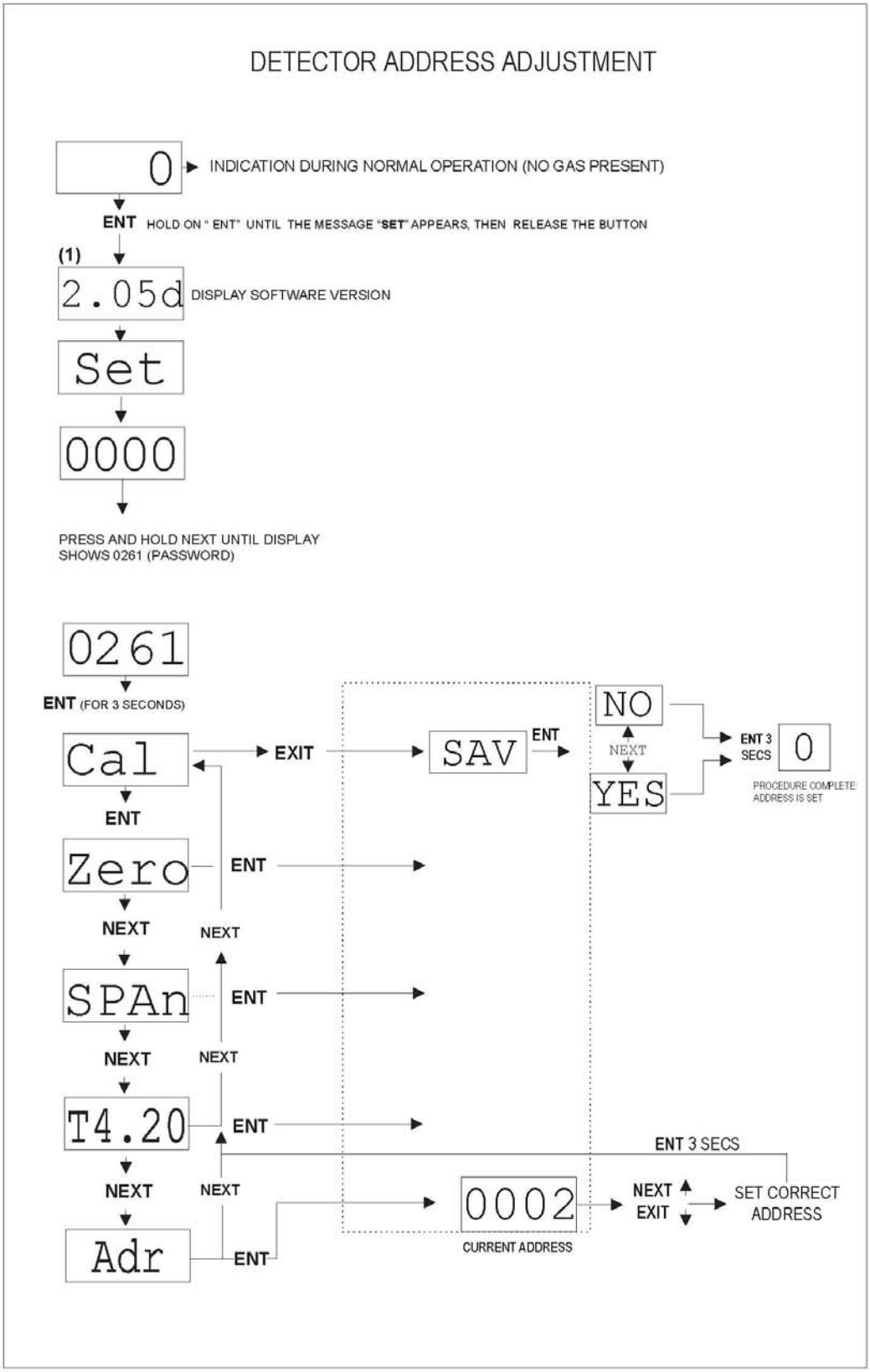
7.1 CONNECTING THE KEYPAD

The keypad should be connected to the appropriate port inside the Hydra detector (see Appendix A) using the ribbon cable which is stored in the keypad battery compartment. The keypad may be connected when the detector is switched on. The RS485 switch inside the detector must be set to Position 1 (see Appendix A) before connecting the keypad.

Once connected, the keypad will display the gas concentration being measured by the detector (which should be 0 in clean air).

7.2 ADJUSTING SETTINGS

The diagram on the following page shows the calibration keypad menu sequence.
Note: the RS-485 witch within the detector must be set to position 2 before connecting the keypad if the detector address needs to be set (see section 5.3).



Calibration Keypad Menu Sequence

7.2.1 Instructions for Setting Detector Address:

1. Switch the RS-485 switch to the left-hand position (the top green LED lights)
2. Plug the keypad in: the keypad display shows '0'
3. Hold the Enter button for 3 seconds, the display shows: 2.05d SET then '0000'
4. Push and hold Next until the display shows '0261'
5. Push and hold Enter for 3 seconds, display shows CAL
6. Press Enter, the display shows Zero
7. Press Next, the display shows SPAn
8. Press Next, the display shows C4.20
9. Press Next, the display shows Adr
10. Press Enter, the display shows the current address (e.g. 0003), use Next (up) and Exit (down) to set the required address
11. Press the Enter button for 3 secs, the display shows CAL
12. Press Exit button, the display shows 'SAV'
13. Press Enter, the display shows NO
14. Press Next, the display shows YES
15. Press Enter for 3 seconds, the display blanks and then shows '0'
16. Switch the RS-485 switch to the right-hand position and remove the keypad
17. The detector is now operational

7.2.2 Detector Calibration

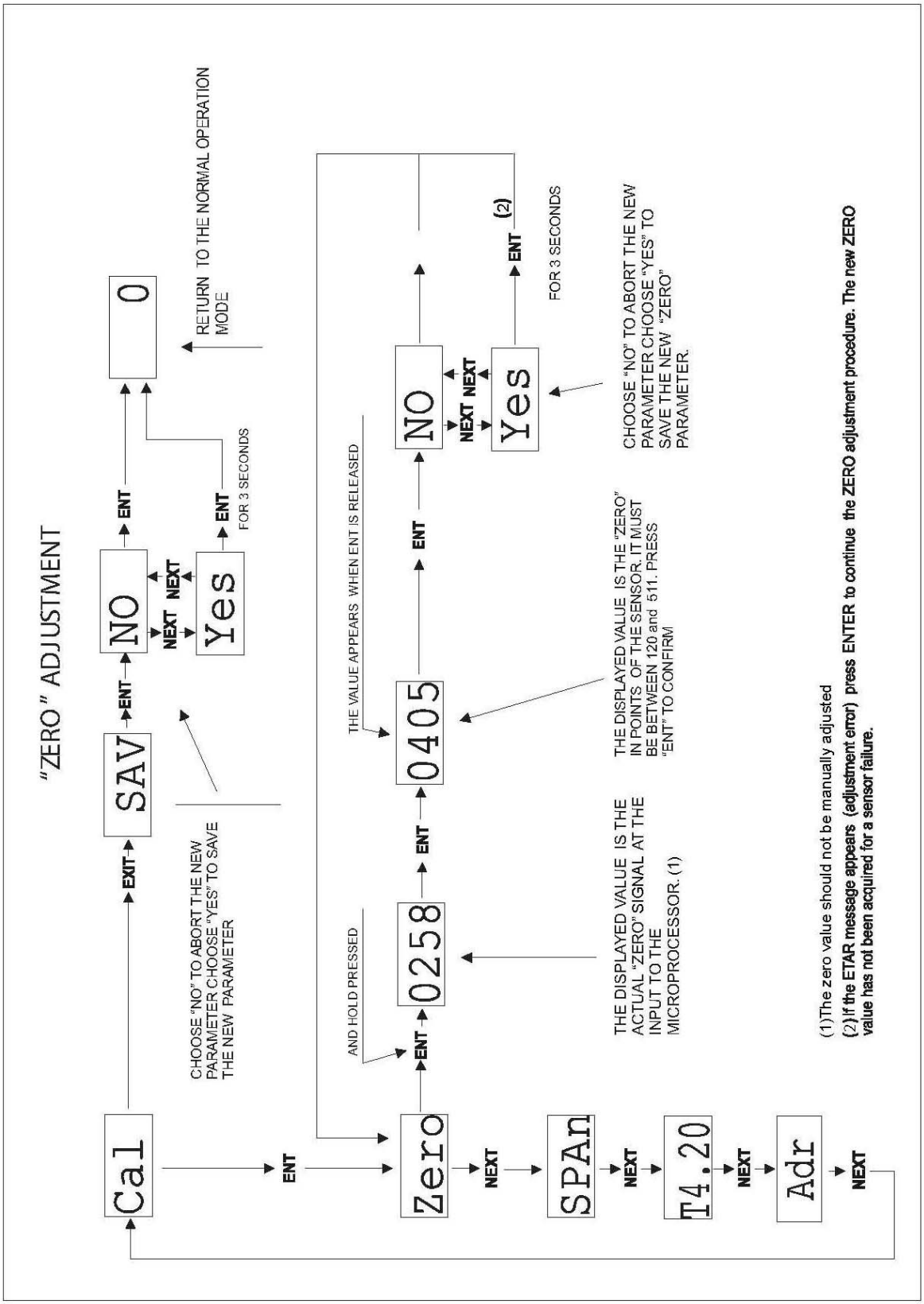
Note: During routine calibration always put the control panel into UNSET mode to avoid causing alarms.

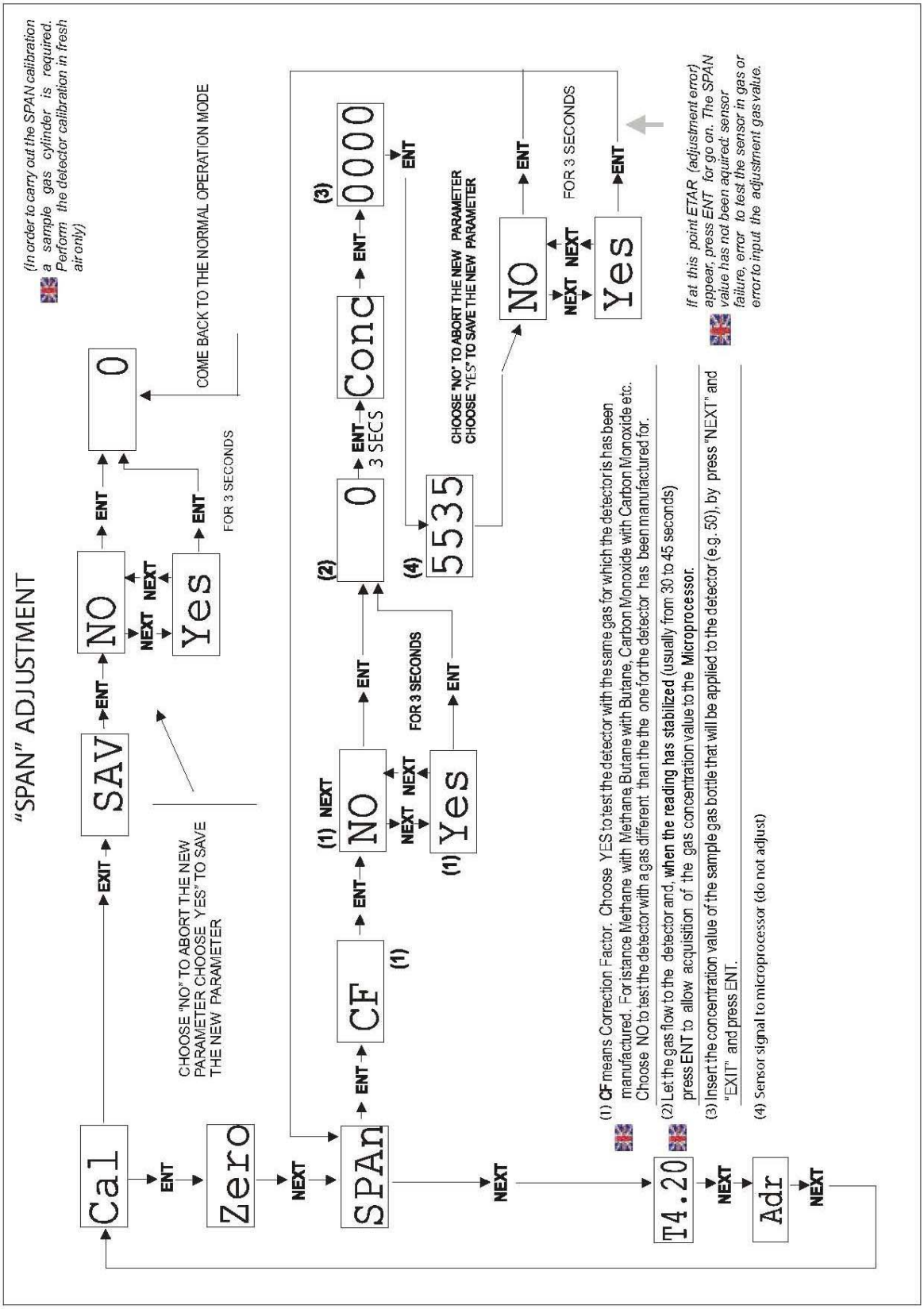
These instructions describe the method required to zero and calibrate a Hydra gas detector.
Calibration is required whenever either Fault or unjustified Alarms due to environmental conditions occur (Zero adjustment) or where detectors are due for routine calibration.
Calibration requires a calibration gas cylinder, either filled with the same gas the detector has been calibrated for, or a reference gas advised by the manufacturer (e.g. Propane for an LPG detector, or Pentane for a Petrol Vapour detector).
A calibration cap is necessary to let the gas flow to the sensor head.

Essential requirements to perform correct Zero and Span adjustments are as follows:

- **Gas detectors are to be in fresh air** (without any gas or interfering compounds) and powered on for a minimum of 8 hours where practical.

- Once the calibration routine is complete, **a test with gas (ie 'bump test') must be made to verify the detector and control panel are operating correctly.**


"ZERO" ADJUSTMENT
Cal
ENT
Zero
NEXT
SPAn
NEXT
T4.20
NEXT
Adr
NEXT
ENT
0258
ENT
0405
ENT
NO
NEXT NEXT
Yes
ENT
(2)
FOR 3 SECONDS
EXIT
SAV
ENT
NO
NEXT NEXT
Yes
ENT
FOR 3 SECONDS
0
RETURN TO THE NORMAL OPERATION MODE
AND HOLD PRESSED
THE VALUE APPEARS WHEN ENT IS RELEASED
THE DISPLAYED VALUE IS THE ACTUAL "ZERO" SIGNAL AT THE INPUT TO THE MICROPROCESSOR. (1)
THE DISPLAYED VALUE IS THE "ZERO" IN POINTS. OF THE SENSOR. IT MUST BE BETWEEN 120 and 511. PRESS "ENT" TO CONFIRM
CHOOSE "NO" TO ABORT THE NEW PARAMETER CHOOSE "YES" TO SAVE THE NEW PARAMETER
CHOOSE "NO" TO ABORT THE NEW PARAMETER CHOOSE "YES" TO SAVE THE NEW "ZERO" PARAMETER.
(1)The zero value should not be manually adjusted
(2)If the ETAR message appears (adjustment error) press ENTER to continue the ZERO adjustment procedure. The new ZERO value has not been acquired for a sensor failure.


"SPAN" ADJUSTMENT
(In order to carry out the SPAN calibration a sample gas cylinder is required. Perform the detector calibration in fresh air only)
Cal
ENT
Zero
NEXT
SPAn
ENT
CF
(1)
ENT
(1) NEXT
NO
NEXT NEXT
(1) Yes
FOR 3 SECONDS
ENT
(2)
0
ENT
3 SECS
Conc
ENT
(3)
0000
ENT
(4)
5535
CHOOSE "NO" TO ABORT THE NEW PARAMETER
CHOOSE "YES" TO SAVE THE NEW PARAMETER
NO
NEXT NEXT
Yes
FOR 3 SECONDS
ENT
EXIT
SAV
ENT
NO
NEXT NEXT
Yes
FOR 3 SECONDS
ENT
0
COME BACK TO THE NORMAL OPERATION MODE
CHOOSE "NO" TO ABORT THE NEW PARAMETER CHOOSE "YES" TO SAVE THE NEW PARAMETER
NEXT
T4.20
NEXT
Adr
NEXT
(1) CF means Correction Factor. Choose YES to test the detector with the same gas for which the detector is has been manufactured. For istance Methane with Methane, Butane with Butane, Carbon Monoxide with Carbon Monoxide etc. Choose NO to test the detector with a gas different than the the one for the detector has been manufactured for.
(2) Let the gas flow to the detector and, when the reading has stabilized (usually from 30 to 45 seconds) press ENT to allow acquisition of the gas concentration value to the Microprocessor.
(3) Insert the concentration value of the sample gas bottle that will be applied to the detector (e.g. 50), by press "NEXT" and "EXIT" and press ENT.
(4) Sensor signal to microprocessor (do not adjust)
If at this point ETAR (adjustment error) appear, press ENT for go on. The SPAN value has not been aquired: sensor failure, error to test the sensor in gas or error to input the adjustment gas value.

8. APPENDIX D - COMMISSIONING NOTES

Note: Crowcon Hydra systems are supplied un-configured; a new configuration file must be created before commissioning and operating the system (refer to Appendix F for instructions).

Once the system has been installed, power can be applied to the control panel and detector loops.

1. Visit each detector in turn; verify a minimum of 12V is present.
2. Check that 120Ω terminating resistors are fitted across the RS485 A and B terminals at the beginning and end of each detector loop.
3. Connect the Calibration Keypad to each detector in turn and set a unique address (see Appendix C).
4. Check that all output module addresses are correctly set (see Appendix B)
5. Once all detector and output module addresses are set, reset the control panel and ensure no faults are present.
6. Calibrate each detector in turn (see Appendix C)
7. With the control panel in normal operating state (and correctly configured for the application), apply test gas to each detector and verify that the gas reading is displayed on the control panel, gas alarms are activated, relays are activated, any external control system connected registers the gas alarms.

9. APPENDIX E – CONFIGURATOR SOFTWARE INSTRUCTIONS

9.1 INTRODUCTION

The configurator software has been designed to make the control panel programming simpler and faster. Although the control panel can be fully programmed using the keypad, system configuration can be completed simply and quickly using the software interface.

MINIMUM PC HARDWARE REQUIREMENTS
Microprocessor: 486 SX
RAM Memory: 4MB
Clock frequency: 33Mhz

The software has been designed to operate on Windows 98/ME/2000/XP platforms.

To install the software insert the CD into the PC drive and follow the set-up instructions.

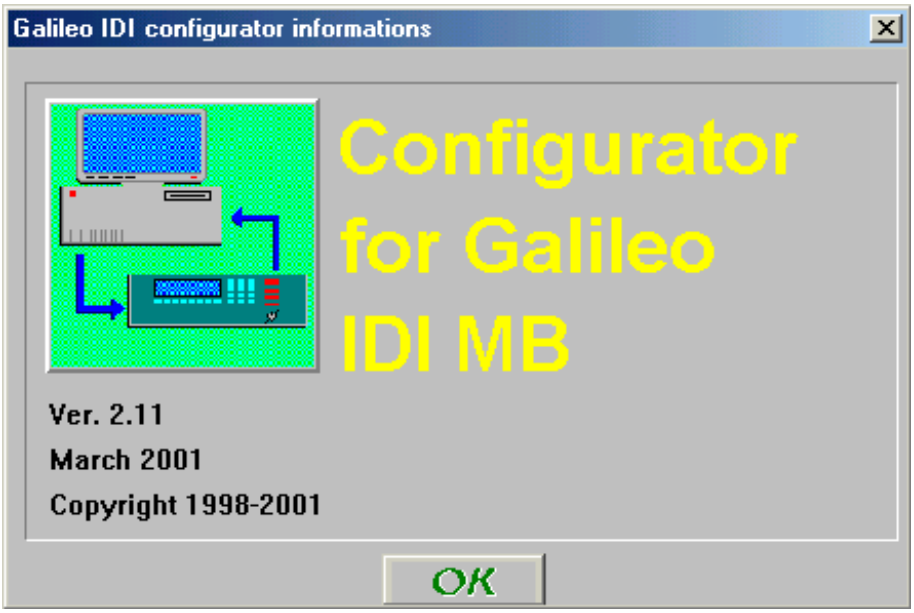
Refer to section 3.2 of this manual for details on connecting a PC to the control panel.

9.2 USING THE PROGRAM

9.2.1 Starting the Program

From the Programs menu select the " Configurator for GALILEO MULTISCAN IDI" group and then select " Configurator for GALILEO MULTISCAN IDI".
The following window will appear:

Fig. 9.1



9.2.2 Using the Software

Click on the OK button, shown in Figure 9.1. This will take you into the main page of the software.

The graphical user interface:

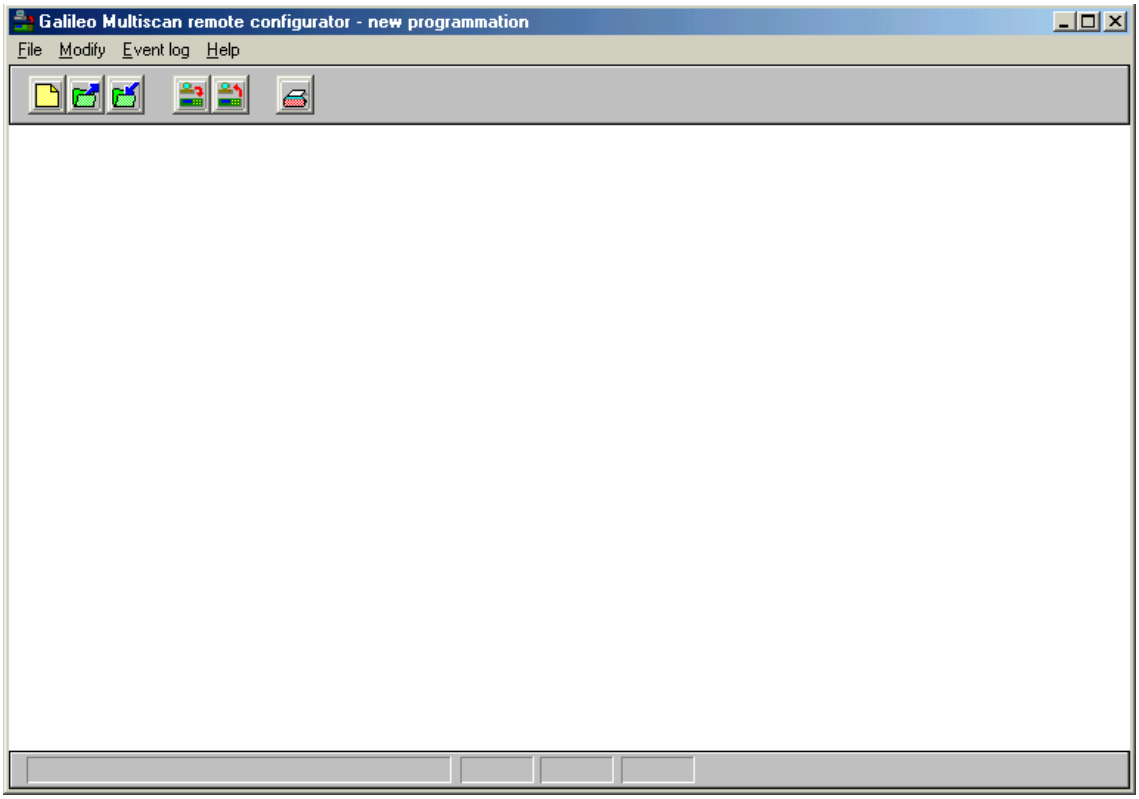


Fig. 9.2

The **programming software** window offers the following menus:

- File
- Event Log
- Help

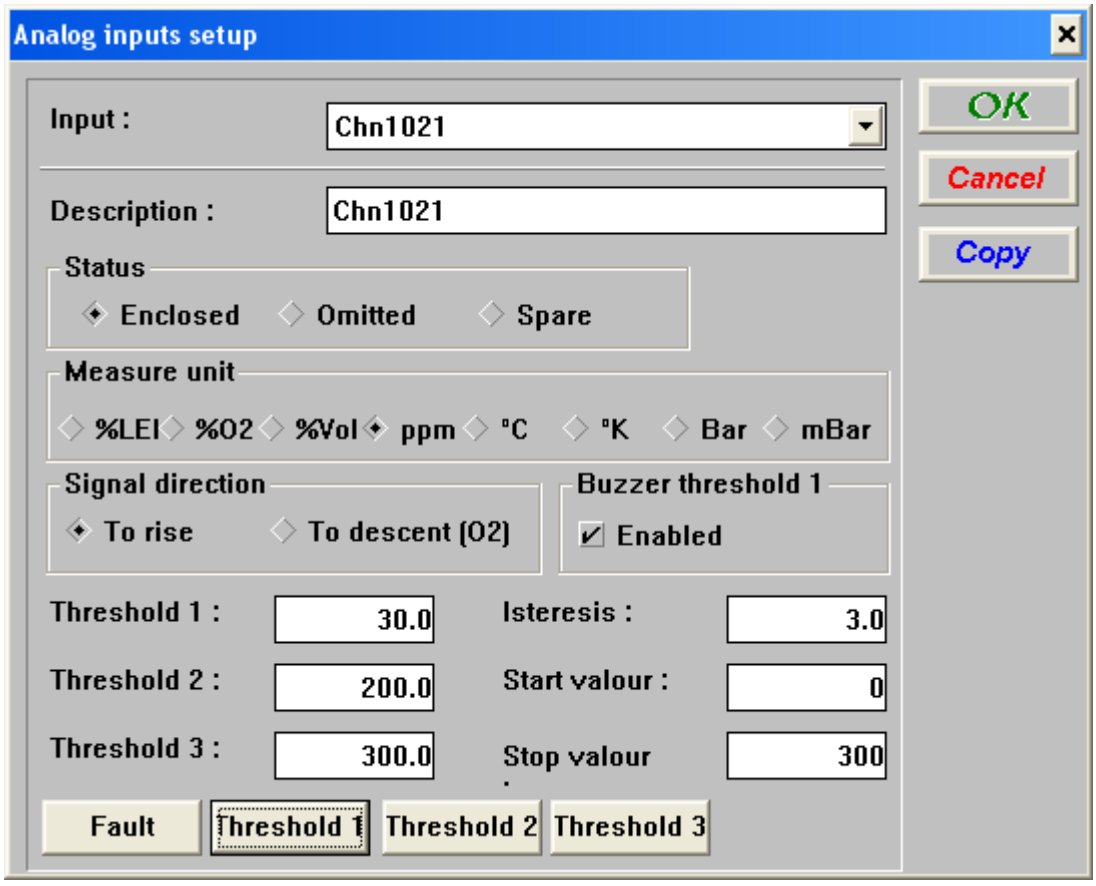
At this stage no system configuration file has been set or uploaded from the control panel. The following section describes the procedure for creating a new configuration file, and must be followed when installing any new Crowcon Hydra system.

9.2.3 Creating New Configuration Files

Select New from the File menu, at which point the Modify menu, situated between the File and the Event Log menus, becomes active. That the Modify menu is active indicates that the system is ready to program the operating parameters of the control panel.
It is advisable to nominate the working directory before starting to program the control panel; Select: Save As … from the File menu and proceed to name and assign a location for the file in question.

9.2.4 Input Parameter Set-up

Setting the input parameters, defines the input alarm thresholds, the input descriptions, the outputs that will be activated when an input signal exceeds alarm thresholds, etc.
Select Inputs from the Modify menu. The following window will be displayed:



All the parameters relative to channel (detector) 1021 to be programmed are shown above: Detector 1, (address 02), connected to the first loop of the control panel. For the input channel coding please refer to section 2.3.1 of this manual.

"**Input**" refers to the physical address of the detector. A downward pointing arrow can be found on the right hand side of the *Input* window, this activates a drop-down menu offering the available channels.

"**Description**" From this window it is possible to assign the input in question a description: For example:- "**CO Level 1**".
Once the system configuration is downloaded to the control panel, this descriptor will be displayed together with all the other control parameters.

"**Status**" indicates the operational status that one wishes to give the channel in question:

ENCLOSED	The input channel is monitored and in the event of an alarm condition all the associated out-puts are activated ('Set' on the control panel menu).
OMITTED	The input channel is monitored, but in the event of an alarm condition the associated out-puts are not activated ('Dis' on the control panel menu).
SPARE	The input channel is not monitored and as such no information relating to that channel will be displayed ('Spr' on the control panel menu).

Only channels (detectors) that are connected to the Control Unit should be configured as ENCLOSED *(or OMITTED if appropriate); all un-used detector addresses should be set as SPARE. If channel (detector) addresses are programmed as ENCLOSED but no detector is fitted the control panel will show a fault for that address.*

"**Measure unit**" It is necessary to define the units of measurement for each detector: the range start-value and end-value, plus the measuring units: PPM, %LEL, °C, mB, etc.
For Example: A gas detector which measures a range from 0 to 300 ppm: select ppm as the units of measure, Start Value=0, End Value=300, Measure Value=ppm. Note: the end of value for **L.E.L.** is automatically set at 100.

"**Signal direction**" This parameter sets the signal direction for the detector (normally "To Rise").
For example; the output signal **CO** detector in the absence of gas will be "0". This output will increase proportionally in the presence of CO gas, hence "To rise". For **Oxygen Deficiency** detectors set to "To descent".

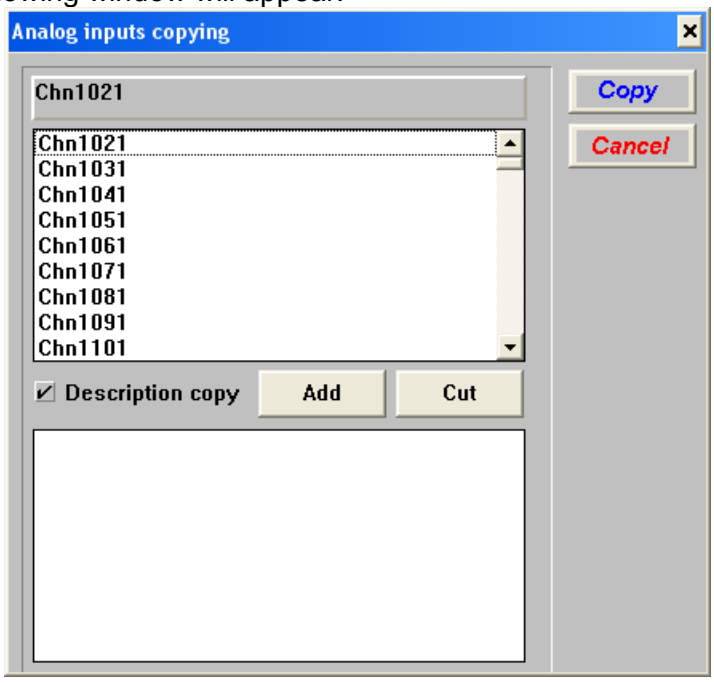
"Buzzer Threshold 1" the internal buzzer on the control panel can be set so that it does not activate on a Level 1 alarm from any detector. It always activates on a Level 2 or 3 alarm.

"Hysteresis" This value defines variations in the signal which will be ignored when in close proximity to the alarm threshold. The value is expressed as a %. When 300 ppm of range is set, configure a Hysteresis level of at least '3'.

"**Threshold 1**" "**Threshold 2**", "**Threshold 3**" defines the alarm thresholds for the associated outputs. When a 100 % measuring unit is configured, the alarm thresholds are expressed as a % of the end of scale. When 300 ppm of the range is set, the alarm thresholds are expressed in ppm (so, for instance, set the levels at 30, 200 and 300).

"**Fault**", "**Threshold 1**" "**Threshold 2**", "**Threshold 3**" **buttons** activate the relative drop down menus in which it is possible to select 4 different outputs for each of the 4 input channel conditions.
Addresses 1001 to 1004 link the output to the relays fitted within the control panel. Outputs 1 to 4 on the first output module (if fitted) will also be activated by these addresses.
Refer to section 2.3.2 for details on output modules addresses.

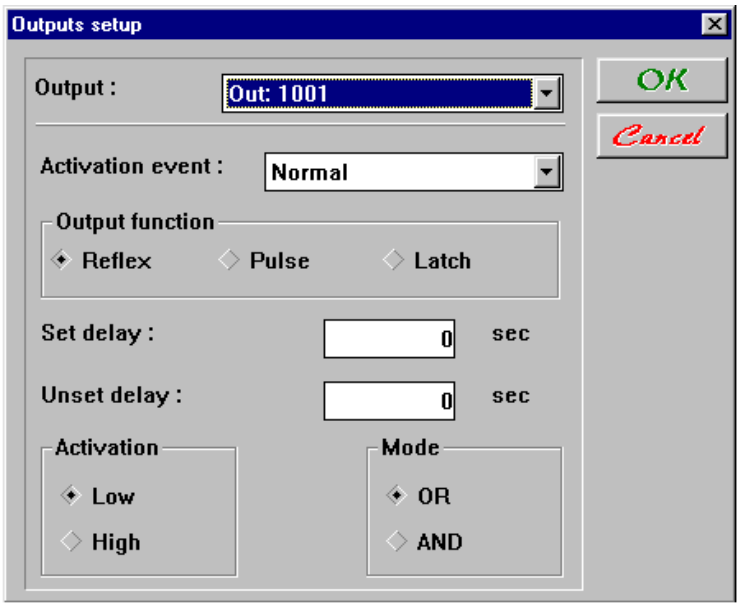
"**Copy**" This command allows the settings for a particular channel (detector) to be copied to other channels.
Once all the input and output parameters for a detector have been programmed select "Copy" and the following window will appear:



Highlight the channels that are to be copied, click on “Add” and then confirm by clicking on “Copy”. Note: the channel descriptor is also copied when using the “Copy” command, this may need to be altered for each channel.

9.2.5 Output Parameter Set-up

Programming the output parameters defines how the outputs (that have been programmed in the various input channels), will operate. Selecting the “Outputs” option from the Modify menu will display the window shown:



Activation event links the output to particular events or input states. It can have the following functions:

- When **NORMAL** is set, this is the physical address of the input channel (detector) from Chn 1021 to Chn 4311.
- Other functions

Low battery	The battery voltage is low (if the input is used)
AC fail	There is the AC fail of the lower supply
Battery Fault	There is the battery disconnected or in fault (if the input is used)
Line fault	the output is activated when the serial loops are in a fault condition.
Set	the output is activated when the system is set.
Bell	the output it is activated in case of alarm and fault event. Is deactivated when the system is silenced

The ***Output function*** can have three different modes:

Reflex	Non-latching	the output follows the activity of the triggering event. For example an output configured as *normal* will activate on an alarm condition and reset automatically when the alarm is cleared. An output configured as *set* will activate when the control panel is switched between Set and Unset modes.
Pulse	Pulsed	the output remains active for the programmed pulse and delay time (single pulse only)
Latch	Latched	the output remains active until a reset procedure is performed

Activation (default Lo)

Low	Low	Outputs are set as *normally energised* (fail safe).
High	High	Outputs are set as *normally de-energised*.

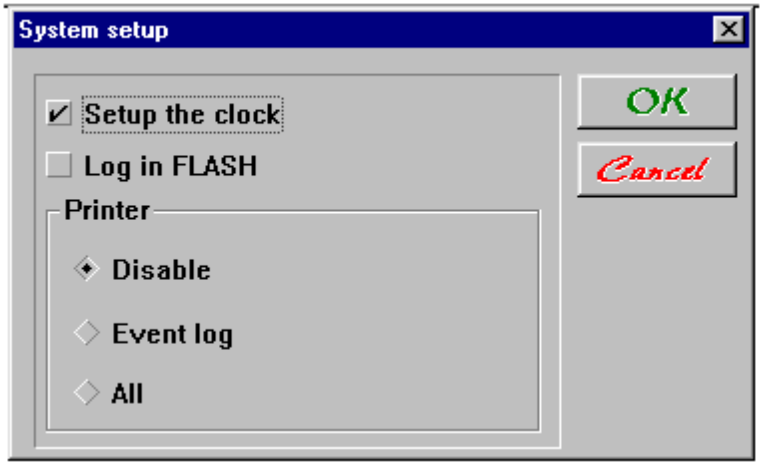
Mode (default Or)

Or	One	the output is activated if one of the events linked to that output goes into alarm
And	All	the output is activated if all of the events linked to that output go into alarm

Set Delay	*On-delay:* delays the activation for the output from 1 to 999 seconds after the triggering event.
Unset delay	*Off-delay:* sets the duration time of an output (pulse function)

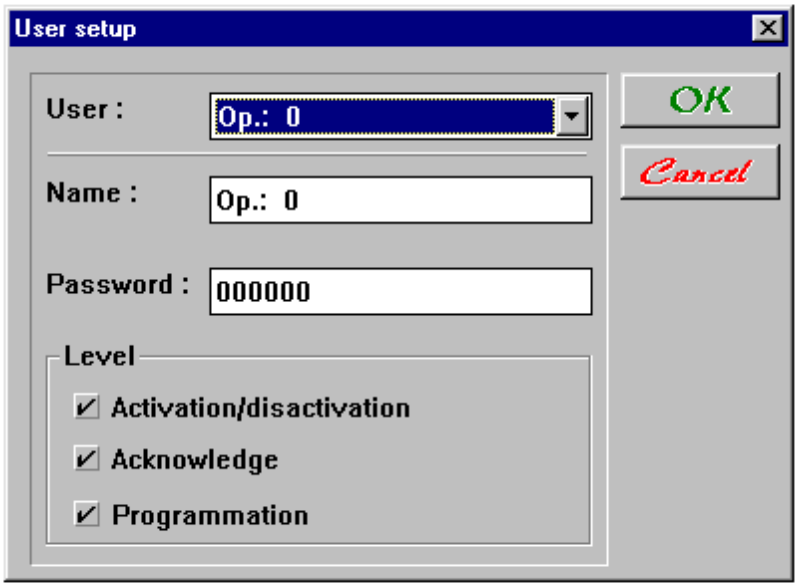
9.2.6 System Set-up

Select "System" from the Modify menu (see below); it is possible to decide whether the control panel time is synchronised with that of the PC when the data is downloaded from the PC to the control panel. Storing to **FLASH** is not implemented and hence is not used. It is possible to set the operation of the control panel printer from this menu.



9.2.7 System Operators

Up to ten different users and one manager can be programmed in the control panel. A user is defined as someone that uses the control panel, for example silencing the panel after an alarm.
The window shown on the following page will be displayed after selecting "Users" from the Modify menu.



To change the password of each user key in the new password in the appropriate "password" window; to select the user number, select the pull down menu. The entitlements enabled are those that have the check boxes checked in the "Entitlements" window.

9.2.8 Language

From this menu it is possible to edit all the text strings that are displayed by the control panel. It is advisable that only persons having a thorough knowledge of the system use this option as changing the text will remove all links with the relative text in the technical manual.
It is advised that only the input descriptors are changed as described in the preceding chapter.

9.2.9 Print Out

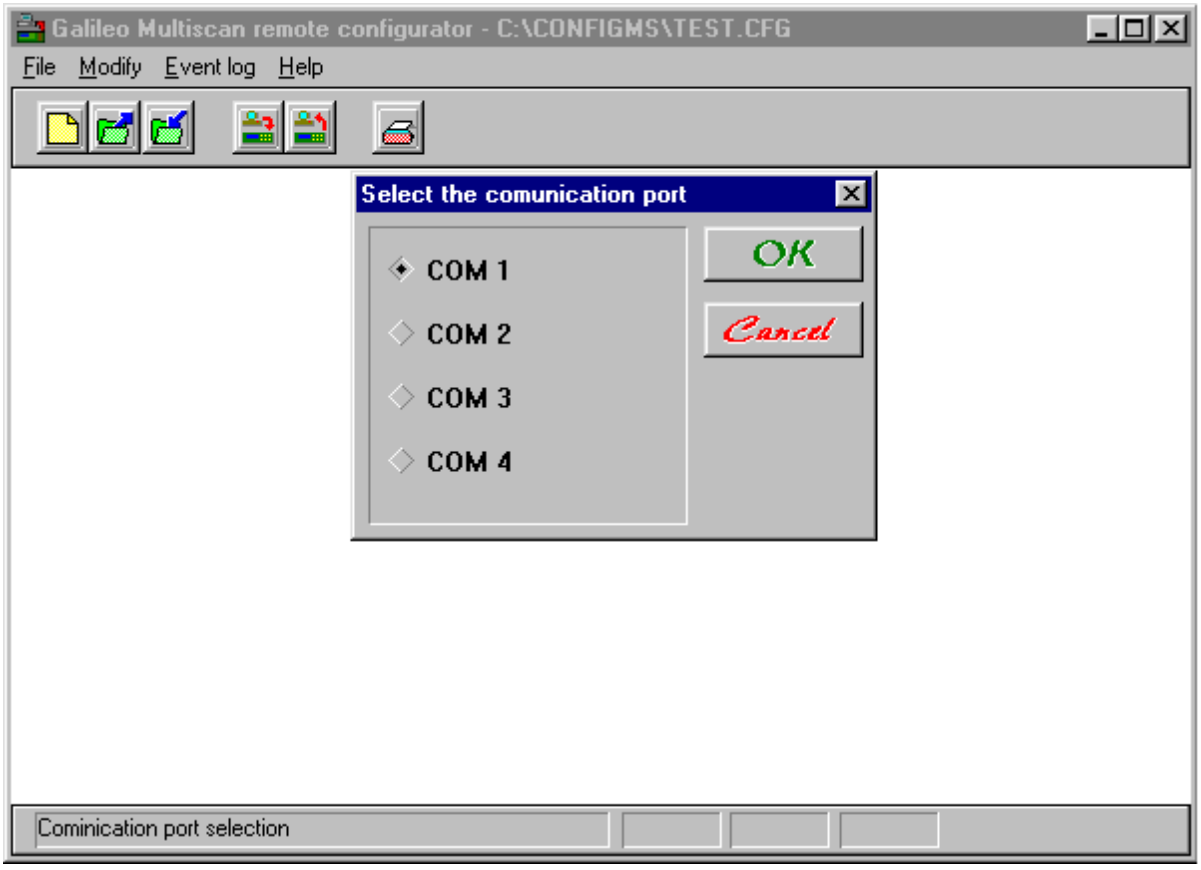
Once the Input and Output parameter programming has finished the contents of the selected file can be printed.

9.3 Control Panel Connection for Upload and Download

Note: The Crowcon Hydra control panel must be in **Programming** mode before configuration files can up-loaded or down-loaded.

9.3.1 Configuration File Down-load

Once the programming of the control panel parameters has been completed, the file must be down-loaded to the control panel. It is advisable to save the programming file before downloading the data to the Crowcon Hydra control panel using the Save option from the File menu. Check, using Communication option in the File menu, that the serial port configurations, for the port to which the control panel has been connected are correct. A USB to Serial converter may be used where no Serial port is fitted to the PC.



Once sure that all the parameters have been programmed correctly, save the file and then:

a. Select “”Download data” from the Modify menu, key-in the manager password (default 543210) but do not give the OK command at this point.

b. Put the control panel into the programming mode (please refer to the control panel technical manual)

c. From the “Configurator software” program give the OK command. The downloading bar will be immediately displayed. On the control panel display will show the message “Remote programming requested” during which it is not possible to carry out any other operation on the control panel and the control panel does not monitor the inputs.

d. Once the data download has ended disconnect the cable connecting the control panel to the PC and follow the commissioning instructions shown in Appendix D. The control panel will go immediately into the set condition when the download is finished and as such any alarm or fault condition present will activate the programmed outputs.

9.3.2 Uploading the Configuration File from the Control Panel

When the control panel has already been programmed and it is necessary to edit some of the parameters, the data can be uploaded from the control panel.

Put the control panel into programming mode
Activate the Read Configuration data option in the Modify menu
Key-in the manager’s password memorised in the control panel (default password: 543210).
Change all the parameters

Save the file and download the new set-up to the control panel

9.3.3 Reading the Event Log

Put the control panel into programming mode
Activate the “Read” option in the “Event Log” menu
Key-in the manager’s password memorised in the control panel (default password: 543210).
Wait for the date upload and if necessary save the memory log file on a diskette or to the hard disk (to be used as a data archive file).

9.3.4 Loading an Event Log File

The Load option of the Memory log menu allows an archived file to be opened and printed out, using the Print option of the File menu.

10. APPENDIX F – WARRANTY

This equipment leaves our works fully tested and calibrated. If within a period of one year, the equipment is proved to be defective by reason of faulty workmanship or material, we undertake at our discretion either to repair or replace it free of charge, subject to the conditions below.

Warranty Procedure

To facilitate efficient processing of any claim, contact our customer support team on 01235 557711 with the following information:

Your contact name, phone number, fax number and email address.
Description and quantity of goods being returned, including any accessories.
Instrument serial number(s).
Reason for return.

Obtain a Returns form for identification and traceability purpose. This form may be downloaded from our website 'crowconsupport.com', along with a returns label, alternatively we can 'email' you a copy.
Instruments will not be accepted for warranty without a Crowcon Returns Number ("CRN"). It is essential that the address label is securely attached to the outer packaging of the returned goods.
Units returned to Crowcon as faulty, and are subsequently found to be 'fault free' or requiring service, may be subject to a handling and carriage charge.

Warranty Disclaimer

The guarantee will be rendered invalid if the instrument is found to have been altered, modified, dismantled, or tampered with. The warranty does not cover misuse or abuse of the unit.
Any warranty on batteries may be rendered invalid if an unreasonable charging regime is proven.
Sensor types have individually defined warranty periods which can differ from the hardware warranty period. Crowcon reserve the right to amend warranty periods for particular applications. Sensor warranty is rendered invalid if the sensors have been exposed to excessive concentrations of gas, extended periods of exposure to gas or have been exposed to 'poisons' that can damage the sensor, such as those emitted by aerosol sprays
Crowcon accept no liability for consequential or indirect loss or damage howsoever arising (including any loss or damage arising out of the use of the instrument) and all liability in respect of any third party is expressly excluded.
The warranty and guarantee does not cover the accuracy of the calibration of the unit or the cosmetic finish of the product. The unit must be maintained in accordance with the Operating and Maintenance Instructions.
Our liability in respect of defective equipment shall be limited to the obligations set out in the guarantee and any extended warranty, condition or statement, express or implied statutory or otherwise as to the merchantable quality of our equipment or its fitness for any particular purpose is excluded except as prohibited by statute. This guarantee shall not affect a customer's statutory rights.