



# 8 Channel Controller

## Operating Manual

GDA 4288 Revision 3.1

for V7.0.7.0b

# Contents

<b>1 PROPRIETARY RIGHTS</b>	<b>5</b>
<b>2 Overview</b>	<b>6</b>
2.1 Precautions	6
2.2 Introduction	6
2.3 Specifications	7
<b>3 Connection Details</b>	<b>9</b>
3.1 Power Supply Connection	10
3.2 Relays	10
3.2.1. Using the Relays	11
3.3 Sensor Connection	12
3.3.1. Input Test Current	13
3.4 RS485 Connections (Mimic and Modbus)	15
<b>4 Wiring</b>	<b>16</b>
4.1 Inputs	16
4.2 Outputs	16
4.3 Communications	17
4.3.1. Remote Zone Display	17
4.3.2. Modbus	18
<b>5 Operation</b>	<b>19</b>
<b>6 Menu</b>	<b>23</b>
6.1 Menu Structure	24
6.2 Input Set Up (Sensor Settings)	25
6.2.1. Inputs Page 1	25
6.2.2. Inputs Page 2	26
6.2.3. Inputs Page 3	28
6.3 Relays Set Up	29
<b>7 Modbus Interface</b>	<b>31</b>
7.1 Wiring	31
7.2 Settable Interface Parameters	31
<b>7.3 Modbus Register Table</b>	<b>32</b>
<b>8 Menu Passwords</b>	<b>38</b>
<b>9 Revision History</b>	<b>38</b>

**Thank you for purchasing this product from Gas Detection (Australia) Pty Ltd**

This manual contains information about the method of installation, simple maintenance and troubleshooting of the GDA 4288. Please read it carefully and keep it nearby for further reference. If you have any further questions about the product, please contact us.

**Location: Suite 1, 218 Anzac Avenue, Harristown QLD 4350**

**Address: PO BOX 597, Darling Heights, QLD 4350**

**Phone: +61 7 4613 5111**

**Web: [gasdetectionaustralia.com.au](http://gasdetectionaustralia.com.au)**

**Email: [support@gasdetect.com.au](mailto:support@gasdetect.com.au)**

**[sales@gasdetect.com.au](mailto:sales@gasdetect.com.au)**

## **1 PROPRIETARY RIGHTS**

No part of the hardware or documentation may be reproduced, transmitted, transcribed, stored in a retrieval system, or translated into any language or computer language, in any form or by any means, without prior written permission of GDA.

While great efforts have been made to ensure the accuracy and clarity of this document, GDA assumes no liability resulting from any omissions in this document, or from misuse of the information contained herein. The information in this document has been carefully checked and is believed to be entirely reliable with all necessary information included. GDA reserves the right to make changes to any products described herein to improve reliability, function, or design, and reserves the right to revise this document and make changes from time to time in content thereof with no obligation to notify any persons of revisions or changes. GDA does not assume any liability arising out of the application or any use of any product or circuit described herein; neither does it convey license under its patent rights or the rights of others.

## 2 Overview

### 2.1 Precautions

To avoid instrument damage and potential dangerous accident; do not use this product before reading the manual. The front panel housing the touch screen is hinged off the base of the enclosure this is to ensure that the thin ribbon cable does not need to be removed or get damaged when the enclosure is open for installation. During installation take precaution when removing connectors not to pull at the ribbon cable going to the screen.

### 2.2 Introduction

The GDA 4288 is a 8 channel controller with a 4.3 inch touch display. The controller accommodates 8 sensor inputs from 4-20 mA loop powered or three wire 4-20mA sensors. The GDA 4288 has 8 configurable output relays.

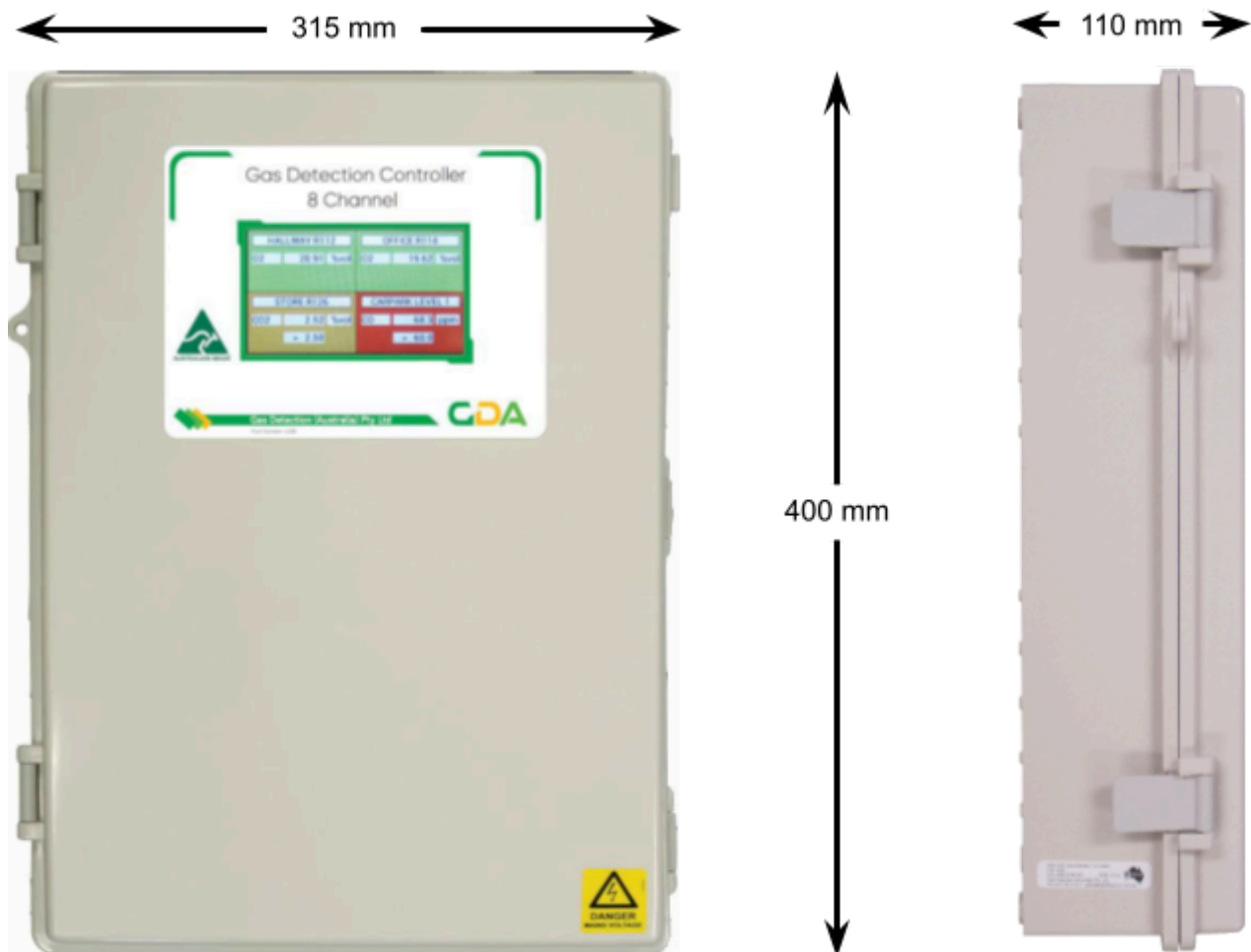


Figure 1: Dimensions of the 4288.

## 2.3 Specifications

Table 1: GDA 4288 Specification

Model	GDA 4288	
Number of sensors inputs	8 x 4-20 mA loop-powered or 3-Wire 4-20 mA Sensors, each input has a pass-through Earth connection. ~250 $\Omega$ input resistance.	
Power	PSU Voltage	24 V <sub>DC</sub> $\pm$ 10 %
	PSU Current	< 200 mA @ 24V <sub>DC</sub> without sensors, 4 A Max (4.4 A pk)
	Auxiliary Output	2 A, is shared with 24 V <sub>DC</sub> on Relay Commons
	Sensor Inputs	550 mA Max each, total 2 A maximum
Display	4.3 inch colour TFT Resistive touch display. 4 sensors values displayed per page (5 sec per page)	
Sensor parameters displayed	Location, Gas type, value, units, alarm status,	
Alarm relays	8 x configurable relays, Normally-energised	
Fault relay	1 x Fault relay, Normally-energised	
Relay specification	Max peak 2 A <sub>DC</sub> non-inductive 30 V <sub>DC</sub> peak (60 VA)	
Sensor Warm up	0 - 250 sec (adjustable)	
Alarm Validation	0 - 250 sec (adjustable)	
Relay Run On Time	0 - 720 min (adjustable)	
Alarm hysteresis	0.5 - 10% of Full Scale (adjustable)	
Alarm levels	3 x Alarm Levels (Rising and Falling) for each sensor	
Channel enable	On/Off	
Watchdog	Detects and recovers from software malfunctions	
Cable Entry	User defined	
Enclosure Material	ABS plastic or ABS and PC for Clear Lid Option, non uv stabilised	
Dimensions	300 x 220 x 103 mm (W x H x D)	
Weight	1.3 kg	
IP Rating of Enclosure	IP40 Indoor use only	

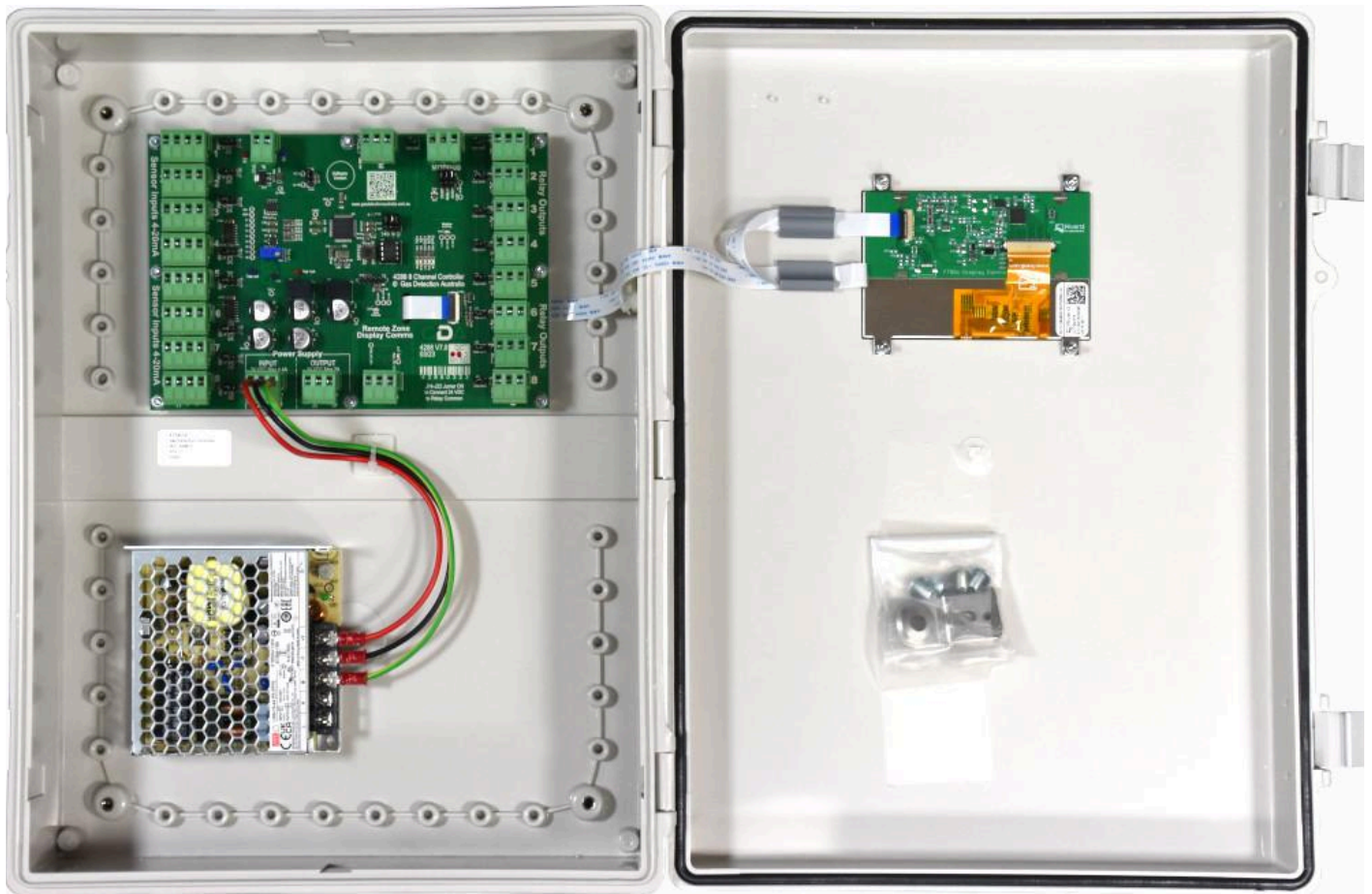


Figure 2: Inside photo of the 4288 Controller.

### 3 Connection Details

Figure 3 shows each area of the control board and its relating section in the manual which has a detailed connection diagram.

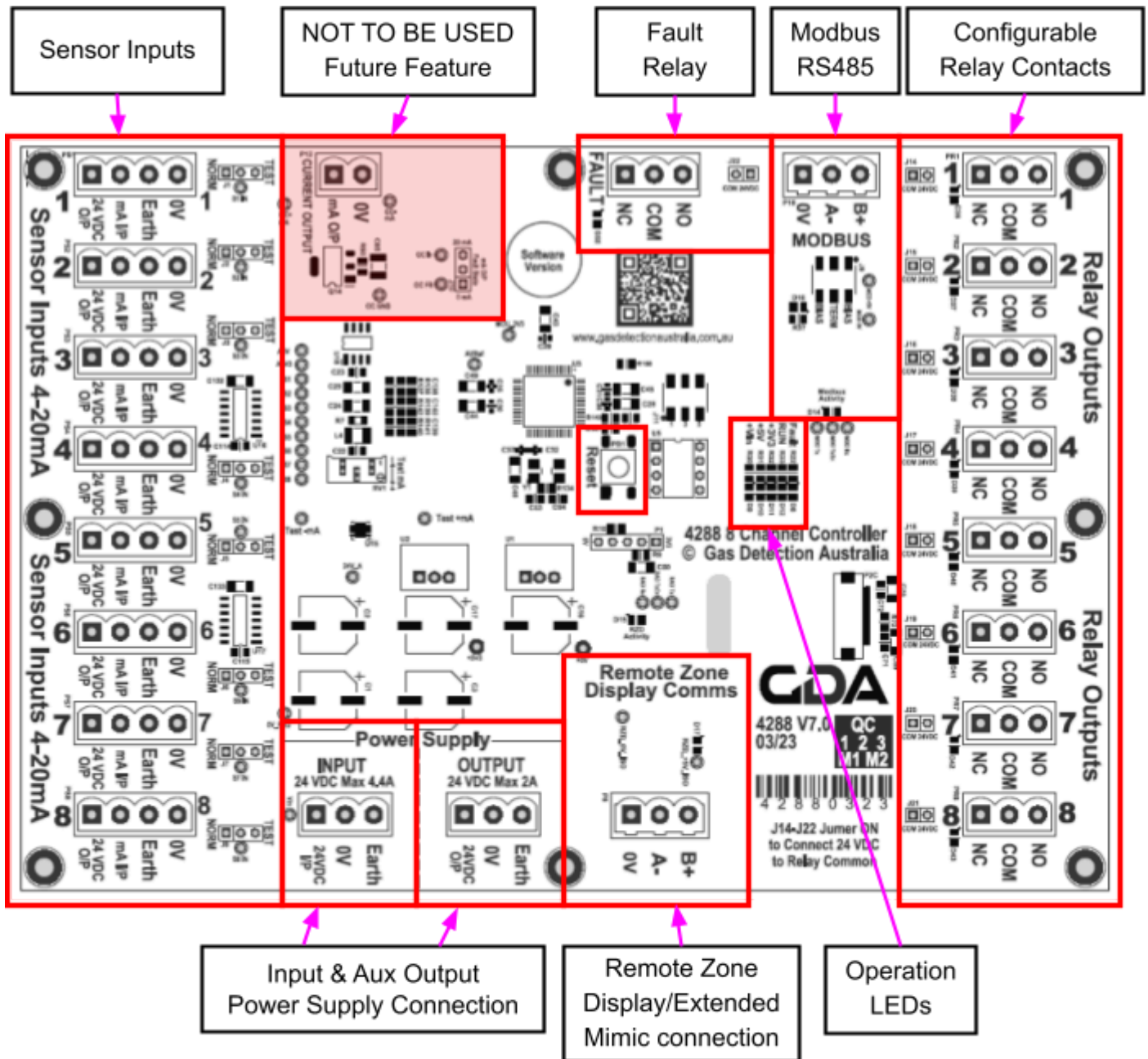


Figure 3: Connector locations on the 4288 main electronics PCB.

### 3.1 Power Supply Connection

The controller operates on 24V<sub>DC</sub>, the power input is labelled **INPUT** on the PCB and is located at the bottom of the PCB. The Earth connection is common throughout the controller board. The auxiliary power output (**OUTPUT**) can be used for powering the auxiliary equipment, for example relays contactors for solenoids, lights, sirens and other equipment that operate on 24V<sub>DC</sub>.

Table 2: Power input/output connector details

Connector	PCB Silk	Description
INPUT (Power input)	24VDC I/P	+24V / Power (+)
	0V	0V, GND / Power (-)
	Earth	Earth
OUTPUT (Power output)	24VDC O/P	+24V output to Mimics and Audio Visual Equipment
	0V	0V, GND
	Earth	Earth

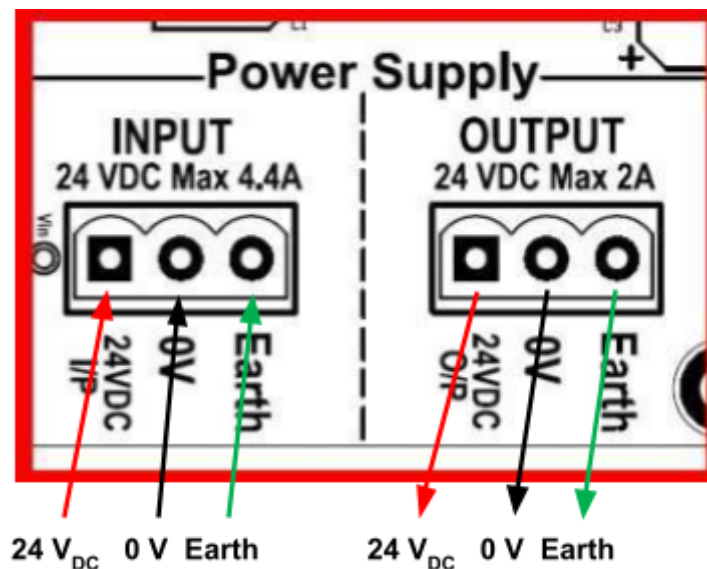


Figure 5: Power Supply Connections.

### 3.2 Relays

All relays on the 4288 are normally-energised and will de-energise during alarms, faults and loss of power, according to how they are configured. **Figure 6** shows the general connections available on each relay. Each relay has a red state indicating LED. The LED will illuminate when the relay is in alarm or fault. Each relay can be configured in hardware through its associated pin headers for jumpers, to be either a dry contact or to have 24 V<sub>DC</sub> on the Common (COM) to switch to either the Normally Closed (NC) or Normally Open (NO) terminals. The 24 V<sub>DC</sub> on the COM current is shared with the power supply OUTPUT connection. See **Table 3** for the relays and their associated headers.

Table 3: Relay Connections

Relay Number	1	2	3	4	5	6	7	8	FAULT
Connector	PR1	PR2	PR3	PR4	PR5	PR6	PR7	PR8	FAULT
Header	J14	J15	J16	J17	J18	J19	J20	J21	J22

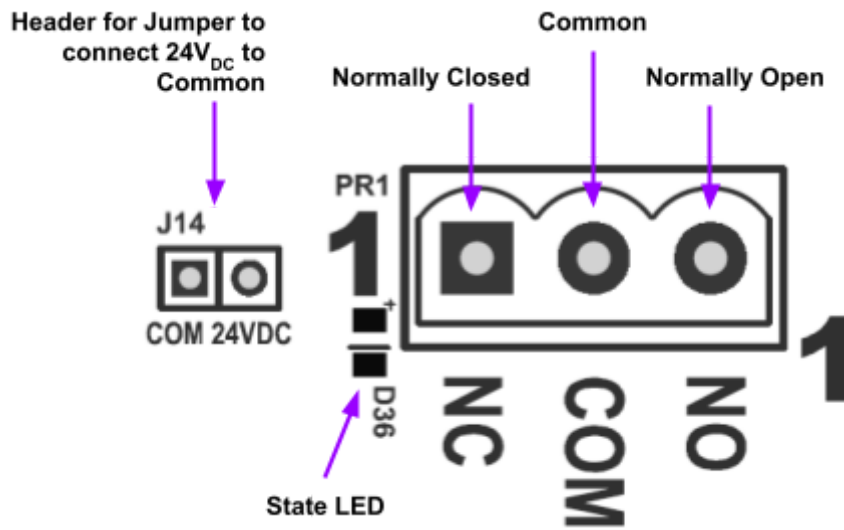


Figure 6: General Relay connections.

### 3.2.1. Using the Relays

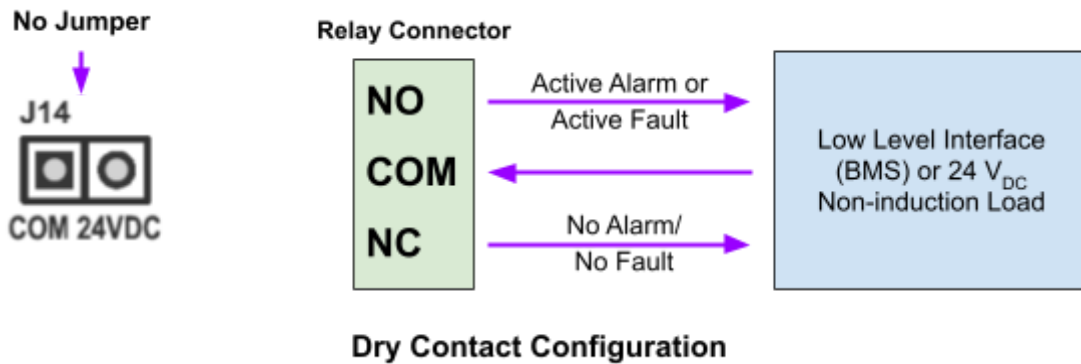
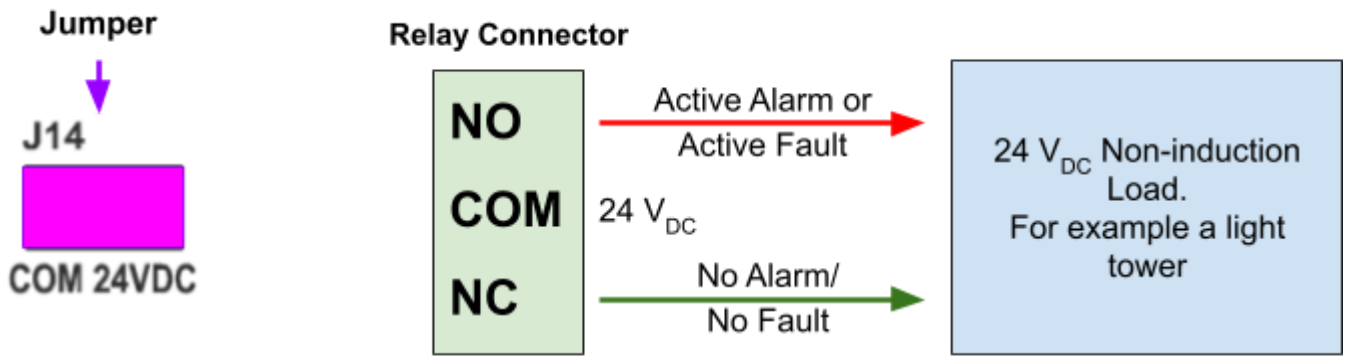


Figure 7: Dry Contact Configuration



### 24V<sub>DC</sub> on Common (COM) Contact Configuration

Figure 8: 24 V<sub>DC</sub> on Common (COM) Configuration

### 3.3 Sensor Connection

Up to 8 sensors can be connected to the GDA 4288 controller. The controller supports loop-powered sensors and 3-wire 4-20 mA sensors on each of the 8 inputs.

Each sensor channel has a jumper to select sensor normal operation (NORM) or to select the on board test current (TEST). The jumper must be in the normal operation position for the controller to receive the sensor's 4-20mA signal. **WARNING** if a loop-powered sensor is connected to the input it will be unpowered when the jumper is changed from NORM to TEST as the circuit will be broken.

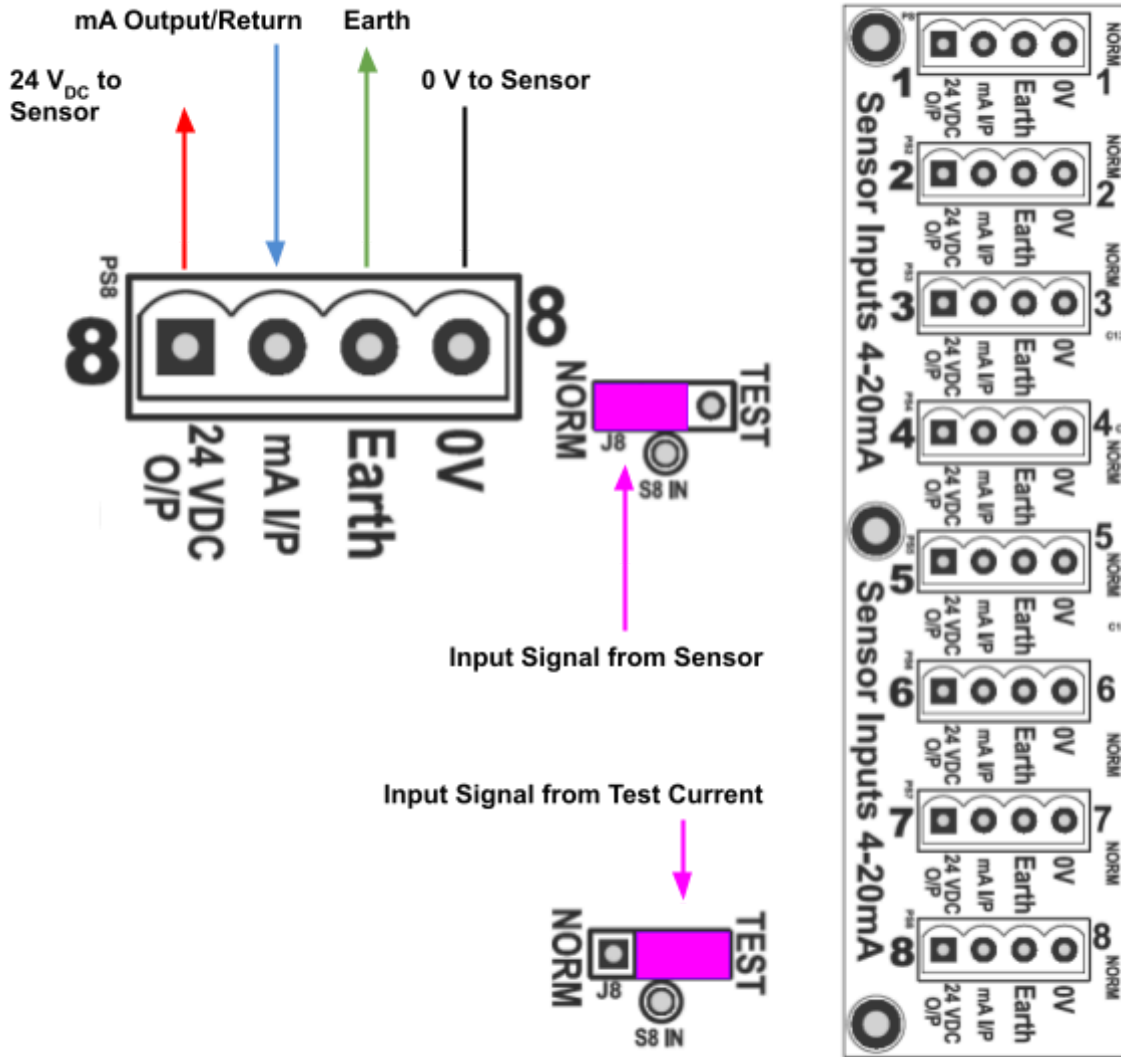


Figure 9: Sensor Input

Table 4: Sensor connection description

Sensor type	PCB Silk	Description	Cable Type
4-20mA Loop Powered	+V	+24V / Power (+)	2 core screened or 3 core cable (min 0.75mm <sup>2</sup> cable)
	I/P	4-20mA from Sensor	
	Er	Cable screen/shield	
	0V	-	
4-20mA Three Wire	+V	+24V / Power (+)	3 core screened or 4 core cable (min 0.75mm <sup>2</sup> cable)
	I/P	4-20mA from Sensor	
	Er	Cable screen/shield	
	0V	0V, GND / Power (-)	

### 3.3.1. Input Test Current

The on board test current option allows the user to test the input current of each sensor input. The test current is varied by a multi turn potentiometer. The current can be measured with a DMM on the mA<sub>DC</sub> range by the current test points shown in Figure 3 and Figure 11. The Test Current has a range of < 4 mA up to 50 mA. If more than one sensor is connected the current will be shared.

**WARNING** if multiple sensors are connected at higher current there will be significant heat generated by the Test Current circuit, only use for short durations. **DO NOT** leave in Test Current Mode.

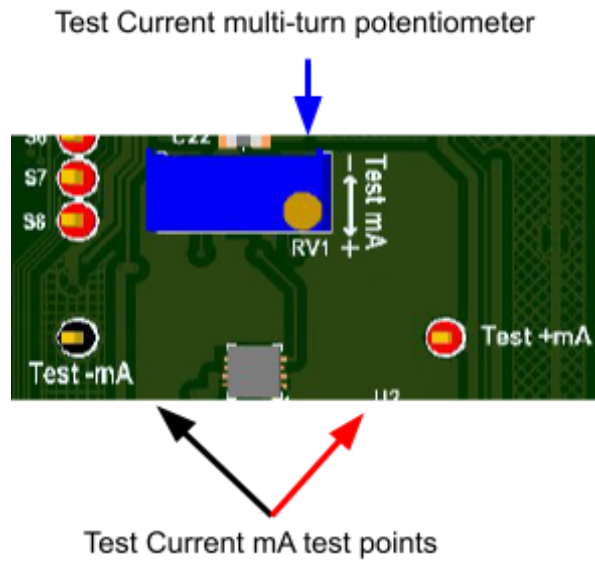


Figure 10: Test Current mA Test Points and adjustment.

### 3.4 RS485 Connections (Mimic and Modbus)

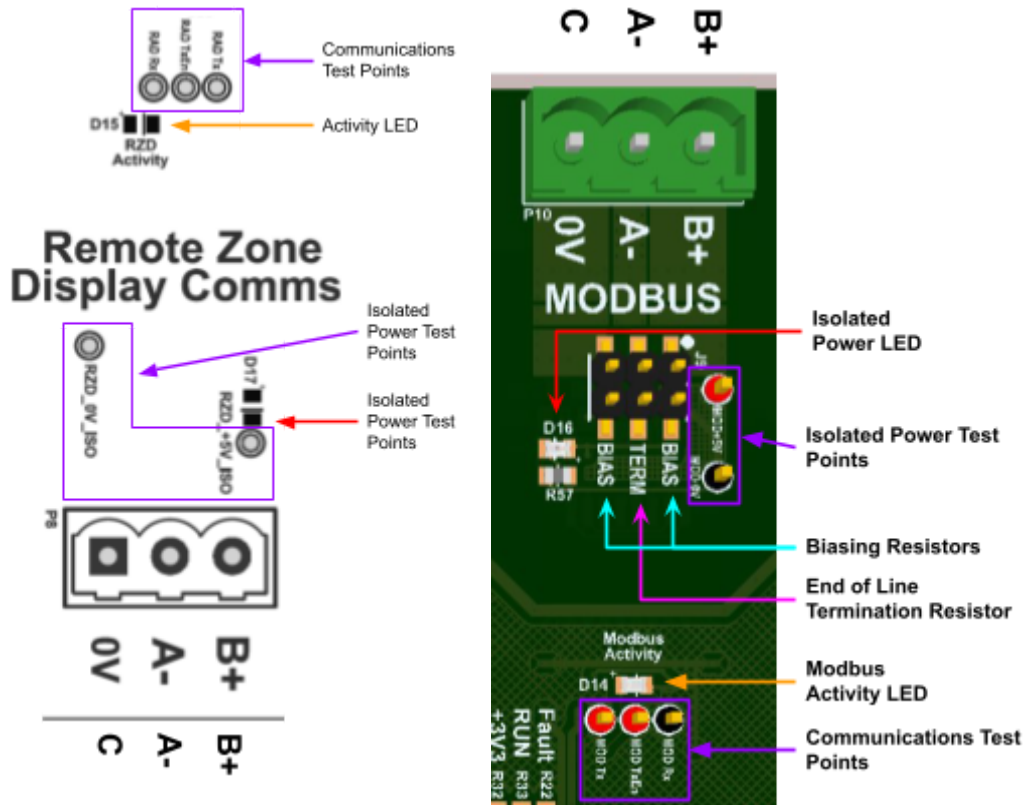


Figure 11: a) Mimic Connection and b) Modbus Connection.

## 4 Wiring

### 4.1 Inputs

Refer to the manual of the sensor being used and section 3.3 Sensor Connection.

### 4.2 Outputs

The most common wiring is to a 6182 Mute Switch and ONN-M4F Tower Light.

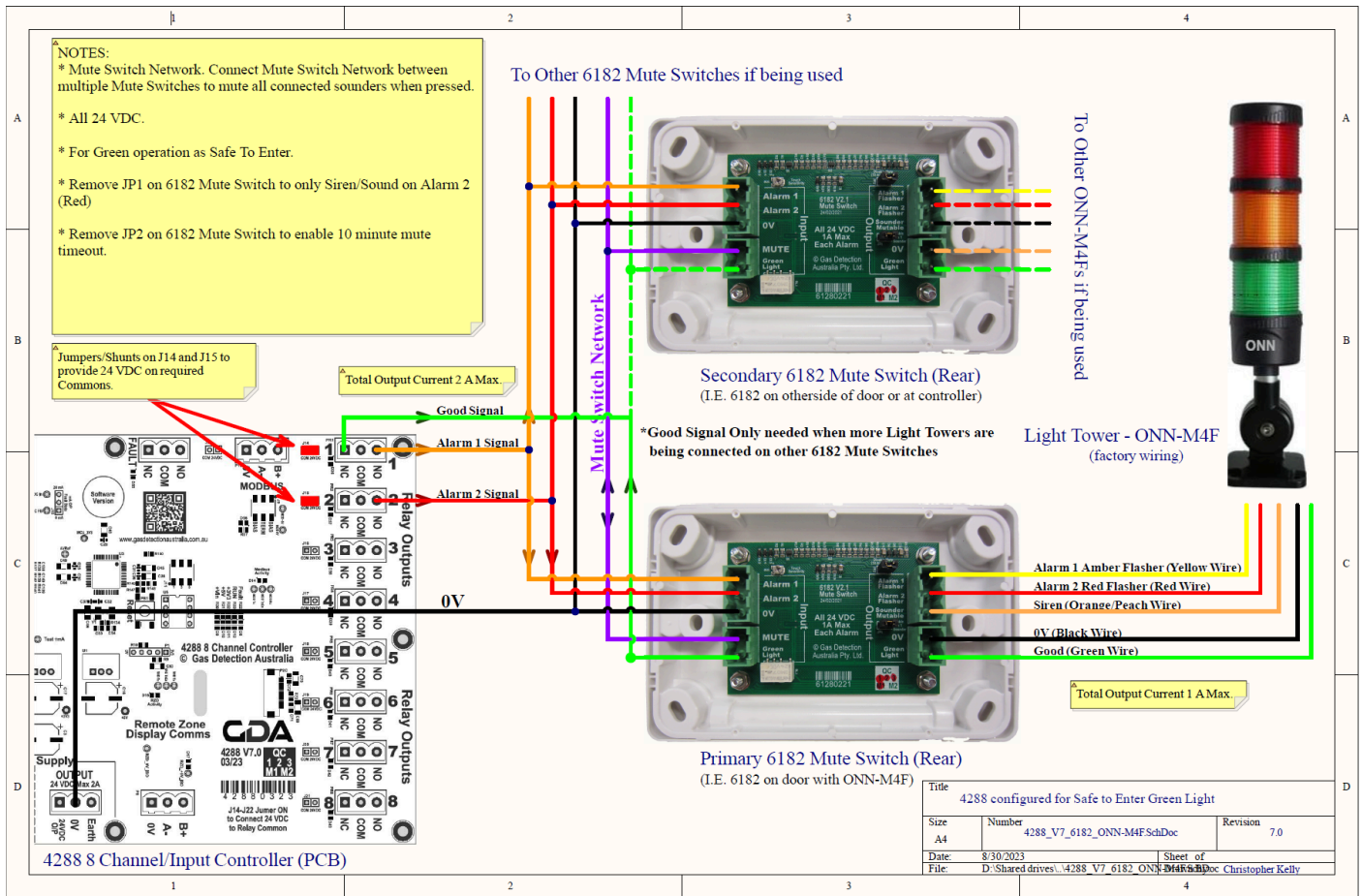


Figure 12: Wiring of 4288 relays to 6182 and ONN-M4F.

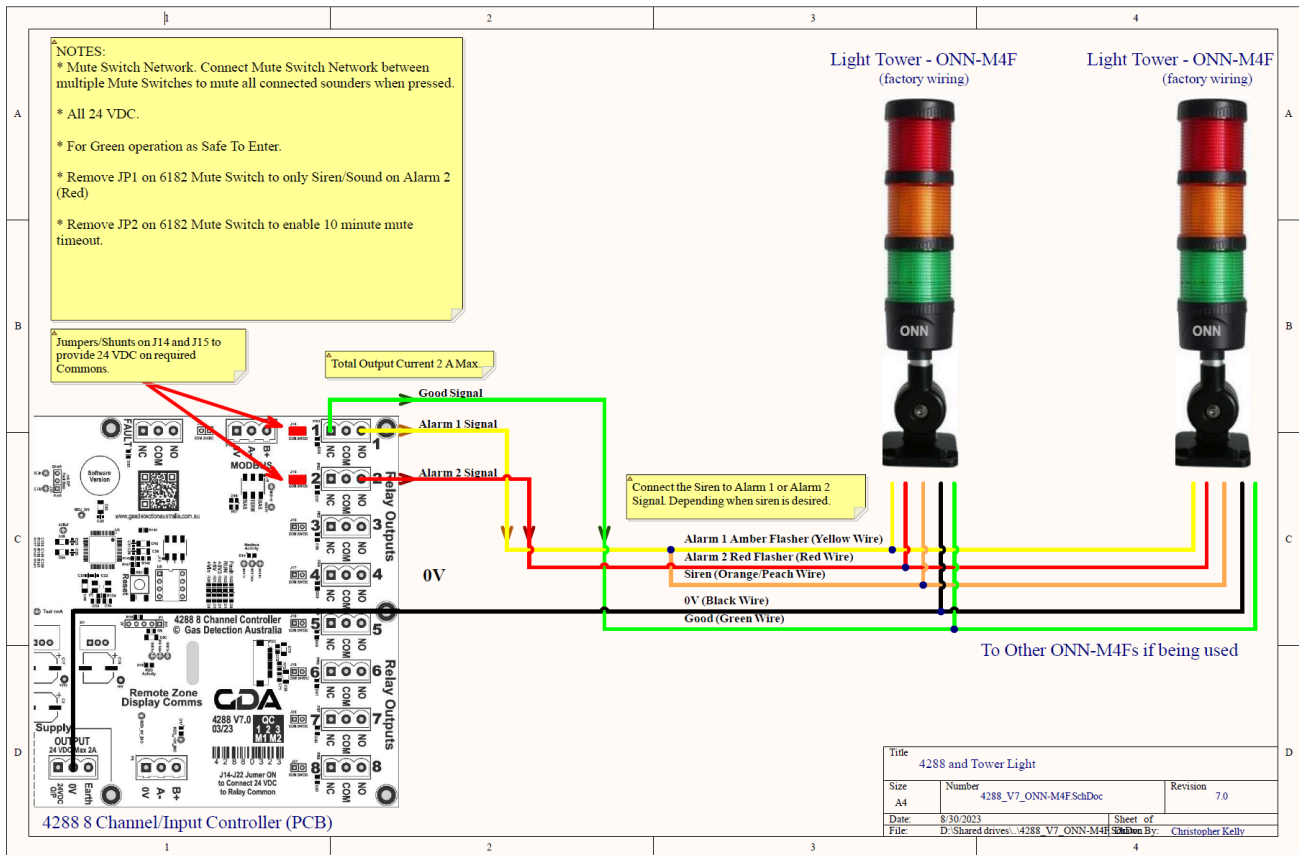


Figure 13: Wiring of only ONN-M4F Tower Lights.

### 4.3 Communications

Both the Remote Zone Display (mimic) and Modbus are RS-485 (TIA/EIA-485).

#### 4.3.1. Remote Zone Display

The Remote Zone Display is a master and has internally connected biasing resistors and terminating resistors. **IT MUST BE AT THE END OF THE DAISY-CHAIN.** The last 6681 Remote Zone Display on the daisy-chain network must have all of its biasing and termination resistors enabled to ensure the integrity of the communications on the RS-485 network. The Remote Zone Display is always enabled and can't be disabled. The activity LED D16 will flash 11 times every 10 seconds. If total wiring length used is less than 30 metres a 2-twisted pair with overall screen can be used. Otherwise the RS-485 must use a separate twisted-pair cable with overall screen. Refer to the 6681 manual for wiring and connections to its electronics.

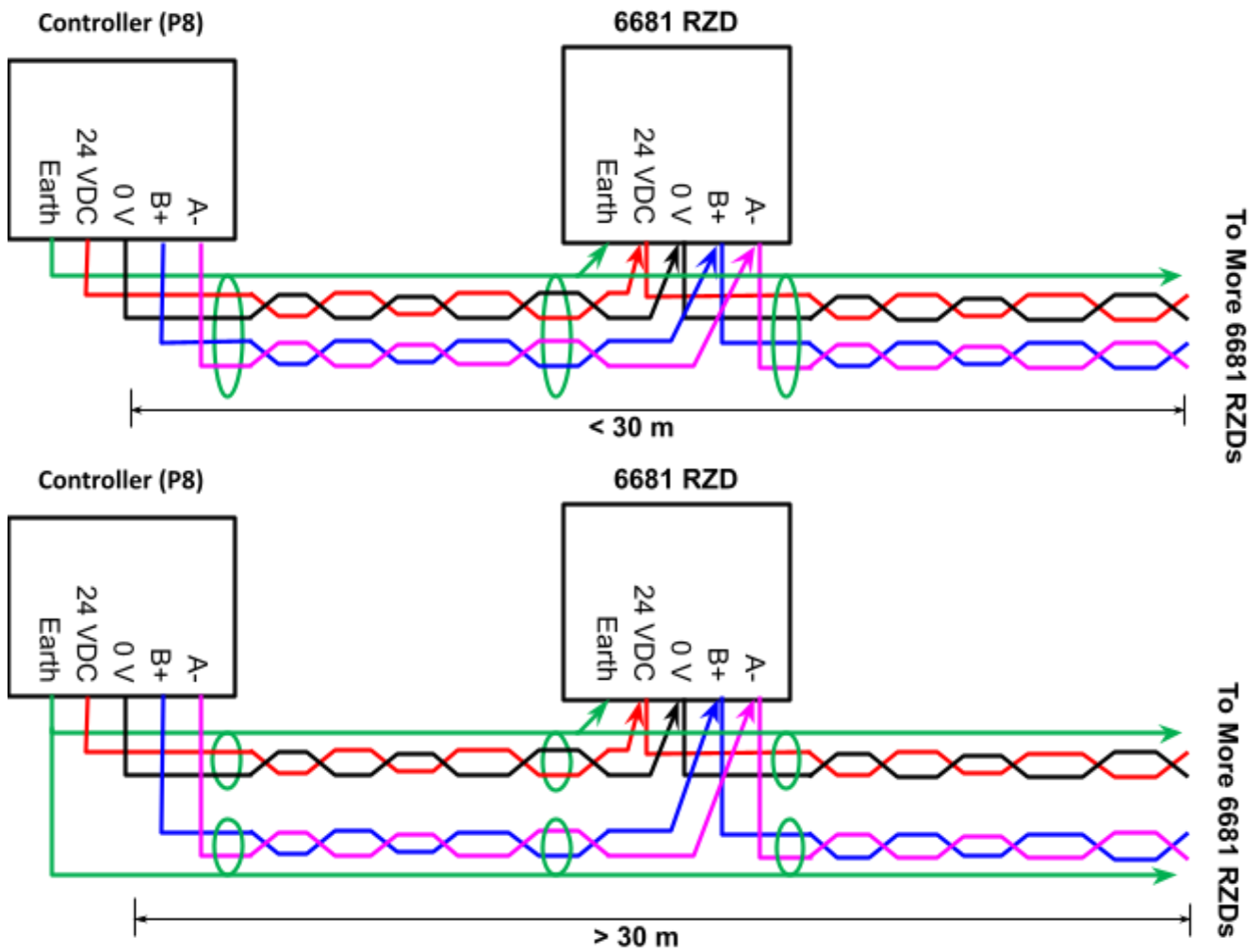


Figure 14: Remote Zoe Display 6681 (mimic) wiring.

#### 4.3.2. Modbus

The Modbus is an isolated RS-485 (TIA/EIA-485) and can be connected at any point according to **Figure 19** from section 3.3.1 Multipoint Serial Bus Infrastructure from **MODBUS over serial line specification and implementation guide V1.02** from **Modbus.org**. The 4288's Modbus has internal biasing and termination resistors which can be used via **J9**.

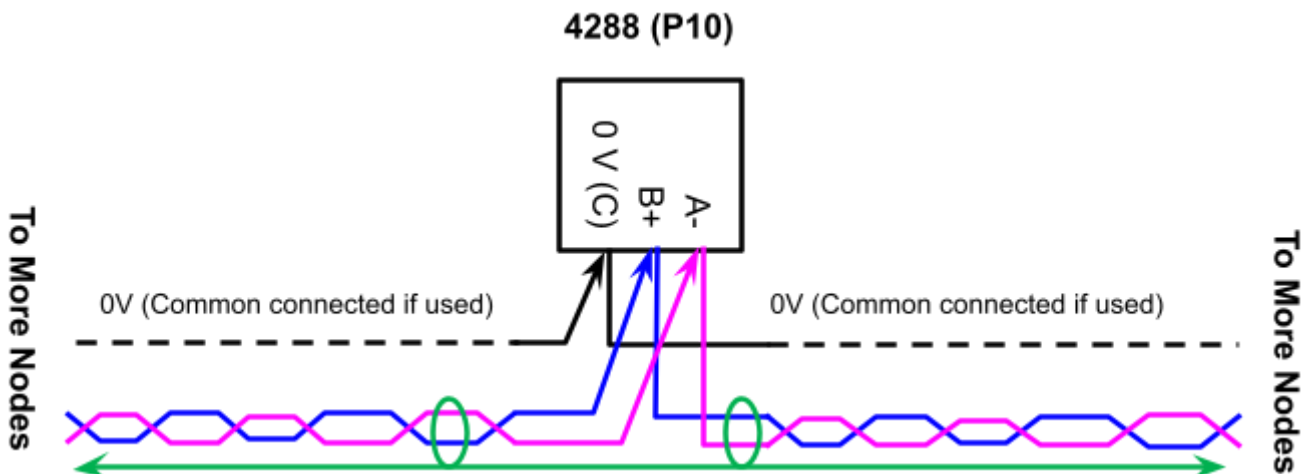


Figure 15: Modbus wiring diagram.

## 5 Operation

The GDA 4288 control board is calibrated and configured from the GDA factory based upon the gas detector and equipment that was purchased with it. During normal operation the 4288 will boot when powered on, briefly showing the Main Menu to display any boot messages and then continue onto normal operation as a gas detection controller and show the Status screen.

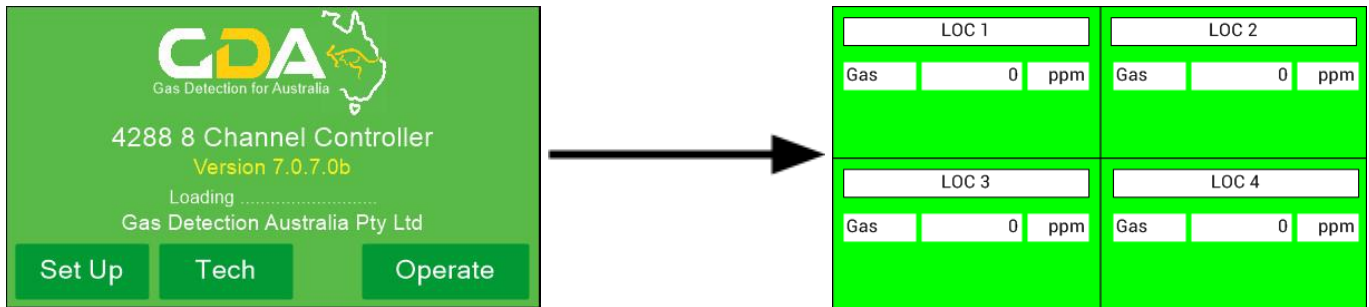


Figure 16: Display on boot to normal operation.



Figure 17: Main Menu/Boot Screen detail.

The Status screen is made up of up to 4 sensors at one time. If there are more than 4 sensors enabled the screen will display the first 4 enabled sensors for 5 seconds and then swap to show the second set of sensors for 5 seconds before swapping back to the first 4. Figure 18 shows the details inside each sensor status rectangle. If there are less than 4 or 8 sensors there will be “Not in use” rectangles in place of sensors to fill the screen, as shown in Figure 20. Figures 19 and 20; and Table 6 below show and detail the different statuses a sensor can have, their colours and descriptions.

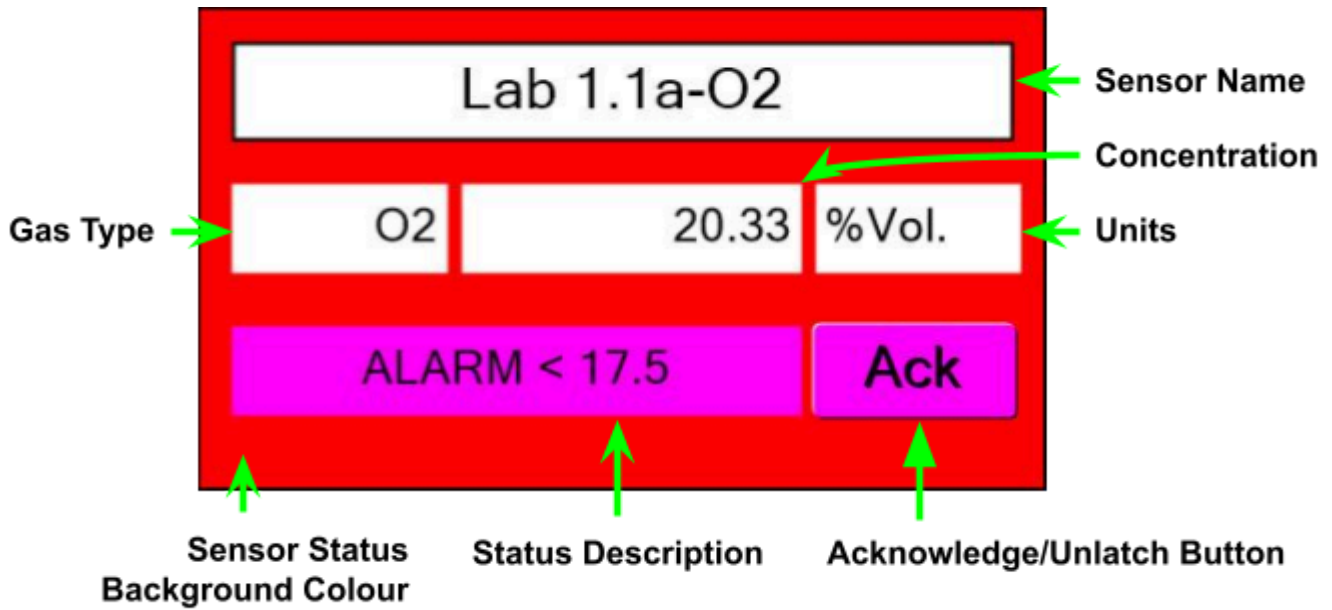


Figure 18: Individual sensor status in detail.

Table 6

Property	Warm-Up	Good	Alarm Level 1	Alarm Level 2	Alarm Level 3	Latched Alarm	Fault	Over Range	Under Range
Background Colour	Green	Green	Yellow	Orange/Amber	Red	Alarm Level Colour	Blue	Red	Green
Status Description	Countdown	None	Alarm Threshold	Alarm Threshold	Alarm Threshold	Alarm Threshold and Acknowledge button	None	Over Range	Under Range
Status Description Colour	Orange	None	White	White	White	Magenta	None	Orange	Cyan

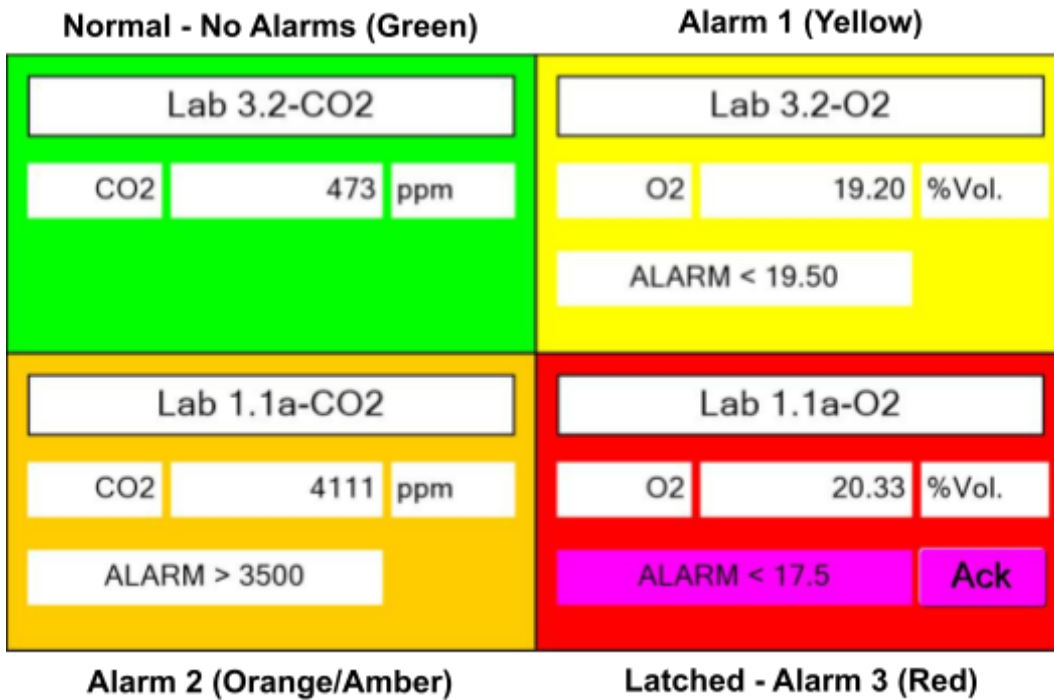


Figure 19: Alarm statuses example.

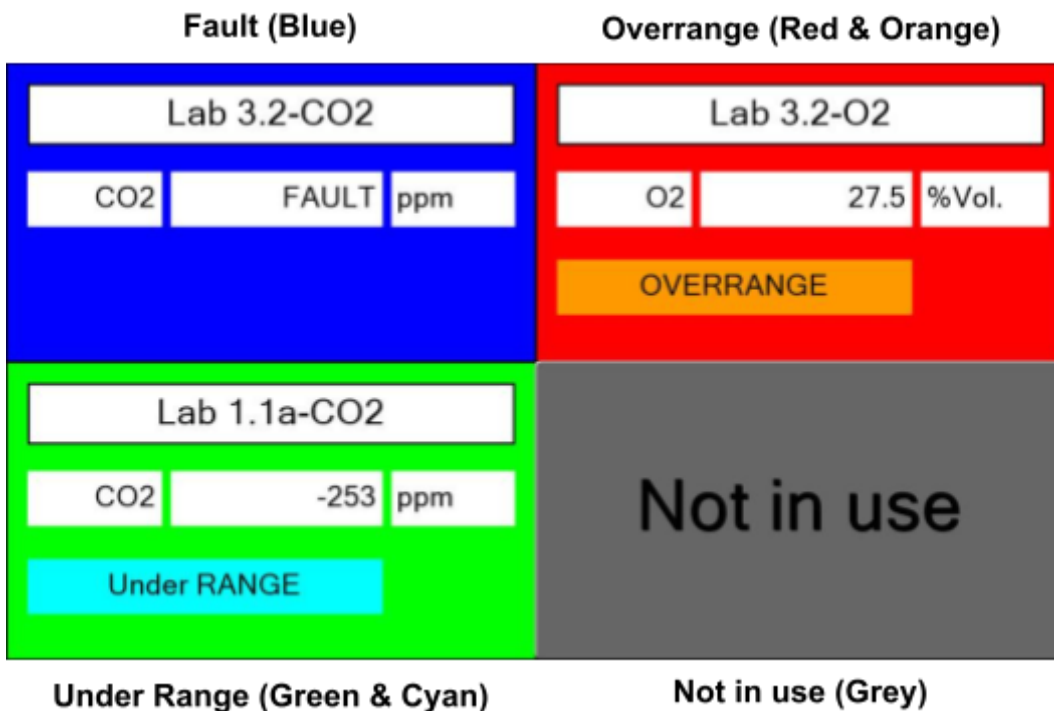


Figure 20: Special statuses example.

The PCB LEDs indicate the controller's operating state.

Table 7: LED status.

PCB LED	State	Function
	OFF	Power is not present
	ON/ Run	Power is present/ <b>Normal operation</b> (Orange Flashing)
	Fault	This indicates a fault is present.

If the software program freezes or the display becomes corrupted the Reset Button can be pushed to manually reset the software. The 4288 has an active watchdog function to catch non-responsive software.

Program Reset Button

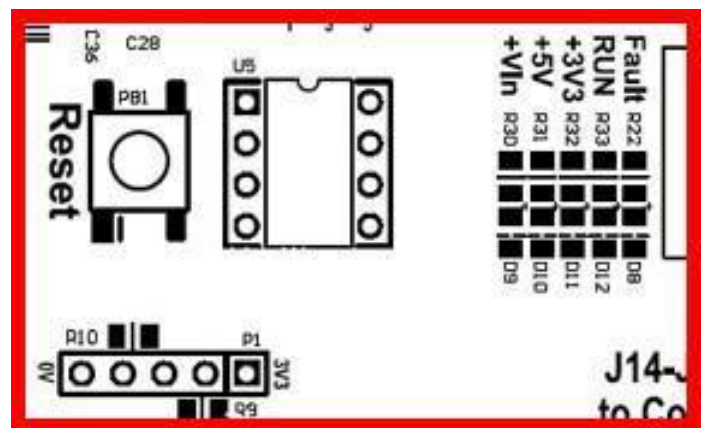


Figure 21: Reset button location.

## 6 Menu

To enter the Menu system double tap the top left square then double tap the bottom right square, as per **Figure 22**, this will display **Figure 23** requiring a pass code to be entered. Any presses out of the sequence will reset the sequence. Enter the Pass Code “4028” and press Enter. This screen will time out after 10 sec or if a wrong pass code is entered and return to operation status screen.

Double tap in this section first

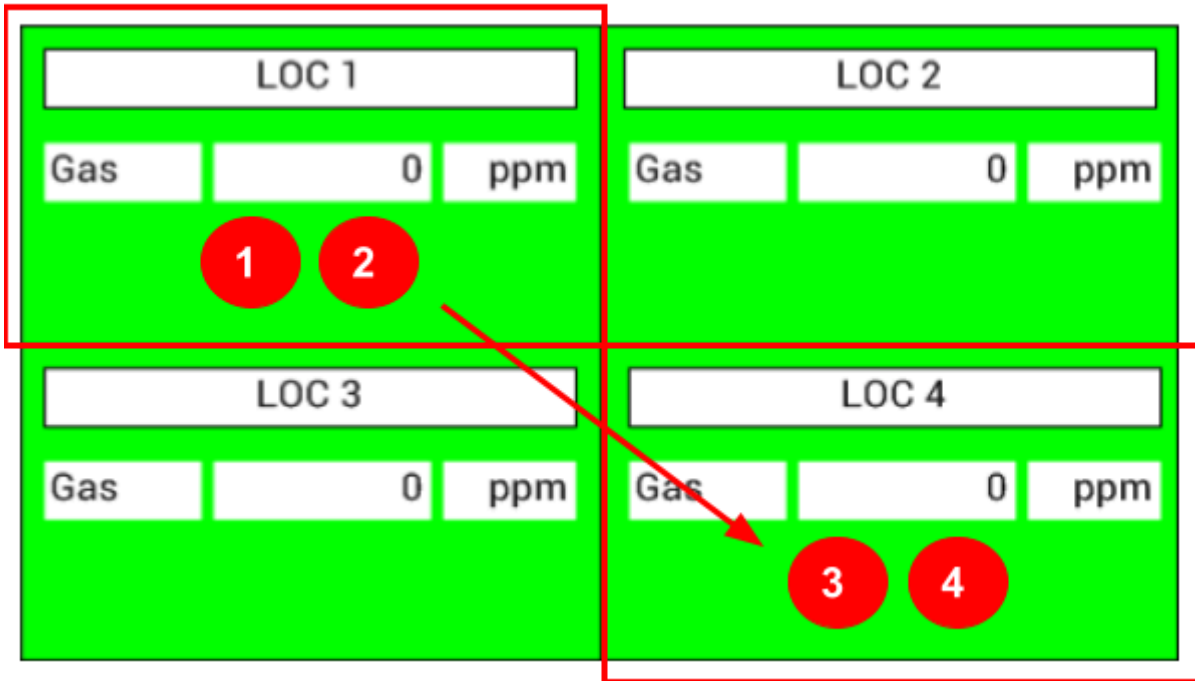


Figure 22: Sequence to get into the menu.

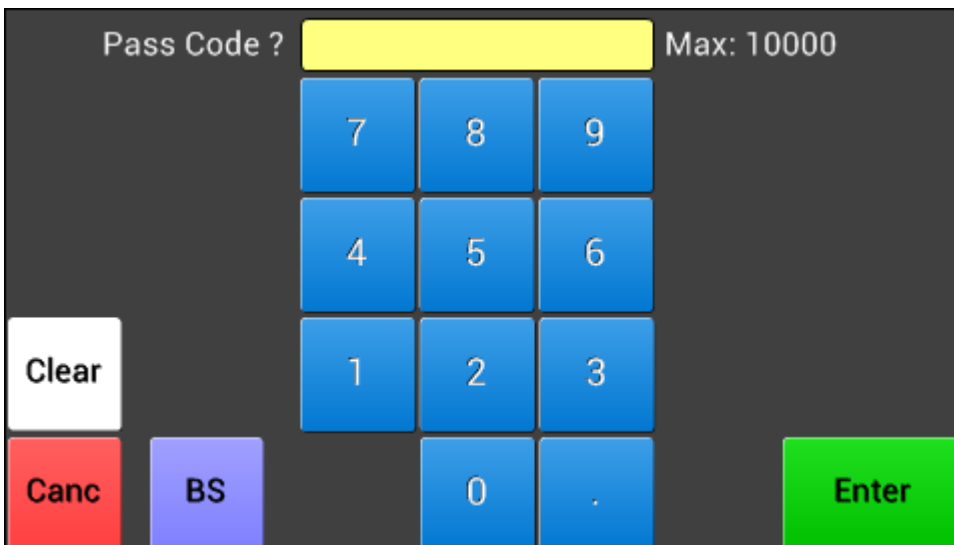
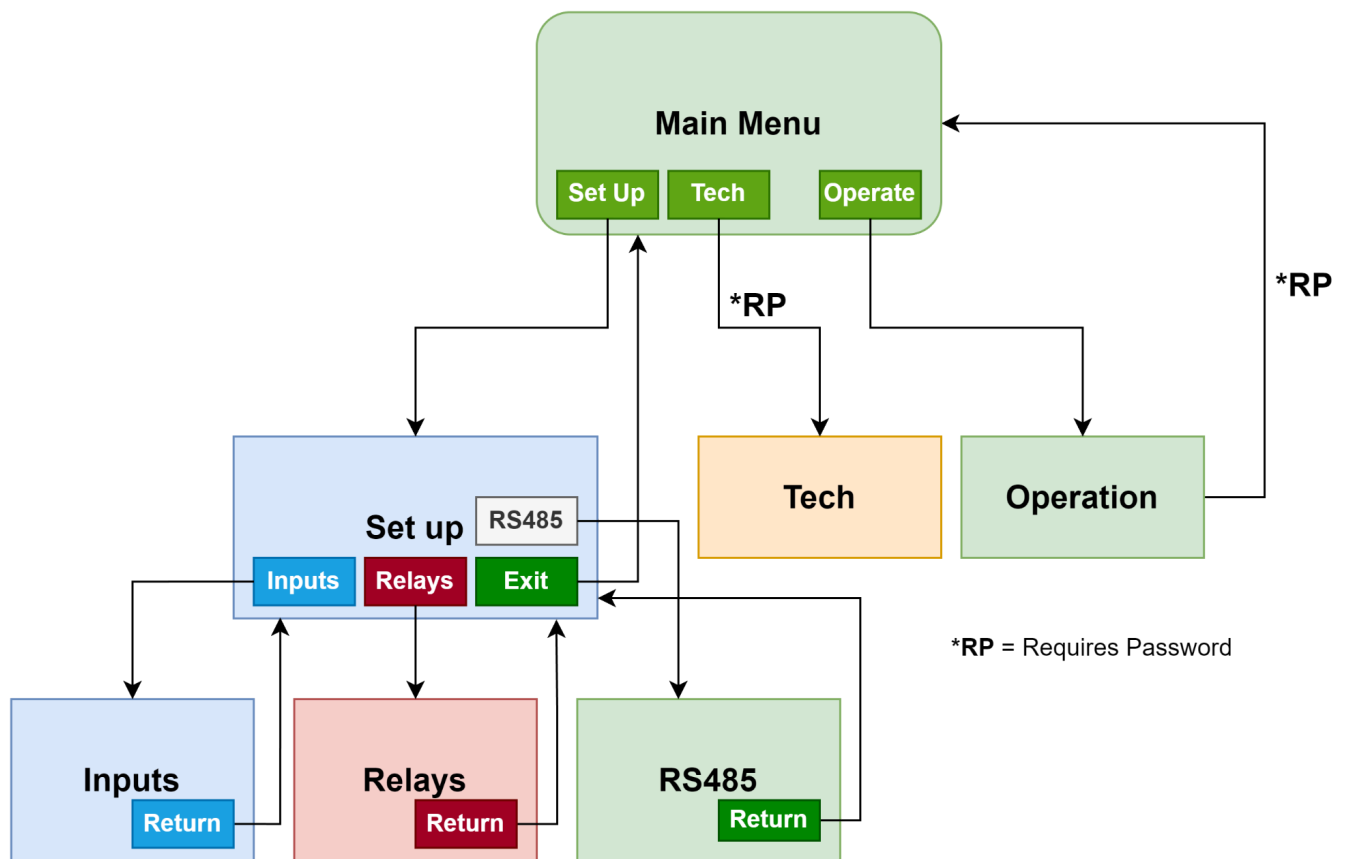


Figure 23: Pass Code entry screen.

## 6.1 Menu Structure

**Figure 24** shows the 4288's menu structure. The Tech menu is factory calibration and testing of the 4288. The pass code is not given in this manual for the Tech menu. Only enter the Tech menu under direct instruction of a GDA technician. The setup of the 4288 is split into three areas: the inputs, the Relays and RS485. The Inputs provides all of the settings specific to the 8 sensors including their alarms. The Relays provides the settings for each of the 8 configurable relays. The RS485 is the setting for the Modbus interface. They are accessed through the Set up menu (**Figure 25**) from the Main Menu. The Set up menu also displays a Sensor Summary to quickly see what sensors are enabled and what gases and ranges they are configured to.



**Figure 24:** Menu structure diagram.

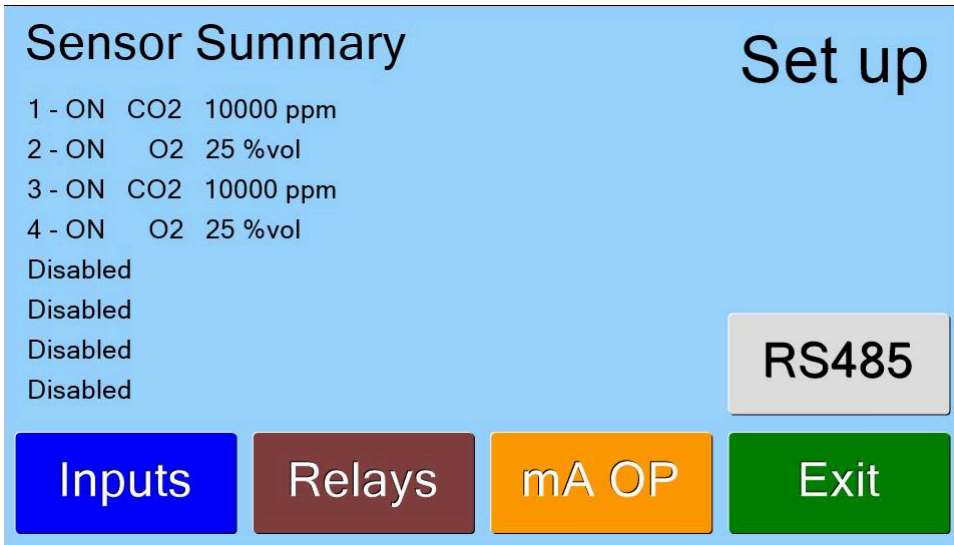


Figure 25: Set Up menu screen showing the Sensor Summary and buttons to the other settings.

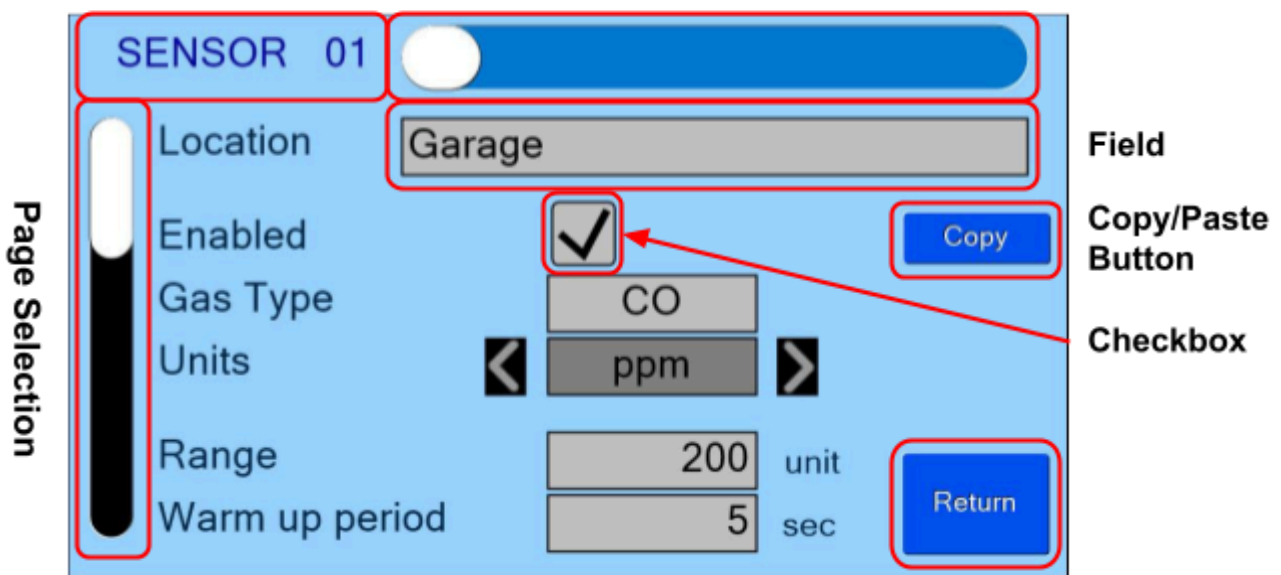
## 6.2 Input Set Up (Sensor Settings)

Each sensor input from 1 to 8 can be selected by tapping along the top scroll bar. The currently selected sensor is displayed in the top left of the screen. There are 3 pages of settings for each sensor. The page can be changed by tapping the page selection bar on the left hand side of the screen. The Return button can be pressed to return to the Set up menu. If any incorrect settings are detected when the Return button is pressed an error message will be displayed and the settings that are in error will be highlighted in red.

### 6.2.1. Inputs Page 1

The sensor's settings can be copied from input to input. If the Copy button is pushed it will change to Paste. Select the desired sensor to paste over and press the Paste button. WARNING this will overwrite the sensor being pasted into. There is no undo! Once the settings have been pasted the button will return to Copy.

**Selected Sensor Number**    **Scroll bar to change which sensor is selected**



**Return Button to go back to Set up menu**

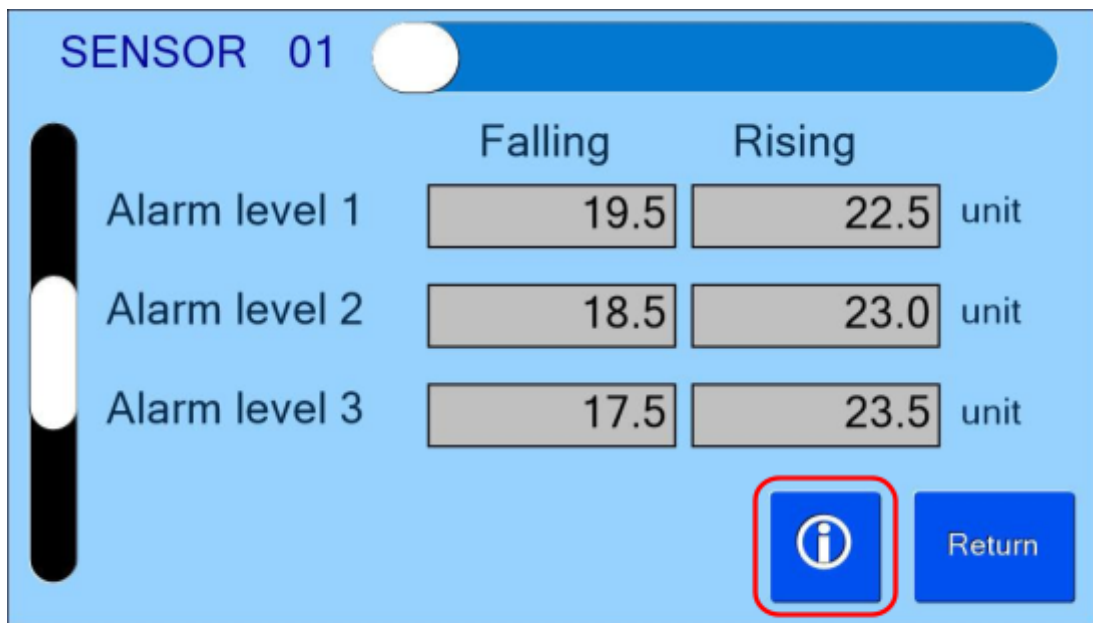
Figure 26: Inputs - Sensor Settings Page 1, highlighting important screen buttons, controls and details.

Table 8: Page 1 Input/Sensor Settings

Setting	Description	How to edit
Location	Displayed sensor name up to 16 characters.	Tap field to edit
Enabled	Enable or disable the sensor input.	Tap checkbox to toggle
Gas Type	Gas name up to 5 characters.	Tap field to edit
Units	Units of the sensor: PPM, %Vol., %LEL, PPB, %UEL, deg C (°C), deg K (°K), %RH, Ratio, %Rel., T/F, %, Arb.,	Tap the arrows
Range	Range of the connected sensor 0-1,000,000 for ppm and similar and 0-100 for %LEL and %VOL	Tap field to edit
Warm up period	Warm up period of 0-250 seconds. During this time faults and alarms will be inhibited.	Tap field to edit

### 6.2.2. Inputs Page 2

Page 2 contains only the alarm thresholds. Press the information icon to see an Alarms help popup screen, **Figure 28**.



Alarms help popup

Figure 27: Inputs - Sensor Settings Page 2.

Table 9: Page 2 Input/Sensor Settings

Setting	Description		How to edit
Alarm Level 1	Falling Threshold	Rising Threshold	Tap field to edit
Alarm Level 2	Falling Threshold (must be larger than AL3 Falling or equal to zero)	Rising Threshold	Tap field to edit
Alarm Level 3	Falling Threshold (must be smaller than AL2 Falling or equal to zero)	Rising Threshold	Tap field to edit

Note:

- Any alarm threshold set to zero will be disabled and ignored.
- AL3 Falling < AL2 Falling < AL1 Falling < AL1 Rising < AL2 Rising < AL3 Rising.
- The Alarm Thresholds are also checked to see if the hysteresis is smaller than the difference between any two Alarm Thresholds.

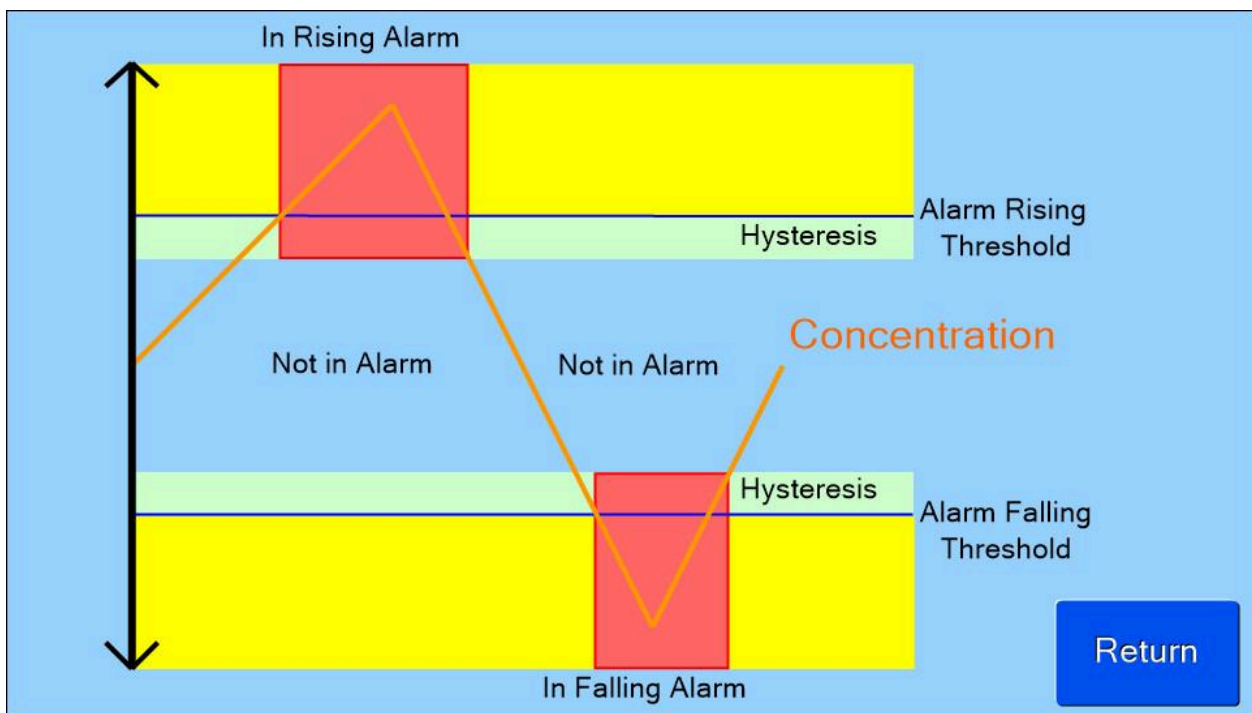
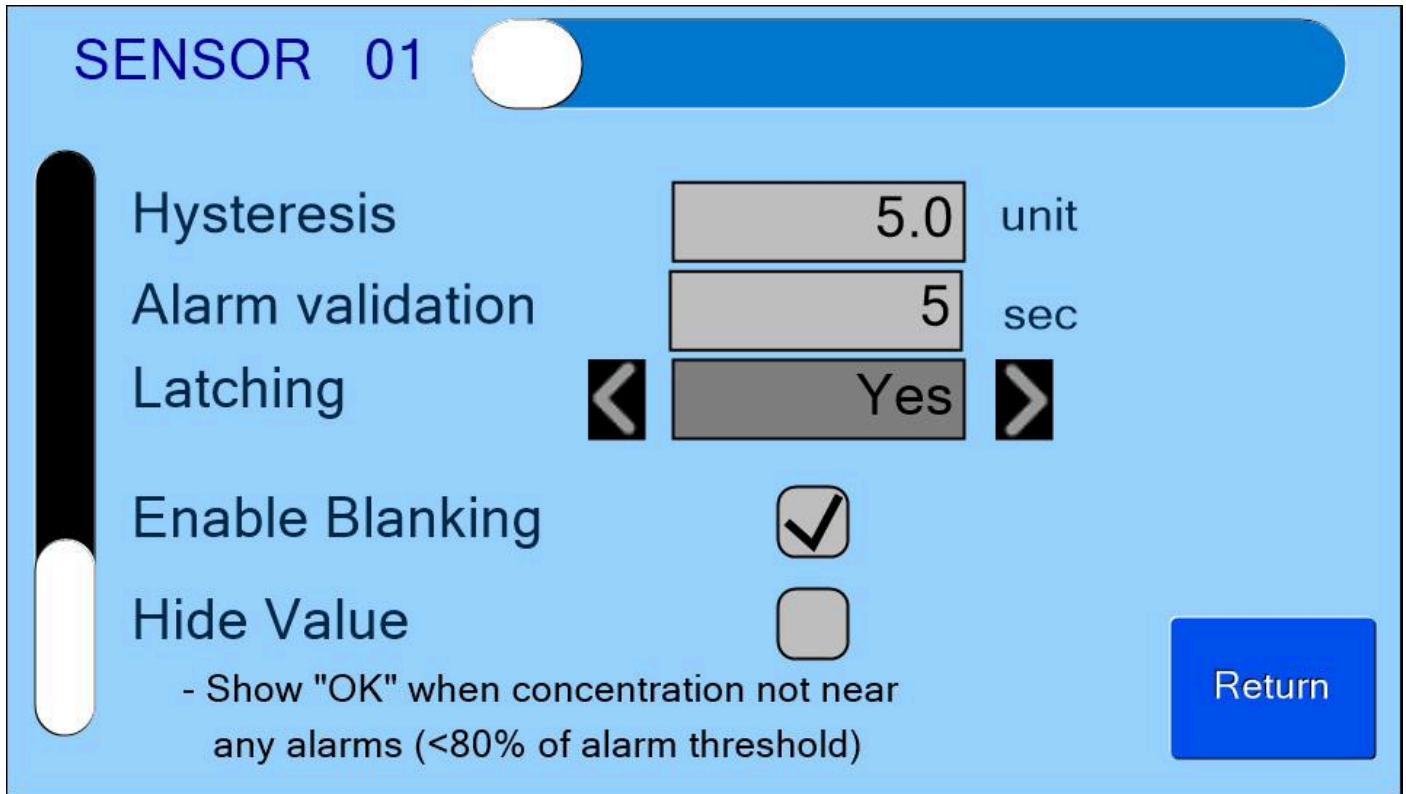


Figure 28: Alarms Help Popup screen.

### 6.2.3. Inputs Page 3



**SENSOR 01**

Hysteresis  unit

Alarm validation  sec

Latching

Enable Blanking

Hide Value

- Show "OK" when concentration not near any alarms (<80% of alarm threshold)

**Return**

Figure 29: Inputs - Sensor Settings Page 3.

Table 10: Page 3 Input/Sensor Settings

Setting	Description	How to edit
Hysteresis	Amount of concentration past the Alarm Threshold required to come out of Alarm Condition. (Adjustable between 0.5% to 10% of Range)	Tap field to edit
Alarm validation	Time the concentration is required to be in the Alarm Condition before the Alarm is raised.	Tap field to edit
Latching	No: When the concentration comes out of the alarm condition the alarm is automatically cleared. Yes: The highest alarm level remains until it is cleared by the user, by Acknowledging the alarm via the "Ack" button. The alarm cannot be cleared until the alarm conditions have been cleared.	Tap the arrows
Enable Blanking	Blanking hides values around zero concentration. (+1x/-2x Hysteresis)	Tap checkbox to toggle
Hide Value	Hides the concentration value when not close to an Alarm Threshold and displays "OK" instead.	Tap checkbox to toggle

### 6.3 Relays Set Up

Each Relay from 1 to 8 can be selected by tapping along the top scroll bar. The currently selected relay is displayed in the top left of the screen. There are settings for each sensor on each relay. The Return button can be pressed to return to the Set up menu.

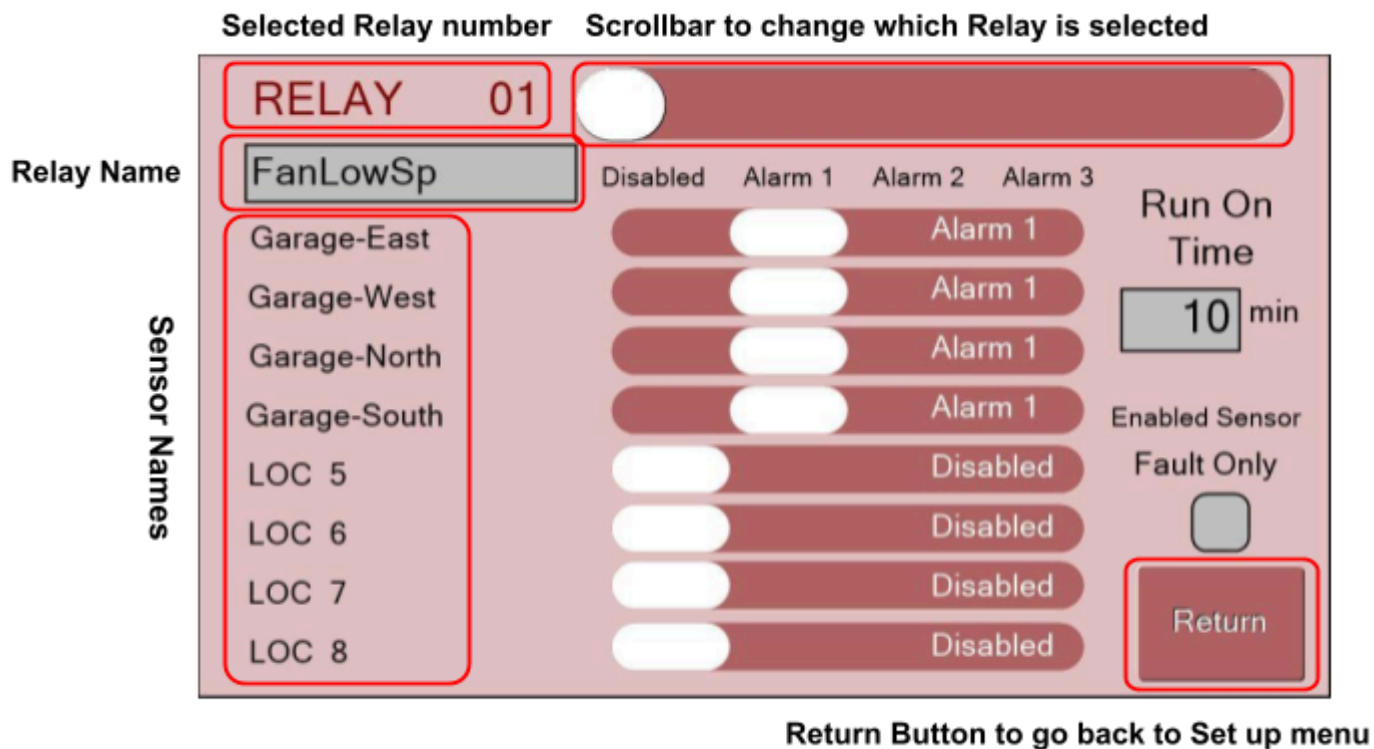


Figure 29: Inputs - Sensor Settings Page 3.

Table 10: Page 3 Input/Sensor Settings

Setting	Description	How to edit
Relay Name	Name for the relay. Up to 8 characters long. This name only appears on this screen.	Tap field to edit
Sensor wise relay activation levels	For each sensor the minimum alarm level that will trigger the relay. (Disabled sensor will be ignored. Eg if set to Alarm 1 the relay will be ON at Alarm Level 1, 2 and 3, see Figure 30)	Tap scrollbar to modify
Run On Time	The time in minutes that the relay will remain ON for after all sources stop triggering the relay.	Tap field to edit
Enabled Sensor Fault Only	When OFF: Any Fault on the system or from any sensor will activate the relay. When ON: The relay will only activate on Faults from sensors that it is configured to trigger from and system Faults. See example Figure 31.	Tap checkbox to toggle



Figure 30: Relay activation levels.

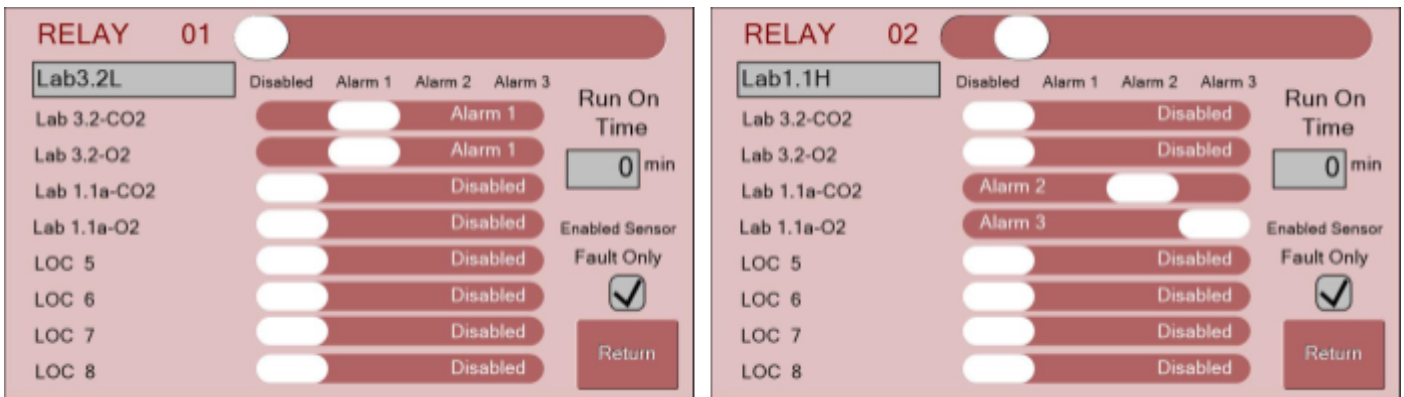


Figure 31: Example of two Zones setup to not share faults.

## 7 Modbus Interface

The 4288 implements an isolated RS-485 (TIA/EIA-485) MODBUS (V1.1b3) compliant RTU slave using a default 19200 baud/bitrate (bps), 8 Data Bits, Even Parity and one Stop Bit (RTU 19200-8E1). Refer to Modbus Register Table for implemented registers and Function Codes. Modbus RTU requires 3.5 Character spacing between packets. Normally the 4288 will respond immediately after the 3.5 character inter-packet spacing or within 100 ms of receiving the request from the Modbus master.

### 7.1 Wiring

Follow guidelines from MODBUS over serial line specification and implementation guide V1.02 from Modbus.org. The 4288 must be wired with a single twisted-pair with overall screen cable connected as a daisy-chain. If the RS485 master requires a Common (0V) wire, please follow the diagram from Figure 20: General 2-Wire Topology in section 3.3.2 Two-Wire MODBUS Definition from the Modbus.org specification.

### 7.2 Settable Interface Parameters

The Modbus Address, Bitrate, Parity and number of Stop Bits can be adjusted. The Modbus Address can be set from 1 to 247. The Bitrate, Parity and number of Stop Bits can be set according to the tables below.

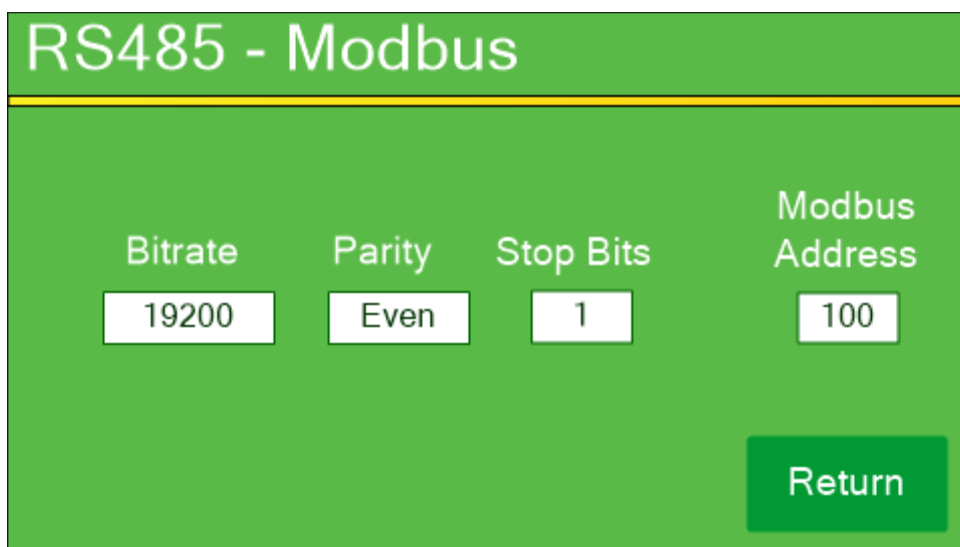


Figure: RS485 Modbus settings screen

Bitrate Options									
1200	2400	4800	9600	14400	19200 (default)	38400	57600	76800	115200

Parity and Stop Bits Options			
<b>Parity</b>	None	Even	Odd
<b>Stop Bits</b>	1 or 2	1	1

### 7.3 Modbus Register Table

Note: Replace “#” in the table with desired channel/sensor number. All integers are signed unless stated.

Modbus Function Code	Offset	Legacy Address	Register Description
Input Coils (Single Register/Sensor Request)			
01	0010#	0010#	Sensor # Alarm 1: SINGLE BIT
01	0020#	0020#	Sensor # Alarm 2: SINGLE BIT
01	0030#	0030#	Sensor # Alarm 3: SINGLE BIT
01	00401	00401	Overall Fault: SINGLE BIT
01	0050#	0050#	Sensor # Fault: SINGLE BIT
01	0060#	0060#	Relay # State: SINGLE BIT
Input Coils (Multi Register/Sensor Request)			
01	00101	00101	Alarm 1: UNSIGNED INTEGER BITS: 0 = Sensor 1 1 = Sensor 2 2 = Sensor 3 3 = Sensor 4 4 = Sensor 5 5 = Sensor 6 6 = Sensor 7 7 = Sensor 8 Maximum Sequential Read of 8 registers. Will only return bit values of the number of registers requested.
01	00201	00201	Alarm 2: UNSIGNED INTEGER Same as above.
01	00301	00301	Alarm 3: UNSIGNED INTEGER Same as above.
01	00501	00501	Sensor Fault: UNSIGNED INTEGER Same as above.
01	00601	00601	Relay State: UNSIGNED INTEGER BITS: 0 = Relay 1 1 = Relay 2 2 = Relay 3 3 = Relay 4 4 = Relay 5 5 = Relay 6 6 = Relay 7 7 = Relay 8

Modbus Function Code	Offset	Legacy Address	Register Description
01	01101	01101	Alarm 1 Condition State: UNSIGNED INTEGER BITS: 0 = Sensor 1 1 = Sensor 2 2 = Sensor 3 3 = Sensor 4 4 = Sensor 5 5 = Sensor 6 6 = Sensor 7 7 = Sensor 8
01	01201	01201	Alarm 2 Condition State: UNSIGNED INTEGER Same as above.
01	01301	01301	Alarm 3 Condition State: UNSIGNED INTEGER Same as above.
<b>Holding Registers (Single Register/Sensor Request)</b>			
03	0020#	4020#	Sensor # Units Of Concentration: 16 BIT INTEGER Response: 00 = PPM 06 = deg K 12 = Arb. 01 = %Vol. 07 = %RH 13 = [blank] 02 = %LEL 08 = Ratio 03 = PPB 09 = %Rel. 04 = %UEL 10 = T/F 05 = deg C 11 = %
03	0030#	4030#	Sensor # Enabled: 16 BIT INTEGER Register: # = Sensor # (Reg 301 = Sensor 1) Response: 0 = Disabled, 1 = Enabled
03	00401	40401	MODAL NUMBER: 16 BIT INTEGER Expect return value of 4288.
03	0050#	4050#	Sensor # Scale: 16 BIT INTEGER Register: # = Sensor # (Reg 501 = Sensor 1) Response: -4 to 3
03	0060#	4060#	Sensor # Range: 16 BIT INTEGER Register: # = Sensor # (Reg 601 = Sensor 1) The actual Range is achieved using formula: Sensor Range = RANGE REGISTER x 10^(SCALE REGISTER)

Modbus Function Code	Offset	Legacy Address	Register Description
03	0100#	4100#	Sensor # Alarm Status: 16 BIT INTEGER Register: # = Sensor # (Reg 1001 = Sensor 1) Response: 1 = Falling Alarm Level 3, 2 = Falling Alarm Level 2, 3 = Falling Alarm Level 1, 4 = No Alarm, 5 = Rising Alarm Level 1, 6 = Rising Alarm Level 2, 7 = Rising Alarm Level 3
03	0110#	4110#	Sensor # Alarm Level: 16 BIT INTEGER Register: # = Sensor # (Reg 1101 = Sensor 1) Response: 0 = No Alarm, 1 = Alarm Level 1, 2 = Alarm Level 2, 3 = Alarm Level 3
Holding Registers (Multi Register/Sensor Request)			
03	00101 to 00164	40101 to 40164	Gas Type: STRING 8 registers long for each sensor. One character per register: Sensor 1 101-108 Sensor 2 109-116 Sensor 3 117-124 Sensor 4 125-132 Sensor 5 133-140 Sensor 6 141-148 Sensor 7 149-156 Sensor 8 157-164
03	00201  max length 8	40201  max length 8	Sensor # Units Of Concentration: 16 BIT INTEGER Response: 00 = PPM 06 = deg K 12 = Arb. 01 = %Vol. 07 = %RH 13 = [blank] 02 = %LEL 08 = Ratio 03 = PPB 09 = %Rel. 04 = %UEL 10 = T/F 05 = deg C 11 = %
03	00301  max length 8	40301  max length 8	Sensor # Enabled: 16 BIT INTEGER Registers: # = Sensor # (Reg 301 = Sensor 1) Response: 0 = Disabled, 1 = Enabled
03	00501  max length 8	40501  max length 8	Sensor # Scale: 16 BIT INTEGER Registers: # = Sensor # (Reg 501 = Sensor 1) Response: -4 to 3

Modbus Function Code	Offset	Legacy Address	Register Description
03	00601 max length 8	40601 max length 8	Sensor # Range: 16 BIT INTEGER Register: # = Sensor # (Reg 601 = Sensor 1) The actual Range is achieved using formula: Sensor Range = RANGE REGISTER x 10^(SCALE REGISTER)
03	00701 to 00828	40701 to 40828	Location Name: STRING 8 registers long for each sensor. One character per register: Sensor 1 101-116 Sensor 2 117-132 Sensor 3 133-148 Sensor 4 149-164 Sensor 5 165-180 Sensor 6 181-196 Sensor 7 197-112 Sensor 8 113-128
03	01001 max length 8	41001 max length 8	Sensor # Alarm Status: 16 BIT INTEGER Register: # = Sensor # (Reg 1001 = Sensor 1) Response: 1 = Falling Alarm Level 3, 2 = Falling Alarm Level 2, 3 = Falling Alarm Level 1, 4 = No Alarm, 5 = Rising Alarm Level 1, 6 = Rising Alarm Level 2, 7 = Rising Alarm Level 3
03	01101 max length 8	41101 max length 8	Sensor # Alarm Level: 16 BIT INTEGER Register: # = Sensor # (Reg 1101 = Sensor 1) Response: 0 = No Alarm, 1 = Alarm Level 1, 2 = Alarm Level 2, 3 = Alarm Level 3
03	01201 max length 8	41201 max length 8	Sensor # Status: 16 BIT INTEGER Register: # = Sensor # (Reg 1201 = Sensor 1) Response: 0 = Initialising, 1 = Warm-up, 2 = Fault, 3 = Under Range, 4 = Good, 5 = Over Range, 6 = Isolated *NB: "Good" doesn't mean no alarms
03	02001 max length 8	42001 max length 8	Relay # Sensor Fault Only: 16 BIT INTEGER Registers: # = Sensor # (Reg 2001 = Sensor 1) Response: 0 = Disabled, 1 = Enabled

Modbus Function Code	Offset	Legacy Address	Register Description
03	02101 max length 8	42101 max length 8	Relay 1 Trigger On Sensor # Alarm Level: 16 BIT INTEGER Registers: # = Sensor # (Reg 2101 = Sensor 1) Response: 0 = Disabled, 1 = Alarm 1, 2 = Alarm 2, 3 = Alarm 3
03	02201 max length 8	42201 max length 8	Relay 2 Trigger On Sensor # Alarm Level: 16 BIT INTEGER Registers: # = Sensor # (Reg 2201 = Sensor 1) Response: As Above
03	02301 max length 8	42301 max length 8	Relay 3 Trigger On Sensor # Alarm Level: 16 BIT INTEGER Registers: # = Sensor # (Reg 2301 = Sensor 1) Response: As Above
03	02401 max length 8	42401 max length 8	Relay 4 Trigger On Sensor # Alarm Level: 16 BIT INTEGER Registers: # = Sensor # (Reg 2401 = Sensor 1) Response: As Above
03	02501 max length 8	42501 max length 8	Relay 5 Trigger On Sensor # Alarm Level: 16 BIT INTEGER Registers: # = Sensor # (Reg 2501 = Sensor 1) Response: As Above
03	02601 max length 8	42601 max length 8	Relay 6 Trigger On Sensor # Alarm Level: 16 BIT INTEGER Registers: # = Sensor # (Reg 2601 = Sensor 1) Response: As Above
03	02701 max length 8	42701 max length 8	Relay 7 Trigger On Sensor # Alarm Level: 16 BIT INTEGER Registers: # = Sensor # (Reg 2701 = Sensor 1) Response: As Above
03	02801 max length 8	42801 max length 8	Relay 8 Trigger On Sensor # Alarm Level: 16 BIT INTEGER Registers: # = Sensor # (Reg 2801 = Sensor 1) Response: As Above
03	03001 max length 3	43001 max length 3	System Voltages (mV): 16 BIT INTEGER Registers: 03001 = 24V PSU Rail = 24000 (mV) 03002 = 3.3 V PSU Rail = 3300 (mV) 03003 = 5V PSU Rail = 5000 (mV)
Input Registers (Single Register/Sensor Request)			

Modbus Function Code	Offset	Legacy Address	Register Description
04	0000#	3000#	Sensor # Concentration : 16 BIT INTEGER Register: # = Sensor # (Reg 1 = Sensor 1) The actual Gas Concentration is achieved using formula: Gas Concentration = CONCENTRATION REGISTER x 10^(SCALE REGISTER)
Input Registers (Multi Register/Sensor Request)			
04	00001 max length 2	30001 max length 2	Sensor # Concentration : 16 BIT INTEGER Register: # = Sensor # (Reg 1 = Sensor 1) The actual Gas Concentration is achieved using formula: Gas Concentration = CONCENTRATION REGISTER x 10^(SCALE REGISTER)

#### Revision Notes:

- V3.0.11.0 (22/12/2017) – Modbus Added to the 4288 software. Modbus table drafted.
- V3.0.11.3 (12/01/2018) – Func. Code 03x0 Offsets 0030# and 00401 added.
- V3.0.12.1 (22/01/2019) – Added Func. Code 03x0 Offsets 0050# & 0060#. Where missing for V11.#
- V3.0.12.2 (25/01/2019) – Added new gas types and units.
- V7.0.7.0d (31/07/2023) – Added Relay Coils, Location Names, Relay settings and improved descriptions.

## 8 Menu Passwords

Passwords below allow access to GDA 4288's menu system. Please remove this page if there are security issues with the end user.

Menu	Password
System Menu	4028
Technician	Contact GDA

## 9 Revision History

Version	Contents	Date
1	Initial revision of the Manual HW: V1.2 SW 1.00	29 May, 2017
1.1	HW: V2.0 Mod 1, SW 1.02	9 Sep, 2017
1.2	HW: V3.0, SW 3.0.1.10.1	13 Apr, 2018
2.0	HW: V3.0, SW 3.0.1.11	7 Aug, 2018
2.1	HW: V3.0, SW 3.0.1.12, MODBUS Table	9 Aug, 2019
2.2	HW: V3.0, SW 3.0.1.12, Remote Display connection	9 Sep, 2019
2.3	Modbus Table*	29 Sep, 2022
2.4	Edit name from 4080 to 4288	22 Dec, 2022
2.5	Modbus table added Legacy Address Column	23 Mar, 2023
3.0	Major update to reflect major changes to software for HW V7.0 & SW V7.0.7.0b	17 Aug, 2023

This product and operating manual are subject to change without prior notice for the improvement of product performance and ease of use.



Gas Detection (Australia) Pty Ltd  
07 4613 5111

[sales@gasdetect.com.au](mailto:sales@gasdetect.com.au)  
[support@gasdetect.com.au](mailto:support@gasdetect.com.au)

Suite 1, 218 Anzac Avenue, Harristown QLD 4350  
[gasdetectionaustralia.com.au](http://gasdetectionaustralia.com.au)

**Your mates in gas detection**