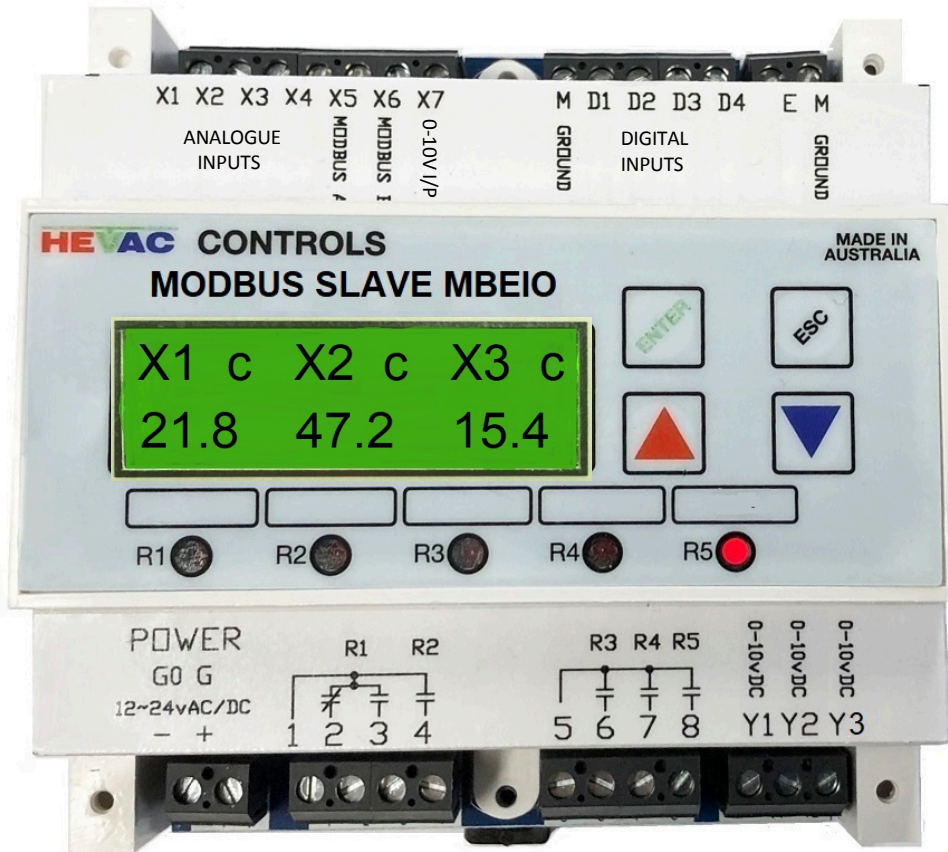


### MODBUS SLAVE I/O MODULE



**MODBUS CONTROLLED I/O MODULE FOR REMOTE ZONE CONTROL / SENSOR MEASUREMENT or BMS I/O EXPANDER. UNASSIGNED INPUTS & OUTPUTS FOR FREE USE AS PROGRAMMED BY BMS SYSTEM.**

- \* AUSTRALIAN DESIGNED & MANUFACTURED.**
- \* MODBUS RS485 COMMUNICATION**
- \* 5 x ANALOGUE INPUTS**
- \* 4 x DIGITAL INPUTS (switched to ground)**
- \* 5 x RELAY OUTPUTS (8 amp res.)**
- \* 3 x 0-10 vDC ANALOGUE OUTPUTS**
- \* 12 to 24 volt AC or DC POWERED.**
- \* INPUT & ANALOGUE OUTPUT STATUS DISPLAYED ON LCD SCREEN**
- \* RELAY STATUS VIA DEDICATED LEDs.**
- \* OUTPUTS SETTABLE AS RESET OR REMAIN STATUS ON COMMS LOSS.**
- \* CAN READ UPTO 4 HEVAC 2 WIRE "D" TYPE TEMPERATURE SENSORS**

**General Specifications**

Operating Voltage	12 to 24 Volts AC or DC
Power Consumption	
At 24vDC Volts	MAX. 150mA
At 24vAC Volts	MAX 4 VA
Switching Capacity of each Relay (5 off)	
Voltage	AC 1....250 Volts
Current	8.0 (2.5) Amps

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**Analogue Inputs**

X1 - X4 inputs are configurable (with jumper & software) as Active 0-10vdc scaled as 0-100% (input impedance =150K), 4-20mA scaled as 0-100% (input impedance = 170 ohms) or passive resistance inputs for Hevac 2 wire temperature sensors (4.2k@22c.NTC~70 ohms/c) displayed in degrees C. X7 if used as an input can only be used as a 0-10vDC input and is scaled 0-100%. Alternatively if X7 isn't needed as an input it can be used as the modbus shield connection -- set jumper CN3-3 on bottom pcb to the "C" (comms) position.

**Digital Inputs**

D1 - D4 responds to input connected to ground (M / 24v neutral ) by volt free contacts

**Analogue outputs**

Y1 - Y3 0-10vDC , Maximum load each output 1mA (10K input load)

**Communication :**

Terminal's X5 & X6 set for RS485 MODBUS RTU communication.  
Addressable as # 1 - 247  
Baud rate selectable as 2400, 9600, 19200, 38400, 57600 & 115200  
Outputs can be set to reset or remain last state on comms loss.

**Output Indication:**

Relay On/Off Status	5 x Red LED's. REL1-REL4 Illuminated = relay energised (1 per relay)
LCD 2 x 16 Display	5 x analogue inputs : X1, X2, X3, X4 & X7 : # # . # 4 x digital inputs D1-D4 : displayed as ON or OFF 3 x analogue outputs Y1, Y2, Y3 : # # . #
Display Resolution	0.1 Increments

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**Environmental Conditions**

Operation	
Ambient Temperature	0...45oC
Humidity	< 85 % RH (Non Condensing)
Storage and Transport	
Ambient Temperature	-5...65oC
Humidity	< 90 % RH (Non Condensing)

**Product Standards**

COMPLIES TO ALL RELEVANT AUSTRALIAN STANDARDS  
including 6mm segregation between high & low voltage connections

**Weight**

Including Packaging 600 grams

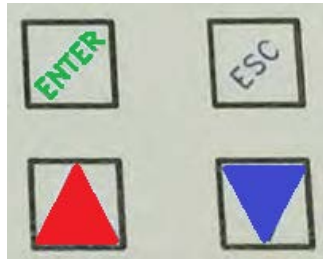
**Enclosure**

Colour	White
Material	ABS POLYCARB
UV Stabilised Fire Retardant	YES
Size	YES
Mounting Method	L105mm x W105mm x D60mm 35mm Din Rail Mountable

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## USER INTERFACE

The controllers face plate has four push buttons to access & edit module settings.



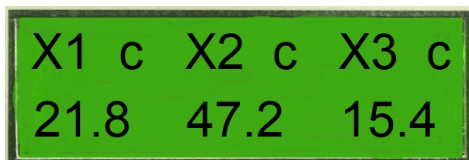
"ENTER" ACTS AS THE SAVE OR MENU OPEN BUTTON

"ESC" ACTS AS THE EXIT OR JUMP BACK TO PREVIOUS MENU BUTTON

"UP" & "DOWN" BUTTONS ADJUST SETPOINT, SCROLL MENUS & TO EDIT VALUES.

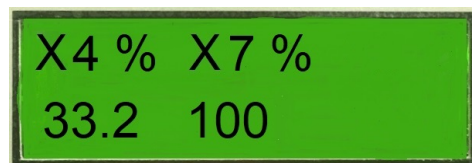
The module has a back lit (16x2) LCD screen & 5 red LED's to give controller input & output status. The LCD screen will automatically cycle through four screens displaying all inputs plus the three analogue 0-10vdc output status. The relays status are displayed by individual dedicated leds.

To access the menu, press the **ENTER** button & use the **UP** & **DOWN** arrow buttons to scroll through the menus, pressing **ENTER** to open a particular menu to edit.



SCREEN 1 DISPLAYS INPUT VALUES OF ANALOGUE INPUTS X1, X2 & X3

*IF AN INPUT IS SET TO PASSIVE MODE (BOTH IN HARDWARE & SOFTWARE) THEN THE DISPLAYED VALUE IS SHOWN IN DEGREES C WHICH IS THE TEMPERATURE MEASURED BY A HEVAC TYPE "D" RESISTANCE SENSOR. IF INPUT SET AS AN ACTIVE INPUT (EITHER 0-10vDC or 4-20mA) THEN AS INPUT TYPE & SCALE IS UNKNOWN VALUE IS DISPLAYED AS A 0-100%*



SCREEN 2 DISPLAYS INPUT VALUES OF ANALOGUE INPUTS X4 & X7

The LCD screen will automatically cycle through the 4 display I/O pages

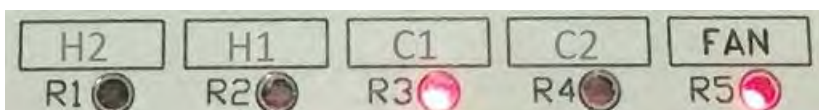


SCREEN 3 DISPLAYS THE OPEN or CLOSED STATUS (SWITCHED TO M) OF THE 4 DIGITAL INPUTS INPUTS D1 - D4



SCREEN 4 DISPLAYS THE 0-10vDC OUTPUT LEVELS OF THE 3 ANALOGUE OUTPUTS Y1-Y3

*example of optional identification of output relays by installation contractor*

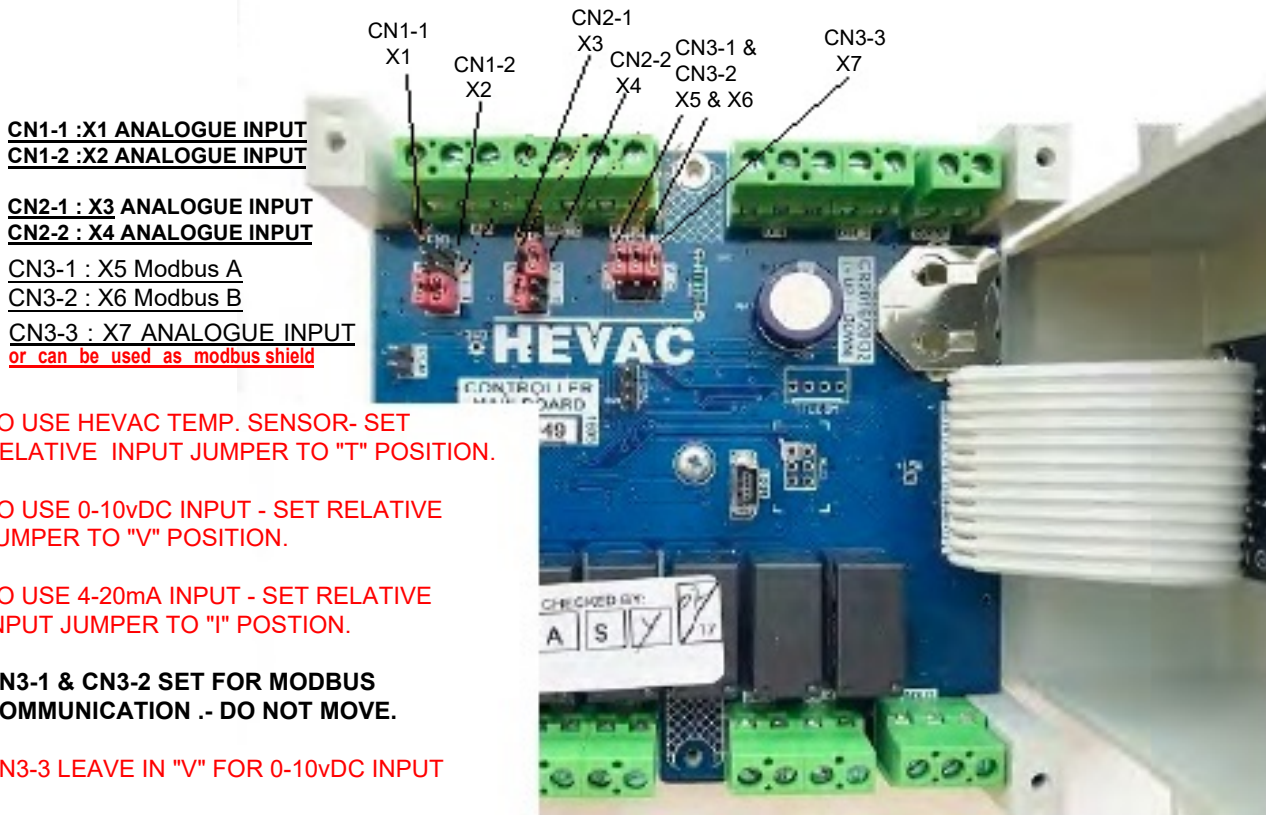


THE 5 OUTPUT RELAY STATUS IS DISPLAYED BY AN LED - ILLUMINATED = RELAY ON

## CONTROLLER BOTTOM PCB SHOWING SENSOR PASSIVE / ACTIVE SELECTION PINS

### SETTING JUMPER PINS TO SUIT INPUT TYPE

To set the jumpers remove the 2 screws securing the modules top housing section to the base and lift the housing up & to the right to access the bottom pcb.



ANALOGUE INPUTS			MODBUS JUMPERS				DO NOT MOVE CN3-1&2 JUMPERS
X1	X2	X3	X4	X5	X6	X7	
CN1-1	CN1-2	CN2-1	CN2-2	CN3-1	CN3-2	CN3-3	
<div><div>V</div><div>I</div><div>T</div></div>	<div><div>V</div><div>I</div><div>T</div></div>	<div><div>V</div><div>I</div><div>T</div></div>	<div><div>V</div><div>I</div><div>T</div></div>	<div><div>V</div><div>I</div><div>T</div></div>	<div><div>V</div><div>I</div><div>T</div></div>	<div><div>V</div><div>I</div><div>T</div></div>	
SHOWN SET FOR 0-10v I/P	SHOWN SET FOR 4-20mA I/P	SHOWN SET FOR HEVAC TEMP SENSOR	SHOWN SET FOR 0-10v I/P	SHOWN SET FOR MODBUS USE	SHOWN SET FOR MODBUS USE	SHOWN SET FOR 0-10v I/P	

**NOTE : FOR INPUTS X1to X4 IT IS REQUIRED USING THE MODULES MENU SYSTEM TO ALSO SET THE INPUT AS PASSIVE OR ACTIVE TO MATCH THE CORRESPONDING PHYSICAL JUMPER SETTING AS REQUIRED. X1-X4 DEFAULT IS SET IN PASSIVE MODE (BOTH HARDWARE & SOFTWARE) FOR USE WITH HEVACS 2 WIRE TEMP. SENSOR RANGE. X5 & 6 ARE SET FOR MODBUS USE, AND X7 IS SET AS AN ACTIVE 0-10V INPUT.**

**ALSO NOTE : UNCONNECTED ANALOGUE INPUTS WILL DISPLAY -765c IF SET TO PASSIVE & 0.1% IF SET TO ACTIVE.**



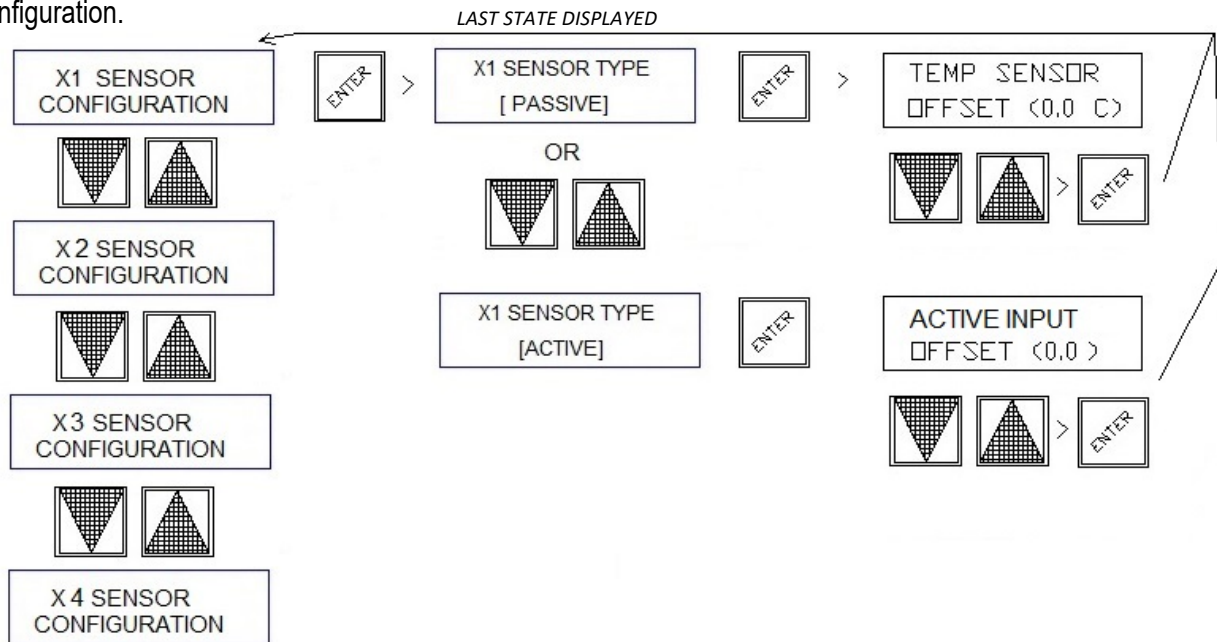
## MENU ACCESS

USING THE   &  BUTTONS ENTER THE PASSWORD [ **9562** ]

## X1 - X4 ANALOGUE INPUT SOFTWARE CONFIGURATION

X1,2,3 & 4 inputs can be configured to read resistance (hevac temperature sensors), 4 to 20 mA or 0-to 10VDC inputs, but note that a physical jumper must also be set to match the appropriate input type. To set the jumpers remove the 2 screws securing the modules top housing section to the base and lift the housing up & to the right to access the bottom pcb. To set the appropriate input type in software , press the ENTER button and enter the password **9562**. The menu will open displaying X1 input configuration, press ENTER to than set this input as passive (for hevac temperature sensors) or ACTIVE to use either 0-10VDC or 4 to 20mA type sensors. If passive is selected a calibration setting is then also displayed allowing a +/- correction factor to calibrate the temperature measurement. Press ENTER to return to the menu to scroll to another input to set its configuration.

*LAST STATE DISPLAYED*






## CONFIGURE MODBUS

TO SET THE MBEIO MODBUS ADDRESS & BAUD RATE, SCROLL THROUGH THE MODULES MENU UNTIL "MODBUS SETUP" IS DISPLAYED & FOLLOW STEPS AS SHOWN BELOW.





Press  to edit settings in the menu "MODBUS SETUP"

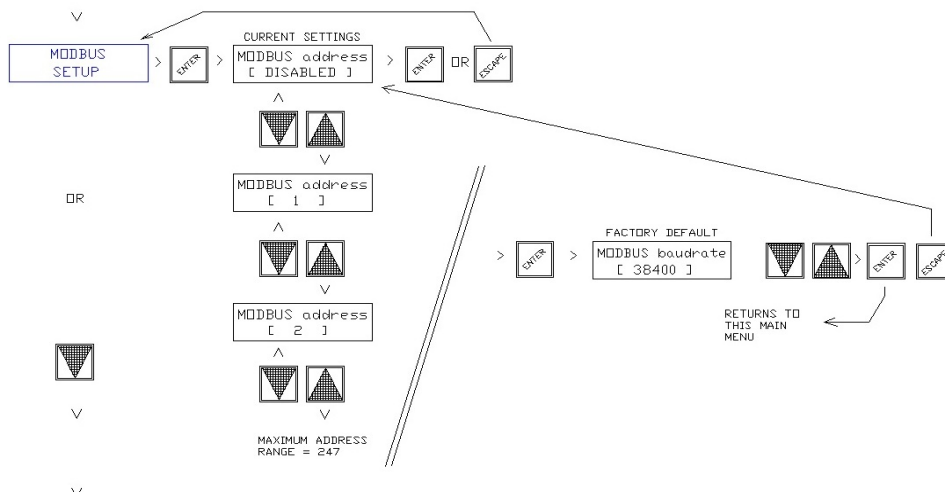
Edit “MODBUS Address” using the  or  buttons.

Press  to accept address and jump to edit screen for the baudrate "MODBUS BAUDRATE"

Edit "MODBUS Baudrate" address using the  or  buttons.

Press  to accept and to move to "OPs on MB fail" (affect on outputs on comms loss)

[ leave ] is displayed as a default, but can be changed using the  or  buttons . Set as [ DROP ] to have outputs reset, or [ leave ] for outputs to remain in the last status before comms loss or remain in last. Press  to ENTER to except choice and return to this menu , then  to exit.



**Modbus** connections X5 (A) & X6 (B) are ex factory hardware & software enabled with default address = 1 & Baud rate set to 38400. Address range can be set from 1 to 247 & Baud rate selectable as 2400, 9600, 19200, 38400, 57600 & 115200.

A	B	C	D	E	F	G	H	I	J	K	L	M
<b>Hevac Modbus Slave</b>												
1	Modicon Address	Access	Description	Units	Type	Explanation	Default	Min	Max	Error	Internaluse	Internaluse
2	Address Offset [0]											
<b>Read Coils</b>											Semaphore/Op Address	Byte Address
3												
4	00161	160 ReadOnly	Input Mirror D1	-	boolean	Mirrors the input of Input D1		-	-	-	00160	20.0
5	00162	161 ReadOnly	Input Mirror D2	-	boolean	Mirrors the input of Input D2		-	-	-	00161	20.1
6	00163	162 ReadOnly	Input Mirror D3	-	boolean	Mirrors the input of Input D3		-	-	-	00162	20.2
7	00164	163 ReadOnly	Input Mirror D4	-	boolean	Mirrors the input of Input D4		-	-	-	00163	20.3
<b>Inputs</b>												
9	10001	0 ReadOnly	Input D1	-	boolean	TRUE if input is ON		-	-	-		
10	10002	1 ReadOnly	Input D2	-	boolean	TRUE if input is ON		-	-	-		
11	10003	2 ReadOnly	Input D3	-	boolean	TRUE if input is ON		-	-	-		
12	10004	3 ReadOnly	Input D4	-	boolean	TRUE if input is ON		-	-	-		
<b>Write Coils</b>											Semaphore Address	Byte Address
13												
14	00169	168 ReadWrite Master Write Request		-	boolean	Signals that Modbus is active						
15	01001	1000 Read/Write Relay 1		-	boolean	Relay outputs will be cleared if this is not triggered within 60s of the last trigger		-	-	-	00168	21.0
16	01002	1001 Read/Write Relay 2		-	boolean	TRUE if relay is active		-	-	-	00000	n/a
17	01003	1002 Read/Write Relay 3		-	boolean	TRUE if relay is active		-	-	-	00001	n/a
18	01004	1003 Read/Write Relay 4		-	boolean	TRUE if relay is active		-	-	-	00002	n/a
19	01005	1004 Read/Write Relay 5		-	boolean	TRUE if relay is active		-	-	-	00003	n/a
											00004	n/a
<b>Read Registers</b>												Byte Address
20												
21	45001	5000 ReadOnly	Controller model	-	unsigned 16b	Controller model number		30	-	-		
22	45002	5001 ReadOnly	MODBUS mapping version	-	unsigned 16b	MODBUS memory/coil mapping version number		10	-	-		
23												
24	43018	3017 ReadOnly	Analogue Input X1	°C or normalised	IEEE Float	Reading for Analogue Input X1		-	-	-		34 - 35
25	43019	3018 ReadOnly	Analogue Input X1	°C or normalised	IEEE Float	If set to Passive mode, returns temperature in °C, otherwise returns normalised value as 0-		-	-	-		36 - 37
26	43020	3019 ReadOnly	Analogue Input X2	°C or normalised	IEEE Float	Reading for Analogue Input X2		-	-	-		38 - 39
27	43021	3020 ReadOnly	Analogue Input X2	°C or normalised	IEEE Float	If set to Passive mode, returns temperature in °C, otherwise returns normalised value as 0-		-	-	-		40 - 41
28	43022	3021 ReadOnly	Analogue Input X3	°C or normalised	IEEE Float	Reading for Analogue Input X3		-	-	-		42 - 43
29	43023	3022 ReadOnly	Analogue Input X3	°C or normalised	IEEE Float	If set to Passive mode, returns temperature in °C, otherwise returns normalised value as 0-		-	-	-		44 - 45
30	43024	3023 ReadOnly	Analogue Input X4	°C or normalised	IEEE Float	Reading for Analogue Input X4		-	-	-		46 - 47
31	43025	3024 ReadOnly	Analogue Input X4	°C or normalised	IEEE Float	If set to Passive mode, returns temperature in °C, otherwise returns normalised value as 0-		-	-	-		48 - 49
32	43026	3025 ReadOnly	Analogue Input X5	Normalised	IEEE Float	Reading for Analogue Input X7, normalised to 0-1.000		-	-	-		50 - 51
33	43027	3026 ReadOnly	Analogue Input X5	Normalised	IEEE Float			-	-	-		52 - 53
<b>Write Registers</b>												Byte Address
34												
35	43012	3011 Read/Write Output Y1		Normalised	IEEE Float	Desired output for Y1, normalised to 0-1.000		-	-	-		22 - 23
36	43013	3012 Read/Write Output Y1		Normalised	IEEE Float			-	-	-		24 - 25
37	43014	3013 Read/Write Output Y2		Normalised	IEEE Float	Desired output for Y2, normalised to 0-1.000		-	-	-		26 - 27
38	43015	3014 Read/Write Output Y2		Normalised	IEEE Float			-	-	-		28 - 29
39	43016	3015 Read/Write Output Y3		Normalised	IEEE Float	Desired output for Y3, normalised to 0-1.000		-	-	-		30 - 31
40	43017	3016 Read/Write Output Y3		Normalised	IEEE Float			-	-	-		32 - 33

## Terminal Designations

**X1 - X4** Inputs (Passive or Active)

### X5 MODBUS RS485 - A Terminal

**X6** MODBUS RS485 - B Terminal

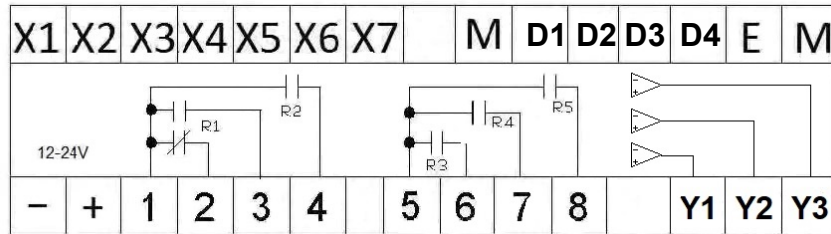
**X7** 0-10vDC analogue input only

*or can be used for modbus shield if not required as an input*

**M** Common sensor & signal ground

**D1 - D4** Digital inputs (switched to ground)

**E** Future expansions comms.



- 12-24 Volt Supply Neutral  
(internally connected to terminals M)

- + 12-24 Volt AC or DC Supply Active

- 1 Relay 1 & 2 Common
- 2 Relay 1 Normally Closed
- 3 Relay 1 Normally Open
- 4 Relay 2 Normally Open

- ### 5 Relay 3,4 & 5 Common

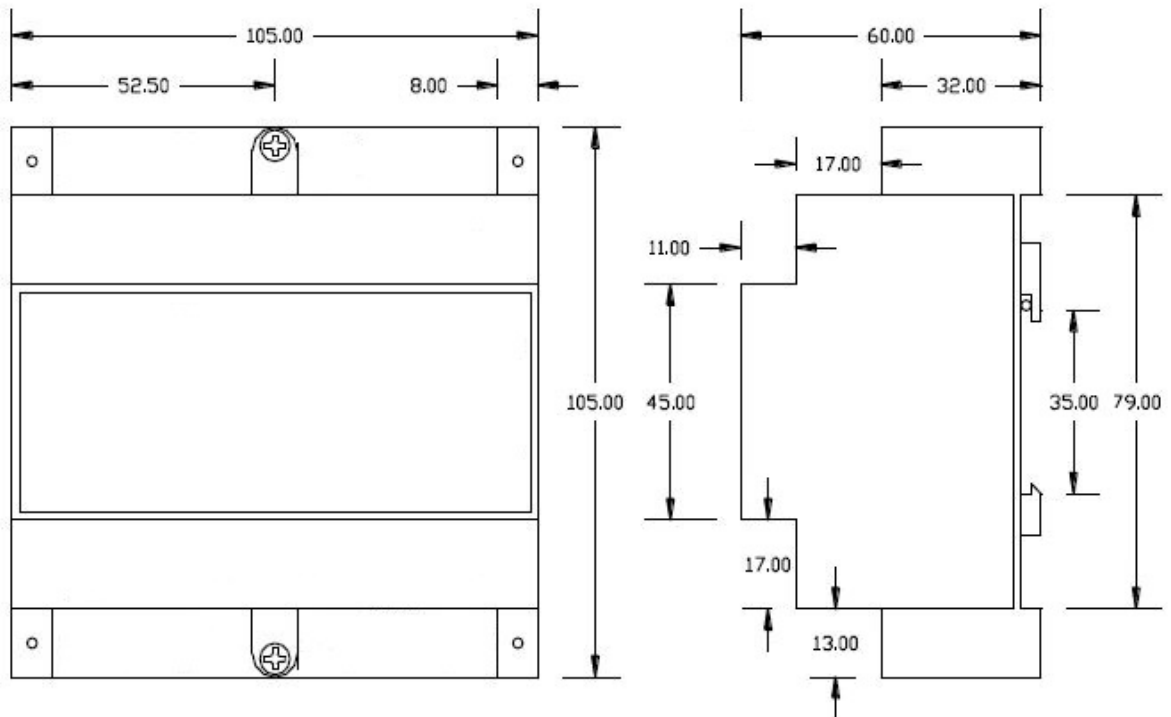
- ### 6 Relay 3 Normally Open

- ## 7 Relay 4 Normally Open

- ## 8 Relay 5 Normally Open

- Y1- Y3** Analog Outputs 0-10v DC

## Dimensions



## CONNECTION & USE EXAMPLES

