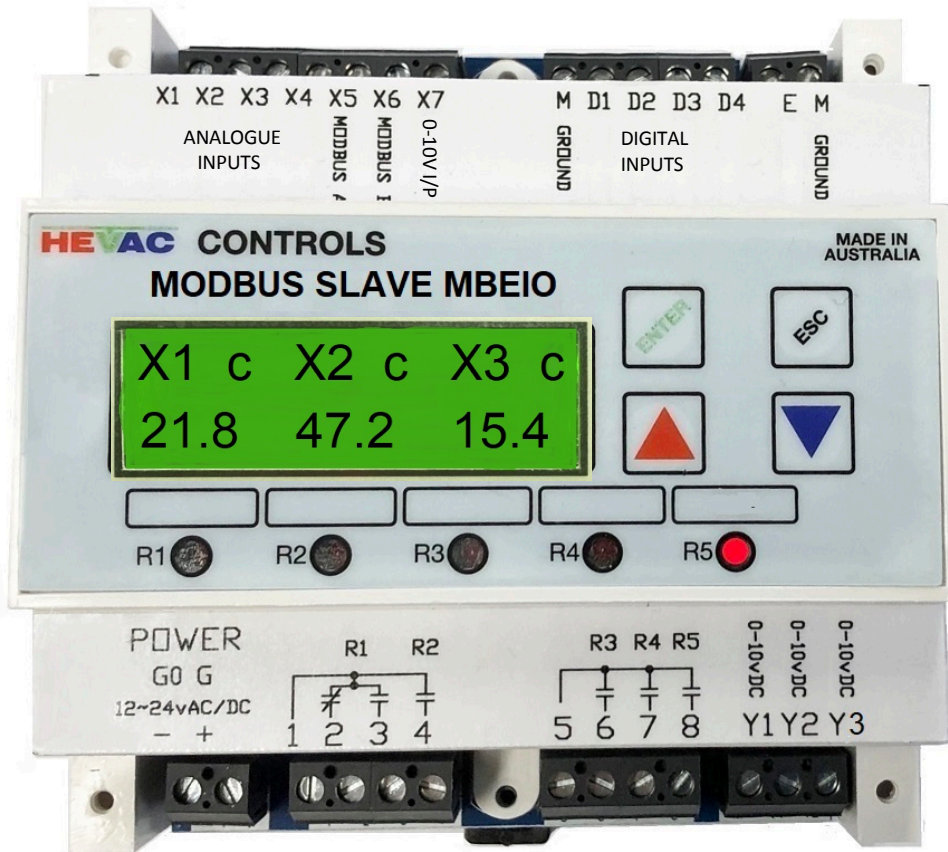![HEVAC Control Agencies logo]

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 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.*

 * *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

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

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

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 RELEVENT AUSTRALIAN STANDARDS
including 6mm segregation between high & low voltage connections
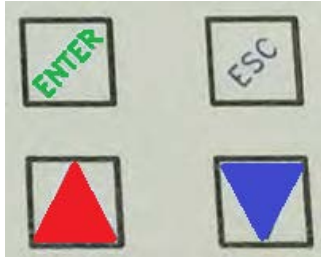
Weight

Including Packaging   600 grams

Enclosure

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

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.

| X1 c X2 c X3 c |
| 21.8   47.2   15.4 |
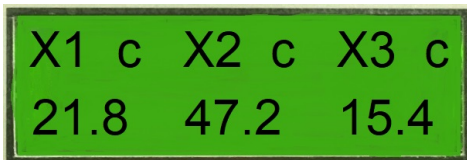
SCREEN 1 DISPLAYS INPUT VALUES OF ANALOGUE INPUTS X1, X2 & X3

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%
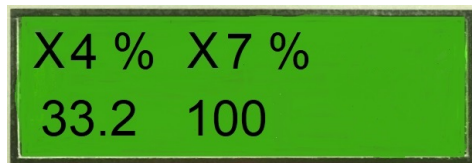
| X4 % X7 % |
| 33.2   100 |

SCREEN 2 DISPLAYS INPUT VALUES OF ANALOGUE INPUTS X4 & X7

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

| D1   D2   D3   D4 |
| OFF ON   OFF ON |

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

| Y1 %   Y2% Y3 % |
| 56.2   0.0   100 |

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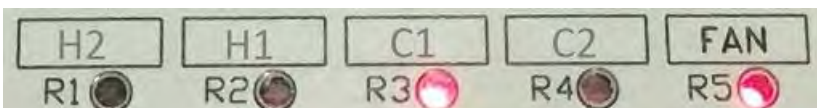
THE 5 OUTPUT RELAY STATUS IS DISPLAYED BY AN LED - ILLUMINATED = RELAY ON

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.

X1	X2	X3	X4	X5	X6	X7		M	D1	D2	D3	D4	E	M
−	+	1	2	3	4	5	6	7	8			Y1	Y2	Y3
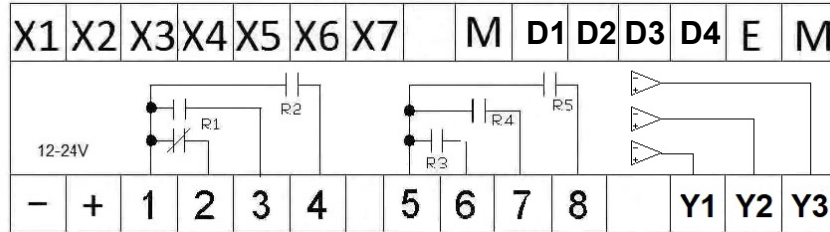
- 12-24 Volt Supply Neutral
(internally connected to terminals M)

+ 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

SDT-D
OUTSIDE AIR
TEMPERATURE
SENSOR

HUMIDITY
SENSOR
%RH
Y G G0

NOTE :
WE STRONGLY RECOMMEND THE USE
OF TWISTED PAIR SCREEN CABLE
FOR ALL SENSOR WIRING

SDT-D
S/A DUCT
TEMPERATURE
SENSOR
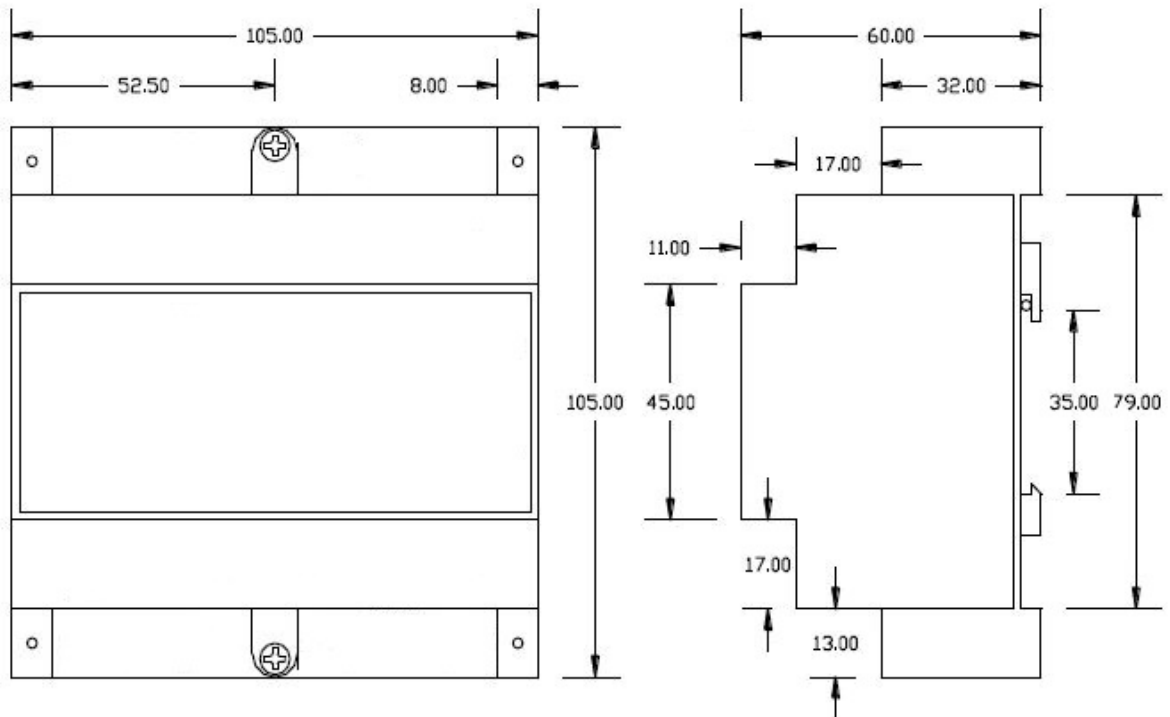
ROOM CO2
SENSOR
CO2
Y G G0

SRT3-D
ROOM
TEMPERATURE
SENSOR

A/C RUN
A/C FAULT
A.H.R
D.P FAN PROVE

MODBUS
COMMS.
looped to
all MBEIO's

CONTROLLED
BY BMS
SYSTEM

X1 X2 X3 X4 X5 X6 X7   M D1 D2 D3 D4   M
MBEIO

− + 1 2 3 4   5 6 7 8   Y1 Y2 Y3

24V~

A/C ACTIVE
COMPRESSOR 3
COMPRESSOR 2
A/C NEUTRAL
COMPRESSOR 1
R/V HEAT
SUPPLY AIR FAN
MOD.FAN SPEED
MOD.COMPRESSOR 1

A/C UNIT

G G0 Y
G G0 Y
G G0 Y

MODULATING
ECONOMY CYCLE
DAMPER MOTORS

ROOM TEMP./
CO2 SENSOR
C/W SETPOINT
& AHR BUTTONS

D.P
G G0 Y

DIFFERENTIAL
AIR PRESSURE
SENSOR

HSMO-DAQT
1 2 3 5 6 7

TEMP.
SETPOINT
CO2
AHR

MODBUS
COMMS.
looped to
all MBEIO's

X1 X2 X3 X4 X5 X6 X7   M D1 D2 D3 D4   M
MBEIO

− + 1 2 3 4   5 6 7 8   Y1 Y2 Y3

24V~

G G0 X
H/V

G G0 X
V.A.V

HE-DELP
4 5 1 2

MODBUS
ROOM SENSOR c/w
Temp.,Humidity &
CO2 measurements

OFF   ON
AUTO

MODBUS
COMMS.
looped to
all MBEIO's
& HEDELPS

X1 X2 X3 X4 X5 X6 X7   M D1 D2 D3 D4   M
MBEIO

− + 1 2 3 4   5 6 7 8   Y1 Y2 Y3

LOCAL RUN
LAMP INDIC.

24V~

G G0 X
H/V

G G0 X
C/V

G G0 X
O/A