CN1132
Auto/Hand IO Expansion Module

ebmpapst

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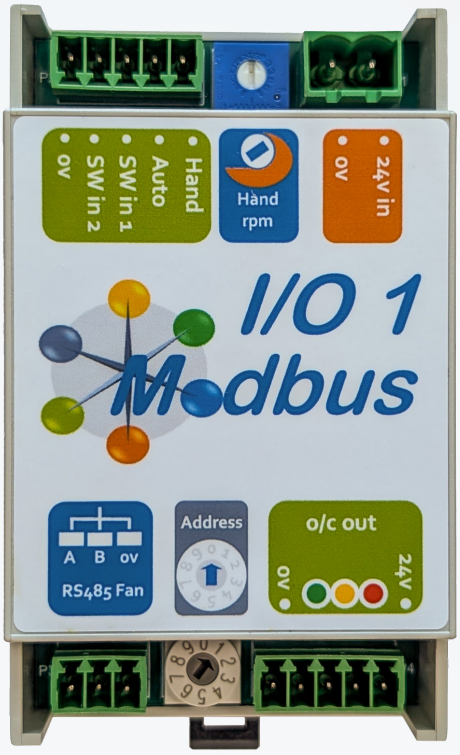

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⚠ Important ⚠

To assure proper usage, we ask you to read these operating instructions carefully before installation and commissioning of the control device.

⚠ **NOTE:** The table below identifies the features compatible with your controller's firmware issue number. This is shown in the configuration app when connected and on the label at the back of the printed circuit board.

Firmware Issue	Notes
1.1.0	As per this OMI release

1.0 General notes

Before installation and start-up of the Auto/Hand Module, please read this OMI carefully to ensure correct use. This OMI applies only to the Auto/Hand Module and not for the complete system it is connected to. It is recommended to keep a copy of these operating instructions together with the device. It must be ensured that all persons that are to work on the device can refer to the operating instructions at any time.

1.1 Exclusion of liability

To allow for future developments, in fan technology and controller refinements, any technical data given here is subject to alteration. We do not accept any liability for possible errors or omissions in the information contained in the data, illustrations or drawings provided. We accept no liability for damage caused by misuse, incorrect use, improper use or as a consequence of unauthorised repairs or modifications.

1.2 Introduction

The Auto/Hand IO Expansion Module is a device that is designed to be used with Modbus Monitor & Control Unit (MMCU). The 'RS485 fan' port is used to connect to the main Modbus loop controlled by MMCU. The Auto/Hand IO Expansion Module adds external panel mounted controls.

2.0 Safety notice

⚠ CAUTION – Safety

The Auto/Hand IO Expansion Module is only suitable for a safety extra low voltage supply of 24VDC up to 57VDC or 24VAC. An isolated voltage supply is recommended to be used.

⚠ CAUTION – Electro-Static Discharge

Many modern electronic components are susceptible to damage from Electro-Static Discharge (Static Electricity). During programming and commissioning, avoid unnecessary contact with electronic components on PCBs. PCBs are sensitive to static discharges so should be stored and transported in anti-static packaging until they are required to be used.

⚠ Warning – Do not operate in an explosive atmosphere.

⚠ Warning – The fans may start during connection and programming. If there is a residual risk of contact with a fan, then contact shall be prevented by suitable control methods to prevent accidental contact.

3.0 Overview

3.1 Specification

Product	Auto/Hand IO Expansion Module - CN1132
Supply Voltage (Reverse Polarity Protected)	24 VDC nominal (12 to 57VDC) from an external PSU or 24 VAC nominal (20 to 28VAC) from an external transformer
Supply Current	Max 100mA
Enclosure	DIN rail mount IP20
Enclosure Dimensions	See Section 6.0
Weight	70g
Operating Environment	-20°C to +60°C, 90%RH at 40°C max.
EMC Compliance	EN61000-6-3 (emissions) EN61000-6-1 (immunity)
Safety Compliance	EN62368-1

Table 1 - Specification information

3.2 Installation

Avoid exposure to vibration, high temperatures. The unit shall be installed according to relevant safety guidelines and requirements. Attention should be paid to local regulations and guidance.

3.3 Hot plugging

Hot plugging the controller is permissible, however, if a new or replacement controller is not at factory default settings, it will need to be reset to such.

3.4 RS485 wiring

For reliable communication with the fans and MMCU, it is recommended to use shielded twisted pair cable with 120Ω impedance (RS485 standard cable), in a “Daisy Chain” wiring layout, run separate from mains supply wiring. We recommend placing the Auto/Hand Module right next to the MMCU. Auto/Hand Module is not designed to be placed at the end of the Modbus Loop.

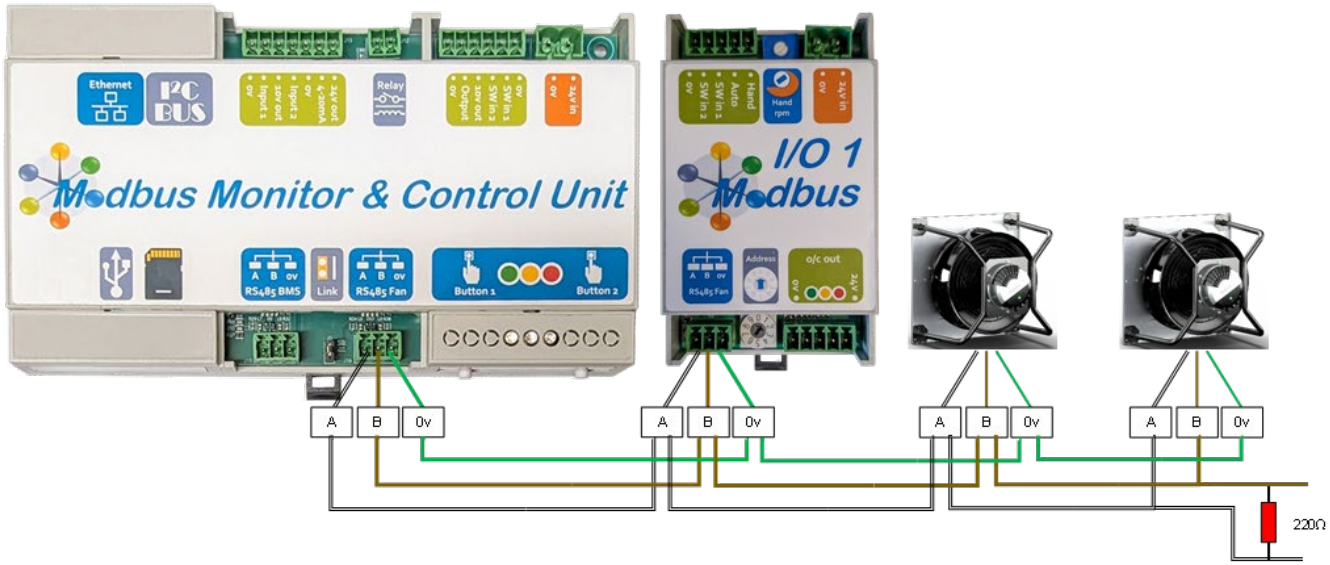


Figure 1 - RS485 connections - MMCU on end

4.0 Configuration and first use

4.1 Electrical connections

Connection	Pin	Description	Function
• 24v in • ov	24V DC in	Or 24V AC ~	Power in
	0V (GND)		
Hand rpm	Manual set	Hand speed adjustment	Setting the fan speed for Hand mode
• Hand • Auto • SW in 1 • SW in 2 • ov	Hand	Panel switch input - Hand	Connect to 0v - group of fans in Hand mode
	Auto	Panel switch input - Auto	Connect to 0v - group of fans in Auto mode
	SW in 1	External switch input - Hand	Connect to 0v - group of fans in Hand mode (priority)
	SW in 2	External switch input - Off	Connect to 0v - group of fans to Off (priority)
	0V	Common 0V GND	Ground reference for switch inputs

Table 2 - Connection details top row

Connection	Pin	Description	Function
	0V	Common 0V (GND)	Ground reference
	Green	Good / powered	LED indicator for good operation - Flashing
	Yellow	Warning	LED indicator for Warnings
	Red	Alarm	LED indicator for Alarms
	24V	24V output	24V reference for panel LED's
	Manual set	Modbus Address	Unique I/O address setting
	A	RS485 'A' pin	RS485 connection to Fans
	B	RS485 'B' pin	
	0V	Common 0V (GND)	

Table 3 - Connection details bottom row

⚠**CAUTION:** The controller cannot be powered by the fans Vout connection. It requires a separate power source.

4.2 Initial power ON

The Auto/Hand Module uses a 10-way rotary switch to set its Modbus Address. Default factory setting is position '0'. Change the address by turning the dial, it is recommended to set the address to '1' if this is the first module and then any further modules will follow sequentially.

The Offset Modbus Address for the Expansion Modules is '100 + a number set by the address dial'. Hence, addresses '101' to '109' are valid.

If more than one Auto/Hand Module is required to be connected, for example one for each group of fans, make sure that each module has a unique Modbus Address.

Once the address is set, the power can be applied to the module.

⚠ Note**:** If the Auto/Hand module is powered with address dial set to position '0', the open collector output for 'Red LED' will be set, representing an incorrectly set Modbus Address. In this case, switch the device off, set the valid Modbus Address and power the device up.

4.3 Communication Settings

The Auto/Hand Module's defaults settings are 19200 baud rate, even parity and 1 stop bits to match factory default settings for ebm-papst fans and MMCU's settings.

The Auto/Hand Module includes hardware that allows for the communication settings to be updated. Take the module out of its enclosure. Use below table to assist with the correct positions for the switches:

10-way Rotary Switch (SW4) - baud rate		2-way DIP Switch (SW5) - parity, stop bits		
Position	Setting	Switch		Setting
		1	2	
0	19200	OFF	OFF	Even, 1 stop bit
1	1200			
2	2400	OFF	ON	Odd, 1 stop bit
3	4800			
4	9600	ON	OFF	None, 2 stop bits
5	19200			
6	38400	ON	ON	None, 1 stop bit
7	57600			
8	115200			
9	115200			

⚠ Note: Changing the communication settings while the Module is powered has no effect. The settings are read on start up only.

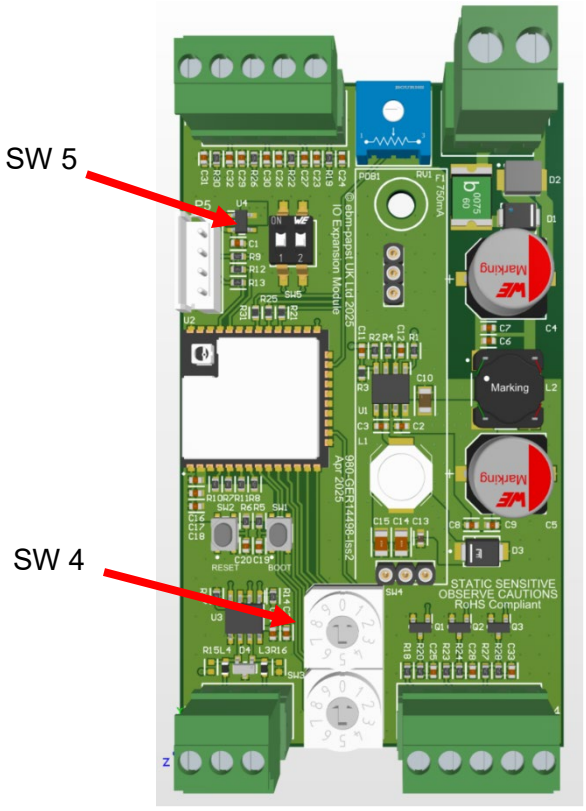


Figure 2 - Baud rate and Parity adjustment

5.0 Functionality

5.1 Overview

The Auto/Hand Module is designed to be connected to an Auto/Off/Hand panel mounted switch. The module reads the switch position and reports back to the MMCU, which updates MMCU's control.

An Auto/Hand Module controls one group of fans controlled by the MMCU. If there are 2 fan groups configured on the MMCU, two Auto/Hand Modules are required.

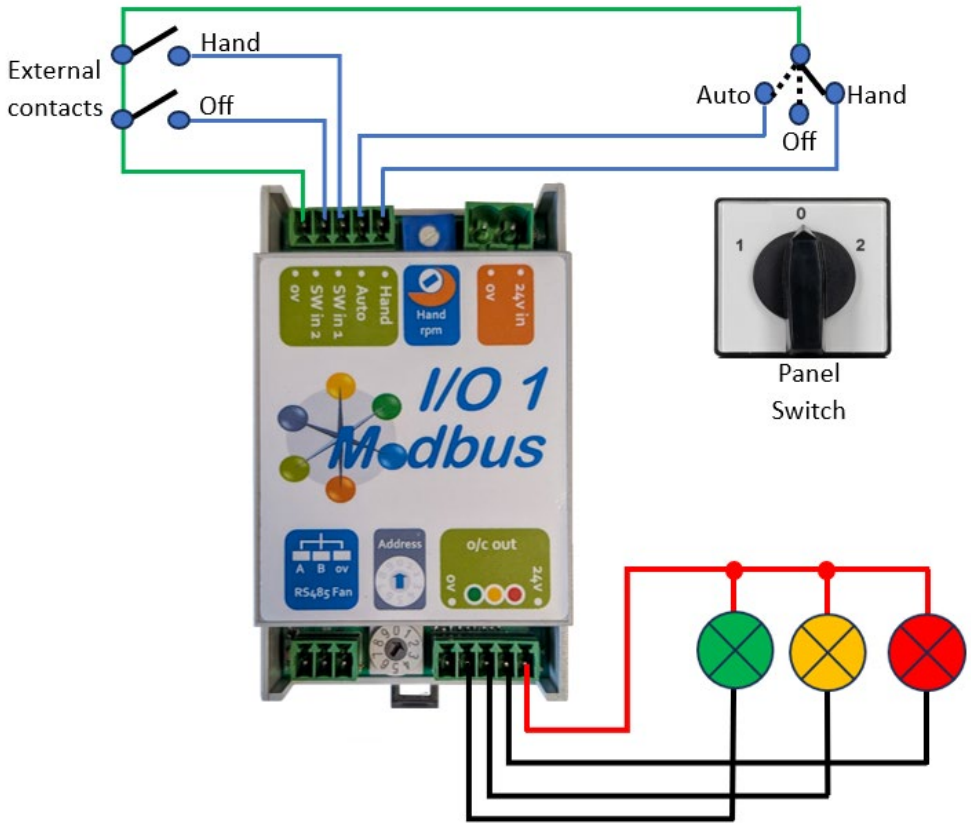


Figure 3 - Typical wiring for switches and LED's

Auto mode:

- When the Panel switch is in "Auto" position, fans in the corresponding MMCU group will be controlled in whatever mode the MMCU is set for.

Manual Hand mode:

- When the Panel switch is in "Hand" position, fans in the corresponding MMCU group will run at "Hand" speed. (See Section 5.2)

Manual Off mode:

- When the Panel switch is in "Off" position, fans in the corresponding MMCU group will stop.

External Hand mode:

- When an “External Hand” signal is received, fans in the corresponding MMCU group will run at “Hand” speed. (See Section 5.2)
- “External Hand” signal overwrites any manual signal.

External Off mode:

- When an “External Off” signal is received, fans in the corresponding MMCU group will stop.
- “External Off” signal overwrites any manual signal.
- “External Off” signal overwrites “External Hand” signal.

5.2 Hand Speed

When the Auto/Hand Module is running in either “Manual Hand” or “External Hand” modes, a 0-100% speed value is sent to MMCU.

This speed is adjusted via on-board potentiometer.

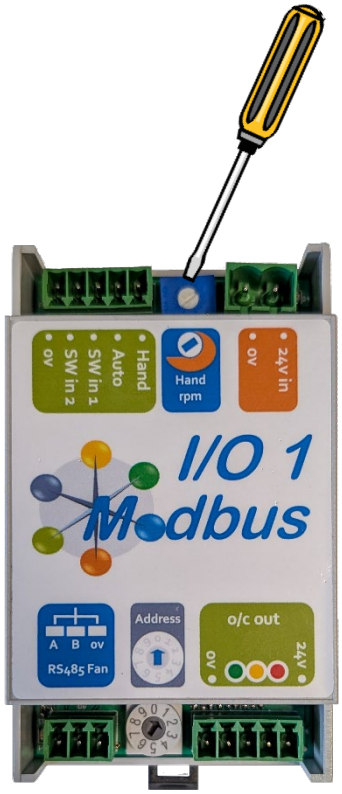


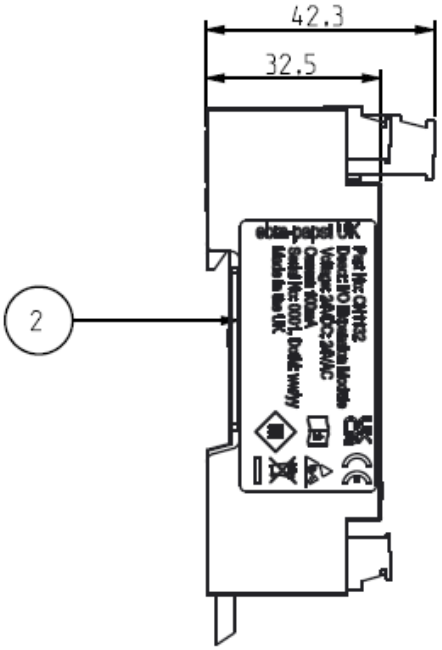
Figure 4 - Manual Hand speed adjustment

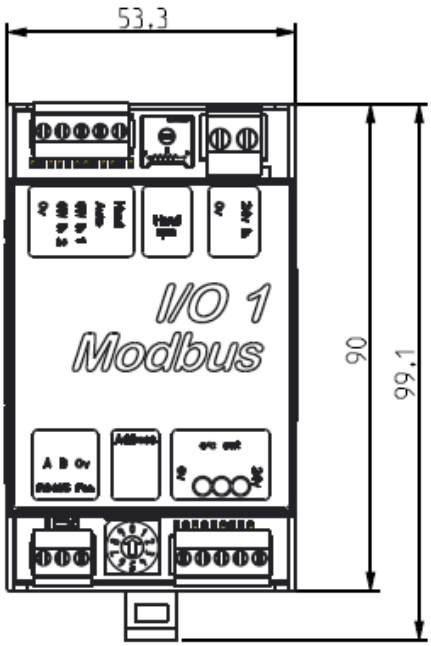
5.3 Open Collector Outputs

There are 3 open collector outputs on the Auto/Hand Module, which can be connected to panel door LEDs. The outputs mimic MMCU's LEDs.

Mode	LED Sequence
Normal operation, no Ethernet or no Wi-Fi or no Cellular connection, Wi-Fi is switched off.	Green pulsing 1sec on, 1sec off.
Normal operation, no Ethernet or no Wi-Fi or no Cellular connection, Wi-Fi is switched on.	Green pulsing 0.25sec on, 0.25sec off.
Normal operation, either Ethernet or Wi-Fi or Cellular connection is made.	Green is on solid.
Controller Detected Warning or Fan Warning.	Yellow pulsing 1sec on, 1sec off.
Inhibit signal.	Yellow is on solid. Priority over warning LED sequence.
Fan Alarm	Red is on solid.
Fan Addressing	Red and Green pulsing 1sec on, 1sec off. Yellow pulses quickly when finding fans
Mode Select	Green pulsing 1sec on, 1sec off, yellow pulsing on-off, red pulsing off-on at 0.25sec rate
Advanced Settings	All 3 lights are on solid.
Sensor Mapping	Sequence of lights: green, yellow, red, all off, repeat.
Resonance Avoidance	Sequence of lights: red, yellow, green, all off, repeat.

6.0 Dimensions



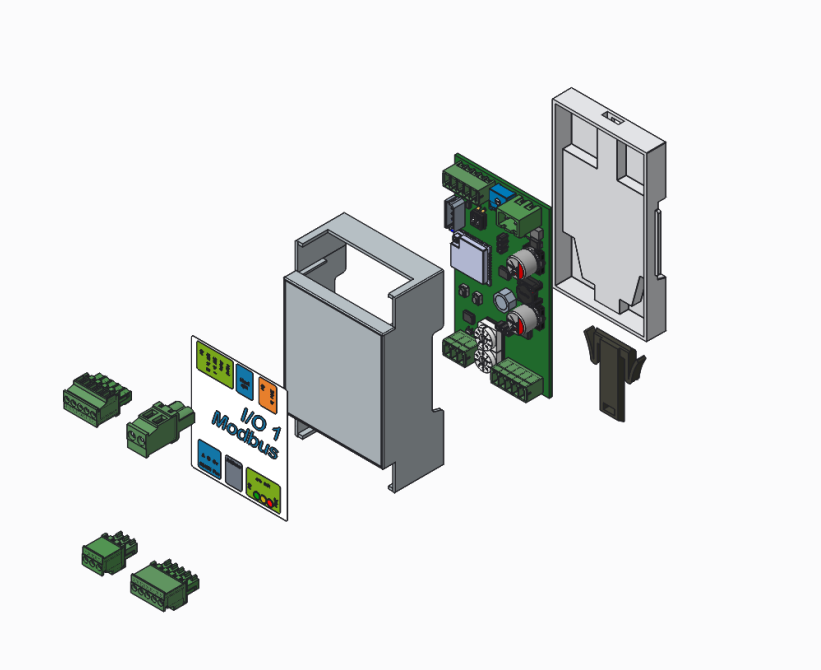


7.0 WEEE (Waste Electrical and Electronic Equipment)

ebm-papst UK Ltd complies with the Waste Electrical and Electronic Equipment (WEEE) Regulations through membership of a producer compliance scheme (PCS) as a B2B producer. EEE Producer registration number: WEE/CA0209WR.

8.0 End of life

This product has been designed to consider end-of-life disposal. If the product has come to the end of its life, the unit can be easily disassembled for the components to be recycled. The product has been designed to meet the requirements of the REACH & RoHS directives. Refer to the figure below when dismantling.



9.0 Take back policy

As part of our commitment to minimise the disposal of Waste Electrical and Electronic Equipment (WEEE) customers can return the controller at the end of its life. Please contact us on 01245 468555 for details and issue of an end of life RMA number.

10.0 Transport & Storage

PCBs not housed in enclosure should be transported in anti-static build-up bag or static dissipative bags.

- Store in a dry environment.
- Storage temperature: -20°C to +60°C.

11.0 Maintenance and servicing

There are no user serviceable parts.

12.0 CE Certificates

The product has been CE marked. The certificates are available upon request.

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