

Modbus Display & Control (MDC)

Document No: 210-OMI14229

Issue No: 10

Part No: CN1116 -Modbus Display & Control (MDC)


Manufacturer: ebm-papst UK Ltd

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Operating & Maintenance Instructions – Short Form

Part No	CN1116		
Description	Modbus Display & Control (MDC)		
			
Issue	Date	Author	Comments
10	03/03/2025	K. Zadoika	To be used with 980-CAS14438

Installation, Commissioning and Use

- To assure proper installation, commissioning and use download the full operating and maintenance instructions at www.ebmpapst.co.uk/instructions document identity 210-OMI14229 Modbus Display and Control.
- The UKCA / CE documentation for this controller is available upon request at info@uk.ebmpapst.com

Safety Notice

⚠ CAUTION – Safety

- The Modbus Display & Control is only suitable for a safety extra low voltage supply of up to 57 VDC.

⚠ 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 PCB's. PCB's which are sensitive to static discharges and 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

⚠ WEEE (Waste Electrical and Electronic Equipment) – Please see full Operating and Maintenance Instructions

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The Modbus Display & Control

The Modbus Display & Control (MDC) is a device with two RS485 Modbus ports, a keypad for setting parameters and a display to view the status of the connected equipment. The RS485 Modbus master port communicates with ebm-papst Modbus enabled, Electronically Commutated (EC) fans with software version 5.0 or later using a two-wire plus ground RS485 connection. The RS485 Modbus slave port communicates with an external Modbus Master device e.g. Building Management System (BMS) or IoT datalogger, and provide real-time monitoring and control data.

The MDC features a Modbus auto-addressing program to ease installation and commissioning where it automatically searches and addresses up to 100 EC fans connected to its RS485 Modbus master port.

Four different operating modes are supported:

Monitor:

- Monitors pre-defined fan parameters and displays the information on the LCD & RS485 Modbus slave port.
- A fault condition is raised by an on-board LED and a volt-free relay.
- An optional 0-10V differential pressure sensor can provide a signal to the controller to display either differential pressure or used to calculate and display volume flow.

Monitor & Control:

- As per Monitor operating mode plus the fan speed is controlled by one, or a combination of:
 - An external 0-10V control signal connected to the controller's 0-10V input.
 - A third-party Modbus Master device connected to the controller's RS485 Modbus slave port.
 - Local control using the controller's keypad.

Constant Volume / Constant Pressure:

- As per Monitor operating mode but requires one or multiple 0-10V differential pressure sensors used by the controller to maintain a constant volume / constant pressure setpoint configured via the keypad and/or the RS485 Modbus slave port.

Modbus Relay:

- This operating mode converts the controller into a simple messenger where it relays all Modbus information received from the RS485 Modbus slave port to the master port, enabling individual fan control and access to all Modbus Registers of each fan.

Specification

Product	Modbus Display & Control - CN1116
Supply Voltage (reverse polarity protected)	Two sets of connections are provided for either: <ul style="list-style-type: none"> • 9VDC to 24VDC from an optional external PSU or • 10VDC sourced from connection to the fans PSU* (note must be the >20 mA version and at least 2 fan's supplies are required in parallel)
Supply Current	20mA (low LDC backlight) – 40mA (full LCD backlight)
Enclosure	Wall Mount
Enclosure Dimensions	See full Operating and Maintenance Instructions document 210-OMI14229
Weight	204 g
Operating Environment	-20°C to +60°C, 90%RH at 40°C max.
EMC Compliance	BS EN61000-6-3 (emissions) BS EN61000-6-2 (immunity)

* Patent GB 2 431 303

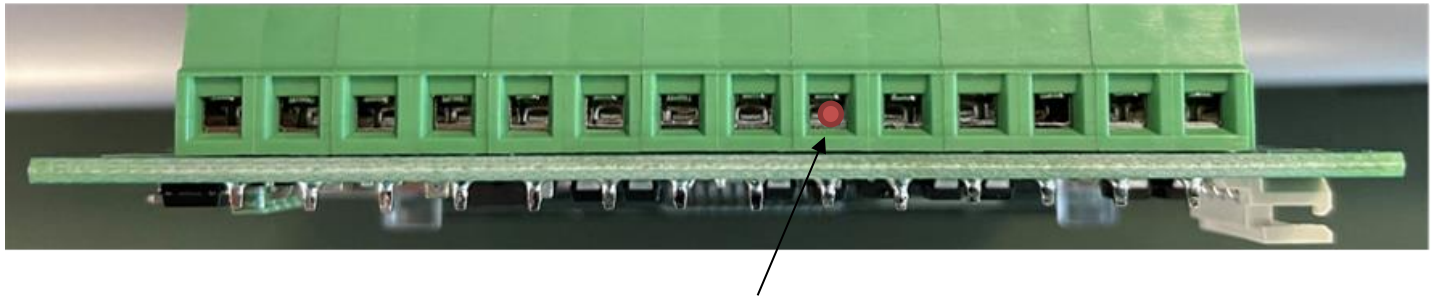
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Electrical Connections

The following is an image of the PCB showing location and identity of the connectors and pin functions.

0V	+	POT	0-10V	0V	A - FAN - B	0V	+	RELAY	A - BMS - B	0V			
0V (GND)	10V to 24VDC	+10V Output	0-10V Input	0V (GND)	RSA	RSB	0V (GND)	10V to 24VDC	Com Relay	N/C Relay	RSA	RSB	0V (GND)



Sealing Plug: **DO NOT CONNECT the 10VDC output from fans here if the controller is powered from an external power supply.**

PCB Label	Connection
0V	Common 0V (GND)
+	Power Supply +
POT	+10VDC Output (only when Supply is 24VDC)
0-10V	Speed Control Input / Pressure Sensor Input
0V	Common 0V (GND)
A	RS485 'A' from Fans
B	RS485 'B' from Fans
0V	Common 0V (GND)
+	Power supply +
Relay	Com Relay
	N/C Relay
A	RS485 'A' from 3 rd Party System e.g. BMS
B	RS485 'B' from 3 rd Party System e.g. BMS
0V	Common 0V (GND)

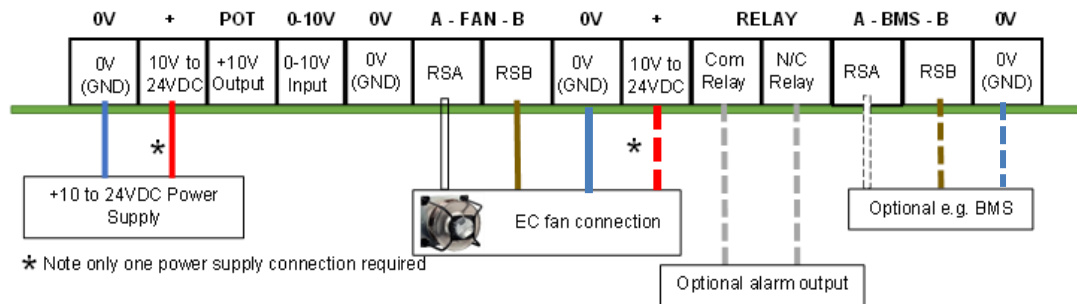
PCB Connector Identities and Pin Functions

Note: All “+” and “+24V” terminals are common (i.e. connected together)
All “0V” terminals are common (i.e. connected together)

Note: Do not connect anything to the 4-way plug-in “COM” connector or to the 5-way plug-in and “PROGRAMMER” connectors.

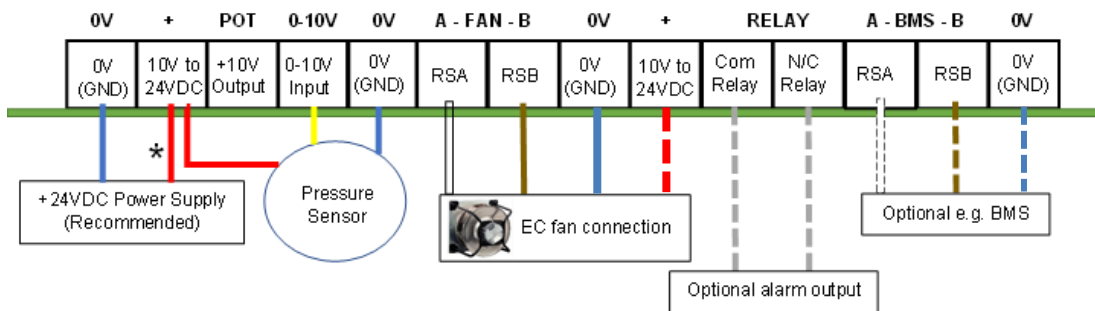
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Typical Wiring for Default Operation (Monitor Mode)



⚠ CAUTION: Danger of damaging the fan if two different power supplies are connected at the same time
Do not connect the fans' 10Vdc output to the controller if powering the controller from an external supply

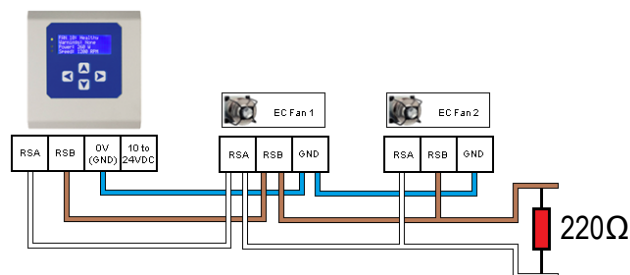
Typical Wiring for Constant Volume / Constant Pressure Operation



Alternatively, it is possible to connect the pressure sensor to the fan's 0-10V input - for more information please read the full operating and maintenance instructions document identify 210-OMI14229.

RS485 Wiring Installation

For reliable communication with the fans, it is recommended to use shielded twisted pair cable with 120Ω impedance (RS485 standard cable), in a "Daisy Chain" wiring layout, and run it separated from mains supply wiring. We recommend placing the controller at one end of the RS485 network and to add a 220Ω termination resistor at the other end of the network cable as shown below:



In case the controller is in the middle of the network, the built-in termination resistor must be taken out of the circuit by removing the jumper bar located on back of the PCB. If that is the case, two resistors of the same value must be added at each end of the network.

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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 at temperatures: -20°C to +60°C.

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