# Modbus Bias Module MBM-1™

## For Modbus RS-485 (ASCII or RTU)

## DATA SHEET


## FEATURE SUMMARY

- Pull and termination resistors
- Fully potted
- Pluggable terminal blocks
- Made in USA.

## DESCRIPTION

Modbus data can be transmitted using RS-485 networks. These can be configured as full-duplex or half-duplex data buses. Half-duplex networks use the same lines for receive and transmit.

In half-duplex configurations, when neither a slave or master is driving the bus, the lines may float to marginal voltages. Floating data lines can sometimes cause the receiver chips to see data when there is really nothing there. The result is intermittent communication errors (framing and CRC errors).

Data errors can be prevented by pulling the lines to the idle state. However, if too many devices on an RS-485 include pull resistors, the data signal can be affected. Consequently, device manufacturers may leave it up to the automation technician to understand the nature of the network and add biasing as required.

**Dyacon Modbus Bias Module MBM-1™** was designed to address this issue by providing specific pull and termination resistors in a rugged, convenient package.

**MBM-1™** is available for specific devices powered by 5 V, 12 VDC, and 24 VDC supplies.

## KEY FEATURES

**Construction:** Fully potted circuitry.

**Connection:** 5.08 mm pitch pluggable terminal blocks with screw clamp.

Pass-through supply voltage for 12 V and 24 V versions.

Pass-through data.

## APPLICATION

**Modbus Bias Module MBM-1™** May be needed when connecting low-power Modbus slave devices to PLCs, SCADA, and Modbus RTU converters.

The following are two typical uses.

1) Dyacon weather station controller CM-1™ connects to a PLC.

MBM-1-024 (24 V) would be wired to the PLC, connecting +V and Gnd to the 24 VDC power supply and A and B single lines to the same Master connector.

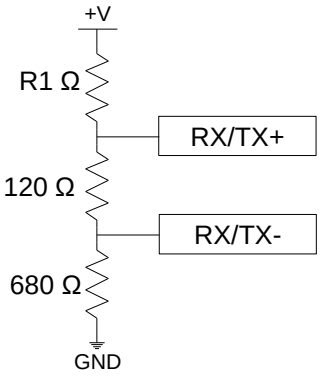
Slave Device A and B signals would then connect to the CM-1 slave port. CM-1 power can also be routed over a second pair of wires and would connect to the Battery connector of CM-1.

2) Dyacon sensor connects to PLC.

Dyacon Modbus RTU sensors can be connected to PLCs. Power and data would connect to the master side of MB-1-024 and the sensor would be connected to the slave side.

## ELECTRICAL

| | |
|---|---|
| Power Input | 5 VDC, 12 VDC, or 24 VDC |
| Current | Passive resistive load only.<br>-005 (5 V): ~3 mA<br>-012 (12 V): ~6 mA<br>-024 (24 V): ~6 mA |




| Model | +V | R1 Value |
|---|---|---|
| -005 | 5 V | 680 Ω |
| -012 | 12 V | 1.3 kΩ |
| -024 | 24 V | 2.7 kΩ |

*Illustration 1: Internal Connections*

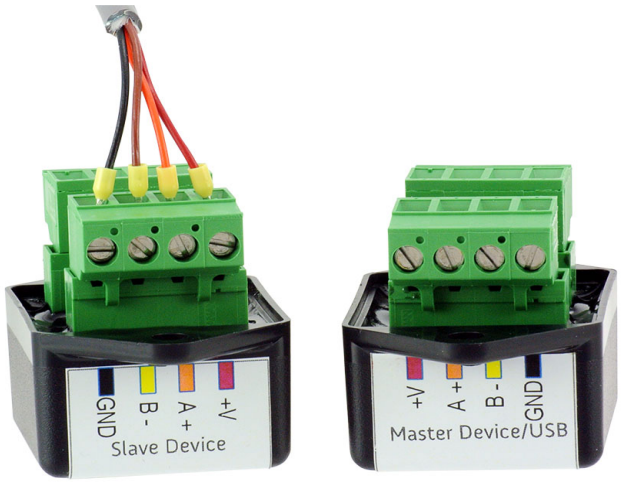



*Image 1: MBM-1-012*

## ENVIRONMENTAL

| | |
|---|---|
| Operating Temperature | -40°C to 80°C |
| Storage Temperature | -40°C to 80°C |
| Humidity | 0% to 99%, non-condensing |

## MECHANICAL

| | |
|---|---|
| Material | ABS enclosure, epoxy, Polyamide 6.6 connector body |
| Overall (WxDxH) | 3.18 cm x 3.8 cm x 3.3 cm<br>(1.25” x 1.5” x 1.3”) |
| Total Weight | 44 g (1.6 oz) |

## DATA

| | |
|---|---|
| RS-485 | Pass-through. No active circuitry. |

## COMPATIBILITY

| | |
|---|---|
| Dyacon Controllers | CM-1 |
| Dyacon Sensors | WSD-1, TPH-1, GT-1, LD-1, PM-1 |
| RS-485 to USB Conveter | CNVTR-USB-RS485<br>(Use with -005 only) |


*Image 2: MBM-1-005 shown w/ CNVTR-USB-RS485.*