C441M Motor Insight™ Modbus Communication Module Product Installation Leaflet

Mounting Instructions

To mount the Modbus® communication module to the Motor Insight overload relay, first make sure power is disconnected. Next, align the communication module with the overload realy, using the 10-pin header as reference for the correct orientation. Hook the lower tabs (furthest from the 10-pin header) into the base unit, and then rotate the communication module into position until a click is heard.

Quick Start

The following parameters configure the Modbus communication interface. Parameters may be set either with the user interface or through the Modbus port. For more information on setting the parameters via the user interface, please reference user interface section of Motor Insight User Manual MN04209001E.

TABLE 1. MODBUS PARAMETERS

MODBUS PARAMETER	UI INTERFACE	MODBUS REGISTER	DEFAULT	NOTES
Modbus Address	Operation Parameter	431	1	Must be unique and between 1 and 247.
Modbus Baud Rate	Advanced Parameter P.00	432	19.2K	Requires power cycle reset to take effect.
Modbus Parity	Advanced Parameter P.01	442	8,e,1	8 data bits, even parity, 1 stop bit. Requires power cycle reset to take effect.
Comm Loss Behavior[1]	Advanced Parameter P.04	441	1	Default is 1 for fault.
Comm Loss Timeout	----	440	2000	2 seconds.
Configuration Reset	Advanced Parameter P0.05	402	0, no reset asserted	Set to 1 to give power cycle reset (soft reset). Clears after reset asserted.

[1]To eneable comm loss behavior, write 136 to register 400.

Register Set

Please see the Motor Insight User Manual, MN04209001E for details on the Modbus register space.

TABLE 2. SPECIFICATIONS

PARAMETER	VALUE
Mode	Slave mode only
Modbus Address/Slave Address	1-247 (0 for broadcast) (1 is default)
Baud Rate	1200 Bd to 115k Bd (19,200 Bd default)
Byte Characteristics	8-bit. Even parity (default), 1 stop bit (default) Options: 8-bit, no parity, 2 stop bits 8-bit, odd parity, 1 stop bit
Slave Response to Master	10 ms plus the time it takes to transmit response (when applicable)
Commands Supported	0x01 Read Coils 0x02 Read Discrete Inputs 0x03 Read Holding Registers 0x04 Read Input Register 0x05 Write Single Coil 0x06 Write Single Register 0x0F Write Multiple Coils (15) 0x10 Write Multiple Registers (16) 0x17 Read/Write MUltiple Registers (23) 0x2B/0x0E Read Device Identification Get Device Identity (43/14)
Protocol Supported	Modbus RTU
Electrical Signaling	RS-485 (ANSI/TIA/EIA-485), Two-wire
Checksum	CRC 16-bit 0x8005 (for CRC-CCITT 0x1021)
Max. Data Signaling Error Accepted	2% in reception, 1% in transmission
Max. Number of Devices	32 (1 unit load per RS-485); Note: line polarization will reduce max. # of devices by 4.
LED Indication	Frame Reception (Rx) - Yellow Frame Transmission (Tx) - Yellow
Max. cable Length	Dependent on baud rate, cable characteristics (gauge, capacitance or impedance), number of loads. 4000 ft. max. theoretical. Reference MODBUS-IDA over Serial Line Specification and Implementation Guide and EIA-485 for details.
Max. Number of Writes to Non-Volatile Memory	Unlimited
Connector Style	Screw terminal
Network Topology	Two-wire Modbus, Daisy-chain and/or repeater
Line Polarization	Not required. Reference MODBUS over Serial Line Specification and Implimentation Guide and EIA-485 for more information.

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TABLE 3. MODBUS FIELD WIRING

PIN #	CIRCUIT	EIA-485 NAME	RECOMMENDED WIRE COLOR	DESCRIPTION
1	Common	C/C'	Grey	Signal and optional power supply com.
2	D1	B/B'	Yellow	Transceiver teminal 1, V1 Voltage, Data + (V1>V0 for binary 1 [OFF] state)
3	N/C			
4	DO	A/A'	Brown	Transceiver terminal 0, V0 Voltage, Data - (V0>V1 for binary 0 [ON] state)
5	N/C			

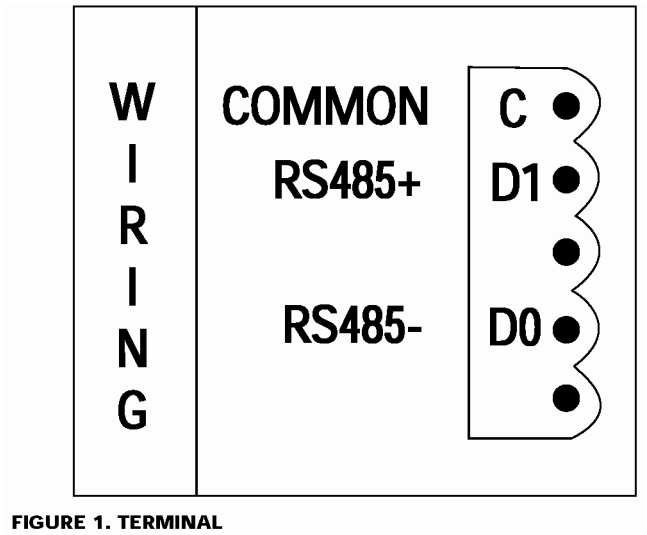

FIGURE 1. TERMINAL

TABLE 4. ENVIRONMENTAL SPECIFICATIONS

DESCRIPTION	SPECIFICATION
Ambient Operating Temperature	-20°C to 50°C
Storage Temperature	-40 to 85°C
Operating Humidity	5% to 95% non-condensing
Pollution Degree per IEC 60947-1	3
Overvoltage Category per UL® 508	III
Altitude	2000m
Vibration	3g in any direction
Shock	15g in any direction

TABLE 5. EMC/EMI

DESCRIPTION	SPECIFICATION
Radiated Emissions	IEC 60947-4-1 - Table 15, EN 55011 (CISPIR 11) Group 1, Class A, ISM Equipment for Industrial, Scientific, and Medical Equipment. 30 MHz to 1000 MHz.
Conducted Emissions	IEC 60947-4-1 - Table 14, EN 55011 (CISPIR 11) Group 1, Class A, ISM Equipment for Industrial, Scientific, and Medical Equipment. 0.15 MHz to 30 MHz.
ESD Immunity	IEC 60947-4-1, +/-8 kV air, +/-4 kV contact.
Radiated Immunity	IEC 60947-4-1 10V/m 80 MHz - 1000 MHz 80% Amplitude Modulated 1 kHz sine wave.
Conducted Immunity	IEC 60947-4-1 140 dBuV (10V RMS) 150kHz - 80 MHz
Fast Transient Immunity	IEC 60947-4-1 and IEC 6100-4-4 +/-2kV
Surge Immunity	IEC 60947-4-1 IEC 61000-4-5 Class 3.
Voltage Variations Immunity	IEC 60947-4-1 30% dip @100 ms 60% dip @10 ms >95% interrupt @5 ms
Power Freq. Magnetic Field Immunity	IEC 60947-4-1 30 A/m, 50Hz

Reference:

User Manual MN04209001E.

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