

OptiDrive Modbus Module Product Specification

Features

- ❑ Modbus RTU network interface
- ❑ Works with any Invertek OptiDrive
- ❑ Closed loop control optio
 - External hall-effect type sensor
 - PID values programmable via network
- ❑ Integrated Power Meter Function
 - Estimates kWh used by this drive
- ❑ Diagnostic LED for Network Status
- ❑ Powered from drive – no external supply required



Electrical Specifications

Parameter	Min	Typical	Max
Nominal Supply Voltage (From Drive)		10Vdc	
Ambient Operating Temperature (°C)	0	25°C	50°C
Supply Current (mA)		< 30mA	
Sensor Supply Current Output (mA)			15mA

Communications Specification

Summary of capabilities

- Modbus RTU protocol
- Selectable Physical medium
 - RS422 (4-wire)
 - RS485 (2-wire)
- Selectable baud rate – 1200 or 9600
- Network connection pass-through
 - Dual RJ-45 sockets (2 or 4 wire)
- Supports 1/8th unit load, for 255 devices per network
- Dip-switch or Plug in Module address selection
- Slew rate limited for improved performance

For assistance call 512-249-7526

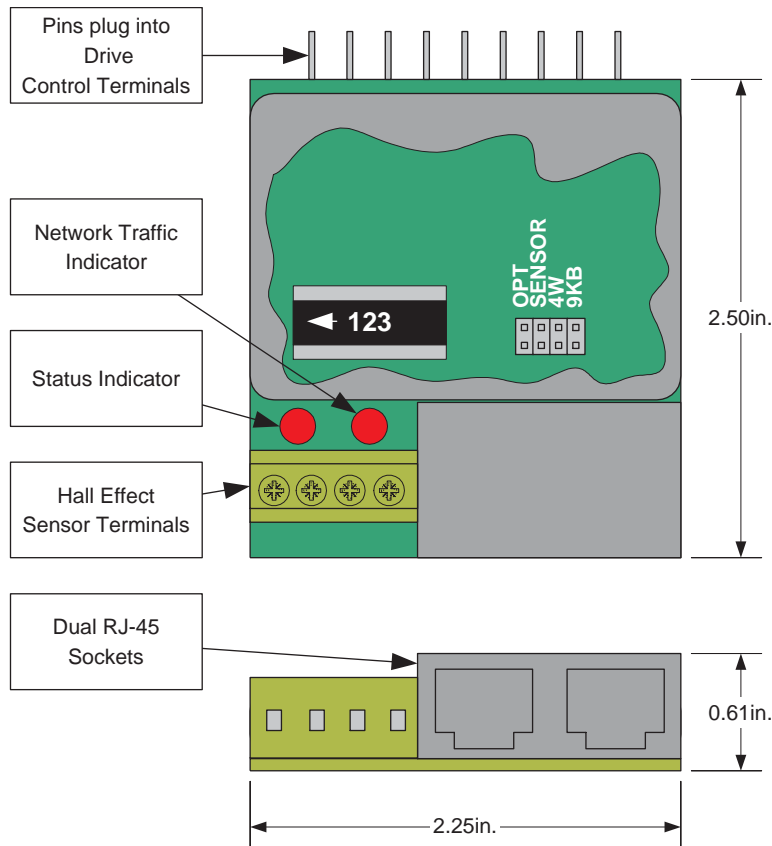
OptiDrive Setup

The following parameters must be set correctly to enable Modbus communications:

- Drive P-08 (Motor Rated Current) must agree with Modbus Register 8.
- Drive R-10 (Motor Rated Speed) must agree with Modbus Register 18.
- Drive P-12 (Terminal/Keypad Control) must be set '0' to enable terminal control.
- Drive R-16 (Analog Input Format) must be set to '0-10V' option.
- Drive P-25 (Analog Output Function) must be set to '1' to enable current sense output.

Mechanical Specification

The Modbus Module is a compact assembly which installs on the front of an Drive by connecting to the Drive's control terminal Block.



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Modbus Implementation

No parity, 8 data bits, 1 stop bit

Register Map

Register	Upper Byte	Lower Byte	Commands	Type
1		Bit 0: Start/Stop	03, 06, 08	R/W
2		Motor Speed (0-100%)	03, 06, 08	R/W
3	P Value		03, 06, 08	R/W
4	I Value		03, 06, 08	R/W
5	D Value		03, 06, 08	R/W
6	Current Motor Speed (RPM)		03	R
7	Current (Amps * 10)		03	R
8	Motor FLA (Amps * 10)		03, 06, 08	R/W
9	Configuration Jumpers		03	R
10		Default Speed (0-100%)	06	R/W
11	Version Major	Version Minor	03	R
12	Watt Hours (Wh)		03, 06, 08	R/W
13	1000's Watt Hours (kWh)		03, 06, 08	R/W
14		Bit 0: Default Start/Stop	06	R/W
15		Group 1 Address	06	R/W
16		Group 2 Address	06	R/W
17		Motor PF (1-100%)	03, 06, 08	R/W
18	Motor Rated Speed (RPM)		03, 06, 08	R/W
19	Motor Rated Voltage		03, 06, 08	R/W

Notes:

1. PID Values control the response characteristic in closed-loop mode. The values are not important in open-loop mode.
2. Motor PF trims the kWh calculation to allow for the motors PF. A value of 100 equals a PF of unity. The default value is 70 (PF = 0.7).
3. When Motor Speed is set to 100%, the drive will run at Motor Rated Speed.
4. The following configuration registers must be set correctly for the module to calculate Power Consumption:
 - a. Register 8 – Motor FLA
 - b. Register 17 – Motor PF (or leave at default)
 - c. Register 19 – Motor Rated Voltage
5. The kWh registers accumulate until zeroed by the Modbus master. If not zeroed they will eventually over-run.

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Installer

All drive parameters must be programmed using the front panel keypad or with an **OptiEye** programming device. Drive parameters are not configurable through the Modbus interface.

Dip Switch Address Selection

SW1-8	SW1-7	SW1-6	SW1-5	SW1-4	SW1-3	SW1-2	SW1-1
Addr 7	Addr 6	Addr 5	Addr 4	Addr 3	Addr 2	Addr 1	Addr 0

Or set addresses with a Plug-in Address module. This method requires no knowledge of binary coding. Each module is a factory programmed and labelled with a fixed address.

Jumper Options

A 3 way 0.1” header and shunts are used to select various options. The black plastic cover must be removed to access the header. Factory settings are indicated.

JP1	JP2	JP3
Baud	4-Wire	Sensor

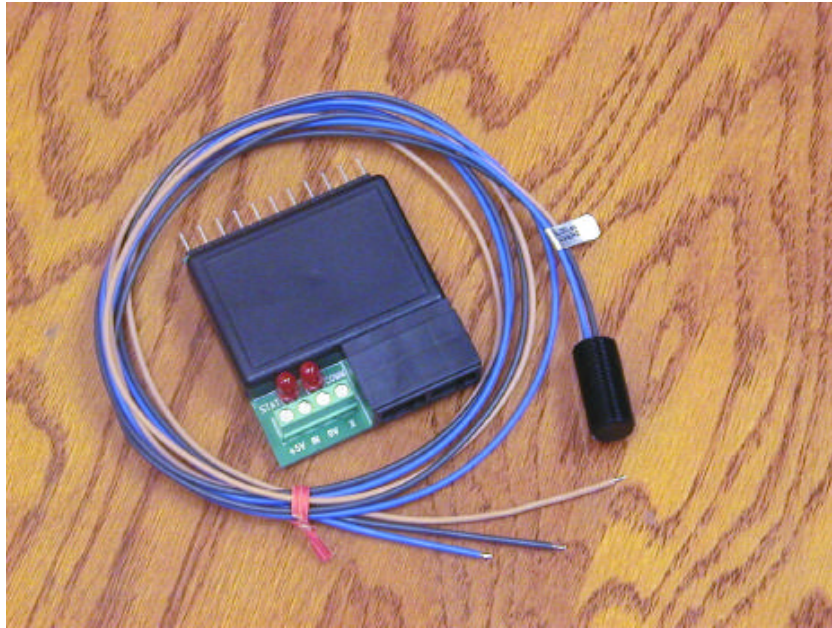
- Sensor Fit jumper to enable closed loop control using external sensor. If network control is enabled, the sensor will be used to control set speed in RPM. If local analog control is selected, the sensors only function is to detect locked rotor. If jumper position is open, the sensor input will be ignored.
- 4-Wire Fit Jumper to select 4-wire (RS422) communications. Default (jumper open) is 2-wire (RS485) communications.
- Baud Fit jumper to select 9600 baud. Default (open) is 1200 baud.

Connections

Ref	Type	Function	Pin	Detail
J1	4 position 0.2”Screw Terminal Block	Hall Sensor Signals	1	+5V output (15mA)
			2	Sensor Signal (Digital)
			3	0V - Common
			4	Unused
J2	RJ45 (x2)	Modbus Network (In/Out)	1	Pass through
			2	Pass through
			3	TX+ (4wire) A (2wire)
			4	RX- (4wire)
			5	RX+ (4wire)
			6	TX- (4wire) B (2wire)
			7	Pass through
			8	Pass through

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Modbus Module with Optional Hall Effect Sensor



Drive with Modbus Module Installed



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