



Emerson Motion Control

Axima Series, EN Series, Epsilon Series

Overview

Maple Systems’ **Silver Series Plus** Operator Interface Terminals (Maple OITs) communicate with Emerson Motion Control Axima controllers, EN drives and Epsilon Drives (Emerson controllers) using the Modbus RTU protocol. When configured with EZware, the Maple OIT is the master in a point-to-point single master, single slave format.

Compatible Controllers	
Family	Model
Axima Controllers	Axima 2000/4000 with Emerson Connectivity Processor (CP) card
EN Drives	EN-204, EN-208, EN-214, EN-216
Epsilon Drives	E(x)-202, E(x)-203, E(x)-205

Communications Cable

The Maple OIT should be connected to the Emerson Serial Communications port.

A list of communications cables offered by Maple Systems as well as cable assembly instructions to assist you in assembling your own communications cable are available on our website.

WARNING: If your communications cable is not wired exactly as shown in our cable assembly instructions, damage to the OIT or loss of communications can result.

Controller Settings

The E-Series Drive’s Serial Communication Protocol is Modbus RTU Slave with a 32-bit Data Extension.

Accessible Controller Memory

Register Memory

The following table lists the controller's register memory ranges that the Maple OITs are able to access. Please note that your controller's memory range may be *smaller* or *larger* than that supported by these OITs. The following register memory can be displayed in 16, 32, or 64 bit format on the Maple OIT.

Controller Register Address	Controller Register Description
30001 - 9999	Input Register, Read-Only, 16-bit Format
40001 - 49999	Holding/Output Register, 16-bit Format

Note: The 5x memory designator under Device Type is used for 32-bit representation. This memory area 'swaps' the most significant word and least significant word. The 6x memory designator forces the OIT to use MODBUS function code 6 instead of function code 16 when writing to multiple data registers.

Note: All Emerson EN, Epsilon and Axima Series drivers listed on this Controller Information Sheet will require use of the Modbus "5x" word swap when reading or writing to 3-bit registers in the servo drive. The 16-bit registers will still need the "4x" reference as the Device Type. Also, two words must be selected since the 32-bit registers within the Emerson Servo Drives use two 16-bit words. One exception is if an FM3 or FM4 module is plugged onto the servo, the Emerson programming software can be configured to enable the "word swap" feature; if this is done, the Maple Systems OIT can use "4x" as the Device Type when referencing 32-bit words in the Emerson Servo Drive.

For more information, see the Emerson Drives Parameter Manual on Modbus addresses used in the servo drive Example: When creating a Numeric Input Object using EasyBuilder, for an EN-204 Servo Drive, use Device Type 5X and Device Address 0023. This Modbus address indicates the servo drives power up time in minutes (this should display a number between 0 and 59), this is a 32-bit register using 40023 and 40024.

Discrete Memory

The following table lists the controller's discrete memory ranges that the Maple OITs are able to access. Please note that your controller's memory range may be *smaller* or *larger* than that supported by these OITs. The following discrete memory is displayable in single-bit format on the Maple OIT.

Controller Bit Address	Controller Bit Description
00001 - 09999	Discrete Coils/Output, Bit Format
10001 - 19999	Discrete Inputs, Read-Only, Bit Format

Note: the 3x_Bit memory designator under Device Type is used to write in individual bits of the 3x register memory. The 4x_Bit memory designator is used for the 4x register memory.

Important Memory Considerations

If your controller's memory range is smaller than the range supported by the Maple OITs, it is possible to configure the OIT to monitor a controller memory address which does not exist. Since this can cause unpredictable results, when you configure the OIT please ensure that all selected controller memory addresses are valid for your controller model.

Do not configure the OIT to write to any controller memory address which should only be written to by the controller.

The Maple OITs use the following Modbus function codes:

- 01 - Read output coils (ex. 00001)
- 02 - Read input coils (ex. 10001)
- 03 - Read data registers (ex. 40001)
- 04 - Read input registers (ex. 30001)
- 05 - Write output coils (ex. 00001)
- 06 - Write data registers (ex. 40001)
- 15 - Write multiple output coils (ex. 00001-00016)
- 16 - Write multiple data registers (ex. 40001-40016)

EZware Settings

The following table lists the communications settings that must be configured in EZware. These settings can be found in the Edit-Set System Parameters menu under the Device tab. Please note:

- the **Recommended Settings** column provides the recommended setting based upon the default settings most commonly used in the Emerson Motion Control drives
- the **Options** column lists EZware’s options; your controller may not support every option

Name	Recommended Settings	Options	Important Notes
Name:	Modbus RTU		Description label
HMI or PLC	PLC		
Location	Local	Local, Remote	Select local if PLC directly connected to OIT, remote if PLC connected thru another OIT
PLC type:	Modbus RTU		
PLC I/F:	RS232	RS-232, RS-485 2W, RS-485 4W, Ethernet	Must match the PLC port setting
PLC default station no.:	0	0-255	Must match the Modbus Port Setting
Settings: COM:	COM 1	COM1-COM3	Serial port of OIT connected to PLC
Settings: Baud rate:	19200	9600,19200, 38400,57600, 115200	Must match the Modbus port setting. Use the fastest baud rate supported by the Controller.
Settings: Data bits	8	7 or 8	Must match the Modbus port setting.
Settings: Stop bits:	2	1 or 2	Must match the Modbus port setting.
Settings: Parity:	None	Even, Odd, None	Must match the Modbus port setting.
Settings: Timeout (sec)	1.0	0.1 to 25.5	Adjust if longer timeout is required
Settings: Turn around delay (ms)	0	0-1000	Timeout period between OIT polls
Settings: Reserved 1:	0		Not Applicable
Settings: Reserved 2:	0		Not Applicable
Settings: Reserved 3:	0		Not Applicable
Settings: Reserved 4:	0		Not Applicable

Interval of block pack (words):	5	0-512	see <i>Silver Series Plus Installation and Operation Manual</i>
Max. read-command size (words):	32		Not Adjustable
Max. write command size (words):	32		Not Adjustable