



Emerson Motion Control

Axima Controllers, EN Drives, Epsilon Drives

Overview

Maple Systems’ OIT Family Operator Interface Terminals (Maple OITs) communicate with Emerson Axima controllers, EN drives, and Epsilon drives using Emerson’s Modbus communications protocol. Additionally, the Axima controllers can use simple ASCII communication.

To communicate using Emerson’s Modbus communications protocol, configure the Maple OIT with Maple Systems’ **OITware-200** configuration software (be sure to select the “Emerson Motion Control-Modbus” communications protocol). When configured with OITware-200, the **Maple OIT is the master** in a point-to-point single-master, single-slave or single-master, multiple-slave format.

To communicate using simple ASCII communications, configure the Maple OIT with Maple Systems **STEPware-100** configuration software. When configured with STEPware-100, the **Maple OIT is the slave** in a point-to-point single-master, single-slave or single-master, multiple-slave format.

Compatible Controllers		
Family	Model	Maple Software
Axima Controllers	Axima 2000/4000 with Emerson Connectivity Processor (CP) card	OITware-200
	Axima Classic, Axima 2000/4000, Axima ISA	STEPware-100
EN Drives	EN-204, EN-208, EN-214, EN-216	OITware-200
Epsilon Drives	E(x)-202, E(x)-203, E(x)-205	OITware-200

Communications Cable

Connect the Maple OIT to the RS-232 or RS-422 communication 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 at www.maple-systems.com/cables.htm.

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

OITware-200 Settings

The following table lists the communications settings that must be configured in OITware-200. Please note:

- The Default column lists OITware-200's default setting; your controller's default may be different.
- The Options column lists OITware-200's options; your controller may not support every option.

Name	Default	Options	Important Notes
Baud rate	19200	19200, 9600, 4800, 2400, 1200, 600, 300	Must match the controller's port settings. Use the fastest baud rate supported by both.
Parity	None	Even, Odd, None, Mark, Space	Must match the controller's port settings
Data bits	8	7, 8	Must match the controller's port settings
Stop bits	2	1, 2	Must match the controller's port settings
Status coils (optional)	385	000001 to 065536 400001 to 465536	Must be within the controller's supported memory range
Address, source address	N/A		
Destination address (net address)	1	1 to 247	Must match the controller's network address
Password	N/A		
Message request register (optional)	400001	000001 to 065536 400001 to 465536	Must be within the controller's supported memory range
Current message register (optional)	400003	000001 to 065536 400001 to 465536	Must be within the controller's supported memory range
Function key coils (optional)	401	000001 to 065536 400001 to 465536	Must be within the controller's supported memory range
Screen-dependent function key coils (optional)	369	000001 to 065536 400001 to 465536	Must be within the controller's supported memory range. Applies to OITs with screen-dependent function keys.
Control key coils (optional)	433	000001 to 065536 400001 to 465536	Must be within the controller's supported memory range

Name	Default	Options	Important Notes
Status LED coils (optional)	1	000001 to 065536 400001 to 465536	Must be within the controller's supported memory range. Applies to OITs with status LEDs.
Function key LED coils (optional)	417	000001 to 065536 400001 to 465536	Must be within the controller's supported memory range. Applies to OITs with function key LEDs.
NVRAM	Enable	Enable/Disable	Sets Coil 01002 to copy RAM to NVRAM

Controller Memory Considerations

(when Maple OIT configured with OITware-200)

Accessible Register Memory

The following table lists the controller's register memory ranges that Maple's OITs are able to access. Please note that your controller's memory range may be *smaller* or *larger* than that supported by Maple's OITs. The following register memory is displayable in 16-bit or 32-bit formats on the Maple OIT.

Controller Register Address	Controller Register Description	Access
300001 to 365536	Input registers	Read only 16-Bit registers
400001 to 465536	Holding/output registers	Read/write 16-Bit registers

Accessible Discrete Memory

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

Controller Bit Address	Controller Bit Description	Access
000001 to 065536	Discrete coils/outputs	Read/write coils
100001 to 165536	Discrete inputs	Read only coils

Important Memory Considerations

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

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

Accessing the 1XXXX Coils or 3XXXX Registers

Although the OITware-200 configuration software allows the programmer to select read/write access for 1XXXX and 3XXXX memory, these controller memory areas are designed to be read only.

On using Bank 8 or Bank 16 formats

When you use these formats, each drive coil (bit) is individually displayed in terms of 1 and 0, with the lowest addressed coil displayed in the right-most position in the field. Therefore, if you use coils 00001-00016, 00016 is the most significant bit displayed in the left-most position and 00001 is the least significant bit displayed in the right-most position.

On using BCD4, Signed, or Decimal formats

If a coil address is used (0XXXX or 1XXXX), then the specified address is the least significant bit of the register monitor and the next 16 consecutive coils are used.

On using BCD8 or Long formats

When you use these formats, if a 16-bit memory address is used (3XXXX or 4XXXX) the specified address is the most significant word of the register monitor with the next consecutive address representing the least significant word of the register. For example, suppose register 40001 is displayed as a register monitor on the OIT using BCD8 format. The current value in register 40001 is 0x1234, and the current value in register 40002 is 0x5678. The OIT would display register monitor 40001 as 12345678.

If a coil address is used (0XXXX or 1XXXX), then the specified address is the least significant bit of the register monitor and the next 31 consecutive coils are used.

STEPware-100 Settings

The following table lists the communications settings that must be configured in STEPware-100.

Please note:

- The Settings column lists STEPware-100's settings for Emerson Motion Control Axima controllers.
- The Options column lists STEPware-100's options; your controller may not support every option.

Name	Settings	Options	Important Notes
Baud rate	9600	19200, 9600, 4800, 2400, 1200, 600, 300	Must match the controller's port settings. Use the fastest baud rate supported by both.
Parity	None	Even, Odd, None, Mark, Space	Emerson Axima controllers support only no parity.
Data bits	8	7, 8	Emerson Axima controllers support only 8 data bits.
Stop bits	1	1, 2	Emerson Axima controllers support only 1 stop bit.
Operating mode	Block	Interactive, Block, Network Modes	Attached sample code requires block mode.
Line terminator	CR	CR, LF, CR/LF, ETX	Attached sample code requires CR.
Turn-around delay	No delay	50, 100, 250, No Delay	

Name	Settings	Options	Important Notes
Handshaking	None	None, Xon/Xoff, RTS/CTS, both	Emerson Axima controllers do not use handshaking.
Password	00000	Any 5-digit value	Application specific
Local echo	Enabled	Enabled/disabled	
Local setup enabled	Enabled	Enabled/disabled	
Local keyboard enabled	Enabled	Enabled/disabled	
Key click enabled	Enabled	Enabled/disabled	
Block echo enabled	Enabled	Enabled/disabled	
Delayed Line Feed Enabled	Disabled	Enabled/disabled	
Append Line Feed	Disabled	Enabled/disabled	
Use 3-Wire RS485	Disabled	Enabled/disabled	Available only in network mode

NOTE: STEPware provides a full range of display and control functions. See STEPware Help, under *ESCAPE Control Commands*, for a complete list.

Sample Programs (when Maple OIT configured with STEPware-100)

Below are code fragments for communicating with the OIT. All samples are using Communications Port #1.

The OIT should be set for Block mode. The Line Terminator should be set as CR.

```

Comment = open the com port
Generic = OPEN "COM1:9600,N,8,1" AS #1
Comment = prompt operator
Generic = PRINT #1, "ENTER VALUE ";
Comment = get operator input
Generic = INPUT #1, NEW$
Comment = store new value
Generic = NEWVAL = VAL(NEW$)

{Code to do something with NEWVAL}
. . . . .
. . . . .
. . . . .
. . . . .
Generic = Close #1
End Of Program

```

Displaying a Pre-Programmed Message

The controller can instruct the OIT to display a pre-programmed message. This can be useful for showing alarm or status messages, without having to place code in the Controller for a lot of Text messages.

The following code will display OIT message numbers 1-25, pausing for 500 msec between messages.

```
Generic = OPEN "COM1:9600,N,8,1" AS #1
MSG=0
LABEL START_LOOP
MSG=MSG+1
Comment = format a message to the OIT: ESC m [msg num] STX
Generic = PRINT #1, CHR$(27) + "m"+ STR$(MSG) + CHR$(2)
Dwell For 0.5 Seconds
If (MSG<25) Then Do
    GoTo START_LOOP
End If/Then
Generic = Close #1
End Program
```

Sounding the OIT's Built-In Buzzer

The controller can instruct the OIT to sound its buzzer for a specified number of seconds.

The following code will sound the OIT's buzzer for 2 seconds.

```
Generic = OPEN "COM1:9600,N,8,1" AS #1
Comment = format a message to the OIT: ESC g [seconds] STX
Generic = PRINT #1, CHR$(27) + "g2"+ CHR$(2)
Generic = Close #1
End Program
```

NOTE: STEPware provides a full range of display and control functions. See STEPware Help under *ESCAPE Control Commands* for a complete list.