



# Entertron Industries

## Programmable Controllers

### Overview

Maple Systems' **Silver Series** Operator Interface Terminals (Maple OITs) communicate with Entertron Industries PLCs 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. Please refer to the *Silver Series Installation and Operation Manual* for information on connecting multiple Maple OITs to a single PLC port.

Compatible PLCs	
Family	Model
Programmable Controllers	SK1600-R-SA, Elite 2000, Smart-Pak, Smart-Pak Plus

### Communications Cable

The Maple OIT should be connected to the 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.

### PLC Settings

Configure the programmable controller port as a Modbus RTU slave mode by using the Entertron-Modbus protocol software, P/N V4.MODBUS. This software will give you full Modbus capability.

PLC Modbus Address is set in one of the internal registers (TC243) in the PLC system.

TC243- Addresses 27 and 47 are forbidden by Entertron and stated to provide unpredictable results if utilized.

# Accessible PLC Memory

## Register Memory

The following table lists the PLC's register memory ranges that the Maple OITs are able to access. Please note that your PLC'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.

PLC Register Address	PLC Register Description
30001 - 30250	Input Register, 16-bit Format
40001 - 40250	Holding Register, 16-bit Format

## Discrete Memory

The following table lists the PLC's discrete memory ranges that the Maple OITs are able to access. Please note that your PLC'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.

PLC Bit Address	PLC Bit Description
00001 - 00149	Coils, Bit Format
10001 - 10048 (PLC Dependent)	Inputs, Bit Format

## Important Memory Considerations

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

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

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 PLC tab. Please note:

- the **Recommended Settings** column provides the recommended setting based upon the default settings most commonly used in the Entertron Industries PLC
- the **Options** column lists EZware-500's options; your PLC may not support every option

Name	Recommended Settings	Options	Important Notes
PLC type:	Modbus RTU Extend V3		See Controller Information Sheet 1033-0045 <i>Modbus Generic Series</i> for more information
Serial port I/F:	RS232	RS232, RS485	
Data Bits:	8	7 or 8	Must match the PLC's port setting.
Stop Bits:	2	1 or 2	Must match the PLC's port setting.
Baud Rate:	19200	9600,19200, 38400,57600, 115200	Must match the PLC's port setting. Use the fastest baud rate supported by the PLC.
Parity:	None	Even, Odd, None	Must match the PLC's port setting.
HMI station No.:	0	0-255	Does not apply to this protocol.
PLC station No.:	1	0-31	Must match the Modbus port setting.
Multiple HMI:	Disable	Disable, Master, Slave	use for multiple OITs
HMI-HMI link speed:	38400	38400, 115200	use for multiple OITs
PLC time out constant (sec)	3.0	1.5 to 5.0	adjust if longer timeout is required
PLC block pack:	0	0-10	see <i>Silver Series Installation and Operation Manual</i>