



Modbus RTU Master Series

Overview

Maple Systems' **BLU300 Series** Operator Interface Terminals (Maple OITs) communicate with any device that uses the Modbus RTU protocol. When configured with the BlueLeaf configuration software, the Maple OIT is the master in a point-to-point single master, multiple slave format. RS485 networking is supported to connect multiple MODBUS slave devices to a single Maple OIT.

The MODBUS RTU Master protocol driver has the following features:

- Network support using RS485 3-wire connection
- Ability to use High Word First format or Low Word First format for 32-bit data stored in 3x and 4x memory
- Ability to read/write to individual bits in 3x and 4x memory

Communications Cable

The Maple OIT should be connected to the device's Modbus 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 OIT or loss of communications can result.

Controller Settings

The Modbus port on the Controller must be set to RTU Slave master mode in order to properly communicate with the OIT (working as a slave).

Accessible 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.

PLC Register Type	Address Range	Format	PLC Register Description
3x	1-65535	dddd (d=decimal)	Input Registers (Read Only)
4x	1-65535	dddd	Holding Registers
Sw3x	1-65535	dddd ¹	Input Registers (Word Swap) ¹
Sw4x	1-65535	dddd	Holding Registers (Word Swap) ¹

¹ The Sw3x and Sw4x registers read and write to the same memory areas as the 3x and 4x respectively. However, these registers swap the word order when 32-bit values are used.

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 format on the Maple OIT.

PLC Register Type	Address Range	Format	PLC Register Description
0x	1-65535	dddd (d=decimal)	Output Coils
1x	1-65535	dddd	Input Coils (Read Only)
Bit3x	1/00-65535.15	dddd/bb (b=bit#)	Input Register Bits (Read Only) ²
Bit4x	1/00-65535.15	dddd/bb	Holding Register Bits ²

² The Bit3x and Bit4x coils read and write to the same memory as the 3x and 4x registers respectively. However, these coils allow access to individual bits within the memory registers. The bit number is specified by using the '/' character followed by the bit number, 0-15.

Address Format when Networking

If you are connecting multiple PLCs/Controllers on a network to a BLU300 OIT, you specify the network node address for each object when you place the object onto the screen. In the Edit PLC/Controller Address Dialog, there is a field titled "Net Addr". Specify the slave station's node address in this field.

BlueLeaf Communication Settings

The following table lists the communications settings that must be configured in BlueLeaf software. These settings can be found in the Tools...HMI-PLC Communications Settings menu.

- The **Recommended Settings** column provides recommended settings based upon the default settings most commonly used in the Modbus controller
- The **Options** column lists BlueLeaf's options; your controller may not support every option.

Name	Default	Options	Important Notes
PLC Type	Modbus RTU Master		
Com Port	RS232	RS232, RS485 (2-wire only)	Tools...Set HMI-PLC Port
Baud Rate	19200	115200, 57600, 38400, 19200, 9600, 4800	Must match the Modbus port settings. Use the fastest baud rate supported by both.
Data bits	8	7, 8	Must match the Modbus port settings
Stop bits	2	1, 2	Must match the Modbus port settings
Parity	None	Even, Odd, None	Must match the Modbus port settings
Net Addr:	1	0-255	Must match the Controller's port setting (configure in each object attribute).

Modbus Commands Supported

The BLU300 MODBUS RTU Master communications driver supports the following Modbus function codes:

- 01 - Read output coils (ex. 0x)
- 02 - Read input coils (ex. 1x)
- 03 - Read holding data registers (ex. 4x)
- 04 - Read input registers (ex. 3x)
- 05 - Write to output coils (ex. 0x)
- 06 - Write to holding data registers (ex. 4x)