C O N T R O L L E R I N F O R M A T I O N S H E E T

Maple Model(s)	PLC or Controller
HMI5000 Series	Bristol Babcock Network 3000 Series and ControlWave

Summary

Maple Systems' **HMI5000 Series** Human/Machine Interface Terminals (Maple HMIs) communicate with Bristol Babcock Network 3000 and ControlWave controllers using the Modbus RTU communications protocol. When configured with EZware-5000, the Maple HMI is the master in a point-to-point single master, single slave format.

Compatible PLCs

PLC Family	PLC Model
Network 3000	RTU 3305, RTU 3310, DPC 3330, DPC 3335
ControlWave	All

Communications Cable

The Maple HMI should be connected to the Modbus port located on the controller. 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.maplesystems.com.

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

PLC Settings

The Modbus port on the Network 3000 Series controllers must be set to RTU mode to communicate properly with the HMI.
The port on the ControlWave controller must be set to Gould Modbus Slave, RTU (Binary).

Accessible PLC Memory

Register Memory

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

Controller Register Address	Controller Register Description	Access
30001 to 39999	Input registers	Read only
40001 to 49999	Holding/output registers	Read/write

Discrete Memory

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

Controller Bit Address (See Notes)	Controller Bit Description	Access
00001 to 09999	Discrete coils/Output	Read/write
10001 to 19999	Discrete inputs	Read only
4x_Bit	Holding/Output Registers	Read/write

NOTES:

The 4x_Bit memory area is used to read/write to individual bits in the 4x memory area. To use this feature, select the 4x_Bit as Device Type for bit-type objects such as Bit Lamps. Under **Device Address,** use the format nnnnbb to enter the word memory area, followed by the two-digit bit reference. For example, to target the 3rd bit of 40015, enter "1502" into the Device Address, (nn=15, bb=02).

The EasyBuilder Modbus driver reads a group of 16 bits at a time. Bit groups are 1-16, 17-32, 33-48, 49-69, etc. All bits in the group must be available in the controller for the HMI to read or errors will result.

Examples:

A) If a Bit Lamp is programmed in the HMI that is addressed for bit 00038, then bits 00032 through 00048 must be available and programmed in the controller.
B) If a Bit Lamp in the HMI is addressed as bit 1068, then bits 10065 through 10080 must be available and programmed in the controller.

Unlike the read statements for bits, the EasyBuilder Modbus driver will write to just one bit at a time; however, whenever a bit write occurs, the HMI will automatically execute a read. Therefore, even if the intention is to only write to one bit, all sixteen bits must be available and programmed into the PLC that includes the bit being written to.

Important Memory Considerations

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

EZware Settings

The following table lists the communications settings that must be configured in EZware. These settings can be found in the *Edit-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 Bristol Babcock Network 3000 Series and the ControlWave controllers.
- The **Options** column lists EZware's options; your PLC may not support every option.

Name	Recommended Settings	Options	Important Notes
Name:	Modbus RTU Master		Description
HMI or PLC	PLC		
Location	Local	Local, Remote	Select *Local* if PLC directly connected to HMI, *Remote* if PLC connected thru another HMI.
PLC type	Modbus RTU Master		
PLC I/F:	RS-232	RS-232, RS-485 2W, RS-485 4W, Ethernet	Must match the PLC port setting.
PLC default station no.:	1	0-255	Must match the default station no. assigned to the PLC.
Settings: COM:	COM 1	COM1-COM3	Serial port of HMI connected to PLC.

Name	Recommended Settings	Options	Important Notes
Settings: Baud rate:	19200	9600, 19200, 38400, 57600, 115200	Must match the PLC's port setting. Use the fastest baud rate supported by the PLC.
Settings: Data bits:	8	7 or 8	Must match the PLC's port setting.
Settings: Stop bits:	2	1 or 2	Must match the PLC's port setting.
Settings: Parity:	None	Even, Odd, None	Must match the PLC's 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 HMI polls.
Settings: Send ACK Delay:	0		Not Applicable
Settings: Parameter 1:	0		Not Applicable
Settings: Parameter 2:	0		Not Applicable
Settings: Parameter 3:	0		Not Applicable
Interval of block pack words	5	0-512	See *HMI5000 Series Programming Manual* (Maple p/n 1010-1007)
Max. read-command size (words):	32		Not Adjustable
Max. write-command size (words):	32		Not Adjustable