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	CTC (Controller Technology Corp) Automation Controller Series (Ethernet)

Summary

Maple Systems' **HMI5000 Series** Human/Machine Interface Terminals (Maple HMIs) communicate with CTC (Control Technology Corp) Automation Controllers using the CTC Ethernet Data communication protocol. When configured with EZware-5000, the Maple HMI is the master in a point-to-point single master, multiple slave format.

Compatible PLCs

Family	Model
CTC Series	200(XM), 2400(iE, iEA), 2600(XM), 2601, 2700, 2800(iE, iEA), 28EAXM, Multipro Family, 2216, Blue Fusion, RS232 or 2716 Dual Channel RS232 Communications Module

Communications Cable

The Maple HMI should be connected via a crossover Ethernet cable to the Ethernet port on the CTC Automation 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.*

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.

(Note: r=row, c=column, d=decimal)

PLC Register Type	Address Range	Format	PLC Register Description
DataTable	001001 to 255255	rrrccc	Row/Column in the Data Table. The row and column are specified in decimal digits, and must be padded to 3 digits each.[1]
NumericRegister	1 to 65535	ddddd	32-bit values in a single Numeric Register
NR.W	1 to 65535	ddddd	32-bit values in multiple Numeric Registers.[1]
AnalogInput	1 to 128	ddd	16-bit values read from an Analog Input
AnalogOutput	1 to 128	ddd	16-bit values read/written from an Analog Output
ServoPosition	1 to 256	ddd	Position of the specified axis (not supported on CTC 2200)
ServoError	1 to 256	ddd	Error on the specified axis (not supported on CTC 2200)

[1] Values up to 65535 are stored in the lowest 16 bits of the specified memory location. Values greater than 65535 are stored in two consecutive memory locations, with the least-significant 16 bits stored in the specified location, and the most-significant 16 bits stored in the next consecutive location. For data table locations, the most-significant 16-bits are stored in the next column.

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.

PLC Bit Type	Address Range	Format	PLC Bit Description
Flag	1 to 32	bb	Flag Registers
NR.B	1.00 to 65535.15	ddddd.bb	Individual bits within Numeric Registers. Only the first 16 (00-15) bits in each register are supported. Bits must be specified with 2 digits.
DigitalInput	1 to 1024	dddd	Digital Inputs
DigitalOutput	1 to 999	ddd	Digital Outputs

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.

Error Codes:

The HMI will write communication error codes into Local Word 8999 under the following circumstances:

Error Code	Description
0	No Error
2	The HMI received and invalid checksum from the controller.
3	Incorrect packet received from controller.
101	The controller received an invalid checksum from the HMI, or the command packet was malformed.
102	An attempt was made to write an illegal address in the command.
104	An attempt was made to write an illegal value to the controller.

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 CTC Controllers.
- The **Options** column lists EZware's options; your PLC may not support every option

Name	Recommended Settings	Options	Important Notes
Name:	CTC Motion (Ethernet)		Description label
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:	CTC Motion (Ethernet)		
PLC I/F:	Ethernet	RS-232, RS-485 2W, RS-485 4W, Ethernet	Must match the controller port setting.
PLC default station no.:	1	0-255	
Use UDP:	Unchecked	Checked or Unchecked	See below
Settings: IP Address:	xxx.xxx.xxx.xxx	0.0.0.0-255.255.255.255	Must match the controller port's IP Address. See Below
Settings: Port	6000	0-65535	See below
Settings: Timeout (sec)	1.5	0.1 to 25.5	Adjust if longer timeout is required.
Settings: Turn around delay (ms):	0	0-1000	Timeout period between HMI polls.

Name	Recommended Settings	Options	Important Notes
Settings: Send Act Delay :	0		Not Applicable
Settings: Parameter 1:	0		Not Applicable
Settings: Parameter 2:	0		Not Applicable

NOTES:

- **IP Address**
  Enter the IP Address of the CTC controller. The IP Address of the CTC controller must be on the same subnet as the HMI. If in doubt, consult your IT personnel. Also, the EasyBuilder5000 Help files provide a discussion on setting IP addresses.

- **Port**
  Use 6000 for a TCP connection (recommended). Use 3000 for a UDP connection. For a UDP connection, also check the *Use UDP* box.

- **Use UDP**
  Leave unchecked (recommended), which will cause a TCP connection. TCP provides a connection with automatic error detection and error retries. UDP is a simple connection, with no error detection other than what the selected protocol provides. UDP can be a faster connection, but TCP is more robust. Maple Systems recommends using the TCP connection because the Galil protocol provides very little in error detection. If you choose a UDP connection, also set the *Port* to 3000.