

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

<b>Maple Model(s)</b>	<b>PLC or Controller</b>
HMI5000 Series	Allen-Bradley Logix Series EtherNet I/P ControlLogix, CompactLogix & FlexLogix



## Summary

Maple Systems' **HMI5000 Series** Human/Machine Interface Terminals (Maple HMIs that use the EZware-5000 configuration software) communicate with Allen-Bradley Logix Family of Programmable Controllers via the CIP protocol using the Ethernet port located on the PLC or communication module.

## Compatible PLCs

Family	Model
ControlLogix Series	1756-L55M12, M13, M14, M16, M22, M23, M24 1756-L63
CompacLogix Series	1769-L31x, 1769-L32x, 1769-L35x
FlexLogix Series	1794-L33x, 1794-L34x

## Communications Cable

The Maple HMI can be connected directly to the Ethernet port located on the Logix controller. If connecting to the PLC/module directly from the Maple HMI, a crossover cable is required. 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](http://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 Controller Settings

The IP address and subnet mask must be consistent with the Maple HMIs IP setup.

When using a ControlLogix PLC:

- Use the IP address of the communications module in EasyBuilder
- Multiple PLCs in a single rack are not supported
- The PLC must be in Slot 0 of the rack

## Accessible PLC Memory

### RSLogix 5000 Configuration:

**Note:** This document assumes that the reader is familiar with the RSLogix 5000 software.

The Logix family of controllers (Control, Compact & Flex) uses variable names to access data. Since the HMI5000 Series refers to register data in data file references such as N7:0, B3:0.00, etc, the tag names in the PLC must match this convention.

The tags must be created as arrays. Each member of the array corresponds to an element within the tag. For example, if N007 is created as an array of 256 elements, then N007[0] corresponds to N7:0; and N007[255] corresponds to N7:255.

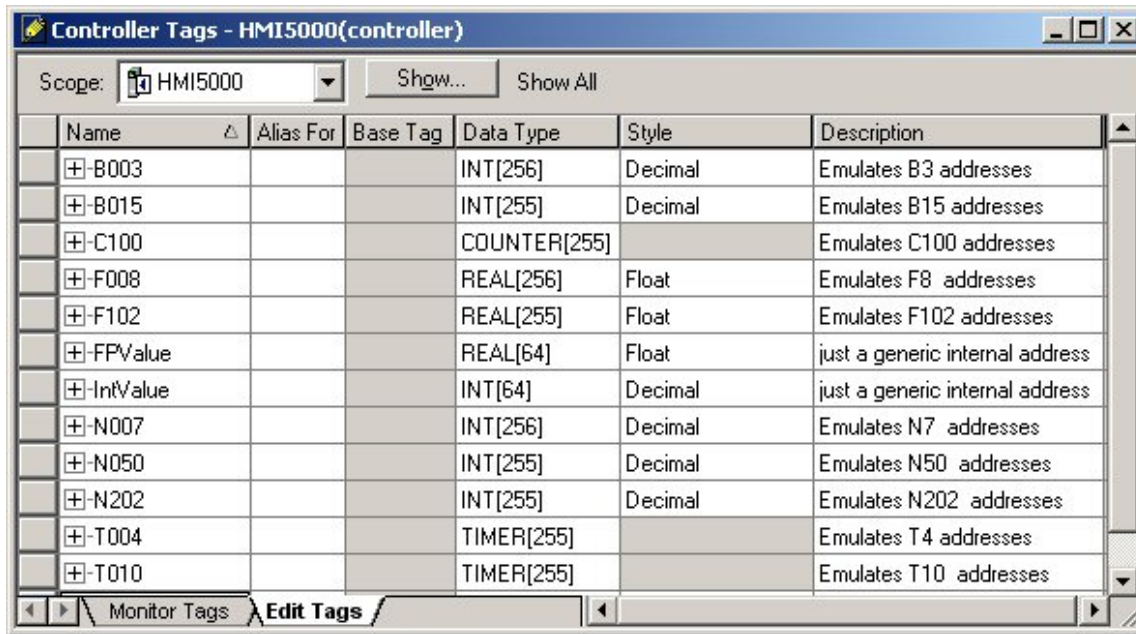
Note that the tags must be created as *controller* tags. The following File Types are supported:

B	Binary
C	Counter
F	Real (or Float)
N	Int
T	Timer

The HMI will be unable to communicate to the PLC unless this format is strictly followed:  
The File Number in the tag name *must match the address specified in EasyBuilder*, and the File Number *must be specified to 3 digits*.

For example:

<u>RS LogixTag</u>	<u>EasyBuilder Device Type</u>	<u>Address</u>
N007[2]	NX_INT	007002
F008[12]	F8_REAL	12
B003[125].7	BX_BOOL	0312507



Tags that are to be created as 'bits' must be created as integer arrays (an array of 16-bit integers). Each member of that array corresponds to an element in the 'bit' file and each bit of the element corresponds to the bit number.

P	Tag Name	Alias For	Base Tag	Type	Style	Description
	⊖-B003			INT[16]	Decimal	
	⊖-B003[0]			INT	Decimal	
	-B003[0].0			BOOL	Decimal	
	-B003[0].1			BOOL	Decimal	
	-B003[0].2			BOOL	Decimal	
	-B003[0].3			BOOL	Decimal	
	-B003[0].4			BOOL	Decimal	
	-B003[0].5			BOOL	Decimal	
	-B003[0].6			BOOL	Decimal	
	-B003[0].7			BOOL	Decimal	
	-B003[0].8			BOOL	Decimal	
	-B003[0].9			BOOL	Decimal	
	-B003[0].10			BOOL	Decimal	
	-B003[0].11			BOOL	Decimal	
	-B003[0].12			BOOL	Decimal	
	-B003[0].13			BOOL	Decimal	
	-B003[0].14			BOOL	Decimal	
	-B003[0].15			BOOL	Decimal	
	⊖-B003[1]			INT	Decimal	
	-B003[1].0			BOOL	Decimal	
	-B003[1].1			BOOL	Decimal	
	-B003[1].2			BOOL	Decimal	

## Supported Register Memory:

PLC Register Types Supported	Size	Format	Address Range	PLC Register Description
Bx_INT	W	fffddd	File # fff: 003, 010-255 Element # ddd: 000-255	Bit data as a 16-bit word. B12:57 would be 012057. Leading zeros for File and Element numbers are required.
Nx_INT	W	fffddd	File # fff: 000-255 Element # ddd: 000-255	Integer Value. N50:198 would be 050198. Leading zeros for File and Element numbers are required.
F8_REAL	DW	ddd	Element # ddd: 000-255	Floating Point Value. F8:240 would be 240. Only file F8 is supported. Set Data Type to “32- bit float.”
Fx_REAL	DW	fffddd	File # fff: 005, 010-255 Element # ddd: 000-255	Floating Point Value. F75:101 would be 075101. Leading zeros for File and Element numbers are required. Set Data Type to “32-bit float.”
Cx.ACC	DW	fffddd	File # fff: 005, 010-255 Element # ddd: 000-255	Counter Accumulated value. C26:109.ACC would be 026109. Leading zeros for File and Element numbers are required. Set Data Type to “32-bit signed.”
Cx.PRE	DW	fffddd	File # fff: 005, 010-255 Element # ddd: 000-255	Counter Preset value. C5:14.PRE would be 005014. Leading zeros for File and Element numbers are required. Set Data Type to “32-bit signed.”
Tx.ACC	DW	fffddd	File # fff: 004, 010-255 Element # ddd: 000-255	Timer Accumulated value. T64:208.ACC would be 064208. Leading zeros for File and Element numbers are required. Set Data Type to “32-bit signed.”
Tx.PRE	DW	fffddd	File # fff: 004, 010-255 Element # ddd: 000-255	Timer Preset value. T15:101.PRE would be 015101. Leading zeros for File and Element numbers are required. Set Data Type to “32-bit signed.”

W = Word (16-bit); DW – Double Word (32-bit)

## Discrete Memory

Bx_BOOL	Bit	ffdddbb	File # ff: 03, 10-99 Element # ddd: 000-255 Bit number bb: 00-15	Bit data from B files. B64:101/6 would be 6410106. Leading zeros for File, Element, and Bit numbers are required.
N_BOOL	Bit	ffdddbb	File # ff: 03, 10-99 Element # ddd: 000-255 Bit number bb: 00-15	Bit data from N files. N12:14/15 would be 1201415. Leading zeros for File, Element and Bit numbers are required.

## 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.

## Troubleshooting Notes:

If the HMI attempts to address an invalid register reference, the HMI may display "PLC No Response". Also, the A-B PLC itself will set a "MINOR FAULT" error in its processor status.

If communications are erratic the Logix PLC may not be devoting enough time to the communication task.

- On the *Advanced* tab of the Controller Properties dialog box, increase the *System Overhead Time Slice* percentage.
- For Periodic tasks, increase the *Period* setting and/or lower the *Priority*.

For more information, refer to the RSLinx documentation.

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

Name	Recommended Settings	Options	Important Notes
Name:	Allen-Bradley Compact/Control/FlexLogix (EtherNet IP-CIP)		Description label
HMI or PLC	PLC		
Location	Local	Local, Remote	Select <i>Local</i> if the PLC is directly connected to the HMI, <i>Remote</i> if the PLC is connected thru another HMI
PLC type:	Allen-Bradley Compact/Control/FlexLogix (EtherNet IP-CIP)		
PLC I/F:	Ethernet	Ethernet	
PLC default station no.:	1	0-255	Not Applicable
Settings: IP Address:	xxx.xxx.xxx.xxx	0.0.0.0-255.255.255.255	Must match the IP Address of the PLC.
Port NO:	44818	44818	<b>Do not change this setting</b>
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

<b>Name</b>	<b>Recommended Settings</b>	<b>Options</b>	<b>Important Notes</b>
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):	0	0-512	See <i>HMI5000 Series Programming Manual</i> (Maple p/n 1010-1007)
Max. read-command size (words):	120		Not adjustable
Max. write-command size (words):	120		Not adjustable