


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	Allen-Bradley Logix Series DF1 ControlLogix, CompactLogix & FlexLogix	

Summary

Maple Systems' **HMI5000 Series** Human/Machine Interface Terminals (Maple HMIs) communicate with the Allen-Bradley Logix Family of PLCs using the [DF1] Full Duplex protocol. When configured with Maple configuration software, the Maple HMI is the master in a point-to-point single master, single slave format.

Compatible PLCs	
Family	Model(s)
ControlLogix Series	1756-L55M12, M13, M14, M16, M22, M23, M24 1756-L63
CompactLogix Series	1769-L31x, 1769-L32x, 1769-L35x
FlexLogix Series	1794-L33x, 1794-L34x

Communications Cable

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 HMI or loss of communications can result*

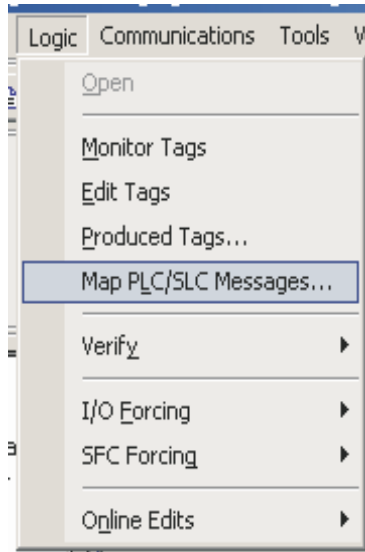
PLC Controller Settings

No hardware handshaking must be set.
Error Detection should be set to BCC.
Set Station Address to 1.
System Protocol should be set to "DF1 Point to Point."

Accessing PLC Memory

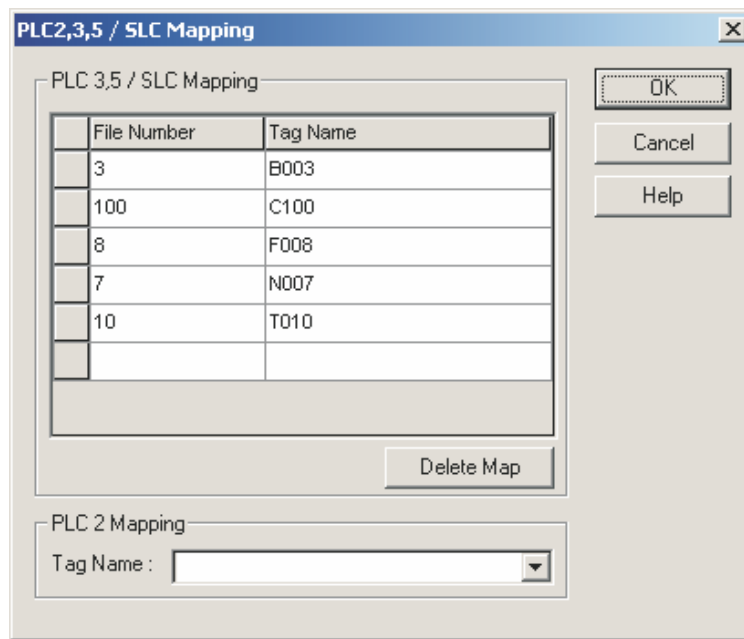
RSLogix 5000 configuration:

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, some element mapping is required to communicate between the HMI and the PLC. Tags are mapped on the Logix menu of the RSLogix5000 software. Select *Map PLC/SLC Messages*, and the following dialog is displayed:



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

In the next picture, the dialog is shown with a few tags already mapped:



The tags must be created as arrays. Each member of the array corresponds to an element within the mapped 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 only Controller tags can be mapped to File Numbers. Tag names to be mapped must follow the <File Type> <File Number> convention. 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 file number that the tag is being mapped to, and the File Number must be specified to 3 digits.** For example, the typical files would be mapped as follows:

File	Tag Name	Mapped to File
B3	B003	3
T4	T004	4
C5	C005	5
N7	N007	7
F8	F008	8

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

Register Memory

PLC Register Type	Accessible PLC Memory	Format	Address Range	PLC Register Description
Tx.ACC	DW	fffddd	File # fff: 004, 010-064 Element # ddd: 000-255	Timer Accumulated value. T64:208.ACC would be 064208. Leading zeros for File and Element numbers are required. Set number of words to 2.
Tx.PRE	DW	fffddd	File # fff: 004, 010-064 Element # ddd: 000-255	Timer Preset value. T15:101.PRE would be 015101. Leading zeros for File and Element numbers are required. Set number of words to 2.
Nx_INT	W	fffddd	File # fff: 000-064 Element # ddd: 000-255	Integer Value. N50:198 would be 050198. Leading zeros for File and Element numbers are required.
Bx_INT	W	fffddd	File # fff: 003, 010-064 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.
Cx.ACC	DW	fffddd	File # fff: 005, 010-064 Element # ddd: 000-255	Counter Accumulated value. C26:109.ACC would be 026109. Leading zeros for File and Element numbers are required. Set number of words to 2.
Cx.PRE	DW	fffddd	File # fff: 005, 010-064 Element # ddd: 000-255	Counter Preset value. C5:14.PRE would be 005014. Leading zeros for File and Element numbers are required. Set number of words to 2.
F8_REAL	DW	ddd	Element # ddd: 000-255	Floating Point Value. F8:240 would be 240. Only file F8 is supported. Set number of words to 2. Set Numeric Display as "Single Float."

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

Discrete Memory

B_BOOL	Bit	ffdddabb	File # ff: 03, 10-64 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	ffdddabb	File # ff: 03, 10-64 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 PLC Memory Considerations

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

Do not configure the Maple 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" or "PLC Response Error." Also, the PLC itself will set a "MINOR FAULT" error in its processor status and it will disable the serial port until the fault is cleared and the PLC controller is reset.

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

- On the Advanced tab of the Controller Properties dialog, increase the System Overhead Time Slice percentage.
- For Periodic tasks, increase the Period setting and/or lower Priority. For more information, refer to the RSLi documentation.

EZware-5000 Settings

The following table lists the communications settings that must be configured in EZware-5000. 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 default settings most commonly used in the Allen-Bradley Logix PLCs.
- The **Options** column lists EZware's options; your controller may not support every option

Name	Recommended Settings	Options	Important Notes
Name:	Allen-Bradley Logix Family (Serial)		Description label
HMI or PLC	PLC		
Location	Local	Local, Remote	Select local if PLC directly connected to HMI, remote if PLC connected thru another
PLC type:	Allen-Bradley Logix Family (Serial)		
PLC I/F:	RS232	RS232	Port on Logix PLC is RS-232 only.
PLC default station no.:	1	0-255	Must match the node address assigned on the Data Highway network.
Settings: COM:	COM 1	COM1-COM3	Serial port of HMI connected to PLC
Settings: Baud rate:	19200	4800,9600,19200, 38400, 57600, 115200	Must match Logix PLC [DF1] programming port settings. Use the fastest baud rate supported.
Settings: Data bits	8	7,8	Must match Logix PLC [DF1] programming port settings.
Settings: Stop bits:	1	1,2	Must match Logix PLC [DF1] programming port settings.
Settings: Parity:	None	Even, Odd, None	Must match Logix PLC [DF1] programming port settings.
Settings: Timeout (sec)	1.0	0.1 to 25.5	Adjust if longer timeout is required.

Name	Recommended Settings	Options	Important Notes
Settings: Turn around delay (ms)	0	0-1000	Timeout period between HMI polls.
Settings: Reserved 1:	0		Not Applicable
Settings: Reserved 2:	0		Not Applicable
Settings: Reserved 2:	0		Not Applicable
Settings: Reserved 4:	0		Not Applicable
Interval of block pack (words):	5	0-512	See <i>HMI5000 Series Programming Manual</i> (Maple p/n 1010-1007)
Max. read-command size (words):	32		Not Adjustable
Max. write command size (words):	32		Not Adjustable