



Galil

DMC Series

Overview

Maple Systems' **Silver Series/HMI500** Human-Machine Interfaces (Maple HMIs) communicate with Galil DMC Series Motion Controllers using a simple ASCII master protocol. When configured with EZware-500, the Maple HMI is the master in a point-to-point single master, single slave format. Please refer to the *HMI Silver Series Installation and Operation Manual* for information on connecting multiple Maple HMIs to a single port.

Compatible PLCs	
Family	Model
DMC Series	All

Communications Cable

The Maple HMI should be connected to the main port 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.maple-systems.com/cables.htm.

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.

Attaching to Controller

When the HMI powers up, it will attempt to ‘attach’ to the controller. It does this by requesting the Controller’s Revision data. If the request is successful, the Controller’s Revision data is stored in the HMI’s Local Words, starting at LW8500. Use an Ascii Data object to display the data. Set it for read address LW8500, with the Number of Words set to 10.¹²

Controller Settings

The controller must be set for Echo On. Use the E01 command in the controller programming. Set this at the beginning of the program.

Accessible PLC Memory

Register Memory

The following table lists the PLC’s register memory ranges that the Maple HMIs are able to access.

Memory Type	Range- see notes below	Details
Maple_nInt	0 – 7999 ^{8,12}	Maple array element as an Integer value
Maple_nFloat	0 – 7999 ^{8,11}	Maple array element as a Floating Point value
VariableVnnnInt	0 – 999 ^{9,12}	Integer Variable V000 – V999
VariableFnnnFloat	0 – 999 ^{10,11}	Floating Point Variable F000 – F999
ActualPosition	1 – 8 ^{1,7}	Use 2 words, Decimal format.
ActualVelocity	1 – 8 ^{1,7}	Use 2 words, Decimal format.
ActualTorque	1 – 8 ^{1,4,7}	Refer to notes.
AuxEncoderPosition	1 - 8 ¹	Use 2 words, Decimal format.
CommandedPosition	1 - 8 ^{1,7}	Use 2 words, Decimal format.
PositionAbsolute	1 - 8 ¹	Use 2 words, Decimal format.
PositionRelative	1 - 8 ¹	Use 2 words, Decimal format.
PositionError	1 - 8 ^{1,7}	Use 2 words, Decimal format.
Speed	1 - 8 ¹	Use 2 words, Decimal format.
Acceleration	1 - 8 ¹	Use 2 words, Decimal format.
Deceleration	1 - 8 ¹	Use 2 words, Decimal format.
ErrorLimit	1 - 8 ¹	Use 2 words, Decimal format.
Jog	1 - 8 ¹	Use 2 words, Decimal format.

Inputs	1 – 1600 ^{2,7}	Refer to notes.
Status	0 – 0 ⁷	Refer to notes.
Switches	1 – 8 ^{1,7}	Refer to notes.
ErrorCode	0 – 0 ⁷	Refer to notes.
StopCode	1 – 8 ^{1,7}	Refer to notes.
AnalogInput	1 – 99 ^{4,7}	Refer to notes.
ExecuteProgram	A000 - FFF ⁷	Refer to notes.

Discrete Memory (use a Set Bit, Bit Lamp, or Toggle Switch part)

The following table lists the Controller's discrete memory ranges that the Maple HMIs are able to access.

Memory Type	Range - see notes below	Details
Maple_nBit	0.00 – 7999.15 ⁸	Bit within an element of the Maple array
VariableVnnnBit	000.00 – 999.15 ⁹	Bit within the specified variable
Output	1.0 – 1604.0 ⁵	Status of the specified output
Inputs	0.0 – 1600.7 ^{2,6,7}	Status of the specified input
Status	0.0 – 0.7 ^{6,7}	Status of the specified status bit
Switches	1.0 – 8.7 ^{1,6,7}	Status of the specified switch
Abort	0.0 or 1.0 ⁵	Sends the Abort command
Begin	1.0 – 8.0 ^{1,5}	Sends the Begin command
Home	1.0 – 8.0 ^{1,5}	Sends the Home command
HaltExecution	0.0 – 7.0 ⁵	Sends the Halt Execution command
Stop	1.0 – 8.0 ^{1,5}	Sends the Stop command

NOTES:

1. Address 1 = Axis A, Address 2 = Axis B, Address 3 = Axis C, etc.
2. For local control, the number to the left of the decimal point corresponds to which set of 8 inputs to read, and is the integer part of n in the following expression:

$$n = (\text{input number} - 1) / 8$$

For example, for input number 67, $n = (67 - 1) / 8 = 8.25$, so 8 is the result.

For distributed control, $n = 100, 200, 300, \dots 1600$.

3. The 3 most-significant digits represent the label, and the least-significant digit represents the thread. For example, B0F2 will execute the program called 'B0F' as thread number 2.
4. The value is returned 2 ways. If the Number of Words for the object is set to 2, the value is reported as a Floating Point value from -9.999 to 9.999. If the Number of Words is set to 1, the value is returned as an Integer Value from -9999 to 9999. This is compatible with the Bar Graph and Trend objects.
5. The '.0' is required.
6. Even though controller addresses the bits as 1 – 8, EasyBuilder addresses them as 0 - 7.
7. Read Only
8. An array named *Maple* must already be defined within the controller's application program. The name is case sensitive.
9. A variable with a name of the form Vabc must exist in the controller's application program. For example, if an object is configured in EasyBuilder to use the device **VariableVnnnInt** with a device address of 6, the corresponding application program variable is V006.
10. A variable with a name of the form Fabc must exist in the controller's application program. For example, if an object is configured in EasyBuilder to use the device **VariableFnnnFloat** with a device address of 37, the corresponding application program variable is F037.
11. EasyBuilder will allow up to 10 decimal places for floating point values, but only the first 4 decimal places are transferred to/from the controller.
12. ASCII data objects referencing controller addresses, need to be set to one word. This means that only 2 ASCII characters may be shown with each ASCII data object.

General note about displaying Integer & Floating Point values:

A.) If **Maple_nInt** or **VariableVnnnInt** is selected, the "Number of Words" parameter, located on the {GENERAL} tab of any numeric input or numeric display object, will control the maximum displayable value. For example, to display a range of +/-32767 or 0-65536 then set the "Number of Words" to one (1). For a range of +/-2,147,483,647 then set the "Number of Words" to two (2). When the "Number of Words" is set to (1), then "Parameter 3 (located in the System Parameters) controls whether the value is signed (i.e. +/-32767) or unsigned (0-65536). For unsigned, set "Parameter 3" to zero (0); this is the default. For signed, set "Parameter 3" to one (1). "Parameter 3" is a global setting for all values.

B.) If **Maple_nFloat** or **VariableFnnnFloat** is selected, Set the "Display" option on the {NUMERIC} tab to "Single Float"

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-500 Settings

The following table lists the communications settings that must be configured in EZware-500. These settings can be found in the Edit-Set System Parameters menu under the PLC tab. Please note:

- the **Recommended Settings** column provides the recommended setting based upon the default settings most commonly used in the Galil Motion Controller.
- the **Options** column lists EZware-500's options; your PLC may not support every option

Name	Recommended Settings	Options	Important Notes
PLC type:	Galil Motion V1.02		Use this version or newer
Serial port I/F:	RS232	RS232, RS485	Recommend using RS485 communications if distance to PLC is over 40 feet (RS232 Max is 50 feet).
Data Bits:	8	7 or 8	Must match the main port setting.
Stop Bits:	1	1 or 2	Must match the main port setting.
Baud Rate:	19200	9600,19200, 38400,57600, 115200	Must match the main port setting. Use the fastest baud rate supported by the PLC.
Parity:	None	Even, Odd, None	Must match the main port setting.
HMI station No.:	0	0-31	Not Applicable.
PLC station No.:	1	0-31	Not Applicable.
Multiple HMI:	Disable	Disable, Master, Slave	use for multiple HMIs
HMI-HMI link speed:	38400	38400, 115200	use for multiple HMIs
PLC time out constant (sec)	3.0	1.5 to 5.0	adjust if longer timeout is required
PLC block pack:	0	0-10	see <i>HMI500 Series Installation and Operation Manual</i>
Parameter 1	0	0-999	Turn around delay (x1mSec) Used for RS485 half-duplex delay Set to 0 for RS232
Parameter 3	0	0,1	Integer type mode (global) 0 = 16-bit integer values are unsigned 1 = 16-bit integer values are signed