

Compumotor 6K and 6000 Series Controllers (STEPware)

Overview

Compumotor manufactures motion control products called the ‘6000 Series’ and “6K” motion controllers. These are diverse motion control products that are designed to control motors with encoders, drivers and other I/O signals.

A Maple Systems’ OIT Family Operator Interface Terminal (Maple OIT) is used to monitor and modify the operating parameters of the motor and to allow the plant floor operator direct control, including changing the position, speed, and acceleration rate of motors or indexers, to start/pause/stop motors, or run specific subroutines of the program.

Below is a listing of the Compumotor motion controllers which can communicate to a Maple Systems OIT:

Compatible Controllers	
Controller Family	Controller Model
6K Series	6Kn
6000 Series	610n, 615n, 620n, 625n, 6270

Maple Systems’ OIT Family Operator Interface Terminals (Maple OITs) communicate with Compumotor 6000 and 6K Series motion controllers, using the STEPware-100 configuration software which allows the OIT to operate as an ASCII terminal using the STEP1 protocol. When configured with **STEPware-100**, the **Maple OIT is the slave** in a point-to-point single master, single slave or single master, multiple slave format.



Reference Documentation

Though this controller information sheet attempts to provide you with pertinent information to connect your Maple System's OIT to a Compumotor 6000 or 6K controller, it is not, by any means, comprehensive on all aspects of operation of the OIT or the motion controller. For a more detailed description of how these products work, we recommend that you refer to the following:

Reference Document	Information
Maple Systems Operator Interface Installation Manual	Covers installation requirements of your specific Operator Interface Terminal
Maple Systems STEP1 Protocol Operation Manual	Details how to operate and program your Operator Interface Terminal when using the STEPware100 configuration software
Parker Automation 6K Series Command Reference	Detailed descriptions of the 6K Series commands
Compumotor 6000 Series Programmers Guide	Details on programming the 6000 Series
Compumotor 6000 Series Software Reference	Detailed descriptions of all 6000 Series commands
Parker Automation 6K Series Hardware Installation Guide	Hardware-related information specific to the 6K Series products

Technical Support

If you need more information regarding the use of your Maple Systems Operator Interface Terminal, please consult the manuals listed above. These manuals were designed to provide you with detailed descriptions on the operation and installation of your OIT. We also have additional information about our Operator Interface Terminals available on our website at www.maple-systems.com.

If you have questions regarding the operation of your Compumotor motion controller which are not addressed in the Compumotor Operations Manuals, we recommend that you contact your Parker Automation Compumotor distributor or call Compumotor's technical assistance at 1-800-358-9070.

Any questions that you may have about your Maple Systems Operator Interface Terminal which are not covered in the Operations Manuals can be answered by our technical support staff at 1-425-486-4477.

Communications Cable

The Maple OIT can be connected to the Compumotor motion controller using RS232 or RS485 communications with the OIT's Port 1 and the motion controllers COM1, COM2, or AUX port (depending on controllers).

Refer to Technical Note 1061 for information on communication cable part numbers and cable assembly instructions. If you will be assembling your own communications cable, cable assembly instructions are also available on our web site at www.maple-systems.com.

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

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Programming the OIT

The Maple Systems Operator Interface Terminal is programmed using the STEPware-100 configuration software. The following table lists the communications settings that must be configured:

- the Default column lists suggested STEPware-100 settings when using the Compumotor motion controller
- the Options column lists STEPware-100's options; your motion controller may not support every option

Name	Default	Options	Important Notes
Baud Rate	9600	19200, 9600, 4800, 2400, 1200, 600, 300	Must match the controller port settings. Use the fastest baud rate possible.
Parity	None	Even, Odd, None, Mark, Space	
Data Bits	8	7, 8	
Stop Bits	1	1, 2	
Operating Mode	Block	Interactive, Block, Network	Attached sample code requires Block Mode.
Line Terminator	CR	CR, LF, CR/LF, ETX	
Turn-around Delay	No Delay	50, 100, 250, No Delay	
Handshaking	None	None, Xon,Soff, RTS/CTS, Both	
Setup Password	00000	Any 5-digit value	
Local Echo	Enabled	Enable or Disable	
Local Setup	Enabled	Enable or Disable	
Local Keyboard	Enabled	Enable or Disable	
Key Click	Enabled	Enable or Disable	
Block Echo	Enabled	Enable or Disable	
Delayed Line Feed	Disabled	Enable or Disable	
Append Line Feed	Disabled	Enable or Disable	
Use 3-Wire RS485	Disabled	Enable or Disable	Available only when in Network Mode.

NOTE: STEPware provides a full range of display and control functions. See STEPware Help, under *ESCAPE Control Commands*, for a complete list.

Programming the Motion Controller

The COM port of the motion controller which you use to connect to the Maple Systems OIT must be properly configured for communication to the OIT. Initialize the motion controller COM port which the OIT is connected to by using the following commands:

Command	Description
!PORT1 or 2	the port that the OIT is connected to
!ECHO0	disable echo
!EOT 13,0,0	use cr as EOT character
!DRPCHK0	serial port will be used for 6000 and 6K commands
!ERRLVL0	All responses are returned with EOT character. Responses are returned minus the command itself and the asterisk. There is no error response.

Sample Programs

Sending Immediate Commands to Controller

The Maple Systems OIT is capable of sending the Compumotor 6000 and 6K Series commands to the motion controller by pressing function keys on the OIT’s keyboard. Each function key can be configured to send two 40 character ASCII strings to the motion controller. These ASCII strings can contain printable ASCII characters as well as any control characters, (e.g. stx or cr).

The following table represents some examples of how function keys can be configured to send commands to the motion controller:

Key	Action	Key State	ASCII String Sent	Description
F1	Momentary	Pressed Key	!VARB3.6-1	Sets bit #6 of VARB3 when F1 is pressed
		Released Key	!VARB3.6-0	Clears bit #6 of VARB3 when F1 is released
F2	Push On/Off	‘On’ State	!GO	Motion is initiated on all axes
		‘Off’ State	!S	Motion is stopped on all axes
F3	‘Shifted’	Non-Shift	!RUN Jog	Run a subroutine in motion controller titled “Jog”
		Shift State	!RUN Auto	Run a subroutine in motion controller titled “Auto”
F4	Push On/Off	On’ State	!HOM 0XXXXXXX	Search for home position in positive-direction on axis 1.
		‘Off’ State	!HOM 0XXXXXXX	Search for home position in positive-direction on axis 1.

Displaying Text on the OIT screen

The motion controller can display text on the OIT screen in order to relay important information to the plant floor operator. The motion controller has two options for sending text to the OIT screen- both of which require using the WRITE command:

1. Using the Write a Message (WRITE) command, the motion controller can transmit message strings to the Maple Systems OIT which are displayed directly onto the OIT screen. Each character string sent to the OIT is displayed immediately on the OIT screen as long as each character is printable. Each control or non-printable command is ignored by the OIT unless it is one of the predefined control commands that is defined in the STEP1 Operations manual. The following are some WRITE commands and how they modify the OIT screen:

Motion Controller sends:	OIT screen displays:
WRITE "\12"	This control command ff clears the OIT screen
WRITE "WARNING: X Axis Position \10"	OIT displays: WARNING: X Axis Position OIT then moves cursor to second line of display
WRITE "exceeds predefined limits!"	OIT displays: WARNING: X Axis Position exceeds predefined limits!
WRITE "\27 g3 \2"	This sends the Sound Bell control command which causes the OIT to sound an internal buzzer for three seconds
WRITE "\27 Y11 \2"	This sends the Status LED control command which causes Status LED #1 on the OIT to turn on.

2. The Maple Systems OIT is capable of storing preprogrammed messages which can be displayed on the OIT screen when the motion controller sends the Display Message Command: `esc m [message number] stx`. This can be easily done by using the Write a Message (WRITE) command. For example, suppose you have configured preprogrammed message #1 on the OIT as "Jog Mode in process!". To display the message on the OIT screen, the motion controller would simply send WRITE "\27 m1 \2" to the OIT. If the control application requires that many messages be displayed on the OIT, then preprogrammed messages provide a means for the controller to display lengthy messages on the OIT without consuming valuable memory space in the motion controller.

Displaying Data on the OIT screen

The motion controller displays variable data on the OIT screen in order to pass important operating parameters to the plant floor operator. The most efficient way to send variable data to the OIT display is to use the WRVAR, WRVARI, WRVARB, and WRVARS commands. These commands transfer the values of specific numeric, binary, and string variables out the serial port of the motion controller. Therefore, the VAR, VARI, VARB, and VARS variables can be used to gather any operating data about the motion controller which needs to be reviewed by the plant floor operator. For example, if VARI1 is set to 100, then using the command WRVARI1 will transmit the integer value of +100 in ASCII format to the currently active serial port.

Requesting Data from the OIT

The motion controller can also request data from the OIT by using the READ command. This command sends out a string variable to the active serial port that is used to prompt the OIT operator for data input. Note that the OIT operator must precede the data with an immediate command identifier and a single quote (!'). After the data is entered by the OIT operator, he can simply press the [ENTER] key to send the data to the motion controller. In Block Mode, the OIT will automatically append the line terminator to the data sent to the motion controller. Make sure that the line terminator selected in the OIT matches the required command delimiter of the motion controller (usually `cr`).

For example, if `VAR1 = "Enter the count >"`, then using the command `VAR2 = READ1` causes the string stored in `VAR1` to be sent to the OIT for display. When the OIT operator enters `"!'+82.5"` followed by pressing the [ENTER]key, causes the value `+82.5` to be stored into `VAR2`.