Operating Software Instruction Manual for Host Controlled Series of Motion Controllers

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**Control Panel** 







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Power-up Help System Operation Teach Mode Position Entry Mode Repeating the Saved Motion Profile Setting the Motion Parameters Controlling the Outputs and Monitoring the Inputs

#### **Power-up**

After power-up the status LED blinks and then remains lit. The controller sends a message to the PC showing its revision number that would be displayed in the Incoming Messages pane.

Outgoing Messages	Incoming Messages	
	Version 10.08 Joystick is on	

#### **Help System**

After installation of the software the online help system will be available.

The online help system may be accessed by;

1) Click on "?" located on upper right corner of the control panel,

				Reset
				?×
				Help
W-Axis	•	XY Plane	►	Z-Axis
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J	oystick /	Trackba	all Operati	on

then drag it to any button and click. A message will explain the functionality of that button.

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C Position Entry	
Outgoing Messages Incoming Messages	
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#### Operation

If the controller is not connected to the PC, Click on 'Configuration' then select 'Demo Mode' from the drop down menu to test drive the software without the controller.

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Inputs - Outputs				<u>?</u> ×
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	Command	Actual		
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Comment © Position Mode © Teach Mode © Position Entry	Add Delete	Change Move	⊂ On  ⊙ Off Joystick / Trackball Operatio	'n
Outgoing Messages		Incoming Messages		
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If you click on any button, you would see the outgoing messages to the controller and the incoming messages from the controller in the corresponding panes.

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Home Zero Stop	Y-Axis	0		+0.000 inch			•
Home Zero Stop	Z-Axis	0		+ 0.000 inch		Slow C Medium C Fast	e
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Outgoing Messages				Incoming Messages			
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Velx 8000							
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#### **Teach Mode**

The controller may be used to learn and execute a motion profile without any programming.

To use the teach mode capability;

1) Select 'Teach Mode' option located on the lower left corner of the pane with the light red background.

Comment	Point 1					
Teach Mode     Position Entry		Add	Delete	Change	Move	

2) Using the keypad located on the right hand side of the screen, and/or the joystick, and/or the trackball move the mechanism to different locations.



3) Press the 'Add' button. This will include the current point to the Position Log File that can be saved and retrieved.

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	<b>B</b>							
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<ul> <li>Teach Mode</li> <li>Position Entry</li> </ul>		Add Delete	Chang	e Move		Jo	ystick / Trackb	all Operation
Outgoing Messages				Incoming	Messages			
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4) The above steps may be repeated as many times as necessary.

5) After completion, save the information in the Position Log File by clicking on 'File' then 'Save as'.

#### **Position Entry Mode**

The software allows the user to enter the position of the points to move to.

To use the Position Entry Mode capability;

1) Select 'Position Entry' option located on the lower left corner of the pane with the light red background.

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File Edit Configuration View Help	
Control Panel Code Development	Reset
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All All All  Open Open	
Home Zero Stop V-Axis 0 Inch Save Home Zero Stop X-Axis 0 inch Save As	W-Axis XY Plane Z-Axis
Home Zero Stop Y-Axis 0 inch New	Slow C Medium C Fast C
Home Zero Stop Z-Axis 0 Inch Done	
Comment Point 1 C Position Mode C Teach Mode Add Delete Change Move	O On O Off Joystick / Trackball Operation
Position Entry	
Outgoing Messages Incoming Messages	

2) Enter the position information in each corresponding field then click on 'Add" button. This will include the current point to the Position Log File that can be saved and retrieved.

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All All Home Zero Home Zero Home Zero Home Zero	All Stop W-Axis 1.156 inch Stop X-Axis 2.367 inch Stop Y-Axis 4.235 inch Stop Z-Axis 6.325 inch Done Slow C Medium C Fast	Z-Axis
Com C Position Mode C Teach Mode C Position Entry	mment Point 1 C On C Off Add Delete Change Move Doystick / Trackball Opera	ation
Outgoing Messages	s Add the current point to the position log file. Incoming Messages	

4) The above steps may be repeated as many times as necessary.

Clicking on Open	button will open an already existing file on the hard disk.
Clicking on Save	button will save the current information to the hard disk.
Clicking on Save As	button will allow the user to save the information with a different name to the hard disk.
Clicking on New	button will erase all the entered information.
Clicking on Delete	button will erase the displayed record.
Clicking on Change	button will change the current record to the displayed values.
Clicking on Done	button will end the Position Entry mode and will return to Position Mode.
	a non-motore and provide the Conception the Mation Developmentary

Make sure that motion parameters are properly set. See <u>Setting the Motion Parameter</u>.

The position information is saved in .csv (Comma Separated Value) format. It is possible to generate and edit a profile using a spread sheet or text editor. However, the file must be saved as .csv file.

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## Repeating the Saved Motion Profile

1) Select 'Position Mode' option located on the lower left corner of the pane with the light red background.

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File Edit Configuration View	w Help							
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🛱 C:\OES\allegra\hexacon	n.csy	<u>? ×</u>						
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C Teach Mode	Add Delete Change Move	ackhall Operation						
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Outgoing Messages	Outgoing Messages Incoming Messages							
© Position Mode © Teach Mode © Position Entry Outgoing Messages	Add Delete Change Move Joystick / Tr	O Off ackball Operation						

2) Using the drop down menu, located at the top of the pane with blue background, or the 'East' and 'West' pointing arrows in the pane with light red background, select a point to move to.

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Comment Point 1   Position Mode  Teach Mode Position Entry  Add Delete Change Move	On C Off     Joystick / Trackball Operation
Outgoing Messages Incoming Messages	

3) Press 'Move'; the mechanism will go to the selected point.

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eposw					Joysti	ck is off					- 1
joff											
line 1732,10	00,0,0				Stoppi	ng					
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It is that simple! You do not have to write a single line of code.

#### **Setting the Motion Parameters**

All the motion parameters are set in the 'Configuration Panel' under 'Configuration' -> 'Motion Parameters'.

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[	X-Axis Y-Axis Z-Axis W-Axis					
Home	X-Axis Settings				Number of Axes	
	Motor Resolution	Microstepper Resolution				Axis
Home	200 Steps per Revolution	10 Microstens per Sten	-		C 1 Axis	
	O 400 Steps per Bevolution	To microsteps per otep			C 2 Axes	
Home	C 500 Steps per Revolution	Other			C 2 Augo	
Home	C 900 Steps per Revolution	,			C D Axes	
		Constant Annalysis Con			4 Axes	
	C Uther	- Speed and Acceleration Set	tings			
6.0.	- Physical Unit	Positioning Speed	4.000	inch / Sec		
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	Cmm	Homing Acceleration	5.000	inch / Sec / Sec	Save	$\vdash$
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epos	Physical Conversion Factor	Jogging Speed - Low	0.400	inch / Sec	Cancel	
epos:	1		5.020			
ioff		Jogging Acceleration	5.000	Inch / Sec / Sec		
line						
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## Controlling the Outputs and Monitoring the Inputs

To control the outputs and monitor the inputs, click on 'Configuration' -> 'Inputs - Outputs'.

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D 😂 🖡 Motion Paramete	Motion Parameters							
Control Comm Parameters nent Reset								
Tinputs - Outputs	s					<u>?</u> ×		
All Demo Mode	торен а р	osition file by click	ting on the File m	enu. 👻				
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Home Zero Stop	W-Axis	0	0	inch	W-Axis	Z-Axis		
Home Zero Stop	X-Axis	0	0	inch	Plane			
Home Zero Stop	Y-Axis	0	0	inch		$\mathbf{T}$		
		•	•	in als	Slow C Medium C Fast	•		
Home Zero Stop	Z-AXIS	0	0	inch		~		
Comment								
Position Mode		1	1 1		C On C Off			
C Position Entry		Add Delete	Change Move		Joystick / Trackball Oper	ation		
Outgoing Messages	Outgoing Messages Incoming Messages							

The following display will appear that allows the user to set or reset each output individually and monitor all analog and digital inputs.

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File Edit Configuration View Help												
Control Panel	Code Develop	ment										Reset
In - Output												
Discrete	Outputs		Discrete Inpu	ts	X-Motor	-	Y-Motor		Z-Motor		W-Moto	r
Out 1 C Low	Out 9 C Low	In 1	High In 9	High	+ Limit	0	+ Limit	0	+ Limit	0	+ Limit	0
Out 2 C Low	Out 10 C Low	In 2	High In 10	High	Home	0	Home	0	Home	0	Home	8
Out 3 O Low	Out 11 C Low	In 3	High In 11	High	Analog	Input	5		Joystic	Key	5	Ť
Out 4 C High	Out 12 High	In 4	High In 12	High	Analog	× [	127			Up Mic	per Right Idle Right	0
Out 5 C High	Out 13 C Low	In 5	High In 13	High	Analog-	·z 🔽	127	Lowe	r Left C	Lo	wer Right	õ
Out 6 C High	Out 14 C Low	In 6	High In 14	High	Quadra	ture I	nputs	Ouad-	× –	_		
Out 7 O High	Out 15 C High	In 7	High In 15	High	Quad-:	1	0	Quad-	Y L	0		
Out 8 C High	Out 16 C High	In 8	High In 16	High	Quad-	<u>د</u> [_	U	Enable		U		Done
Outgoing Messag	es				Incomin	ig Mess	sages					
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Contact Us

MOTION	
ACCW value	Sets the linear acceleration of the W-axis to value.
ACCX value	Sets the linear acceleration of the X-axis to value.
ACCY value	Sets the linear acceleration of the Y-axis to value.
ACCZ value	Sets the linear acceleration of the Z-axis to <i>value</i> .
HOMEW	Instructs home searching sequence of the W-axis.
HOMEX	Instructs home searching sequence of the X-axis.
HOMEY	Instructs home searching sequence of the Y-axis.
HOMEZ	Instructs home searching sequence of the Z-axis.
JOGW	Instructs jogging mode of the W-axis.
JOGX	Instructs jogging mode of the X-axis.
JOGY	Instructs jogging mode of the Y-axis.
JOGZ	Instructs jogging mode of the Z-axis.
MOVAALL	Begins an absolute move on all axes.
MOVAW	Begins an absolute move on the W-axis.
MOVAX	Begins an absolute move on the X-axis.
MOVAY	Begins an absolute move on the Y-axis.
MOVAZ	Begins an absolute move on the Z-axis.
MOVRALL	Begins a relative move on all axes.
MOVRW	Begins a relative move on the W-axis.
MOVRX	Begins a relative move on the X-axis.
MOVRY	Begins a relative move on the Y-axis.
MOVRZ	Begins a relative move on the Z-axis.
POSW value	Sets the distance to move of the W-axis to value.
POSX value	Sets the distance to move of the X-axis to value.
POSY value	Sets the distance to move of the Y-axis to value.
POSZ value	Sets the distance to move of the Z-axis to <i>value</i> .
STOPALL	Stops the motion of all axes.
STOPW	Stops the motion of the W-axis.
<u>STOPX</u>	Stops the motion of the X-axis.
<u>STOPY</u>	Stops the motion of the Y-axis.
<u>STOPZ</u>	Stops the motion of the Z-axis.
<u>VELW</u> value	Sets the maximum step rate of the W-axis to value.
VELX value	Sets the maximum step rate of the X-axis to value.
VELY value	Sets the maximum step rate of the Y-axis to value.
VELZ value	Sets the maximum step rate of the Z-axis to value.

COORDINATED MOTION	
LINE	Makes a coordinated linear motion.
VACCEL value	Sets the vector acceleration to value.
VVEL value	Sets the vector velocity to value.
ARC	Generates a 2-dimensional circular arc segment.

#### **GENERAL CONFIGURATION**

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....

EPOSW	Equates the current position of the W-axis to the value of the corresponding step counter.
EPOSX	Equates the current position of the X-axis to the value of the corresponding step counter.
EPOSY	Equates the current position of the Y-axis to the value of the corresponding step counter.
EPOSZ	Equates the current position of the Z-axis to the value of the corresponding step counter.
JOFF	Disables the joystick and trackball operation.
JON	Enables the joystick and trackball operation.
MOFFW	Turns the motor driver of the W-axis off.
MOFFX	Turns the motor driver of the X-axis off.
MOFFY	Turns the motor driver of the Y-axis off.
MOFFZ	Turns the motor driver of the Z-axis off.
MONW	Turns the motor driver of the W-axis on.
MONX	Turns the motor driver of the X-axis on.
MONY	Turns the motor driver of the Y-axis on.
MONZ	Turns the motor driver of the Z-axis on.
MSGOFF	Turns off the feedback messages sent from the controller.
MSGON	Turns on the feedback messages sent from the controller.
SPOSW value	Sets the current position of the W-axis to value.
SPOSX value	Sets the current position for the X-axis to value.
SPOSY value	Sets the current position for the Y-axis to value.
<u>SPOSZ</u> value	Sets the current position for the Z-axis to <i>value</i> .
SQUADW value	Sets the W-axis quadrature decoder to value
SQUADX value	Sets the X-axis quadrature decoder to value.
SQUADY value	Sets the Y-axis quadrature decoder to value.
SQUADZ value	Sets the Z-axis quadrature decoder to <i>value</i> .
DATA ELOW	
	Resets the discrete output specified by value to low state
	Nosels the discrete output specified by value to low state.
<u>IN</u>	Report the input ports
OUT value	Writes the <i>value</i> to the output ports.

RQUADW	The controller sends the W-axis quadrature decoder value to the serial port.
RQUADX	The controller sends the X-axis quadrature decoder value to the serial port.
RQUADY	The controller sends the Y-axis quadrature decoder value to the serial port.
RQUADZ	The controller sends the Z-axis quadrature decoder value to the serial port.
RSTSW	Reports the status of W-axis
RSTSX	Reports the status of X-axis
RSTSY	Reports the status of Y-axis
<u>RSTSZ</u>	Reports the status of Z-axis.
RW	Reports the value of W-axis step counter.
RX	Reports the value of X-axis step counter.
<u>RY</u>	Reports the value of Y-axis step counter.
<u>RZ</u>	Reports the value of Z-axis step counter.
SETBIT value	Sets the discrete output specified by value to high state.

## Host Controlled Operation

In this mode the host will send a series of ASCII commands to the controller over the RS-232 serial port. The controller process to the incoming commands and responses with the proper messages.

#### Programming Example in Visual BASIC

The following example sets the linear acceleration to 500,000 Steps /  $sec^2$ , step rate at 100 KHz, and the distance to travel equal to 200,000 steps. Then the controller is commanded to make an absolute move on the X Axis.

Private SubCommand1\_Click()

'Function Prototype Declare Function SioPuts Lib "WSC32.DLL" (ByVal Port As Long, ByVal Buffer As String, ByVal Size As Long) As Long

Dim Code As Long Dim StringToBeTransmtd As String ' Set the linear acceleration of X Axis to 500,000 steps / sec / sec StringToBeTransmtd = "accx 500000" + vbCr Code = SioPuts(ThePort, StringToBeTransmtd, Len(StringToBeTransmtd))

' Set the linear velocity of X Axis to 100,000 steps / sec StringToBeTransmtd = "velx 100000" + vbCr Code = SioPuts(ThePort, StringToBeTransmtd, Len(StringToBeTransmtd))

' Set the position to move of X Axis to 200,000 steps StringToBeTransmtd = "posx 200000" + vbCr Code = SioPuts(ThePort, StringToBeTransmtd, Len(StringToBeTransmtd))

'Command the X Axis of the controller to make an absolute move StringToBeTransmtd = "movax" + vbCr Code = SioPuts(ThePort, StringToBeTransmtd, Len(StringToBeTransmtd))

#### End Sub Programming Example in 'C'

The following example sets the acceleration at 10 Million Steps /  $\sec^2$ , step rate at 100 KHz, and the distance to travel equal to 100,000 steps. Then the controller isCommanded to make an absolute move. void send\_command(void)

{

char StringToBeTransmtd[80];

// Set the linear acceleration of X Axis to 500,000 steps / sec / sec strcpy(StringToBeTransmtd,"accx 500000\n"); SioPuts(Port,StringToBeTransmtd,strlen(StringToBeTransmtd)); // Set the linear velocity of X Axis to 100,000 steps / sec strcpy(StringToBeTransmtd,"velx 10000\n"); SioPuts(Port,StringToBeTransmtd,strlen(StringToBeTransmtd));

// Set the position to move of X Axis to 200,000 steps strcpy(StringToBeTransmtd,"posx 200000\n"); SioPuts(Port,StringToBeTransmtd,strlen(StringToBeTransmtd)); // 'Command the X Axis of the controller to make an absolute move strcpy(StringToBeTransmtd,"movax\n"); SioPuts(Port,StringToBeTransmtd,strlen(StringToBeTransmtd));

}

The following is the information that you need to establish communication with OES line of controllers.

1) The baud rate is 19.2 K, 8-bit, no parity, one stop bit.

2) ASCII characters should be terminated with CR or LF.

3) After sending each packet of data to the OES' controller, sufficient time should be given to the controller to process it, usually 100msec.

To receive characters, a buffer is setup and all the incoming characters are stored in it until they are fetched by the application.

The following commands the X-axis to stop, and checks the receiving buffer for "X Stopping" string to make sure the X-axis has received and performed theCommand.

Private Sub cmdXPlus\_MouseUp(Button As Integer, Shift As Integer, X As Single, Y As Single)

Dim S As String Dim Start As Single Dim Counter As Integer Dim Where As Long

StringToBeTransmtd = "stopx" & vbCr

Do While (Counter < NoofRetries And Where = 0) Code = SioPuts(ThePort, StringToBeTransmtd, Len(StringToBeTransmtd)) Start = Timer() Do While Timer() < Start + DelayTime DoEvents 'Yield to other processes. Loop Where = InStr(strRcvdMsg, "X Stopping") Counter = Counter + 1 Loop

#### If (Counter >= NoofRetries) Then

If MsgBox("The controller is not responding! Turn the controller's power off.", vbOKOnly, "Error46") = vbOK Then Exit Sub End If

End Sub

OES uses a serial communication package from www.marshallsoft.com.

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#### accw

#### **Syntax**

accw value

#### **Function**

Sets the linear acceleration of the W-axis to value.

This value is used to accelerate and decelerate the motor. The acceleration may not be modified while moving. The unit of *value* is in steps per  $sec^2$ .

#### **Range of Value**

40,000 - 40,000,000

#### **Controller Returns**

None

#### Mode

Command

#### accx

#### **Syntax**

accx value

#### Function

Sets the linear acceleration of the X-axis to *value*. This value is used to accelerate and decelerate the motor. The acceleration may not be modified while moving. The unit of *value* is in steps per sec<sup>2</sup>.

#### **Range of Value**

40,000 - 40,000,000

#### **Controller Returns**

None

#### Mode

#### accy

#### **Syntax**

accy value

## **Function**

Sets the linear acceleration of the Y-axis to *value*. This value is used to accelerate and decelerate the motor. The acceleration may not be modified while moving. The unit of *value* is in steps per sec<sup>2</sup>.

### **Range of Value**

40,000 - 40,000,000

### **Controller Returns**

None

## Mode

Command

## accz

### **Syntax**

accz value

## Function

Sets the linear acceleration of the Z-axis to value.

This value is used to accelerate and decelerate the motor. The acceleration may not be modified while moving. The unit of *value* is in steps per  $\sec^2$ .

### **Range of Value**

40,000 - 40,000,000

## **Controller Returns**

None

## Mode

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#### homew

#### **Syntax**

homew

#### Function

Instructs a home searching sequence on the W-axis.

The homing sequence is as follows:

The motor will start to move. The sign of the velocity determines the direction of the move. Once it hits the Home switch, it decelerates to stop at the same rate as acceleration.

Then the motor will move in reverse direction, at the slowest speed, until it senses the Home switch changes state then stops.

A normally closed or normally low switch should be connected to the Home pin. Please consult the Hardware Reference Manual for the location of the Home pin.

#### **Controller Returns**

W Homing After completion of the sequence Done W

#### Mode

Command

## homex

#### **Syntax**

homex

#### Function

Instructs a home searching sequence on the X-axis.

The homing sequence is as follows:

The motor will start to move. The sign of the velocity determines the direction of the move. Once it hits the Home switch, it decelerates to stop at the same rate as acceleration.

Then the motor will move in reverse direction, at the slowest speed, until it senses the Home switch changes state then stops.

A normally closed or normally low switch should be connected to the Home pin. Please consult the Hardware Reference Manual for the location of the Home pin.

#### **Controller Returns**

X Homing After completion of the sequence Done X

#### Mode

Command

## homey

#### **Syntax**

homey

#### Function

Instructs a home searching sequence of the Y-axis.

The homing sequence is as follows:

The motor will start to move. The sign of the velocity determines the direction of the move. Once it hits the Home switch, it decelerates to stop at the same rate as acceleration.

Then the motor will move in reverse direction, at the slowest speed, until it senses the Home switch changes state then stops.

A normally closed or normally low switch should be connected to the Home pin. Please consult the Hardware Reference Manual for the location of the Home pin.

#### **Controller Returns**

Y Homing After completion of the sequence Done Y

#### Mode

## homez

#### **Syntax**

homez

### Function

Instructs a home searching sequence of the Z-axis.

The homing sequence is as follows:

The motor will start to move. The sign of the velocity determines the direction of the move. Once it hits the Home switch, it decelerates to stop at the same rate as acceleration.

Then the motor will move in reverse direction, at the slowest speed, until it senses the Home switch changes state then stops.

A normally closed or normally low switch should be connected to the Home pin. Please consult the Hardware Reference Manual for the location of the Home pin.

### **Controller Returns**

Z Homing After completion of the sequence Done Z

### Mode

Command

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## jogw

### **Syntax**

jogw

### Function

Instructs jogging mode of the W-axis.

### **Controller Returns**

W Jogging After stopping Done W

## Mode

Command

## jogx

## Syntax

jogx

#### **Function** Instructs jogging mode of the X-axis.

## **Controller Returns**

X Jogging After stopping Done X

### Mode

## jogy

## **Syntax**

jogy

## Function

Instructs jogging mode of the Y-axis.

## **Controller Returns**

Y Jogging After stopping Done Y

## Mode

Command

## jogz

Syntax jogz

**Function** Instructs jogging mode of the Z-axis.

## **Controller Returns**

Z Jogging After stopping Done Z

## Mode

## movaall

### **Syntax**

movaall

#### Function

Begins an absolute move on all axes.

### **Controller Returns**

W Abs. Move *(if applicable)* X Abs. Move Y Abs. Move Z abs. Move *(if applicable)* 

#### Mode

Command

## movaw

Syntax movaw

**Function** Begins an absolute move on the W-axis.

### **Controller Returns**

W Abs. Move

#### Mode

#### movax

#### **Syntax**

movax

**Function** Begins an absolute move on the X-axis.

### **Controller Returns**

X Abs. Move

## Mode

Command

## movay

Syntax movay

**Function** Begins an absolute move on the Y-axis.

Controller Returns Y Abs. Move

### Mode

Command

#### movaz

## Syntax

movaz

**Function** Begins an absolute move on the Z-axis.

# Controller Returns

Z Abs. Move

## Mode

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## movrall

#### **Syntax**

movrall

### Function

Begins a relative move on all axes.

#### **Controller Returns**

W Rel. Move *(if applicable)* X Rel. Move Y Rel. Move Z Rel. Move *(if applicable)* 

#### Mode

Command

#### movrw

## Syntax

movrw

#### **Function** Begins a relative move on the W-axis.

## **Controller Returns**

W Rel. Move

#### Mode

#### movrx

#### **Syntax**

movrx

## Function

Begins a relative move on the X-axis.

### **Controller Returns**

X Rel. Move

#### Mode

Command

### movry

## Syntax

movry

### **Function** Begins a relative move on the Y-axis.

### **Controller Returns**

Y Rel. Move

## Mode

Command

#### movrz

#### **Syntax**

movrz

## Function

Begins a relative move on the Z-axis.

### **Controller Returns**

Z Rel. Move

## Mode

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### posw

Syntax posw value

**Function** Sets the distance to move of the W-axis to *value*.

Range of Value -2147483647 to +2147483647

Controller Returns
None

Mode Command

## posx

Syntax posx value

Function

Sets the distance to move of the X-axis to value .

Range of Value -2147483647 to +2147483647

Controller Returns None

Mode Command

## posy

#### Syntax posy value

## Function

Sets the distance to move of the Y-axis to value .

#### Range of Value -2147483647 to +2147483647

# **Controller Returns**

None

## Mode

Command

## posz

#### Syntax posz value

## Function

Sets the distance to move of the Z-axis to value .

# Range of Value

-2147483647 to +2147483647

# Controller Returns

None

## Mode

## stopall

#### **Syntax**

stopall

## **Function**

Stops the motion of all axes.

### **Controller Returns**

W Stopping (if applicable) X Stopping Y Stopping Z Stopping (if applicable)

#### Mode

Command

## stopw

### **Syntax**

stopw

## Function

Stops the motion of the W-axis.

## **Controller Returns**

W Stopping

#### Mode

## stopx

#### **Syntax**

stopx

**Function** Stops the motion of the X-axis.

## **Controller Returns**

X Stopping

**Mode** Command

## stopy

Syntax stopy

**Function** Stops the motion of the Y-axis.

Controller Returns Y Stopping

## Mode

Command

## stopz

## Syntax

stopz

**Function** Stops the motion of the Z-axis.

Controller Returns Z Stopping

Mode Command www.OESIncorp.com Copyright © 2002 - 2014 Optimal Engineering Systems, Inc.

## velw

## **Syntax**

velw value

#### **Function**

Sets the maximum step rate of the W-axis to *value*. This value sets the slew speed of the motor. The speed may not be modified while moving. The unit of *value* is in steps / Sec.

#### **Range of Value**

200 - 200,000

#### **Controller Returns**

None

#### Mode

Command

## velx

#### **Syntax**

velx value

#### Function

Sets the maximum step rate of the X-axis to *value*. This value sets the slew speed of the motor. The speed may not be modified while moving. The unit of *value* is in steps / Sec.

#### **Range of Value**

200 - 200,000

#### **Controller Returns**

None

#### Mode

## vely

## **Syntax**

vely value

#### **Function**

Sets the maximum step rate of the Y-axis to value.

This value sets the slew speed of the motor. The speed may not be modified while moving. The unit of *value* is in steps / Sec.

### **Range of Value**

200 - 200,000

#### **Controller Returns**

None

#### Mode

Command

## velz

#### **Syntax**

velz value

### Function

Sets the maximum step rate of the Z-axis to value .

This value sets the slew speed of the motor. The speed may not be modified while moving. The unit of *value* is in steps / Sec.

#### **Range of Value**

200 - 200,000

#### **Controller Returns**

None

### Mode

#### arc

#### **Syntax**

arc X-axis-end, Y-axis-end, X-axis-center, Y-axis-center, Direction

## **Function**

Generates a 2-dimensional circular arc segment.

### **Controller Returns**

None

#### Mode

Command

## done?

#### **Syntax**

done?

## **Function**

Halts the execution of the program until the coordinated motion is completed.

## **Controller Returns**

None

#### Mode

Run

## line

Syntax line X-axis-end, Y-axis-end, Z-axis-end, W-axis-end

Function Makes a coordinated linear motion Controller Returns None

### Mode

Command

## vaccel

### **Syntax**

vaccel value

## Function

Sets the vector acceleration of the coordinated move to *value*. The *value* may not be modified while moving. The unit of *value* is in steps per  $sec^2$ .

## **Range of Value**

40,000 - 40,000,000

#### Mode

## vvel

### **Syntax**

vvel value

## **Function**

Sets the vector velocity of the coordinated move to value .

The *value* may not be modified while moving. The unit of *value* is in steps / Sec.

#### **Range of Value**

200 - 200,000

#### **Controller Returns**

None

### Mode

Command

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#### eposw

#### **Syntax**

eposw

#### **Function**

Equates the current position of the W-axis to the value of the corresponding step counter.

#### **Controller Returns**

None

#### Mode

Command

### eposx

#### **Syntax**

eposx

### **Function**

Equates the current position of the X-axis to the value of the corresponding step counter.

### **Controller Returns**

None

### Mode

## eposy

## **Syntax**

eposy

### **Function**

Equates the current position of the Y-axis to the value of the corresponding step counter.

## **Controller Returns**

None

## Mode

Command

## eposz

### **Syntax**

eposz

### **Function**

Equates the current position of the Z-axis to the value of the corresponding step counter.

### **Controller Returns**

None

### Mode

## joff

#### **Syntax**

joff

## **Function**

Disables the joystick and trackball operation.

## **Range of Value**

None

### **Controller Returns**

Joystick is off.

### Mode

Command

## jon

## Syntax

jon

## Function

Enables the joystick and trackball operation.

### **Controller Returns**

Joystick is on.

#### Mode

Contact Us

## moffw

#### **Syntax**

moffw

### Function

Turns the motor driver of the W-axis off.

#### **Controller Returns**

None

#### Mode

Command

## moffx

#### Syntax moffx

**Function** Turns the motor driver of the X-axis off.

## **Controller Returns**

None

## Mode

Command

## moffy

### **Syntax**

moffy

### Function

Turns the motor driver of the Y-axis off.

### **Controller Returns**

None

### Mode

Command

## moffz

Syntax moffz

## **Function** Turns the motor driver of the Z-axis off.

## **Controller Returns**

None

## Mode

Command

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#### monw

#### **Syntax**

monw

## **Function**

Turns the motor driver of the W-axis on.

#### **Controller Returns**

None

#### Mode

Command

### monx

# Syntax

monx

## Function

Turns the motor driver of the X-axis on.

#### **Controller Returns**

None

#### Mode

## mony

## **Syntax**

mony

**Function** Turns the motor driver of the Y-axis on.

### **Controller Returns**

None

**Mode** Command

#### monz

Syntax monz

**Function** Turns the motor driver of the Z-axis on.

## **Controller Returns**

Z Motor on

### Mode

Command

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## msgoff

## **Syntax**

msgoff

### Function

Turns off the feedback messages sent from the controller.

### **Controller Returns**

None

#### Mode

Command

## msgon

#### Syntax msgon

**Function** Turns on the feedback messages sent from the controller.

### **Controller Returns**

None

#### Mode

Contact Us

#### sposw

Syntax sposw value

sposw value

Function

Sets the current position of the W-axis to value .

Range of Value -2147483647 to +2147483647

Controller Returns None

Mode Command

## sposx

Syntax sposx value

**Function** Sets the current position of the X-axis to *value*.

Range of Value -2147483647 to +2147483647

Controller Returns None

Mode Command

## sposy

Syntax sposy value

**Function** Sets the current position of the Y-axis to *value*.

Range of Value -2147483647 to +2147483647

Controller Returns None

Mode Command

## sposz

Syntax sposz value

**Function** Sets the current position of the Z-axis to *value*.

Range of Value -2147483647 to +2147483647

Controller Returns

### Mode

## squadw

#### Syntax

squadw value

## **Function**

Sets the W-axis quadrature decoder to value.

The optional quadrature decoder card is required.

Range of Value -2147483647 to +2147483647

## **Controller Returns**

None

## **Mode** Command

## squadx

Syntax squadx value

## Function

Sets the X-axis quadrature decoder to value.

The optional quadrature decoder card is required.

Range of Value -2147483647 to +2147483647

## **Controller Returns**

None

## Mode

## squady

## **Syntax**

squady value

**Function** Sets the Y-axis quadrature decoder to *value*.

The optional quadrature decoder card is required.

Range of Value -2147483647 to +2147483647

Controller Returns

Mode Command

## squadz

Syntax squadz *value* 

**Function** Sets the Z-axis quadrature decoder to *value*.

The optional quadrature decoder card is required.

Range of Value -2147483647 to +2147483647

Controller Returns None

**Mode** Command www.OESIncorp.com Copyright © 2002 - 2014 Optimal Engineering Systems, Inc.

## clrbit

#### **Syntax**

clrbit value

#### **Function**

Resets the discrete output specified by *value*. Refer to the hardware reference manual for the location of each pin.

#### **Range of Value**

1 to 16

### **Controller Returns**

None

## Mode

Command

## setbit

#### **Syntax**

setbit value

#### **Function**

Sets the discrete output specified by *value*. Refer to hardware reference manual for the location of each pin.

#### **Range of Value**

1 – 16

#### **Controller Returns**

None

## in

#### **Syntax**

in

#### **Function**

Reads a word from the input ports and reports it via the serial port. Refer to the hardware reference manual for the location of each pin.

#### **Range of Value**

0 to 65535

## **Controller Returns**

None

## Mode

Command

## out

#### **Syntax**

out value

#### **Function**

Writes the *value* to the output ports. Refer to the hardware reference manual for the location of each pin.

#### **Range of Value**

0 to 65535

#### **Controller Returns**

None

#### Mode

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## rquadw

#### **Syntax**

rquadw

#### **Function**

The controller sends the quadrature decoder value to the serial port.

The optional quadrature decoder card is required.

#### **Range of Value**

-2147483647 through +2147483647

#### **Controller Returns**

The value if no argument is specified.

#### Mode

Command

## rquadx

#### **Syntax**

rquadx

## Function

The controller sends the quadrature decoder value to the serial port.

The optional quadrature decoder card is required.

#### **Range of Value**

-2147483647 through +2147483647

#### **Controller Returns**

The value if no argument is specified.

#### Mode

## rquady

#### **Syntax**

rquady

## **Function**

The controller sends the quadrature decoder value to the serial port.

The optional quadrature decoder card is required.

## Range of Value

-2147483647 through +2147483647

## **Controller Returns**

The value if no argument is specified.

## Mode

Command

## rquadz

Syntax rquadz

## Function

The controller sends the quadrature decoder value to the serial port.

The optional quadrature decoder card is required.

#### Range of Value -2147483647 through +2147483647

## **Controller Returns**

the value if no argument is specified.

## Mode

#### rstsw

#### Syntax

rstsw

#### Function

Reports the status of W-axis.

Bit 0 is 1 if in MOVE mode else 0 Bit 1 is 0 if Positive Limit Switch is hit else 1 Bit 2 is 0 if Negative Limit Switch is hit else 1 Bit 3 is 0 if Home Limit Switch is hit else 1 bit 4 - bit 31 Spare

#### **Controller Returns**

The *value* if no argument is specified.

#### Mode

Command

#### rstsx

#### **Syntax**

rstsx

#### Function

Reports the status of X-axis.

Bit 0 is 1 if in MOVE mode else 0 Bit 1 is 0 if Positive Limit Switch is hit else 1 Bit 2 is 0 if Negative Limit Switch is hit else 1 Bit 3 is 0 if Home Limit Switch is hit else 1 Bit 4 is spare Bit 5 is spare Bit 6 is spare Bit 7 is spare Bit 8 is 1 if Joystick Lower Left Key Is Pressed. Bit 9 is 1 if Joystick Middle Right Key Is Pressed. Bit 10 is 1 if Joystick Upper Right Key Is Pressed. Bit 11 is 1 if Joystick Lower Right Key Is Pressed. Bit 12 is spare. Bit 13 is spare. Bit 14 is spare. Bit 15 is spare. Bit 16 - bit 23 = X-axis analog value. Bit 24 - bit 31 = Spare

#### **Range of Value**

-2147483648 to +2147483647

#### **Controller Returns**

The value if no argument is specified.

#### Mode

Command

## rstsy

#### **Syntax**

rstsy

#### Function

Reports the status of Y-axis.

Bit 0 is 1 if in MOVE mode else 0 Bit 1 is 0 if Positive Limit Switch is hit else 1 Bit 2 is 0 if Negative Limit Switch is hit else 1 Bit 3 is 0 if Home Limit Switch is hit else 1 Bit 4 - bit 15 = Spare Bit 16 - bit 23 = Y-axis analog value. Bit 24 - bit 31 = Spare

#### **Range of Value**

-2147483648 to +2147483647

#### **Controller Returns**

The value if no argument is specified.

#### Mode

### rstsz

#### **Syntax**

rstsz

### **Function**

Reports the status of Z-axis.

Bit 0 is 1 if in MOVE mode else 0 Bit 1 is 0 if Positive Limit Switch is hit else 1 Bit 2 is 0 if Negative Limit Switch is hit else 1 Bit 3 is 0 if Home Limit Switch is hit else 1 Bit 4 - bit 15 = Spare Bit 16 - bit 23 = Z-axis analog value. Bit 24 - bit 31 = Spare.

## **Range of Value**

0 to +16777215

## **Controller Returns**

The value if no argument is specified.

### Mode

Command

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#### rw

#### **Syntax**

rw

### **Function**

Reports the value of W-axis step counter prefixed by W.

#### **Controller Returns**

The value of W-axis step counter prefixed by W.

#### Mode

Command

#### rx

Syntax rx

**Function** Reports the value of X-axis step counter prefixed by X.

## **Controller Returns**

The value of X-axis step counter prefixed by X.

#### Mode

## ry

## Syntax

ry

## Function

Reports the value of Y-axis step counter prefixed by Y.

## **Controller Returns**

The value of Y-axis step counter prefixed by Y.

### Mode

Command

### rz

# Syntax

rw

### **Function** Reports the value of Z-axis step counter prefixed by Z.

## **Controller Returns**

The value of Z-axis step counter prefixed by Z.

### Mode

Command

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