MultiStop

TECHNICAL SPECIFICATION

D1009 Version 2.11
\\R&D\Current Products\\Manuals***MultiStop***\ Tech Spec V2.11.doc

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Documentation

This product is available with two manuals; *Technical Specification* and *Operators Manual*. This is the Technical Specification which has been written for the engineer to use and refer to when designing, commissioning and maintaining the ***MultiStop*** system. The other document explains how the positioner is used in day - to - day operation i.e. Programming, Jogging and auto execution of programs.

Please note

The contents of this specification are designed to give the reader an understanding of how the ***MultiStop*** controller operates. The product described is subject to continuous development and improvement. All information of a technical nature and particulars of the product, and its use are given by Goodwin Electronics in good faith. However, it is acknowledged that there may be errors and omissions in this document. We shall not be liable for the loss or damage whatsoever arising from the use of any information in, or any omissions from, this document.

CONTENTS

1. INTRODUCTION

The ***MultiStop*** is designed to control up to two axes of motion using servo motors or other motors with variable speed drives. It is a fully self contained unit with up to two 16 bit +/- 10V servo command signals for controlling the motion of the motors in a full position closed loop or open loop manner. There are up to six terms in the position control loop that can be used to optimise motion. Its range of applications include,

- Packaging / Indexing Machines
- Robotics
- Drilling machines
- Back Stop Positioners

The various options available are given in the model number description given below;

		ORDERING CODE
Unit	**M** *MultiStop*	**M**
Software	**P** analogue motor control, **S** digital motor control	**P**
HPG option	**A** no hpg option, **H** with hpg option	**A**
Number of axes	**1** or **2**	**2**
Mounting	**P** Panel mounting	**P**
Supply Voltage	**4** 100/240 Vac or **3** 24V dc	**3**
Serial Comms.	**S** with RS485 comms, **C** No comms	**C**
Encoder Type	**INC** incremental	**INC**
Encoder Supply Voltage	**5** 5V dc	**5**
Outputs	**1** 1 relay/axis all others PNP, **F** All relay outputs	**1**
X number	**indicates a special unit**	**X100**

Example **MPH-1P-3S-INC5-F**

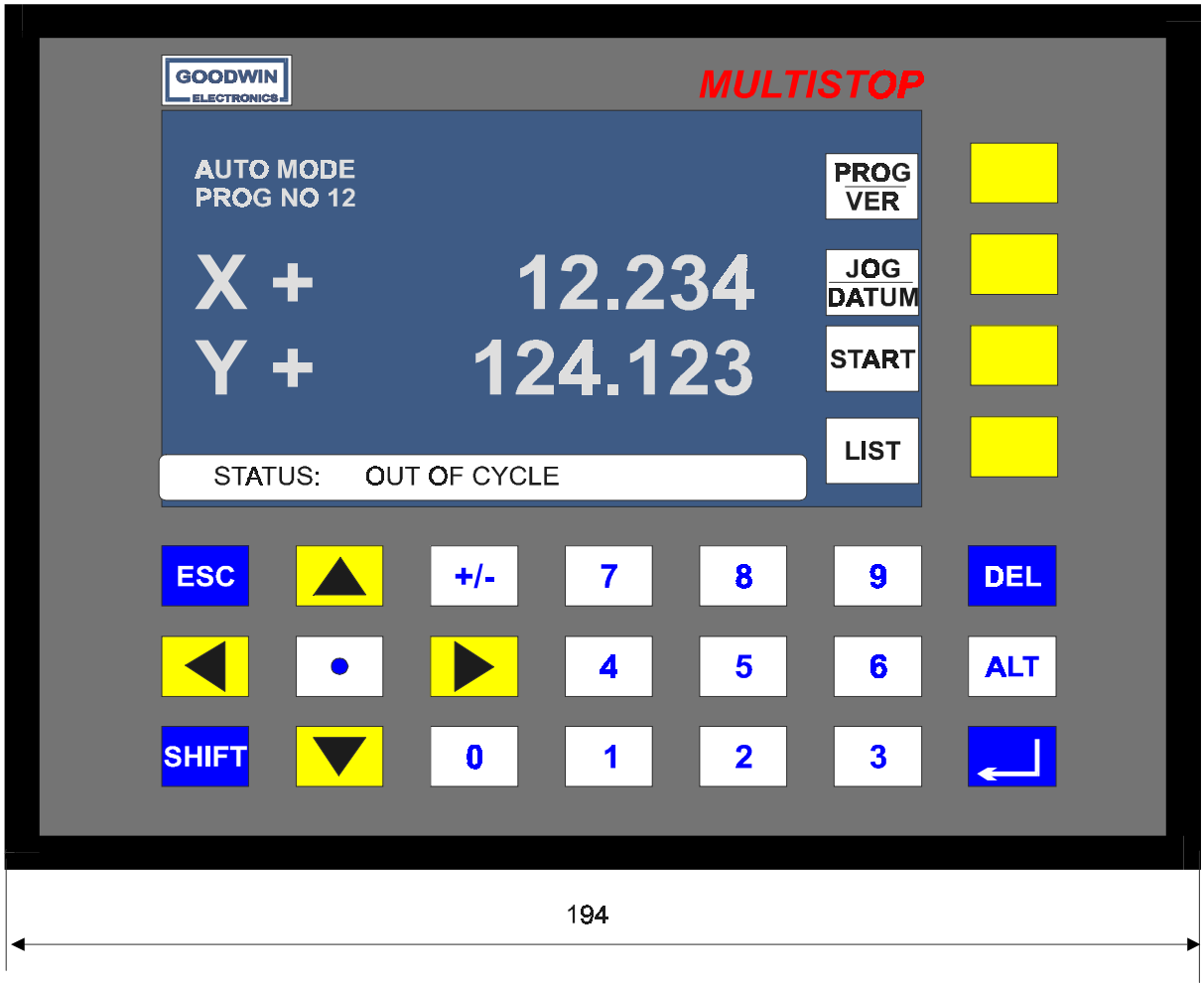
- 1 axis Multistop with analogue output for servo motor
- provision for 1 hpg encoder
- Supply voltage 24V dc
- RS485 communication fitted
- 5V incremental encoders inputs
  choice of scale will give
  - system resolution
  - marker pulse and marker pulse polarity
  - differential or single ended outputs
    (encoder plug needs to be wired accordingly)
- 16 relays outputs
- 16 digital inputs (by default since it is a single axis unit

Use this description to verify the model you have or require.

2. SPECIFICATIONS

2.1. SYSTEM MECHANICAL SPECIFICATION

Approximate weight:	1kg
Protection:	IP 65 front and IP 40 rear
Ambient Working Temperature Range:	0 to 50°C
Storage/shipping Temperature:	-40 to 60°C
Humidity requirement:	5 to 95% non condensing



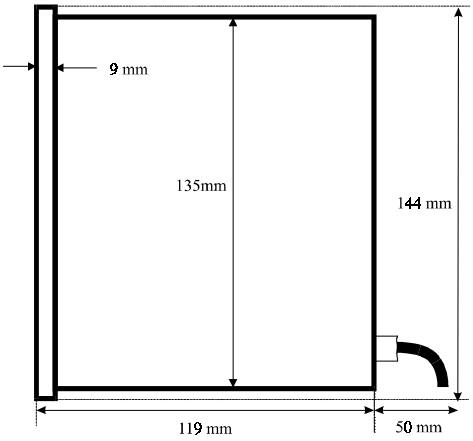
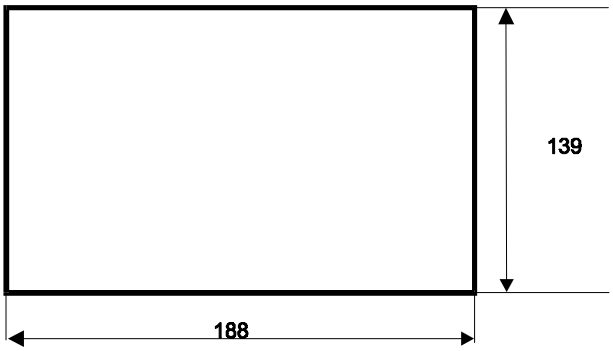


Figure 1: Overall Dimensions

Panel cut out



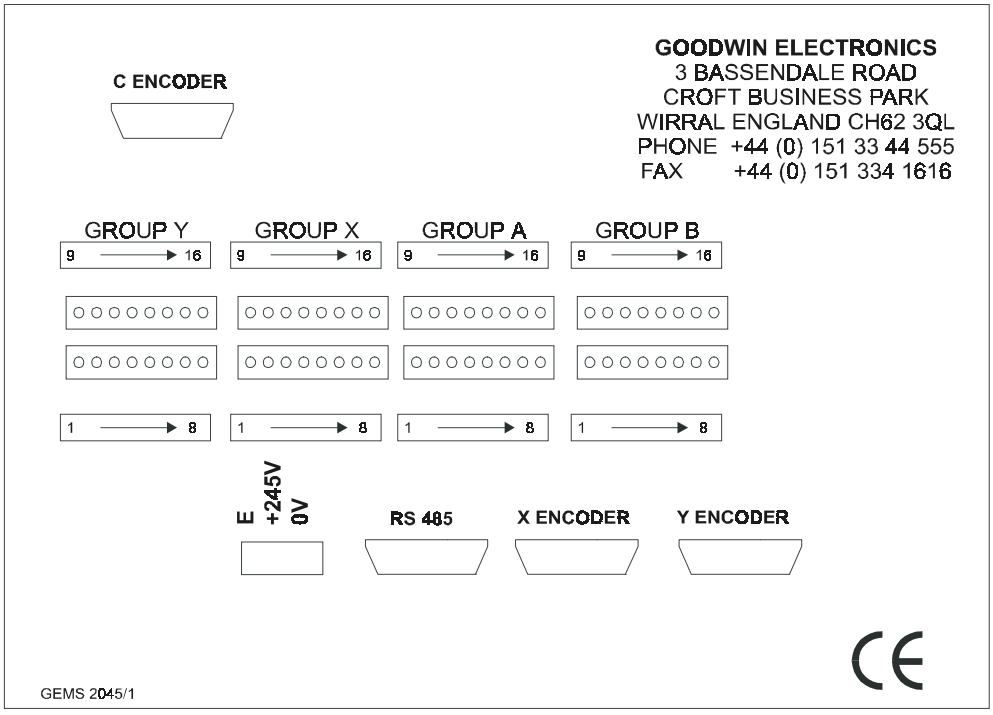


Figure 2 : Rear panel

2.2. SYSTEM ELECTRICAL SPECIFICATION

Linear scales or Encoders:

Differential or single ended quadrature square wave signal inputs from linear scales or rotary encoders. A full description of the encoder/scale inputs is given in section 3.5.The maximum count rate is 2 MHz full quadrature on each axis. A single axis ***MultiStop*** has one encoder input a two axis system has two inputs

Optional encoder input to jog axis.

Differential Quadrature square wave signal inputs from rotary encoders. Specification is identical to the other encoder/linear scale inputs but the maximum count rate is 100 kHz.

Standard Outputs:

All systems have a volt free relay output which indicates system healthy (Watchdog).

One axis ***MultiStop***;

One 16 bit +/- 10V analogue output
One user definable relay outputs per channel are fitted as standard (switching 24V dc @ 0.5 A) maximum)
Up to 16 relay output can be ordered if required
15 PNP (source current 50mA @24V Dc nominal, absolute maximum voltage 25V) outputs

Two axis ***MultiStop***

Two 16 bit +/- 10V analogue output
Two user definable relay outputs are fitted as standard (switching 24V dc @ 0.5 A) maximum)
Upto 24 relay output can be ordered if required
22 PNP (source current 50mA @ 24v) outputs.

HPG option

An encoder can be connected to the C axis encoder input and used to jog the machine to any position when the machine is out of cycle.

Optional Output Configuration:

All outputs can be made relay outputs which are capable of switching 24V DC @ 0.5 A maximum
Use the description in the INTRODUCTION on page 5 to determine the output configuration you have. A description of the output circuits can be found below.

Watchdog: A relay output (closed for system healthy) is available. The watchdog monitors the correct operation on the software and hardware. It will indicate a fault within 20 milliseconds of it occurring.

Inputs: Single axis ***MultiStop***
16 Configurable Inputs.
Two axis ***MultiStop***
24 Configurable Inputs.
Input signals must be in the range 22 to 24V DC (absolute maximum 28V DC).
A full description of the Inputs is given in section 3.4.

Supply: 24VDC (+/-20%)
Power consumption is 30VA maximum.

RS485: A single RS485 channel that can communicate a remote PC is provided. Communication protocols are automatically set. Software to implement a wide range of commands is available from Goodwin Electronics, please ask for details.

CE Standards: The unit conforms to EN55 022, EN60 555, EN 50 093, IEC 801-2 and IEC801_4 of the current EMC requirements. It also meets the low voltage directive requirements 73/23/EEC.

Connectors: Encoder inputs on 15 W high density D type connector (same footprint as a 9 W D type connector).
RS485 on a 9 W D type connector
Digital I/O on 8 way pluggable terminals (Weidmuller BL3.5/8)

Battery: A lithium battery (10 year life) allows the program and configured parameter data to be stored safely during power down. A battery-low monitoring system will provide adequate warning to allow batteries to be changed without loosing data.

2.3. DISPLAY AND KEYPAD

Dimensions: 144 mm high, 194 mm wide, including bezel

Keypad type: Membrane type keyboard with tactile feedback, 25 keys sealed to IP67

Main Display: 240 x 128 supertwist backlit LCD.

Description: The display text will be dependant on which mode of operation has been selected. It consists of single / triple height characters and in all modes has 4 soft key functions available. A description of the display formats is given in the operators manual.

2.4. SOFTWARE SPECIFICATION

Modes: The controller has several operating modes, these are;

AUTO mode
This is the mode into which the unit will power up. All other modes are accessed from this mode. The ESC key will return the user to this mode from any other mode.

LIST mode
The list of program and macro files contained within the unit will be displayed on the screen in this mode. Each program file has three attributes,
Name
Whenever a new program is made it is given an 8 digit number.
The first program generated will be BLANK___A, the next BLANK___B etc
Description
When a program has been selected the file name of that program is displayed in the AUTO window

Identity number
This is a number assigned to the program that can be used to remotely select the program via the digital input lines

Any file can be selected using the scroll keys. The currently selected file will be highlighted. A copy of the selected program can be made using the COPY softkey. The copied file will have its last character changed. The attributes of the copied file can be changed as described below.

Both the ID and description program attributes can be changed using the soft keys. The internally assigned number of the program can be altered using the ID softkey.

Each macro file has a single attribute, it's ID number, a number between 1 and 10.

PROGRAM mode
In this mode the data for all of the commands in the currently selected program or macro are viewed or altered. New commands can be entered.

JOG mode
In this mode each axis can be moved directly by using the UP or DOWN arrow keys. Each axis can also be jogged using the digital input lines.

DATUM mode
In this mode each axis can be made to automatically find the datum marker and to load a specific positional value into the display. For this to happen the automatic datumming option has to be selected in Configure mode.

PARAMETER CONFIGURE mode
This is a special mode in which all the system operating parameters are set up.

Programs: The ***MultiStop*** has the ability to store (and retain at power off) a number of programs containing a given number of lines. The program memory allocation is dynamic therefore the maximum number of programs depends on the number of lines per program. The ultimate maximum is 128 programs 50 lines.

Datums: An automatic and a manual datum procedure is available.

2.5. MULTISTOP VERSIONS

Details concerning the Multistop Control can be found by selecting the Version Page (<SHIFT> <SOFTKEY VER>. Typically this page would display,

MS 2.03	Date 20.06.02	Comments
Version 2.037F		F indicates a runner update time of 5 * IRQ rate set in the configuration pages
		S runner update variable but < 40mS
DAC type	MAX	16 bit dac fitted
Clock	25.166 MHz	Processor clock setting
GOODWIN ELECTRONICS		
3 BASENDALE ROAD		
CROFT BUSINESS PARK		
BROMBOROUGH WIRRAL		
CH62 3QL		
UNITED KINGDOM		
www.goodwinelectronics.com		
sales@goodwin.renold.com		
Contrast :- use UP/DOWN keys		

3. INSTALLATION

3.1. LOCATION

The ***MultiStop*** control unit is designed for panel mounting applications and should be mounted in a convenient position for an operator to see the displays and be able to easily enter program information into the unit.

Take care to prevent liquids and swarf from entering the enclosure and hence the ***MultiStop*** case.

For free standing applications a small enclosure should be used. It conveniently fits into many standard enclosures, for example the European manufacturer “Rittal” enclosure part number AE1031 (380 x 300 x 210) would easily house ***MultiStop*** and a row of connectors.

3.2. SAFETY

Mains voltages are present inside ***MultiStop*** and can cause severe electric shock. If it is necessary to remove the cover of the ***MultiStop***, it **must be disconnected** from the mains supply before work on it is carried out.

A good earth cable must be attached to the ***MultiStop*** and its impedance must conform to the requirements of local industrial safety regulations and should be inspected and tested at appropriate regular intervals.

3.3. POWER SUPPLY

The ***MultiStop*** unit should be connected to a clean 24V dc or 100-230 (+10% - 15%) VAC 50/60 Hz supply depending on the model chosen. This supply should not be shared with other electrically noisy equipment. Filtering should be provided if required.

Weidmuler BL3.5 / 8 (order number 159742) plugs are used for output connections
Wire the control inputs in accordance with the details in this section.

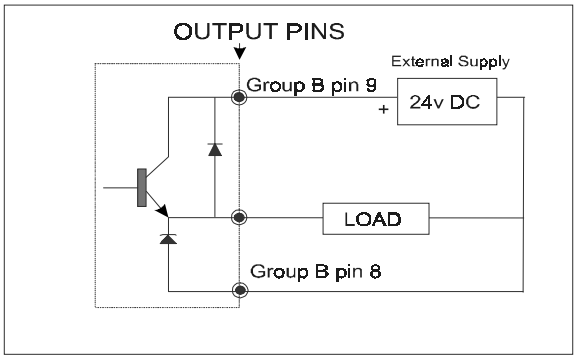
Banks X, Y and A (pins 9 - 16) have polarising pins at positions 2 and 7 on the plug.
Bank B (pins 9 - 16) has polarising pins at positions 1 and 7 on the plug.
Bank B (pins 1 - 8) has polarising pins at positions 2 and 8 on the plug.

DO NOT MAKE OR BREAK CONNECTIONS WITH THE POWER ON.

An external supply is required to power the output lines. If a DC load is being driven then a 24V DC (absolute max. 25V DC) supply of suitable capacity should be connected to the external supply pin.

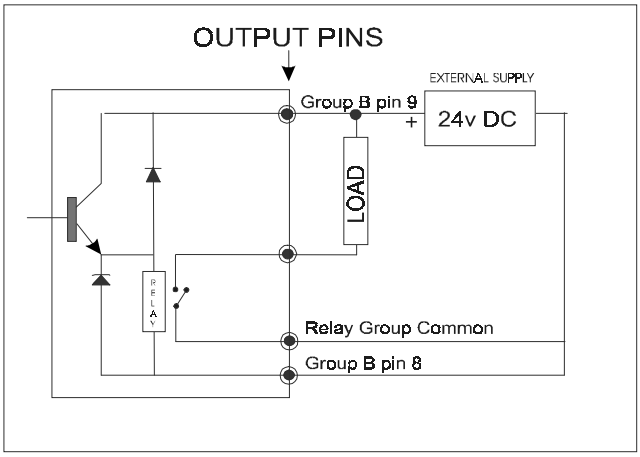
If the ***MultiStop*** has the relay option fitted the power consumption of the relay output stage is 8 mA per relay. This requirement should be added to your switching needs to achieve a minimum overall 24V DC power requirement.

PNP OUTPUT STAGE



The external 24 V (absolute max. 25V) DC supply is common to all outputs. Each output can source 50 mA. Connect the 0V of the external DC supply to pin 8 of Group B (0V digital) to provide protection against inductive loads.

RELAY OUTPUT STAGE



The external 24 V DC supply powers all internal relays. The example above shows a common 24 V DC supply powering internal relays and external loads. If required the relay contacts can switch other supplies up to the above rating.

Output functions can be assigned to any pin on the connectors using the Parameter Configuration mode, or they can be turned off so they do not function. From the factory the unit is defaulted to the configuration shown below.

3.3.1. DEFAULT OUTPUT CONFIGURATION

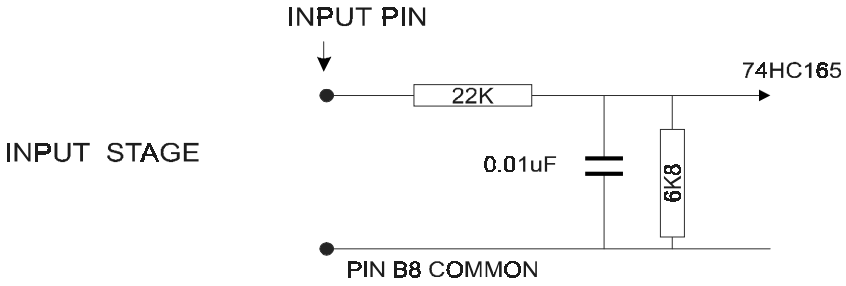
Group Y pin 9	output 1	Y enable	Relay output. High when enabled. Enabled at all times unless there are system faults e.g. axis following error
Group Y pin 10	output 2	OUT (2)	Each output can be turned ON, OFF or
Group Y pin 11	output 3	OUT (3)	made to pulse at any point within the program.
Group Y pin 12	output 4	OUT (4)	Active at all times in cycle
Group Y pin 13	output 5	OUT (5)	
Group Y pin 14	output 6	OUT (6)	
Group Y pin 15	output 7	Y in position	Level high when axis is within inposition limits. Active at all times. In datum mode this output will be high to indicate if the axis is datummed PROVIDING the axis position is within the inposition limits of the datum point
Group Y pin 16	output 8	OUT (8)	
Group X pin 9	output 9	X enable	Relay output. High when enabled. Enabled at all times unless there are system faults e.g. axis following error
Group X pin 10	output 10	OUT (10)	Each output can be turned ON, OFF or
Group X pin 11	output 11	OUT (11)	made to pulse at any point within the program.
Group X pin 12	output 12	OUT (12)	Active at all times in cycle
Group X pin 13	output 13	OUT (13)	
Group X pin 14	output 14	OUT (14)	
Group X pin 15	output 15	X in position	Level high when axis is within inposition limits. Active at all times. In datum mode this output will be high to indicate if the axis is datummed PROVIDING the axis position is within the inposition limits of the datum point
Group X pin 16	output 16	system datummed	Level high if all axes have been datummed
Group A pin 9	output 17	OUT(17)	Each output can be turned ON, OFF or
Group A pin 10	output 18	OUT(18)	made to pulse at any point within the program
Group A pin 11	output 19	OUT(19)	Active at all times in cycle
Group A pin 12	output 20	OUT(20)	
Group A pin 13	output 21	OUT(21)	
Group A pin 14	output 22	OUT(22)	
Group A pin 15	output 23	OUT(23)	
Group A pin 16	output 24	OUT(24)	
Group B pin 1		- Vx analogue	+/-10V dc. Inverse of pin B3
Group B pin 2		Vx analogue 0V	normally connected to 0V of +24V supply
Group B pin 3		+ Vx analogue	+/-10V dc. Inverse of pin B1
Group B pin 4		- Vy analogue	+/-10V dc. Inverse of pin B6
Group B pin 5		Vy analogue 0V	normally connected to 0V of +24V supply
Group B pin 6		+ Vy analogue	+/-10V dc. Inverse of pin B4
Group B pin 7		Internal +5V supply	Reserved for test purposes only
Group B pin 8		External supply Common (0V)	
Group B pin 9		External supply for outputs (+24V DC)	
Group B pin 10		spare	
Group B pin 11		spare	
Group B pin 12		Watchdog Contact, 1	Contact closed for system Healthy
Group B pin 13		Watchdog Contact, 2	
Group B pin 14		Relay Common for group A outputs	
Group B pin 15		Relay Common for group X outputs	
Group B pin 16		Relay Common for group Y outputs	

3.4. INPUT CONNECTIONS

Weidmuler BL3.5 / 8 (order number 159742) plugs are used for input connections
Wire the control inputs in accordance with the details in this section. Remember that these wires should be treated as signal wires and kept away from electrically noisy equipment
Input Connections are on the bottom row (pin 1 is on left hand side as seen from the rear).
Each input can be configured to be active (i.e. cause a response) in one of the following four conditions,
The DC supply to the input lines should be 24V (+ / - 10%)

LOW when the input line (at the input pin) is 0 volts

HIGH when the input line (at the input pin) is +24 volts
+ ve transition when the input line (at the input pin) goes from 0 to +24 volts
■ ve transition when the input line (at the input pin) goes from 24 to 0 volts



Banks X, Y and A (pins 1- 8) have polarising pins at positions 2 and 8 on the plug.
Bank B (pins 9 - 16) has polarising pins at positions 2 and 7 on the plug.
Bank B (pins 1 - 8) has polarising pins at positions 1 and 8 on the plug.

3.4.1. DEFAULT DIGITAL INPUT CONFIGURATION

All inputs are active HIGH

Group Y pin 1	input 1	general purpose input	can be assigned to any function
Group Y pin 2	input 2	general purpose input	can be assigned to any function
Group Y pin 3	input 3	general purpose input	can be assigned to any function
Group Y pin 4	input 4	Jog Y +ve	if ***MultiStop*** is in jog mode and Y jog selected asserting this input will jog Y in the +ve direction at the selected jog feed
Group Y pin 5	input 5	Jog Y -ve	if ***MultiStop*** is in jog mode and Y jog selected asserting this input will jog Y in the -ve direction at the selected jog feed
Group Y pin 6	input 6	Y near home	Only active in datum mode; This input indicates that the Y axis is near the datum marker pulse. The direction of motion is then reversed and slow speed is selected. A search for the datum marker pulse is then carried out
Group Y pin 7	input 7	not Y+ end stop	This input is reserved for this function. It is NOT set as a factory default but has to be assigned in Parameter Configuration mode. This input should be switched off when positive Y axis end stop is reached. This must normally be high to operate. Any motion and program execution will stop and Jog mode will be selected.
Group Y pin 8	input 8	not Y - end stop	This input is reserved for this function. It is NOT set as a factory default but has to be assigned in Parameter Configuration mode. This input should be switched off when negative Y axis end stop is reached. This must normally be high to operate. Any motion and program execution will stop and Jog mode will be selected.
Group X pin 1	input 9	program number bit 0	part of the bit pattern specifying the program number
Group X pin 2	input 10	program number bit 1	part of the bit pattern specifying the program number
Group X pin 3	input 11	program number bit 2	part of the bit pattern specifying the program number
Group X pin 4	input 12	Jog X +ve	if ***MultiStop*** is in jog mode and X jog selected asserting this input will jog X in the +ve direction at the selected jog feed
Group X pin 5	input 13	Jog X -ve	if ***MultiStop*** is in jog mode and X jog selected asserting this input will jog X in the -ve direction at the selected jog feed
Group X pin 6	input 14	X near home	Only active in datum mode; This input indicates that the X axis is near the datum marker pulse. The direction of motion is then reversed and slow speed is selected. A search for the datum marker pulse is then carried out
Group X pin 7	input 15	not X + end stop	This input is reserved for this function. It is NOT set as a factory default but has to be assigned in

			Parameter Configuration mode. This input should be switched off when positive X axis end stop is reached. This must normally be high to operate. Any motion and program execution will stop and Jog mode will be selected.
Group X pin 8	input 16	not X - end stop	This input is reserved for this function. It is NOT set as a factory default but has to be assigned in Parameter Configuration mode. This input should be switched off when negative X axis end stop is reached. This must normally be high to operate. Any motion and program execution will stop and Jog mode will be selected.
Group A pin 1	input 17	general purpose input	can be assigned to any function
Group A pin 2	input 18	Keyboard Disable	inhibits all keyboard activity
Group A pin 3	input 19	Cycle interrupt	Only active when running a program. Causes the program to HALT in its current position. The motors will be switched off.
Group A pin 4	input 20	System Enable	This input is reserved for this function. It is NOT set as a factory default but has to be assigned in Parameter Configuration mode. Checked at all times. If healthy ***MultiStop*** can respond to all commands. If this signal is not present then both X and Y enable are switched OFF and all other outputs remain unchanged. The state of the system enable input is constantly displayed in the status bar. When enabled the HEALTHY' is displayed; when not enabled the message will be 'DISABLED' which is self cancelling should the system enable signal return to the true state.
Group A pin 5	input 21	Select Datum Cycle	Only active if controller is not running a program. Selects datum mode and awaits a start command to begin a datum cycle
Group A pin 6	input 22	start axes	start program from beginning unless in a HALT condition. If in a HALT condition resume program from current program position. This input will also start a datum cycle if datum mode is selected. Pulse this input for a minimum of 100mS, maximum of 1 second.
Group A pin 7	input 23	Program select strobe	Only checked if not in cycle. When present it causes a new program to be selected. The program number is set by Program bits 0 to 6. Use a binary code to represent the required program. The program number is the number on the right of the display when the program LIST is shown.
Group A pin 8	input 24	stop axes	stop move and program execution immediately. Pulse this input for a minimum of 100 ms, maximum of 1 second
Group B pin 1		Reserved	
Group B pin 2		Reserved	
Group B pin 3		Reserved	
Group B pin 4		Reserved	
Group B pin 5		Reserved	
Group B pin 6		Reserved	
Group B pin 7		Internal +5V supply	Reserved for test purposes only.
Group B pin 8		Common 0V for all inputs	

3.5. ENCODER CONNECTIONS

All encoders are connected via a 15 way High Density D type Socket (Female) fitted on the rear panel of ***MultiStop***.

Pin No.	*Description*
1	+ Phase A (differential)
2	+ Phase B (differential)
3	Phase A (single ended
4	+ Marker pulse (differential)
5	Phase B (single ended
6	- Phase A (differential)
7	- Phase B (differential)
8	Reserved
9	- Marker pulse (differential)
10	No connection
11	No connection
12	+ 5 V supply for 5V encoders (250mA max.)
13	0 V
14	Marker pulse (single ended)
15	No connection

3.6. RS485 CONNECTIONS

This facility is via 9 way D type Plug (Male) fitted on ***MultiStop***.

Pin No.	*Signal*	*Description*
1	- TX	transmitted data **to** remote device
2	+ TX	transmitted data **to** remote device
3	+CTS	clear to send signal **from** remote terminal ready
4	-CTS	clear to send signal **from** remote terminal ready
5	GND	
6	+RX	received data **from** remote device
7	- RX	received data **from** remote device
8	- DTR	data terminal ready signal **to** remote terminal
9	+ DTR	data terminal ready signal **to** remote terminal

The data format used is 8 data bits, even parity and 2 stop bits. The baud rate is 9600.

3.7. AUTO DATUM CYCLE

This is initiated only using the external digital input signals. The sequence is as follows,

- assert the external datum cycle input and keep asserted until cycle is complete
- assert the external start axes input. The X cycle begins its search for X NEAR HOME at the configured datum feed rate
- on seeing the X NEAR HOME signal the direction reverses and the speed changes to 25% of the datum feed rate and a search for the marker pulse begins
- on seeing the marker pulse the X INPOSTION line is pulsed to indicate that the marker has been found
- in 2 axes systems the external start axes line is asserted a second time and the same sequence is carried out for the Y axis.
- once all axes have been datummed the system datummed output line is set
- remove the datum cycle input and the controller will return to the auto mode

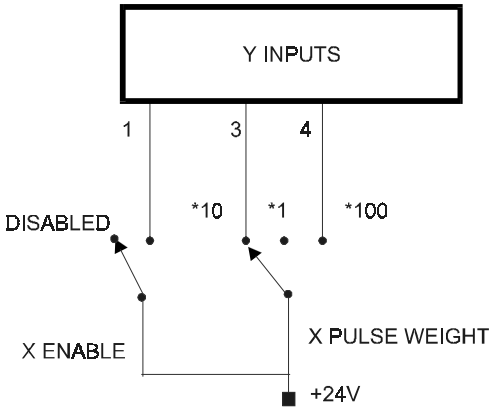
4. HAND PULSE GENERATOR OPTION

If an extra encoder input is specified (Option **H**) then the axis can be jogged using an encoder connected to the C encoder socket. This arrangement is frequently referred to as a hand pulse generator (hpg).
For this to operate it is necessary to,

- enable the hpg function for each axis by assigning an input to the enabling function. (see Engineering Configuration, Input setup, assign Input Number, X HPG enable, Y HPG enable)
- assign inputs to the hpg weighting factors of *10 and *100 if any weighting other than the default *1 is required.
- assign a scale factor to the hpg channel. (see Engineering Configuration, X axis setup, Y axis setup, , X HPG encoder, Y HPG encoder)

The selected axis can now be moved using the hpg

Typical hpg connection with X enable assigned to input 1, X hpg *10 assigned to input 3 and X hpg *100 assigned to input 4. The hpg encoder is connected to the C Encoder socket on the rear panel.



5. FEED RATE OVERRIDE

If feed rate override is required then the following procedure should be followed,

- in INPUT SETUP / ASSIGN INPUT NUMBER assign the BCD Input bits 0 to 2 to inputs pins that are not used in the application(may be Program Bits 0 to 6 are not used). It is not necessary to assign all 8 bits to inputs. Any bit that is not assigned is automatically treated as 0. It is important to assign all 3 bits.
- in INPUT SETUP / ASSIGN INPUT SIGNAL TYPE configure the BCD Input bits to their required asserted states (should be either HI or LOW)
- in GENERAL SETUP enable the FEED RATE OVERRIDE function. Note that when this is enabled the input command GET_BCD cannot be used in any program
- a means of setting the BCD_INPUTS is required and is usually achieved by using a bcd to hex encoded rotary switch.
- the following feed rate override values are generated

b2,b1,b0	Feed rate override %
0 0 0	0
0 0 1	5
0 1 0	10
0 1 1	30
1 0 0	50
1 0 1	70
1 1 0	100
1 1 1	140

6. MODES OF OPERATION

6.1. POSITIONAL OPERATION

This is the default setup configuration of MultiStop. (General Setup, Application type set to POSITIONING).The letter L indicates that this axis is a linear axis. In this mode the positional information of the axes can only be reset by carrying out a datum cycle (manual or automatic)

6.2. INDEXER OPERATION

If the INDEXER mode of operation is selected (General Setup, Application type set to INDEXING) then before a move to a position is begun the axis display is reset to zero. For this mode of operation it is necessary to disable the inposition outputs for each of the axes, (Input setup, Assign Input Number, X inposition 0, Y inposition 0).

6.3. LINEAR OPERATION

For an axis to become a linear axis it must be configured as such. (General Setup window). This is the default configuration of both axes.
The axis indicator X or Y will now have a suffix L to indicate that the axis is a linear axis. The letter p indicates that the position displayed is the profile position of the axis

Only use linear move commands with a linear axis

6.4. ANGULAR OPERATION

For an axis to become an angular axis it must be configured as such. (General Setup window)
The axis indicator X or Y will now have a suffix A to indicate angle and a revolution counter initially set to 0 associated with it. The letter p indicates that the position displayed is the profile position of the axis

Every time the axis position increases past 360 degrees the revolution counter increments by 1 and the angular position resets to 0.000 degrees

Every time the axis position decreases past 0 degrees the revolution counter decrements by 1 and the angular position resets to 359.999 degrees

Only use angular move commands with an angular axis.

7. PARAMETER CONFIGURATION

Parameters are available to allow the user to configure the ***MultiStop*** for use in a wide variety of applications without the need to write low level software.

To enter the user machine configuration mode press <ALT> <1>
A password will be requested. If the correct password is entered the following menu of options will appear.

Input Setup
Output Setup
Speeds
Position Zones
Display and Resolution
Datum Parameters
General Setup
X axis Setup
Y Axis Setup
Passwords
Goodwin Setup

Select the appropriate item and press ENTER. The list of parameters associated with the selection made will then be available for viewing or editing.

7.1. INPUT SETUP

7.1.1. ASSIGN INPUT NUMBER

Each of the following input functions can be assigned to any of the 24 input pins available. The default input configuration of the functions are given below.

Clear Error	0		X -ve limit switch	16		X hpg *10	0
Start cycle	22		X +ve limit switch	15		X hpg *100	0
Stop cycle	24		Y -ve limit switch	8		Y hpg enable	0
Halt cycle	19		Y +ve limit switch	7		Y hpg *10	0
Select datum cycle	21		Strobe Prog bits	23		Y hpg *100	0
Program Bit 0	9		Disable keyboard	18		BCD Input Bit 0	0
Program Bit 1	10		Jog X +	12		BCD Input Bit 1	0
Program Bit 2	11		Jog X -	13		BCD Input Bit 2	0
Program Bit 3	0		Jog Y +	4		BCD Input Bit 3	0
Program Bit 4	0		Jog Y -	5		BCD Input Bit 4	0
Program Bit 5	0		X hpg enable	0		BCD Input Bit 5	0
Program Bit 6	0					BCD input bit 6	0
System enable	20					BCD Input Bit 7	0
X near home	14						
Y near home	6						

To assign inputs to pins other than the defaults, each pin is given a reference number ranging from 1 to 24 which defines the I/O groups X, Y and A on the rear panel of the ***MultiStop*** unit.

Inputs 1 to 8 are on Group Y pins 1 - 8.
Inputs 9 to 16 are on Group X pins 1 - 8.
Inputs 17 to 24 are on Group A pins 1 - 8.

Any input function can be disabled by assigning the number 0 to it.

For example, the axis limits inputs may not be relevant on a continuously indexing machine and can be un-assigned. Any unassigned input can be used as a general purpose input from within a PowerTalk program.

7.1.2. ASSIGN INPUT SIGNAL TYPE

Each input can be configured to asserted either as a level or an edge,
ie., asserted when HI
LOW
+ ve (edge)
- ve (edge)

BCD Input bits 0 to 7 should only be assigned HI or LOW

7.2. OUTPUT SETUP

7.2.1. ASSIGN OUTPUT NUMBER

Each of the following output functions can be assigned to any of the 24 output pins available. The default configuration of the assignable parameters are given below.

X enable	9
X inposition	15
Y enable	1
Y inposition	7
System Datummed	16

To assign outputs to pins other than the defaults, each output pin is given a reference number ranging from 1 to 24 which defines the I/O groups X, Y and A on the rear panel of the ***MultiStop*** unit.

Outputs 1 to 8 are on	Group Y pins 9 -16.
Outputs 9 to 16 are on	Group X pins 9 -16.
Outputs 16 to 24 are on	Group A pins 9 -16.

If a parameter is assigned to output 0 the parameter is disabled and the output previously assigned to it can be used

7.2.2. ASSIGN OUTPUT STATE

The asserted state of each of the following output lines can be defined as asserted HIGH or asserted LOW.

7.2.3. ASSIGN OUTPUT TYPE

If RESET has been selected then any outputs which have been set in the program will be automatically reset when a PowerTalk program is stopped.

If LEAVE has been selected then any outputs which have been set in the program when the cycle is stopped then that output will remain asserted.

7.3. SPEEDS

7.3.1. JOG FINE FEED

Options: 0 to 1000 mm/sec

Setting Method: Select JOG FINE FEED option from the SPEEDS parameter list and press ENTER. Enter a numeric value in the option range. Press ENTER to accept the value and to return to the main system parameter list.

Application Notes: This sets the speed at which the motors will move when they are activated in the JOG mode with fine feed selected

Default Setting: 6 mm/sec

Your Setting:
Also see: Jog coarse feed

7.3.2. JOG COARSE FEED

Options: 0 to 1000 mm/sec

Setting Method: Select JOG COARSE FEED option from the SPEEDS parameter list and press ENTER. Enter a numeric value in the option range. Press ENTER to accept the value and to return to the main system parameter list.

Application Notes: This sets the speed at which the motors will move when they are activated in the JOG mode with coarse feed selected

Default Setting: 12 mm/sec
Your Setting:
Also see: Jog fine feed

7.3.3. X, Y MOTOR PHASE

Options: Positive or Negative

Setting Method: Select Motor Phase from the SPEEDS parameter list and press ENTER. Use the UP or DOWN arrow keys to select the required sign from the list of options provided on the screen. Press ENTER to accept the highlighted value and to return to the main system parameter list.

Application Notes: This will invert the motor direction. If the controller is running in a stable manner when this is changed the encoder count direction must also be changed. However, when commissioning a new motor or drive, the system may drive in the wrong direction 'out of control' until an error shuts it down. If this was the case before changing this parameter then the encoder phase does not need to be changed.

Default Setting: Motor phase: X axis: + direction Y axis: + direction
Your Setting:: Motor phase : X axis: Y axis:
Also see: Count direction, Machine Datum Direction

7.3.4. X, Y COUNT DIRECTION

Options: Positive or Negative

Setting Method: Select Count Direction from the SPEEDS parameter list and press ENTER. Use the UP or DOWN arrow keys to select the required sign from the list of options provided on the screen. Press ENTER to accept the highlighted value and to return to the main system parameter list.

Application Notes: This will invert the positive (and negative) count direction. If the controller is running in the correct manner when this is changed the motor phase must also be changed. However, when commissioning a new encoder, the system may operate in an uncontrolled manner. In this case only the encoder count direction needs to be changed.

Default Setting: X axis: - direction Y axis: - direction
Your Setting:: X axis: Y axis:
Also see: Motor Phase, Machine Datum Direction

7.3.5. HPG COUNT DIRECTION (X AND Y)

Options: Positive or Negative

Setting Method: Select **HPG** Count Direction from the AXIS SET UP parameter list and press ENTER. Use the UP or DOWN arrow keys to select the required sign from the list of options provided on the screen. Press ENTER to accept the highlighted value and to return to the main system parameter list.

Application Notes: This will invert the positive (and negative) hpg count direction.

Default Setting: X HPG direction: + direction Y HPG direction: + direction
Your Setting:: X HPG direction: Y HPG direction:
Also see: Encoder Scale factor

7.3.6. ACCELERATION CONSTANT

Options: 0 to 10000

Setting Method: Select Acceleration Constant from the SPEEDS parameter list and press ENTER. Use the UP or DOWN arrow keys to select the required option from the list provided on the screen. Press ENTER to accept the highlighted value and to return to the main system parameter list.

Application Notes:

Default Setting: X axis: 500 Y axis: 500
Your Setting: X axis: Y axis:

7.3.7. DECCELERATION CONSTANT

Options: 0 to 10000

Setting Method: Select Decceleration Constant from the SPEEDS parameter list and press ENTER. Use the UP or DOWN arrow keys to select the required option from the list provided on the screen. Press ENTER to accept the highlighted value and to return to the main system parameter list.

Application Notes:

Default Setting: X axis: 500 Y axis: 500
Your Setting: X axis: Y axis:

7.3.8. MAXIMUM FEED RATE

Options: 0 to 1000 mm/sec

Setting Method: Select MAX FEED RATE option from the SPEEDS parameter list and press ENTER. Enter a numeric value in the option range. Press ENTER to accept the value and to return to the main system parameter list.

Application Notes: This sets the speed at which the motors will move when they are activated in the JOG mode with coarse feed selected

Default Setting: X Axis: 10000 mm/sec Y Axis: 10000 mm/sec
Your Setting: X axis: Y axis:

7.4. POSITION ZONES

7.4.1. SOFT LIMITS

Options: +/-10,000

Setting Method: Select axis limit from the POSITION ZONES parameter list and press ENTER. Use the numeric keys to enter a system position relative to datum (zero), (this can be a positive or negative value). This value must be less than the Positive Axis Limit.

Application Notes: This is used to determine the limit of axis travel in the positive direction. The axis enable will be turned off if this value is exceeded. **To disable the software limits BOTH positive and negative limits must be set to 0.00**

Default Setting:	Negative X axis: - 10,000.00	Negative Y axis: -10,000.00
	Positive X axis: + 10,000.00	Positive Y axis: +10,000.00
Your Setting:	Negative X axis:	Negative Y axis:
	Positive X axis:	Positive Y axis:

7.4.2. INPOSITION ZONES

Options: 0 to +99.99

Setting Method: Select Positive or Negative Inposition Zone from the POSITION ZONES parameter list and press ENTER. Use the numeric keys to enter a position value, relative to the target position. Then press enter.

Application Notes: This is the distance (in the positive or negative directions) from the target position within which the INPOSITION output will be set. It can be used to interface to other external logic to allow other functions to occur on a machine.
If the unit is configured as an indexer this parameter is not valid and should be disabled in the output line set up.

Default Setting:	X axis: + 1.00	Y axis: + 1.00
Your Setting:	X axis:	Y axis:
Also see:	Count direction.	
	Display resolution	

7.5. DISPLAY AND RESOLUTION

7.5.1. DISPLAY DATA

Options: REAL, PROFILE, ERROR.

Setting Method: Select Display Resolution from the DISPLAY AND RESOLUTION parameter list and press ENTER. Use the UP or DOWN arrow keys to select the required mode of display from the list of options provided on the screen. Press ENTER to accept the highlighted value and to return to the main system parameter list.

Application Notes: In normal conditions it is recommended that Profile mode be used. During commissioning ofg the machine it is useful to indicate the errors associated with an axis and then either REAL (for steady state errors) or ERROR modes of display can be selected.

Default Setting: Display data: PROFILE

Your Setting: Display data :

7.5.2. DISPLAY DIGITS

Options: 1 to 10

Setting Method: Select DISPLAY DIGITS from the DISPLAY AND RESOLUTION parameter list and press ENTER. Use the numeric keys to enter the system position value at the position of the marker pulse, (this can be a positive or negative value

Application Notes: By setting this parameter only the number of decimal places is being set and the rounding of the last digit. The resolution of the display will ultimately depend upon the encoder resolution and the scaling factor. Do this for each axis.

Default Setting: Display Digits: 10
Your Setting: Display Digits :
Also see: Scaling Factor, Display Resolution

7.5.3. DISPLAY RESOLUTION

Options: 100 to 0.00001

Setting Method: Select Display Resolution from the DISPLAY AND RESOLUTION parameter list and press ENTER. Use the numeric keys to enter the required resolution e.g. for 2 decimal places 0.01 should be entered. Press ENTER to accept the value.

Application Notes: By setting this parameter only the number of decimal places is being set and the rounding of the last digit. The resolution of the display will ultimately depend upon the encoder resolution and the scaling factor. Do this for each axis.

Default Setting: Display Resolution: X axis: 0.001 Y axis: 0.001
Your Setting: Display Resolution : X axis: Y axis:
Also see: Scaling Factor

7.6. DATUM PARAMETERS

7.6.1. DATUM DIRECTION

Options: Positive or Negative search direction

Setting Method: Select DATUM DIRECTION from the DATUM PARAMETERS list and press ENTER. Use the UP or DOWN arrow keys to select the required sign from the list of options provided on the screen. Press ENTER to accept the highlighted value and to return to the main system parameter list.

Application Notes: This defines the direction that the system will move to find its Near Home input during a datum cycle. Changing from plus to minus (or vice-versa) will change the direction it travels to find its datum.

Default Setting: X axis: + direction Y axis: + direction
Your Setting:: X axis: Y axis
Also see: Count direction, Motor phase

7.6.2. DATUM OFFSET VALUE

Options: +/- 10,000

Setting Method: Select Datum Position from the DATUM PARAMETERS list and press ENTER. Use the numeric keys to enter the system position value at the position of the marker pulse, (this can be a positive or negative value).

Application Notes: This parameter can be used to force the axis display position to a given value at the marker pulse position when an automatic datum cycle is complete. Alternatively, it can be loaded into the display by pressing the DATUM button when in Jog mode.

Default Setting:	X axis:	+ 0.000	Y axis:	+ 0.000
Your Setting:	X axis:		Y axis:	

7.6.3. DATUM METHOD

Options: Manual Datum Only (MANUAL)
Auto Datum Cycle (AUTO)

Setting Method: Select Machine Datum Method from the DATUM PARAMETERS list and press ENTER. Use the UP or DOWN arrow keys to select the required option from the list provided on the screen. Press ENTER to accept the highlighted value and to return to the main system parameter list.

Application Notes: The two options have the following meaning,

Manual Datum - The machine datum is set by moving the axis to the datum position using either the jog keys or the HPG. Datum can then be set by pressing the appropriate soft key (in Datum mode) using the keypad or using an external input.
Auto Datum Cycle - The machine is datumed by selecting Datum mode from the soft keys. When the Datum start is pressed the system will carry out an automatic datum cycle. It is required that an input signal (Near Home) is available for this operation. When the Datum is complete the Datum Load value is loaded into the absolute position register of the axis concerned. The auto datum cycle can also be initiated from a digital input.

Default Setting: MANUAL
Your Setting:
Also see: Datum Load Value

7.6.4. DATUM FEED RATE

Options: 1 - 500 mm/sec

Setting Method: Select DATUM FEED RATE from the DATUM PARAMETERS list and press ENTER. Use the numeric keys to enter the system position value at the position of the marker pulse.

Application Notes: This parameter can be used to set the axis speed whenever the system is in a datum cycle. The same datum speed is used for both axes.

Default Setting: 1
Your Setting:
Also see: Machine Datum Method

7.6.5. DATUM MEMORY

Options: RESET , LAST

Setting Method: Select Datum Memory from the DATUM PARAMETERS list and press ENTER. Use the UP or DOWN arrow keys to select the required option from the list provided on the screen. Press ENTER to accept the highlighted value and to return to the main system parameter list.

Application Notes: The two options have the following meaning,

RESET - The machine datum will be cancelled after every power up of the controller. The machine will now have to be re-datummed before any program can be executed.

LAST - Once the machine has been datumed the controller will record this and there will be no need to redatum the machine after a power up. The datum flags will only be reset in the event of a following error.

Default Setting: X axis: LAST Y axis: LAST
Your Setting: X axis: Y axis:
Also see: Machine Datum Method, Datum Position Value, Overshoot Value

7.6.6. MARKER PULSE POLARITY

Options: Positive or Negative edge triggered

Setting Method: Select MARKER PULSE POLARITY from the DATUM PARAMETERS list and press ENTER. Use the UP or DOWN arrow keys to select the required sign from the options provided on the screen. Press ENTER to accept the highlighted value and to return to the main system parameter list.

Application Notes: This defines the edge of the marker pulse that will be used internally to signify that the marker has been seen. Datumming is complete once this event has occurred.

Default Setting: X axis: + ve Y axis: + ve
Your Setting:: X axis: Y axis
Also see: Near Home input

7.7. GENERAL SETUP

7.7.1. APPLICATION TYPE

Options: INDEXING or POSTIONAL

Setting Method: Select APPLICATION TYPE from the GENERAL SETUP parameter list and press ENTER. Use the UP or DOWN arrow keys to select the required type from the list of options provided on the screen. Press ENTER to accept the highlighted value and to return to the main system parameter list.

Application Notes: If the index option is chosen then before a move to a position is begun the axis display is reset to zero. If position option is chosen then this action does not occur

Default Setting: X axis: POSITIONAL Y axis: POSITIONAL
Your Setting: X axis: Y axis:

7.7.2. AVAILABLE AXES

Options: X or XY

Setting Method: Select the AVAILABLE AXES option from the GENERAL SETUP parameter list and press ENTER. Select a value from the menu and press ENTER to accept the value and to return to the parameter list.

Application Notes: On single axis models only one axis will be operational because of hardware limitations. Dual axes models can be made to operate as sinle axis models if the application warrants the change. This simplifies the display and marginally improves operational speeds.

Default Setting: X on single axis models XY on dual axes models
Your Setting:

7.7.3. FEEDRATE OVERRIDE

Options: OFF or BCD_INPUT

Setting Method: Select the FEEDRATE OVERIDE option from the GENERAL SETUP parameter list and press ENTER. Select an option from the menu and press ENTER to accept the value and to return to the parameter list.

Application Notes: Ensure that BCD_INPUT BITS have been assigned in INPUT SETUP. Note that the GET_BCD command cannot be used in a PowerTalk program if the option is enabled. Uploading programs that contain GET_BCD commands will result in the commands being ignored at run time.

Default Setting: OFF
Your Setting:

7.7.4. AXIS TYPE

Options: Linear , Angular or Open Loop
Setting Method: ANGULAR OR LINEAR from the GENERAL SETUP parameter list and press ENTER. Use the UP or DOWN arrow keys to select the required option from the list provided on the screen. Press ENTER to accept the highlighted value and to return to the main system parameter list.

Application Notes: If the angular option is selected then the axis position will overflow at 360 degrees to 0 and underflows at values below zero to 359.999. As the position over/ under flows a revolution counter is incremented or decremented. The value of the rev counter will be displayed in the AUTO window.
Open Loop should be selected if the DAC commands are to be used. These commands set the level of the analogue out channel to a specified value (0 to +/-10V). If open loop is selected then that axis cannot be jogged or datummed. The datum flag is always set. On completion of a program or if a program is stopped the analogue output foe an open loop axis is set to 0V.

Default Setting: X axis: Linear Y axis: Linear
Your Setting: X axis: Y axis:
Also see: Scale Factor, Display resolution

7.7.5. INTERRUPT PERIOD (IRQ RATE)

Options: 5 to 30 msec

Setting Method: Select IRQ RATE from the GENERAL SETUP parameter list and press ENTER. Use the numeric keys to enter a lower limit value. Then press enter.

Application Notes: This is the time interval between updating the time critical system variables such as the drive commands, the digital input and outputs and the keyboard scan. The setting of this parameter is a trade off between system response and the updating of the operator interface, eg the display and keyboard response.

Default Setting: IRQ RATE 8.000
Your Setting: IRQ RATE

7.7.6. OUTPUT PULSE WIDTH (S)

Options: 0 to 999 secs

Setting Method: Select the OUTPUT PULSE DURATION option from the GENERAL SETUP parameter list and press ENTER. Enter a numeric value and press ENTER to accept the value and to return to the parameter list.

Application Notes: This will be the asserted time of an output when the OUT command is used in the pulsed mode.

Default Setting: 1.00 sec
Your Setting:

7.7.7. INPUT LOCK OUT

Options: 0 to 90%

Setting Method: Select the INPUT LOCKOUT option from the GENERAL SETUP parameter list and press ENTER. Enter a numeric value and press ENTER to accept the value and to return to the parameter list.

Application Notes: This determines the percentage of a MOVINP (move to input) command that has to be completed before the input is enabled. If a value of 0% is set then the input will be immediately enabled at the start of the move. If a value of 50% is set then after starting the move, 50% of that move must have been completed before the input is enabled.

Default Setting: 0%
Your Setting: 10%

7.7.8. DAC MAX VOLTAGE

Options: 1 to 15.000 V

Setting Method: Select the DAC Max Voltage option from the GENERAL SETUP parameter list and press ENTER. Enter a numeric value and press ENTER to accept the value and to return to the parameter list.

Application Notes: This will scale the analogue output voltage on both X and Y axes to allow the user to set an exact scaling factor between the output requested by the DAC commands and the actual voltage delivered to the analogue output pins. **It is only in applicable to DAC commands, i.e. when the axis has been configured as open loop**. To set this scaling factor write a simple program setting the output to 10.0V. Halt the program and measure the output voltage, (some older IO cards will produce either a maximum output voltage of 9.2V or 14 Volts).

If the max voltage is 9.2 V then the scaling factor will be 1.087 and the maximum voltage that can be obtained is 9.2V.
If the max voltage is 14.0 V then the scaling factor will be 0.7143 and the maximum voltage that can be obtained is 10V.

Default Setting: 10.000 V
Your Setting:

7.8. X AXIS SETUP , Y AXIS SETUP

These two windows are identical with one allowing the X axis to be setup in the appropriate manner and the other the Y axis.

7.8.1. SCALE (X, Y AXES)

Options: 0.000001 to 9.999999

Setting Method: Select SCALE from the AXIS SETUP parameter list and press ENTER. Use the numeric keys to enter the required scale factor for the system.

Application Notes: The scale factor is defined as "The movement represented by one encoder pulse, programmed in display units". For example if one encoder count equals 0.001mm, the scale factor is 0.001. If a scale factor greater than the display resolution is used it means the display will not count in increments of one display resolution. This means it may not be possible for a target position to be reached if it falls between encoder counts.

Default Setting: Scale Factor : X axis: 0.001 Y axis: 0.001
Your Setting: Scale Factor : X axis: Y axis

Also see: Display Resolution

Example: A motor is connected via a 2:1 drive to a 50 mm diameter pulley. The motor has an encoder with 2048 lines. It is required to display the distance a point on the pulley moves as the pulley is rotated by the motor.

Number of encoder pulses per rev of motor 2048 * 4
Number of encoder pulses per rev of pulley 2048 * 4 * 2
Circumference of pulley 50 * 22/7
Required scaling factor (50 * 22/7) / (2048 * 8) = 0.009587

If a display resolution of 0.01 is chosen then one rev of the pulley would be displayed as 157.08

7.8.2. DIFFERENTIAL PERIOD

Options: 0 to 99

Setting Method: Select Differential Period from the AXIS SETUP parameter list and press ENTER. Enter a number in the allowable range. Press ENTER to accept the value and to return to the main system parameter list.

Application Notes: This is the time period over which the rate of change of position error is calculated.

Default Setting: X axis: 10 Y axis: 10
Your Setting: X axis: Y axis:
Also see: Differential Gain

7.8.3. DIFFERENTIAL GAIN

Options: 0 to 10000

Setting Method: Select Differential Gain from the AXIS SETUP parameter list and press ENTER. Enter a numeric value in the option range. Press ENTER to accept the value and to return to the main system parameter list.

Application Notes: This is the value of the differential gain in the PID loop.

Default Setting: X axis: 0 Y axis: 0
Your Setting: X axis: Y axis:
Also see: Differential period

7.8.4. INTEGRAL GAIN

Options: 0 to 10000

Setting Method: Select Integral Gain from the AXIS SETUP parameter list and press ENTER. Enter a numeric value in the option range. Press ENTER to accept the value and to return to the main system parameter list.

Application Notes: This is the value of the integral gain in the PID loop.

Default Setting: X axis: 0.04 Y axis: 0.04
Your Setting: X axis: Y axis:
Also see: Integral Limit

7.8.5. INTEGRAL LIMIT

Options: 0 to 10000

Setting Method: Select Integral Limit from the AXIS SETUP parameter list and press ENTER. Enter a numeric value in the option range. Press ENTER to accept the value and to return to the main system parameter list.

Application Notes: This value limits the effect of the Integral gain on the PID control loop.

Default Setting: X axis: 0.10 Y axis: 0.10
Your Setting: X axis: Y axis:
Also see: Integral Gain, Velocity FF Term

7.8.6. VELOCITY FF GAIN

Options:

Setting Method: Select Velocity FF Gain from the AXIS SETUP parameter list and press ENTER. Enter a numeric value in the option range. Press ENTER to accept the value and to return to the main system parameter list.

Application Notes: This is the value of the Velocity Feed Forward gain in the PID loop.

Default Setting: X axis: 0.10 Y axis: 0.10
Your Setting: X axis: Y axis:
Also see: Velocity FB Term

7.8.7. PROPORTIONAL GAIN

Options: 0 to 10000

Setting Method: Select Proportional Gain from the AXIS SETUP parameter list and press ENTER. Enter a numeric value within the option range. Press ENTER to accept the value and to return to the main system parameter list.

Application Notes: The is the value of the proportional gain in the PID loop.

Default Setting: X axis: 2.000 Y axis: 2.000
Your Setting: X axis: Y axis:

7.8.8. MAXIMUM FOLLOWING ERROR (SYSTEM MOVING AND SYSTEM STOPPED)

Options: 0 to 9999 of the minimum displayed distance.

Setting Method: Select MAXIMUM FOLLOWING ERROR option from the AXIS SETUP parameter list and press ENTER. Enter a numeric value in the option range. Press ENTER to accept the value and to return to the main system parameter list.

Application Notes: This sets the maximum discrepancy between the real and profile positions that can exist before a following error occurs. Once a following error occurs the system must be re-datummed. If a display resolution of 0.01 is chosen then the maximum following error that can be set using this parameter is 99.99 mm. Setting a value of 0 disables the following error tests.

Default Setting: X Axis (moving): 20 Y Axis(moving): 20
X Axis (stopped): 0.5 Y Axis(stopped): 0.5
Your Setting: X Axis (moving): Y Axis(moving):
X Axis (stopped): Y Axis(stopped):
Also see: Displayed data, control loop parameters

7.8.9. DAC OFFSET

Options: +/- 9999 scaled encoder counts

Setting Method: Select DAC OFFSET from the AXIS SETUP parameter list and press ENTER. Enter a numeric value in the option range. Press ENTER to accept the value and to return to the main system parameter list.

Application Notes: This value limits the effect of the Integral gain on the PID control loop. When the system is stable and stationary set the display to indicate following error and note its value say 0.10. Enter -10 as the DAC offset and again observe the following error. Repeat until the following error is below an acceptable value for the application

Default Setting: X axis: 0 Y axis: 0
Your Setting: X axis: Y axis:
Also see: Displayed Data, Motor acceleration, all PID parameters

7.8.10. HPG ENCODER (X AND Y)

Options: 0.000001 to 9.999999

Setting Method: Select HPG ENCODER from the AXIS SETUP parameter list and press ENTER. Use the numeric keys to enter the required scale factor for the system.

Application Notes: The scale factor is defined as “The movement represented by one encoder pulse, programmed in display units”. For example if one hpg count equals 0.001mm, the scale factor is 0.001. If a scale factor greater than the display resolution is used it means the display will not count in increments of one display resolution. This means it may not be possible for a target position to be reached if it falls between hpg counts.

Default Setting:	X HPG Encoder: 0.00025	Y HPG Encoder: 0.00025
Your Setting:	X HPG Encoder	Y HPG Encoder
Also see:	Display Resolution	

7.9. PASS WORDS

There are 5 passwords that can be set. These are for access to,

- jog window
- datum window
- list window
- program window
- engineering parameter windows,

The pass words can be identical or different as required by the application.
If a password of 0 is set for a window then free entry to that window is allowed.

The same procedure is used to set all pass words,

Options: 0 to 9999

Setting Method: Select the appropriate window from the above list and press ENTER. Use the numeric keys to enter the new password to be used.

Application Notes: Each password can be used to access critical windows, e.g. program window from the keyboard. If it is set to zero the user has free access to that window

Default Setting: code 0 (no password required) for all windows

Your Setting:
Password to Jog -
Password to Datum -
Password to List-
Password to Program-
Password to Engineering config:-

7.10. GOODWIN SETUP

This is a special configuration page that can be accessed by inserting a password that can be only obtained from Goodwin Electronics.

Access to this page allows the user to enable the serial communication software that allows Multistop to use PowerStation and the remote uploading facility.

To enter this page select Goodwin Setup and the current ID number of the unit will be displayed.

Please Contact Vendor
Quote ID No xxxx
5 access attempts left
Enter Goodwin Password ID

Do not attempt to enter a Goodwin password. Exit this page by pressing ESC and call the Sales office at Goodwin Electronics with the ID number shown on the screen. If appropriate, a password allowing access to the setup page will be given.

Enter this number and access to the setup page will be allowed.

Serial comms software OFF

Alter the relevant parameters in the usual manner and exit the page once the configurations are correct.

You will not be able to enter this page without a new password from Goodwin Electronics.
Five incorrect attempts to guess this number will result in a complete lockout from this configuration page producing the message,

Password Access Violation
Contact vendor
Press ESC to cancel

8. MAINTENANCE

The only service that can be performed in the field is the replacement of the memory back up battery and the cold cathode fluorescent lamp used to back light the LCD screen.

8.1. BATTERY REPLACEMENT

To replace the battery the main processor board has to be removed. This is the bottom board in the controller. To carry out this procedure anti static precautions must be taken and a replacement battery must be available before the procedure is started. The following steps should be taken

- remove the controller from the system
- remove the back panel and carefully disconnect the 5 pin connector to the lcd. Remove the bottom card from the system. The card is firmly attached to a back plane at the front of the unit by a 50 way inter-pcb connector.
- locate the battery and the jumper labelled BATT on the circuit board. Remove and carefully save the jumper link, The battery is now isolated and can be removed and replaced with a new battery. Now replace the BATT jumper. This operation must be completed within 30 minutes of removing the jumper or else the data stored in memory may become corrupted.
- replace the card into the back plane making sure that no pin miss alignment occurs at the back plane connector. Ensure that the card is firmly 'home'.
- replace back panel and apply power.
- power up and check that the unit functions
- reinstall in the system and reconnect all input/output connections. Ensure that all connectors are securely mated.
- power up system.

8.2. LCD BACKLIGHT

The cold cathode fluorescent lamp (CFL) is a field replaceable item. The replacement Hitachi part is a 742X CFL.
Anti-static procedures must be employed to carry out the replacement procedure.

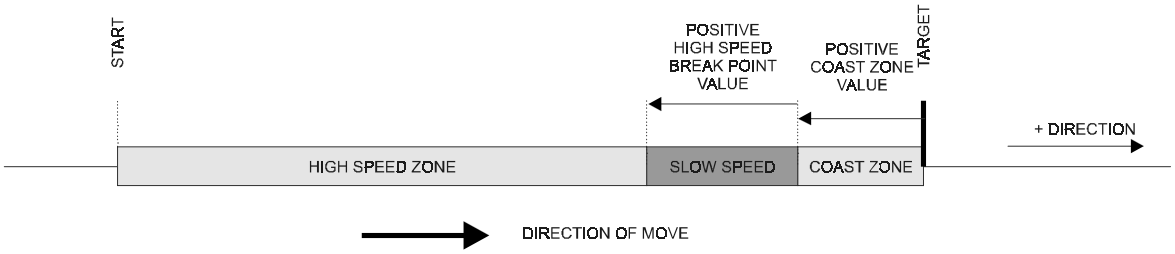
- remove the controller from the system
- remove the back panel and carefully remove the three cards from the system (power supply card, I/O card and main CPU card). Carefully note the position of each card.
- remove the front panel from the controller housing by removing the clip on bezel and then by carefully pealing back the facia in each corner and removing the 4 small countersunk screws
- place the front panel face down on a soft anti-static surface.
- press the centre of the two black retainers to release the retainers
- turn the front panel the correct way up and remove the 2 retainers and the small metal cover that shields the CFL.
- pull gently to remove the CFL back light unit
- turn light guide over and place on a soft surface
- remove the tapes securing the reflector then remove the CFL lamp and cable assembly
- replace the lamp with the new lamp and cable assembly
- wrap the CFL with the reflector sheet and replace the tapes to secure the reflector
- ensure that the CFL back light is free from contamination and replace in into unit.
- replace metal covers and retainers and press centre pin home to secure retainer
- replace front panel in housing and replace 4 countersunk screws
- replace bezel
- insert the 3 circuit boards in their correct position

9. APPENDIX

Schematic representation of axis moves for the different types of controllers which allow backlash to be removed.

CONTROLLER TYPE 1; APPROACH TO TARGET IN A POSITIVE DIRECTION

The axis moves in a positive direction towards the target passing through the zones indicated.
When moving through the HIGH SPEED ZONE the outputs FAST, POSITIVE, and ENABLE are ON
When moving through theSLOW SPEED ZONE the outputs SLOW, POSITIVE, and ENABLE are ON
When In the COAST ZONE the outputs INPOSTION, and ENABLE are ON

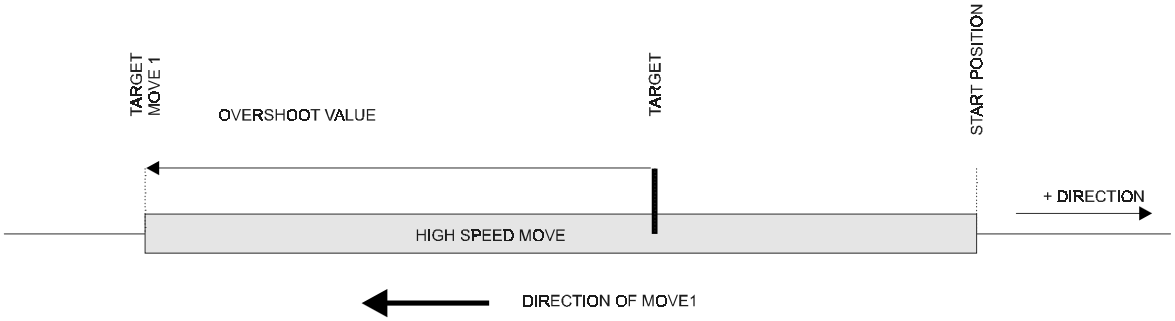


CONTROLLER TYPE 1; APPROACH TO TARGET IS A MOVE IN A NEGATIVE DIRECTION

There are 2 moves made before the axis finally reaches the target position.

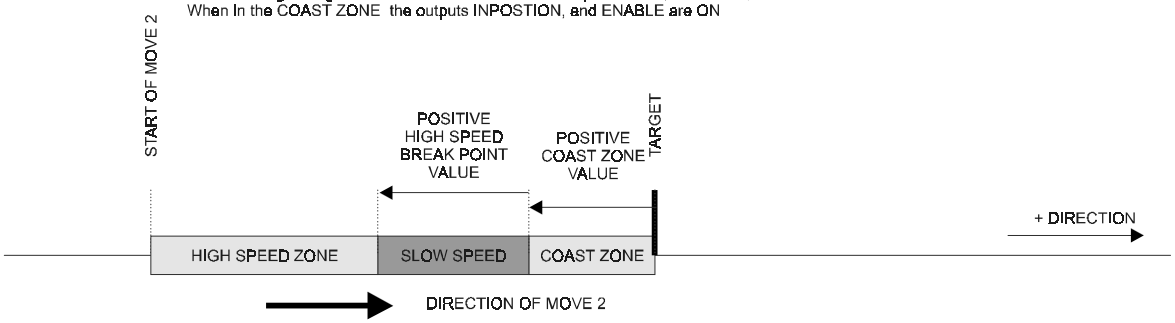
MOVE 1

The axis initally moves in a negative direction and overshoots the target by the OVERSHOOT value
When moving through the HIGH SPEED ZONE the outputs FAST and ENABLE are ON
At the overshoot position the axis reverses direction and moves towards the target observing the high speed and coast zone rules.



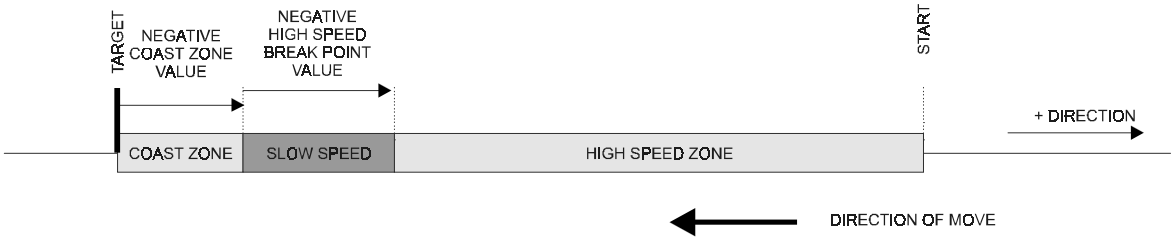
MOVE 2.

When moving through the HIGH SPEED ZONE the outputs FAST, POSITIVE, and ENABLE are ON
When moving through theSLOW SPEED ZONE the outputs SLOW, POSITIVE, and ENABLE are ON
When In the COAST ZONE the outputs INPOSTION, and ENABLE are ON



CONTROLLER TYPE 2; APPROACH TO TARGET IN A NEGATIVE DIRECTION

The axis moves in a negative direction towards the target passing through the zones indicated.
When moving through the HIGH SPEED ZONE the outputs FAST and ENABLE are ON
When moving through the SLOW SPEEDZONE the outputs SLOW and ENABLE are ON
When in the COAST ZONE the outputs INPOSTION, and ENABLE are ON

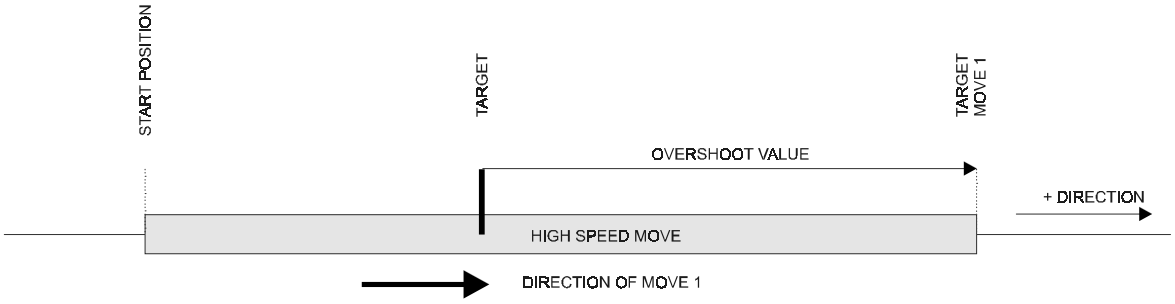


CONTROLLER TYPE 2; APPROACH TO TARGET IS A MOVE IN A POSITIVE DIRECTION

There are 2 moves made before the axis finally reaches the target position.

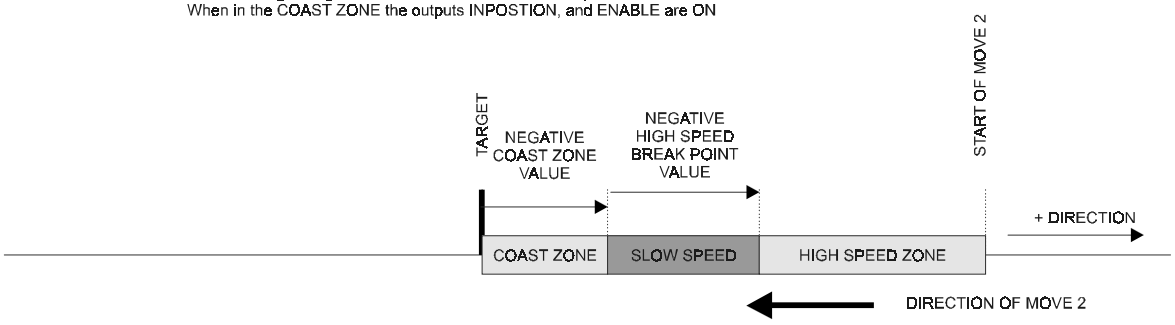
MOVE 1

The axis initally moves in a positive direction and overshoots the target by the OVERSHOOT value
When moving through the HIGH SPEED ZONE the outputs FAST, POSITIVE and ENABLE are ON
At the overshoot position the axis reverses direction and moves towards the target observing the high speed and coast zone rules.



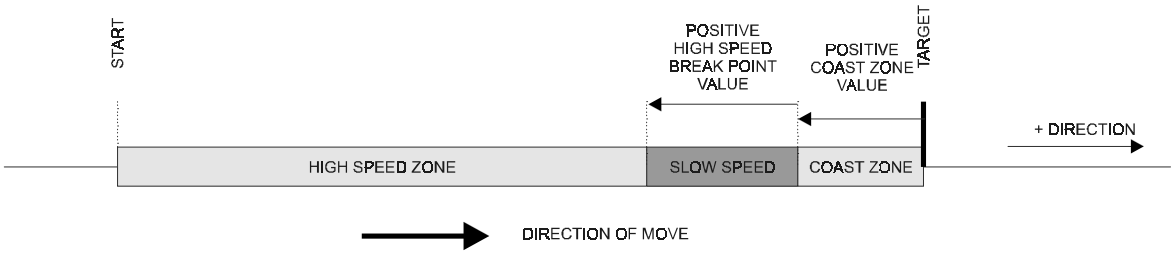
MOVE 2.

When moving through the HIGH SPEED ZONE the outputs FAST and ENABLE are ON
When moving through the SLOW SPEED ZONE the outputs SLOW and ENABLE are ON
When in the COAST ZONE the outputs INPOSTION, and ENABLE are ON



CONTROLLER TYPE 3; APPROACH TO TARGET IN A POSITIVE DIRECTION

The axis moves in a positive direction towards the target passing through the zones indicated.
When moving through the HIGH SPEED ZONE the outputs FAST, POSITIVE, and ENABLE are ON
When moving through theSLOW SPEED ZONE the outputs SLOW, POSITIVE, and ENABLE are ON
When in the COAST ZONE the outputs INPOSTION, and ENABLE are ON



CONTROLLER TYPE 3; APPROACH TO TARGET IN A NEGATIVE DIRECTION

The axis moves in a negative direction towards the target passing through the zones indicated.
When moving through the HIGH SPEED ZONE the outputs FAST and ENABLE are ON
When moving through the SLOW SPEED ZONE the outputs SLOW and ENABLE are ON
When in the COAST ZONE the outputs INPOSTION, and ENABLE are ON