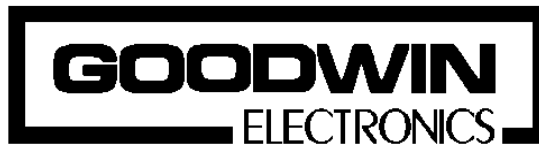


***MultiStop* Plus**

TECHNICAL SPECIFICATION

D1009 Version 1.74

\\Development\c\Products\MultiStop\MultiStop^{plus} Manuals\MultiStop Plus Tech Spec V1.74.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^{Plus}** 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^{Plus}** 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 Ltd 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.

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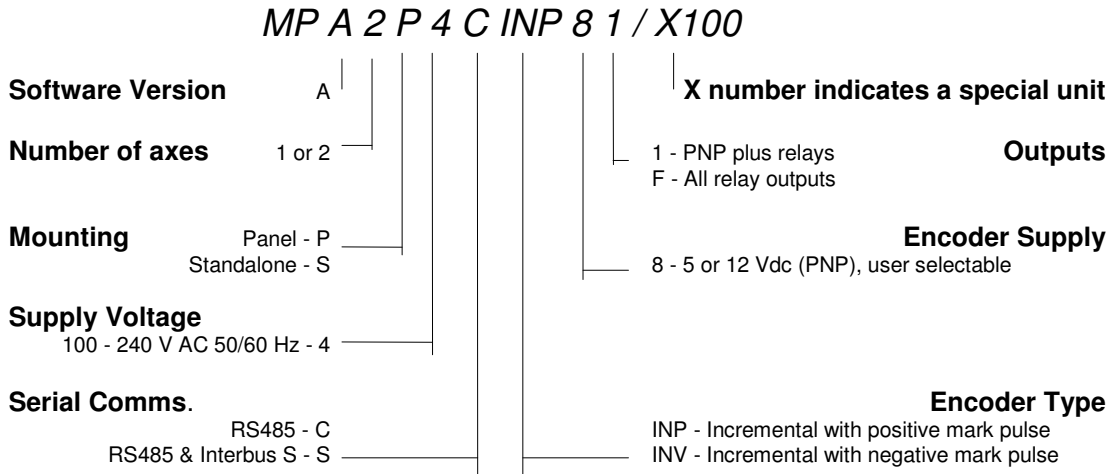
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1. INTRODUCTION

The **MultiStop^{Plus}** is designed to control up to two axes of motion 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 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;



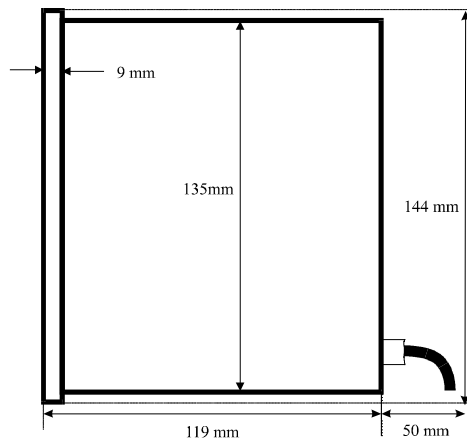
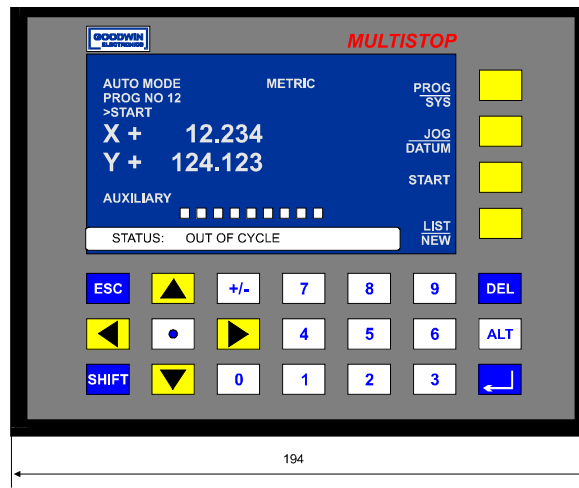
The various options available are in the model number description given below, check which options your unit has before proceeding any further.

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



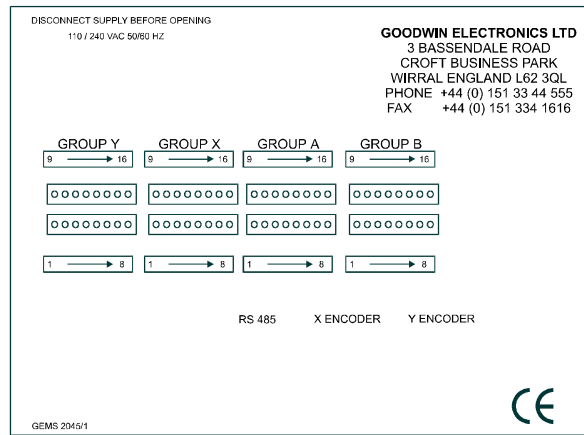


Figure 1: Overall Dimensions

2.2. SYSTEM ELECTRICAL SPECIFICATION

Linear scales or Encoders:

Differential Quadrature square wave signal inputs from linear scales or rotary encoders. A full description of the encoder/scale inputs is given in section 3.5.1. The maximum count rate is 120kHz full quadrature on each axis. A single axis **MultiStop^{Plus}** has one encoder input a two axis system has two inputs

Standard Outputs:

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

One axis **MultiStop^{Plus}**,

- One 14 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
- 14 PNP (source current 50mA @24V Dc nominal, absolute maximum voltage 25V) outputs

Two axis **MultiStop^{Plus}**

- Two 14 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 @ 30v) outputs.

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 in section 3.4

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^{Plus}**
16 Dedicated Inputs.
- Two axis **MultiStop^{Plus}**

24 Dedicated Inputs.

Input signals must be in the range 22 to 24V DC (absolute maximum 25V DC).
A full description of the Inputs is given in section 3.5.

- Supply: 100 - 230 V (+10%, -15%) Universal AC 50/60 Hz supply.
Power consumption is 30VA maximum.
- RS485: A single RS485 channel that can communicate with either other **MultiStop^{Plus}** units or a remote PC is available. Software to implement a wide range of commands is available from Goodwin Electronics, please ask for details.
- InterBus S: The unit can be made a slave unit using the InterBus-S protocol. This is an optional feature, refer to the INTRODUCTION on page 5 to determine if you have this option fitted.
- 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 losing 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 files contained within the unit will be displayed on the screen in this mode. Each file has three attributes,
Name
Whenever a new program is made it is given an 8 digit number.
The first program generated will be AAAAAAAAAA, the next AAAAAAAB etc
Description

When a program has been selected the description of that program is displayed in the AUTO window

Identity number

This is the 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 shown in the status bar line. 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.

PROGRAM mode

In this mode the data for all of the commands in the currently selected program are viewed or altered 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 externally commanded 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^{Plus}** 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 300 programs 30 lines. The maximum number of lines per program is 100.

Each line of the program contains all the information for an instruction which can be one of the following,

- A move to X and Y Target position in a variety of ways
- Set or reset an auxiliary output
- Subroutine call
- A loop instruction to repeat a set of instructions N times
- The type of move, Incremental or Absolute
- A Dwell timer.
- A Halt instruction.
- A feed rate
- Read the status of an input into a variable.
- A wait for input signal to be true.
- Do - While loop
- If - Else - End if loop
- Set a variable
- Modify (adjust) the variable

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

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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. THE *MULTISTOP* POWER SUPPLY

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

3.4. OUTPUT CONNECTIONS

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.

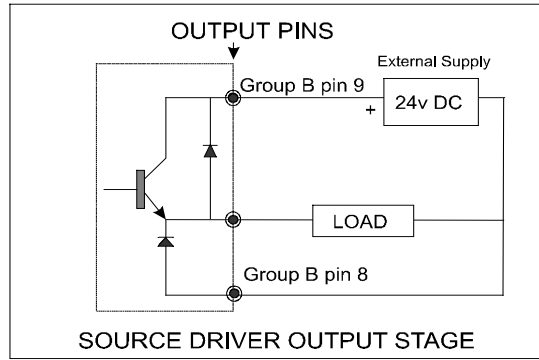
Banks X, Y and A (pins 9 - 16) have polarising pins at positions 2 and 7 on the plug.
Bank B (pins 9 - 16) has polarising pins at positions 1 and 7 on the plug.
Bank B (pins 1 - 8) has polarising pins at positions 2 and 8 on the plug.

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 see.

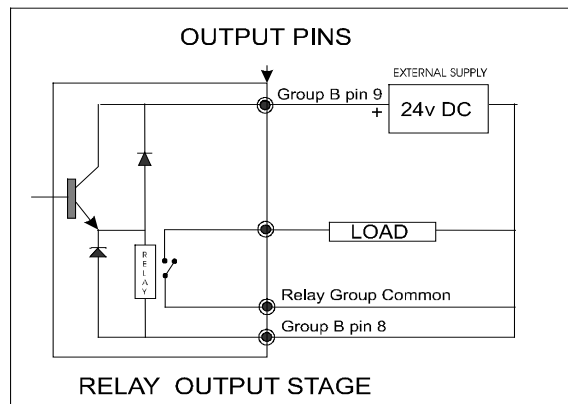
If the **MultiStop** has the relay option fitted the power consumption of the relay output stage is 8 mA per relay. This requirement should be added to your switching needs to achieve a minimum overall 24V DC power requirement..

A typical output stage is shown below,



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.

A relay output stage is shown below:



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.

3.4.1. DEFAULT OUTPUT CONFIGURATION

Group Y pin 9	output 1	Y enable	high when enabled. Enabled at all times
Group Y pin 10	output 2	spare	
Group Y pin 11	output 3	spare	
Group Y pin 12	output 4	spare	
Group Y pin 13	output 5	spare	
Group Y pin 14	output 6	spare	
Group Y pin 15	output 7	Y in position	Level high when axis is within inposition limits. Active all times In datum mode this output will be high to indicate if the axis is datumbed PROVIDING the axis position is within the inposition limits of the datum point
Group Y pin 16	output 8	spare	
Group X pin 9	output 9	X enable	Level low when axis disabled, high when enabled
Group X pin 10	output 10	spare	
Group X pin 11	output 11	spare	
Group X pin 12	output 12	spare	
Group X pin 13	output 13	spare	
Group X pin 14	output 14	spare	
Group X pin 15	output 15	X in position	Level high when axis is within in position limits. Active when incycle or in the HALT state

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	Auxiliary:1	Each auxiliary output can be turned ON, OFF or made to pulsed at any point within the program Active at all times
Group A pin 10	output 18	Auxiliary:2	
Group A pin 11	output 19	Auxiliary:3	
Group A pin 12	output 20	Auxiliary:4	
Group A pin 13	output 21	Auxiliary:5	
Group A pin 14	output 22	Auxiliary:6	
Group A pin 15	output 23	Auxiliary:7	
Group A pin 16	output 24	Auxiliary:8	
Group B pin 1		- Vx analogue	
Group B pin 2		analogue 0V	
Group B pin 3		+ Vx analogue	
Group B pin 4		- Vy analogue	
Group B pin 5		analogue 0V	
Group B pin 6		+ Vy analogue	
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	

3.5. 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).

Banks X, Y and A (pins 1- 8) have polarising pins at positions 1 and 8 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.

Each input can be configured to be active (ie., cause a response) in one of the following four conditions,

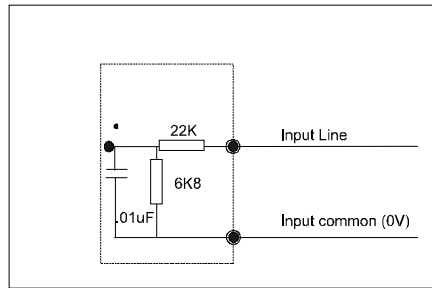
The DC supply to the inputs lines should be 24V (+ / - 1V)

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

DO NOT MAKE OR BREAK CONNECTIONS WITH THE POWER ON.

A typical internal input circuit termination is shown below



All inputs are terminated internally by the above circuit.
 All inputs have one common 0 V line.
 An input is made by taking the input line to +24VDC

Input 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 following configuration.

Any of the inputs can be configured to be used as an clear error or warning message. This is the same as pressing the ESCAPE key on the front panel of the **MultiStop** controller.

3.5.1. DEFAULT DIGITAL INPUT CONFIGURATION

All inputs are active HIGH

Group Y pin 1	input 1	spare	
Group Y pin 2	input 2	program number bit 6	part of the bit pattern specifying the program number
Group Y pin 3	input 3	spare	
Group Y pin 4	input 4	spare	
Group Y pin 5	input 5	spare	
Group Y pin 6	input 6	Y near home	Only active in datum mode; This input indicates that the Y axis is near marker 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	program number bit 3	part of the bit pattern specifying the program number
Group X pin 5	input 13	program number bit 4	part of the bit pattern specifying the program number
Group X pin 6	input 14	program number bit 5	part of the bit pattern specifying the program number
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	X near home	Only active in datum mode; This input indicates that the X axis is near marker 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 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' will 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	

3.6. ENCODER CONNECTIONS

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

<i>Pin No.</i>	<i>Description</i>
1	+ Phase A
2	+ Phase B
3	No connection
4	+ Marker pulse
5	No connection
6	- Phase A
7	- Phase B

8	+ 15 V supply for 15V encoders (150mA max.)
9	- Marker pulse
10	No connection
11	No connection
12	+ 5 V supply for 5V encoders (250mA max.)
13	0 V
14	No connection
15	No connection

3.7. RS485 CONNECTIONS

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

<i>Pin No.</i>	<i>Signal</i>	<i>Description</i>
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.

3.8. INTERBUS S CONNECTIONS (OPTION)

Incoming remote bus IBS signal Pheonix Connector MC1.5/5-G-3.5

<i>Pin No.</i>	<i>Signal</i>	<i>Description</i>
1	- DO1	data from master (or previous node on bus)
2	+ DO1	data from master (or previous node on bus)
3	- DI1	data to master (or previous node on bus)
4	- DI1	data to master (or previous node on bus)
5	GND	Ground

Outgoing remote bus IBS signals Pheonix Connector MC1.5/6-G-3.5

<i>Pin No.</i>	<i>Signal</i>	<i>Description</i>
1	RBST	node status
2	GND	Ground
3	+ DI2	data from next node on bus
4	- DI2	data from next node on bus
5	+ DO2	data from master to next node on bus
6	- DO2	data from master to next node on bus

3.9. AUTO DATUM CYCLE

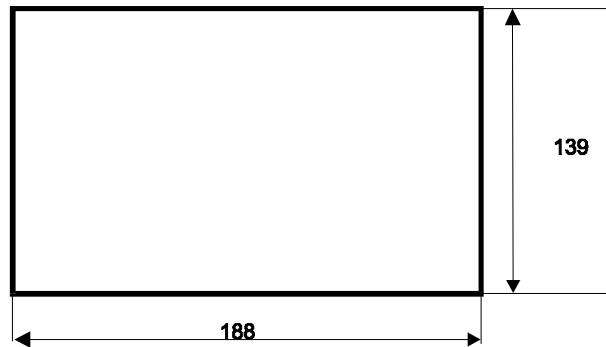
This is initiated only using the external digital input signals. The sequence is as follows,

- the external datum cycle is asserted and kept asserted
- the external cycle start is asserted and the X cycle begins its search for X NEAR HOME at the configured datum feed rate

- on seeing the X NEAR HOME signal the speed changes to slow the direction reverses 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 cycle start line is asserted 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

3.10. PANEL CUT OUT DIMENSIONS

Panel cut out



4. PARAMETER CONFIGURATION

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

To enter the user machine configuration mode press <ALT> <.>

A password will be requested. If the correct password is entered the following menu of options will appear. Select the appropriate item and press ENTER

INPUTS SETUP
OUTPUTS SETUP
MACHINE SETUP

Note that not all of the parameters listed below in sections 4.1 to 4.3 are available in the lists that can be edited from these windows. The full list of parameters are only available from the engineering window.

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

To enter the engineering level machine configuration mode press <ALT> <1>

A password will be requested. If the correct password is entered the following menu of options will appear.

INPUTS
OUTPUTS
MACHINE SETUP
X SERVO SETUP
Y SERVO SETUP
FRONTEND SETUP
PASSWORDS

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

A list of the parameters that can be configured is given below.

4.1. INPUT SETUP

Each of the following input functions can be assigned to any of the 24 input pins available. The default configuration and descriptions of the functions are given in section 3.5.

From the engineering window each input can be configured to asserted either as a level or a an edge,

ie., asserted when

HI
LOW
+ ve (edge)
■ ve (edge)

Inputs that are assigned by default are.

Clear Error if used will reset any error that has been reported.(same as ESCAPE key)
 Start program
 Stop program
 Select datum
 Total keyboard disable
 System disable
 Cycle interrupt
 near home X
 near home Y
 negative end stop X
 positive end stop X
 negative end stop Y

positive end stop Y
Program Bits 0 to 6 asserted
Program strobe
Jog X +
Jog X -
Jog Y +
Jog Y -

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

Any input function can be disabled by assigning the number 0 to it. For example, the end stop inputs may not be relevant on a continuously indexing machine. By assigning 0 to them it means that they do not have to be connected to +24V for normal operation. Enter INPUT SETUP window as described above and select the input you wish to reassign, then press ENTER to select it followed by the input pin number you require. Press ENTER again to confirm the assignment. Press ESC to exit this window.

4.2. OUTPUT SETUP

From the engineering window the asserted state of each output can be defined and the format used is (taking Enable X as an example)

Output # Enable X 1
Enable X asserted LOW

This results in the X axis output 1 is set to 0 volts a whenever the program enables the X axis.

Each of the following output functions can be assigned to any of the 24 output pins available. The default configuration and descriptions of the functions are given in section 3.5.1

Enable X
X inposition disable if unit is configured as an indexer
Enable YY inposition disable if unit is configured as an indexer
Datum set
Auxiliary (1 to 8 inclusive)
Auxiliary reset type (1 to 8 inclusive)

To assign outputs 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.

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

Enter OUTPUT SETUP window as described above and select the output you wish to reassign, then press ENTER to select it followed by the pin number you require. Press ENTER again to confirm the assignment.

Any auxiliary outputs which have been set will reset by default when a PowerTalk program has been stopped or terminates naturally. However, if an auxiliary output is required to remain asserted after a program has stopped, it can be configured to do so by selecting the appropriate 'Auxiliary reset type' for the output. The reset types available to the user are 'LEAVE' (leaving any set auxiliary asserted after program termination) and 'RESET' (forcing the auxiliary to be unconditionally reset after program termination).

5. MACHINE SETUP

This window allows the user to define certain machine parameters that configures the **MultiStop** to the application the X axis to be setup in the appropriate manner and the other the Y axis.

5.1. AXES TYPE

Options: Linear or Angular

Setting Method: Select Axes Type from the system 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. 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.

Default Setting: X axis: Linear
Y axis: Linear

Your Setting: X axis:
Y axis:

Also see: Counts per revolution
Scale Factor
Display resolution

5.2. AXIS MODULUS (ENGINEERING WINDOW ONLY)

Options: 0 to 360.000

Setting Method: Select AXIS TYPE from the system 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 parameter is only used if the angular option is chosen. The controller will reset the axis to zero whenever the position is greater than the modulus value. Also whenever the axis position goes negative the displayed position is reset to the modulus value. A revolution counter keeps track of each of the underflow and overflow events.

Default Setting: X axis: 360.000
Y axis: 360.000

Your Setting: X axis:
Y axis:

Also see: Axis modulus, Scale factor and Display resolution

5.3. APPLICATION TYPE (ENGINEERING WINDOW ONLY)

Options: INDEX or POSTION

Setting Method: Select DAC OFFSET from the system 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 the controller will reset the axis that has just moved to 0.000 at the end of the move. If position option is chosen then this action does not occur

Default Setting: X axis: POSITION (POS'N)
Y axis: POSITION (POS'N)

Your Setting: X axis:
Y axis:

5.4. RS485 MASTER OR SLAVE (ENGINEERING WINDOW ONLY)

Options: SLAVE or MASTER

Setting Method: Select DISPLAYED DATA option from the system 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: At present the controller can only be set to be a slave

Default Setting: SLAVE

Your Setting:

Also see:

5.5. RS485 ADDRESS (ENGINEERING WINDOW ONLY)

Options: 0 to 99

Setting Method: Select DISPLAYED DATA option from the system 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: If more than one slave is connected to the RS485 multidrop link then each **MultiStop** must have a different address

Default Setting: 0

Your Setting:

Also see: RS485 Master or Slave

5.6. DISPLAY RESOLUTION

Options: 0.05, 0.01, 0.005, 0.001.

Setting Method: Select Display Resolution from the system parameter list and press ENTER. Use the UP or DOWN arrow keys to select the required resolution 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: 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 :
Also see: Scaling Factor

5.7. DISPLAY DIGITS (ENGINEERING WINDOW ONLY)

Options: 1 to 10
Setting Method: Select Datum Load Value from the system 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: X axis: 10
Y axis: 10
Your Setting: Display Digits :
Also see: Scaling Factor, Display Resolution

5.8. DISPLAY DATA (ENGINEERING WINDOW ONLY)

Options: REAL, PROFILE, ERROR.
Setting Method: Select Display Resolution from the system 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:
Default Setting: Display Resolution: X axis: 0.001
Y axis: 0.001
Your Setting: Display Resolution :
Also see: Scaling Factor

5.8.1. MACHINE DATUM DIRECTION

Options: Positive or Negative search direction
Setting Method: Select Machine Datum Direction from the system 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 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: Positive direction
Y axis: Positive direction

Your Setting:: X axis:
Y axis

Also see: Count direction
Motor phase

5.9. MACHINE DATUM METHOD

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

Setting Method: Select Machine Datum Method from the system 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: The two options have the following meaning,

Manual Datum - The machine datum is set only be set using the keypad. This can only be carried out if the unit is in Jog mode and the appropriate soft key is pressed.

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 a 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: X axis: Manual
Y axis: Manual

Your Setting: X axis:
Y axis:

Also see: Datum Load Value

5.10. DATUM MEMORY

Options: RESET
LAST

Setting Method: Select Datum Memory from the system 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: 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-datumed 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: RESET
Y axis: RESET

Your Setting: X axis:
Y axis:

Also see: Machine Datum Method, Datum Load Value, Overshoot Value

5.11. DATUM LOAD VALUE

Options: +/- 19999.99 Measurement units

Setting Method: Select Datum Load Value from the system 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: 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:

Also see: Machine Datum Method

5.12. COUNT DIRECTION

Options: Positive or Negative

Setting Method: Select Count Direction from the system 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. Do this for each axis.

Default Setting: X axis: positive direction
Y axis: positive direction

Your Setting:: X axis:
Y axis:

Also see: Motor Phase
Machine Datum Direction

5.13. MOTOR PHASE

Options: Positive or Negative

Setting Method: Select Motor Phase from the system 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 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

5.14. SCALE FACTOR

Options: 0.000001 to 9.999999

Setting Method: Select SCALE FACTOR from the system 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: +0.01
Y axis: +0.01

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

5.15. NEGATIVE INPOSITION ZONE

5.16. POSITIVE INPOSITION ZONE

Options: 0 to +99.99

Setting Method: Select Positive or Negative Inposition Zone from the 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: Negative X inposition zone: - -1.000
Negative Y inposition zone: - -1.000
Positive X inposition zone: - +1.000
Positive Y inposition zone: - +1.000

Your Setting: Negative X inposition zone: -
Negative Y inposition zone: -
Positive X inposition zone: -
Positive Y inposition zone: -

Also see: Count direction.
Display resolution

5.17. NEGATIVE (-VE) AXIS LIMIT

5.18. POSITIVE (+VE) AXIS LIMIT

Options: +/-99999.999

Setting Method: Select axis limit from the system 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.

Default Setting: Negative X axis: - 1000.000
Negative Y axis: -1000.000
Positive X axis: + 1000.000
Positive Y axis: +1000.000

Your Setting: Negative X axis: -
Negative Y axis:
Positive X axis:
Positive Y axis:

5.19. INTERRUPT PERIOD (ENGINEERING WINDOW ONLY)

Options: 5 to 30 msec

Setting Method: Select Interrupt period from the system 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:

Your Setting:

Also see:

5.20. MAXIMUM FEED RATE

Options: 0 to 1000 mm/sec

Setting Method: Select DISPLAYED DATA option from the system 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: 100 mm/sec
Y Axis: 100 mm/sec

Your Setting: X axis:
Y axis:

Also see:

5.21. JOG COARSE FEED

Options: 0 to 1000 mm/sec

Setting Method: Select DISPLAYED DATA option from the system 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: 100 mm/sec

Your Setting:

Also see: Jog fine feed

5.22. JOG FINE FEED

Options: 0 to 1000 mm/sec

Setting Method: Select DISPLAYED DATA option from the system 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: 10 mm/sec

Your Setting:

Also see: Jog coarse feed

5.23. DATUM SPEED

Options: 0 to 1000 mm/sec

Setting Method: Select DATUM SPEED option from the system 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 a DATUM cycle

Default Setting: 0.4 mm/sec

Your Setting:

Also see:

5.24. ENCODER COUNTS / REVOLUTION (ENGINEERING WINDOW ONLY)

Options: Any positive non zero value.

Setting Method: Select Encoder Counts/rev from the system parameter list and press ENTER. Use the numeric keys to enter a position value, relative to the target position. Then press enter.

Application Notes: In order for the over under flow to occur correctly the number of encoder counts that will be received in completing one revolution has to be calculated and inserted into this parameter. The scale factor should be set to the same value as that selected for the display resolution. For example if a 3600 ppr encoder is used and 0.1 degree resolution is required on the display, set scale factor and display resolution to 0.1

Default Setting: X axis: 3600
Y axis: 3600

Your Setting: X axis:
Y axis:

Also see: Scale Factor
Display resolution

6. SERVO SET

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

6.1. DIFFERENTIAL PERIOD

- Options: 0 to 99
- Setting Method: Select Differential Period from the system 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 term
Differential Gain

6.2. PID INTEGRAL TERM

- Options: ON or OFF
- Setting Method: Select Integral Term from the system 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: This turns the integral gain in the PID control loop on and off.
- Default Setting: X axis: ON
Y axis: ON
- Your Setting: X axis:
Y axis:
- Also see: Integral Gain
Integral Limit

6.3. PID DIFFERENTIAL TERM

- Options: ON or OFF
- Setting Method: Select PID Differential Term from the system 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: This turns the Differential gain in the PID control loop on and off.
- Default Setting: X axis: OFF

Y axis: OFF

Your Setting: X axis:
Y axis:

Also see: Differential Gain
Differential Period

6.4. PID VELOCITY FF TERM

Options: ON or OFF

Setting Method: Select Velocity FF Term from the system 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: This turns the Velocity Feed Forward term in the PID control loop on and off.

Default Setting: X axis: OFF
Y axis: OFF

Your Setting: X axis:
Y axis:

Also see: Velocity FF Gain

6.5. PID VELOCITY FB TERM

Options: ON or OFF

Setting Method: Select Velocity FB Term from the system 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: This turns the Velocity Feed Back term in the PID control loop on and off.

Default Setting: X axis: OFF
Y axis: OFF

Your Setting: X axis:
Y axis:

Also see: Velocity FB Gain

6.6. DAC OFFSET

Options: +/- 9999 scaled encoder counts

Setting Method: Select DAC OFFSET from the system 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

6.7. MOTOR ACCELERATION CONSTANT

Options: 0 to 10000

Setting Method: Select Motor Acceleration Constant from the system 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: 0.1
Y axis: 0.1

Your Setting: X axis:
Y axis:

Also see:

6.8. PID PROPORTIONAL GAIN

Options: 0 to 10000

Setting Method: Select Proportional Gain from the system 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: This is the value of the proportional gain in the PID loop.

Default Setting: X axis: 1.000
Y axis: 1.000

Your Setting: X axis:
Y axis:

Also see:

6.9. PID INTEGRAL GAIN

Options: 0 to 10000

Setting Method: Select Integral Gain from the system 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: 1.000

Y axis: 1.000
Your Setting: X axis:
Y axis:

Also see: Integral Gain
Integral Limit

6.10. PID DIFFERENTIAL GAIN

Options: 0 to 10000

Setting Method: Select Differential Gain from the system 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: 1.000
Y axis: 1.000

Your Setting: X axis:
Y axis:

Also see: Differential gain

6.11. PID VELOCITY FF

Options:

Setting Method: Select Velocity FF Gain from the system 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: 1.000
Y axis: 1.000

Your Setting: X axis:
Y axis:

Also see: Velocity FB Term

6.12. PID VELOCITY FB

Options: 0 to 10000

Setting Method: Select Velocity FB Gain from the system 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 Back gain in the PID loop.

Default Setting: X axis: 1.000
Y axis: 1.000

Your Setting: X axis:
Y axis:

Also see: Velocity FF Term

6.13. INTEGRAL LIMIT

Options: 0 to 10000

Setting Method: Select Integral Limit from the system 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: 10.000
Y axis: 10.000

Your Setting: X axis:
Y axis:

Also see: Integral Gain
Velocity FF Term

Options: ON or OFF

6.14. FOLLOWING ERROR

Options: 0 to 9999 of the minimum displayed distance.

Setting Method: Select DISPLAYED DATA option from the system 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 redatummed. 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. If a value less than 0 is set then the following error tests are disabled

Default Setting: X Axis: 100
Y Axis: 100

Your Setting: X axis:
Y axis:

Also see: Displayed data, control loop parameters

6.15. AXIS TEST LOWER LIMIT

Options: 0 to 9999 mm

Setting Method: Select Axis Test (Lo Limit) from the system parameter list and press ENTER. Use the numeric keys to enter a lower limit value. Then press enter.

Application Notes: This is the position at which the motor will reverse direction when the axis test is underway. The test is initiated by pressing ALT <7> from the AUTO window.

Default Setting: X axis: -1000
Y axis: -1000

Your Setting: X axis:
 Y axis:

Also see: Axis Test Feed Rate
 Axis Test Hi Limit

6.16. AXIS TEST UPPER LIMIT

Options: 0 to 9999 mm

Setting Method: Select Axis Test (Hi Limit) from the system parameter list and press ENTER. Use the numeric keys to enter a lower limit value. Then press enter.

Application Notes: This is the position at which the motor will reverse direction when the axis test is underway. The test is initiated by pressing ALT <7> from the AUTO window.

Default Setting: X axis: +1000
 Y axis: +1000

Your Setting: X axis:
 Y axis:

Also see: Axis Test Feed Rate
 Axis Test Lo Limit

7. FRONT END SETUP

In certain applications it may be convenient to allow the operator to change certain variables in the program without allowing him to change the structure of the program. This can be done using a FRONT END window, in which the variables that are allowed to be changed are presented to the operator. Behind this front end window will be a standard power talk program that can be locked out from the operator and which requires a pass number to enter.

The front end allows parameters to be entered and passed to the powertalk program. The text associated with these parameters can be set to meaningful text in the configuration setup of the front end window.

The default front end window has 4 lines of text and 4 variables associated with it.

FRONT END WINDOW	
Front End Enable	ON
Var 1 Text	AAA
Var 1 Assignment	INT1
Var 2 Text	BBB
Var 2 Assignment	FLT1
Var 3 Text	CCC
Var 3 Assignment	INT2
Var 4 Text	DDD
Var 4 Assignment	OFF

Note

- a FLT is a floating point variable and must be used if the information being given to the program is not a whole number ie., it has a decimal or fractional part associated with it.
- a INT is a integer variable and can be used if the information being given to the program is a whole number ie., it has no decimal or fractional part associated with it.

The text of the highlighted line can be altered by pressing EDIT and using the scroll keys to change the text. On pressing EDIT the F in the first line will be highlighted and pressing the up arrow will scroll through the alphabet. Once the correct letter or number is displayed use the scroll right arrow to edit the next letter. Continue until the line of text is what is require. (A maximum of 20 characters are allowed per item)

Do this for all the lines of text.

Either a float point or an integer variable can be assigned to front end variable. Select the variable assignment line of text and press ENTER. The various options will be highlighted and either the INT or FLT options can be selected as appropriate. (It is possible to assign one of 20 variables to that line , ie., either FLT 1 to FLT 10 or INT 1 to INT 10). If ENTER is pressed once more when the selected variable will be assigned to that line of the window. Note it is possible to deactivate the any variable text and variable assignment by selecting OFF from the variable menu list.

As an example generate the text 'NO OF CUTS REQUIRED' for variable 1 and press ENTER.

Assign INT1 to integer variable 1.

Then generate the text 'LENGTH OF CUT' for variable 2 and press ENTER.

Assign FLT2 to FLOATING POINT variable 2.

Then generate the text 'NO OF CUTS DONE' for variable 3 and press ENTER.

Assign INT2 to integer variable 3

Set all other variable assignments to OFF as they are not required in this front end example.

After editing your front end window (as seen by an operator) would appear as follows, (useful for a simple cut to length program.

FRONT END WINDOW		
X POSITION	0.00	PROG VER
Y POSITION	0.00	
NO OF CUTS REQUIRED	0	JOG DATUM
LENGTH OF CUT	0.00	
NO OF CUTS DONE	0	START
USE SOFT KEYS TO CHANGE DATA		LIST NEW

By pressing ENTER the selected line of text (highlighted) can be edited and the appropriate numbers inserted. Use the scroll keys to select the various lines.

As an example consider a simple cut to length application in which a 100 lengths of material of length 125mm are required. It is also required to display the number of lengths cut at any time and to reset the number cut every time the cycle is started.

The parameters of interest to the program are assigned to program variables, either integers for whole numbers, or floating point variables for non integer numbers, ie., any number that may have a decimal component. In the above example the number of sheets cut and the number of cuts required are all whole numbers and are thus integers. The lengths to be cut may not be a whole number and are thus floating point numbers.

NO OF CUTS REQUIRED	100	(assigned to INT1)
LENGTH OF CUT	125.000	(assigned to FLT1)
NO OF CUTS DONE	0	(assigned to INT2)

The powertalk program would use these variables to perform the task requested. The program may be as follows,

```

START
    INTEGER(INT2,0)           ;reset no of cuts done
    MOTION(X,INC)
    FEED(X,100)
    LOOPI(INT1)              ; do the loop 100 times
        MOVEF(X,FLT1)        ;move a distance equal to programmed first length
        ADJUST(INT2,1)       ;increment no of cuts done counter
        AUX(1,PUL)           ;pulse an output for a shear
        DWELL(2)             ;wait 2 secs
    ENDLOOP
END MAIN
ENDFILE
    
```

8. PASS WORDS

There are 6 passwords that can be set. These are for access to,

- jog password
- program password
- datum password
- list password
- program window
- start program password
- User configuration password allowing access to
 - inputs
 - outputs
 - machine setup
- engineering configuration password allowing access to
 - inputs
 - outputs
 - machine setup
 - servo data
 - passwords
 - frontend

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: This parameter can be used to limit access to critical windows, e.g. program window from the keyboard. If it is set to zero the user has free access to all windows

Default Setting: 1234 for all windows

Your Setting:
Jog password
Datum password
List password
Program password
Start password
Machine setup password
Engineering configuration password

9. 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.

9.1. 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 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. Using a screwdriver to push against the back plane lever out each end of the CPU card a few mm at a time until the board is free.
- 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 unsoldered 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.

9.2. 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 peeling back the fascia 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