Block Diagram

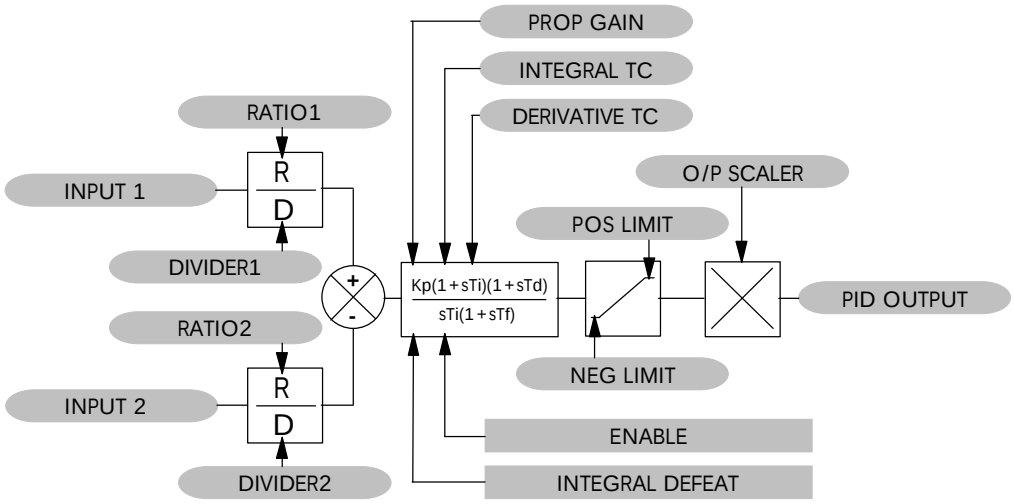

Figure 5.18 PID

MMI Entries:

```
f.....PID
f.......INPUT             [545] =      0.00 %
f.......ENABLE            [534] = TRUE
f.......PROP.GAIN         [549] =       1.0
f.......INT.TIME CONST.   [539] =      5.00 SECS
f.......INT.DEFEAT        [538] = FALSE
f.......DERIVATIVE TC     [531] =     0.000 SECS
f.......FILTER TC         [535] =     0.100 SECS
f.......POSITIVE LIMIT    [547] =    100.00 %
f.......NEGATIVE LIMIT    [542] =   -100.00 %
f.......O/P SCALER(TRIM) [543] =    1.0000
f.......ERROR CALC
f.........INPUT 1           [536] =      0.00 %
f.........INPUT 2           [537] =      0.00 %
f.........RATIO 1           [550] =    1.0000
f.........RATIO 2           [551] =    1.0000
f.........SIGN 1            [601] = POS
f.........SIGN 2            [602] = POS
f.........DIVIDER 1         [532] =    1.0000
f.........DIVIDER 2         [533] =    1.0000
f.........LIMIT             [553] =    100.00 %
f.........ERROR OUTPUT      [500] =      0.00 %
f.......PROFILER
f.........MODE              [541] =         0
f.........MIN PROFILE GAIN [540] =      0.00 %
f.........PROFILED GAIN     [548] =       0.0
f.........PROFILE INPUT     [554] =      0.00 %
f.........PROFILE MININPUT [555] =      0.00 %
f.......OUTPUT              [546] =      0.00 %
f.......CLAMPED             [544] = TRUE
```

Inputs

INPUT 1 This can be either a position/tension feedback or a reference/offset.

RATIO 1 This multiplies **INPUT 1** by a factor (**RATIO 1**).

DIVIDER 1 — This divides **INPUT 1** by a factor (**DIVIDER 1**).

INPUT 2 — This can be either a position/tension feedback or a reference/offset.
Range: ±300.00%
Default: 0.00%

RATIO 2 — This multiplies **INPUT 2** by a factor (**RATIO 2**).

DIVIDER 2 — This divides **INPUT 2** by a factor (**DIVIDER 2**).

INT. DEFEAT — This is a digital input which resets the integral term when TRUE. The block transfer function then becomes P+D only.

ENABLE — This is a digital input which resets the (total) PID Output as well as the integral term when FALSE.

Outputs (Diagnostic)

PID OUTPUT — This is the output of the PID block and is found in the Diagnostics menu.

PID ERROR — This is the difference of (**INPUT 1** - **INPUT 2**) and is found in the Diagnostics menu.

PID CLAMPED — This is a logic output indicating whether the PID limits are active and is found in the Diagnostics menu.

Parameters

PROP. GAIN (P) — This is a pure gain factor which shifts up or down the whole Bode PID transfer function leaving the time constants unaffected. A value of P = 10.0 means that, for an error of 5%, the proportional part (initial step) of the PID output will be:

10 * [1 + (Td/Ti)] * 5 % ,.e. approx. 50% for Td << Ti.

INT. TIME CONST. (Ti) — This is the integrator time constant.

DERIVATIVE (Td) — This is the differentiation time constant. When Td = 0 the transfer function of the block becomes a P+I.

FILTER TC (Tf) — In order to attenuate high-frequency noise a first order filter is added in conjunction with the differentiation. The ratio k of the Derivative Time Constant (Td) over the Filter Time Constant (Tf) (typically 4 or 5) deterMINes the high-frequency lift of the transfer function. For Tf = 0 this filter is eliminated.

POSITIVE LIMIT — This is the upper limit of the PID algorithm.

NEGATIVE LIMIT — This is the lower limit of the PID algorithm.

O/P SCALAR (TRIM) — This is the ratio which the limited PID output is multiplied by in order to give the final PID Output. Normally this ratio would be between 0 and 1.

User Interface

Configuring The PID Function

Input Connections

The two PID inputs (Input 1 & Input 2) by default are not connected to any signals and are only adjustable via the MMI up/down arrow keys.

If the application requires setpoint and/or feedback coming from other sources, then these signals should be configured to point to Inputs 1 and Input 2 respectively.

Output Connection

The default destination for the PID Output is 0 which means that the block will not be operating unless its output is redirected to some other destination, typically a speed setpoint. This can be implemented by using the Block Diagram section of the CONFIGURE I/O menu.

Internal Limit Functions

PID Error

The PID Error is internally clamped to ±105.00%.

Integral Term

The Integral Term is internally clamped to the prevailing values of "Positive Limit" and "Negative Limit" respectively as per PID Output.

It is also held while the PID Output is being clamped.

Preset Block

MMI Entries:

```
......PRESET
........SELECT 1          [92 ] = FALSE
........SELECT 2          [93 ] = FALSE
........SELECT 3          [94 ] = FALSE
........SIGN              [109] = NEG
........INPUT 1           [95 ] =      0.00 %
........INPUT 2           [96 ] =     25.00 %
........INPUT 3           [97 ] =     50.00 %
........INPUT 4           [98 ] =    100.00 %
........INPUT 5           [99 ] =      0.00 %
........INPUT 6           [100] =    -25.00 %
........INPUT 7           [101] =    -50.00 %
........INPUT 8           [102] =   -100.00 %
```

Overview

The Preset block allows the user to select 1 of 8 preset inputs, which in turn may be connected to other blocks of inputs.

Block Diagram

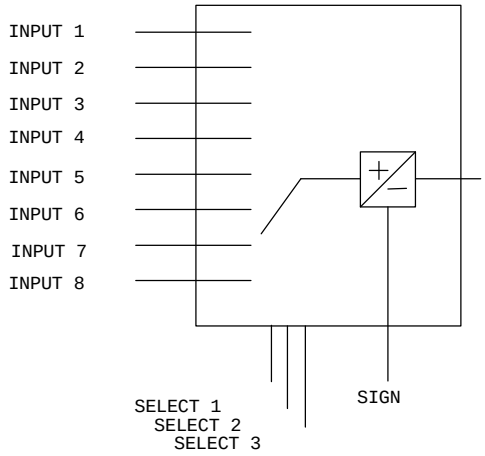

Figure 5.19 Preset Block

Presets

Input 1,2..8	Pre-set input variables.
Select 1,2,3	Select inputs 1
SIGN	Sets the sign of the output.

Selection Table

Three Boolean variables used to select between one of the 8 preset values.

Select 3	Select 2	Select 1	Input
FALSE	FALSE	FALSE	1
FALSE	FALSE	TRUE	2
FALSE	TRUE	FALSE	3
FALSE	TRUE	TRUE	4
TRUE	FALSE	FALSE	5
TRUE	FALSE	TRUE	6
TRUE	TRUE	FALSE	7
TRUE	TRUE	TRUE	8

Table 1 Preset input logic

S-Ramp

MMI Entries:

```
f.....S-RAMP
f.......INPUT              [597] =      0.00 %
f.......RESET              [104] = FALSE
f.......RESET VALUE        [105] =      0.00 %
f.......ACCELERATION       [106] =     10.00
f.......JERK               [107] =     10.00
f.......QUENCH             [108] = FALSE
f.......AT SPEED           [316] = FALSE
f.......AT SPEED LEVEL     [612] =      1.00 %
h.......ACCEL O/P          [253] =      0.00
h.......OVERSHOOT THRESH   [254] =      5.00 %
f.......OUTPUT             [598] =      0.00 %
```

Useful Equations

V is the maximum speed the drive must reach. In % / sec

A is the maximum allowable acceleration in %/sec^2

J is the maximum allowable value for jerk, in %/sec^3

The time needed to stop or accelerate is :

$$t = \frac{V}{A} + \frac{A}{J} \text{ [seconds]}$$

as the speed is symmetrical the average speed is V/2, therefore the stopping / acceleration distance can be calculated.

$$s = \frac{V}{2}\left(\frac{V}{A} + \frac{A}{J}\right) \text{ [meters]}$$

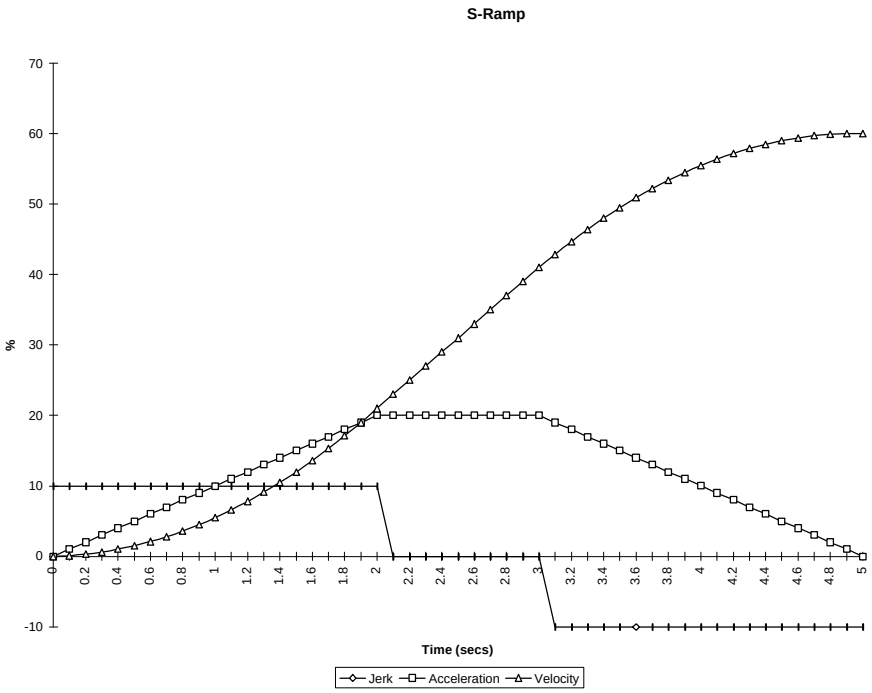

Figure 5.20 S-Ramp

Example acceleration graph for a velocity 60 %/s max. acceleration of 20 %/s^2 and a jerk of 10 %/s^3

Block Diagram

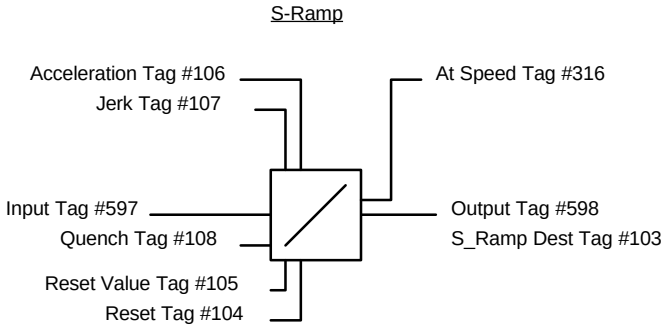

Figure 5.21 S-Ramp Block Diagram

Home

If Enabled the drive will use a position loop to stop the drive in a set number of encoder counts. This mode is triggered from an external input, usually from a mark at a fixed distance from the floor. One of two velocity profiles may be chosen, linear or square root, the square root profile leads to a linear deceleration where as linear profile will give as “s” shaped deceleration.

MMI Entries:

```
f.....HOME
f.......HOME              [397] = FALSE
f.......HOMING DISTANCE   [396] =      2048
f.......1/ENCODER SCALE   [398] =      4.00
f.......LINEAR  O/P       [388] = FALSE
f.......HOME INPUT        [394] =      0.00 %
f.......HOME OUTPUT       [395] =      0.00 %
```

Block Diagram

Speed Demand is the input to the speed loop.

Position Error is the distance in encoder pluses between the current position and Target position.

The homing distance is the stopping distance in encoder pulses.

$$SpeedDemand = \frac{PositionError}{HomingDistance} * SRampOutput$$

NOTES: Possible homing errors

Motor:

100% Speed = 1500 RPM

5000 line encoder.

Gearbox 18:1 @ 2.5m/s)

Pulley 650mm diameter.

@ 2.5 m/s 1 revolution = 110 mm

Internally the encoder is multiplied by 4 so 1 rev. = 20,000 counts.

Relationship between encoder counts and travel in mm on the lift car.

@ 2.5 m/s 1 count = 0.0055mm

How far does the car travel between the detection of the homing sensor and the drive seeing the command ?

It will be assumed that the drive will be travelling relatively slowly when it receives the home command 1.5Hz = 0.75 RPM = 15 counts / ms = 0.0825 mm / ms.

The worst case levelling error will therefore be 0.08 * (cycle time of lift controller + cycle time of vector drive) = 0.08 * (10+15) = 2mm.

This can be halved to +/- 1mm by adjusting the stopping distance by 1mm.

Block Diagram

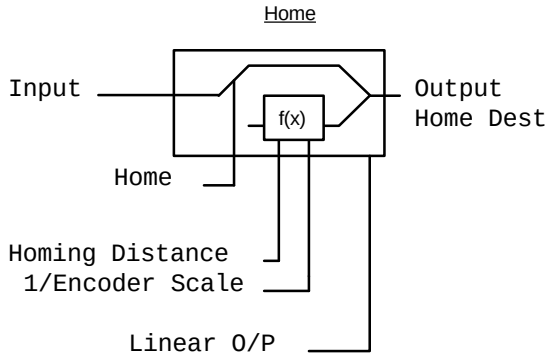

Figure 5.22 Home Block Diagram

Parameters

HOMING DISTANCE	Homing distance is specified in Encoder Counts * 1 / Encoder Scale, a 2048 line encoder equates to 8192 counts per revolution.
1/ENCODER SCALE	Scalar for homing dstance.
HOME	Trigger Input

LOCAL MODE BLOCK DIAGRAM

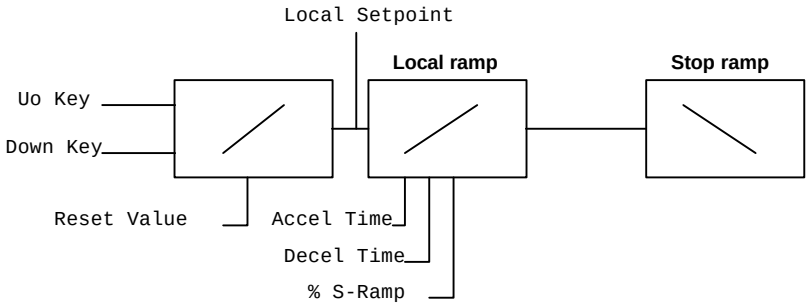

Figure 5.23 Local Setpoint

Only active when the drive is in Local mode.

Start Up Values

SETPOINT	Default setpoint used on power up.
REV DIRECTION	Default Direction used on power up.
PROGRAM	Mode used on power up.
LOCAL	Mode used on power up.

Local Ramp

ACCEL TIME	Ramp up time.
RAMP DECEL TIME	Ramp up time.

FILE TRANSFER

MMI Entries

DUMP MMI (TX)	Starts transmission of MMI Text file **XFER (TX)]** Starts transmission of UDP binary file **XFER (RX)]** Starts reception of UDP binary file

Summary

The P3 port can be used to transfer an ASCII representation of the drive's settings between a 620 and a host computer.

The transfer uses simple ASCII file structure and XON / XOFF protocol. This is provided by most communications packages. Host computers tested include IBM PC XT and AT, running both Windows and MS-DOS, Psion Organiser 3 and many more.

Transferring data from the 620 to a host computer is defined as downloading (TX) whereas transferring data from a host computer to the 620 is defined as uploading (RX).

Communication Port Set-up

9600 Baud (configurable from MMI)

1 stop bit (fixed)

No parity (fixed)

8 bits (fixed)

XON/XOFF handshaking (fixed)

Dump

This is the transfer of the MMI description from the 620 to a host computer. This information fully documents the 620's settings in a textual format that is clear and easy to read. The listing is of the drive's current settings, **not** the settings held in EEprom.

1. Connect the 620 to the host using the appropriate lead.
2. Using a standard communications package prepare the host to receive an ASCII file. Ensure the host's serial port is set-up first.
3. Save the 620's settings using the Parameter Save feature. This ensures the Dump matches the drive settings.
4. Set the **P3 MODE** to **OPTION BOARDS**.
5. Get the host ready to receive a file; use the file extension .MMI to differentiate it from .UDP format files.
6. Start downloading on the 620 by selecting **DUMP MMI (TX)**.
7. The file ends in a ctrl-z; some packages this automatically closes the file. If this is not the case, when the 620 says it has finished and the host has stopped scrolling text, close the file by hand.
8. The file can now be treated like any normal file.

UDP Download (UDP XFER TX)

This is the transfer of parameters from the 620 to a host computer. This information fully describes the 620's settings in a binary format. The listing is of the drive's settings currently held in EEprom, i.e. those that have been saved.

1. Connect the 620 to the host using the appropriate lead.
2. Using a standard communications package prepare the host to receive an ASCII file. Ensure the host's serial port is set-up first.
3. Save the 620's settings using the Parameter Save feature. This ensures the UDP file matches the drive settings.
4. Set the **P3 MODE** to **OPTION BOARDS**.
5. Get the host ready to receive a file; use the file extension .UDP to differentiate it from .MMI format files.
6. Start downloading on the 620 by selecting **UDP XFER (TX)**.
7. The file ends in a ctrl-z; some packages this automatically closes the file. If this is not the case, when the 620 says it has finished and the host has stopped scrolling text, close the file by hand. The last line should read **:00000001FF**
8. The file can now be treated like any normal file.

UDP Upload (UDP XFER RX)

Caution

The 620 UDP files are not compatible with any other EUROTHERM Product.
Uploading a corrupted UDP file cause loss of data.

This is the transfer of parameters from the host computer to the 620. This information is written directly to EEprom, so all the drive's current settings will be overwritten.

1. Connect the 620 to the host using the appropriate lead.
2. Using a standard communications package prepare the host to transfer an ASCII file. Ensure the host's serial port is set-up first.
3. Set the **P3 MODE** to **DISABLE**.

4. Start uploading on the 620 by selecting **UDP XFER (RX)**.
5. When the 620 says "RECEIVING", begin the file transmission.
6. The file ends in a which the 620 uses to close the file.
7. The 620 must now be reset by pressing the 'E' key, as the message on the MMI indicates.

Serial Link Port P3 Lead

There is 24V On Pin 2 of the P3 Port. This may damage your PC or the 620 if connected to the serial port.

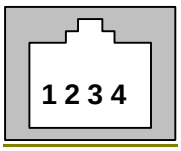

Figure 5.24 P3 Port

P3 Port	Signal	Female DB9	Male DB9	Female DB25	Male DB25
1	Ov	5	5	7	7
2	24v	N/C	N/C	N/C	N/C
3	TX	2	3	2	3
4	RX	3	2	3	2

Table 2 P3 Lead pin allocation

Display Station (D.P.M.)

For infomation only.

Newport 6155AS Revision B onwards

More infomation on the Newport 6 Digit serial input remote display is avalible from:

USA
Newport Electronics Inc.
Phone (714) 540-4914
Fax: (714) 546-3022

Germany
Newport Electronics GmbH
Phone: (07056) 3017
Fax: (07056) 8540

France
Newport Electronics S.A.R.L
Phone: (1) 30.62.14.00
Fax: (1) 30.69.91.20

Benelux (NL)
Newport Electronics B.V.
Phone: (020) 6418405
Fax: (020) 6434643

UK
Newport Electronics U.K.
Phone: (01455) 285998
Fax: (01455) 285604

ASCII hex	Code	Keyboard Character	Function
04	EOT	Ctrl D	Switches display to BS4504 Mode
02	STX	Ctrl B	Start Message
03	ETX	Ctrl C	End Message

Table 3 ASCII Codes

Message Format

<EOT><GID><GID><UID><UID><STX><Indicator><DATA><ETX>

<GID> is fixed at '1' defined by Newport standard.

<UID> is calculated from the position in the tag list, the first tag has address '1'

<Indicator> This toggles the indicator led on the op station to signal data updates.

<DATA> 6 characters padded with spaces containing an ASCII representation of the data with any necessary formatting.

<ETX> the message.

DIP Switch Settings

1	2	3	4	5	6	7	8		
1	0	0	0	0	0	1	0		
1	0	0	0					=	Address 11 GID UID. This is the best address for TAG #1
				0	0			=	Baud 9600
						10		=	Strobed the characters are displayed once a CR is received

Jumpers

DFI (â 15V RS232)

SERIAL LINK

P3 Mode

Selects the operating mode of the P3 Serial port,

Option Board

5703 Master

5703 Slave

Newport

For file transfer select Option Board. During file transfers the mode is automatically set to the correct value. During MMI Download this is set to Busy.

P3 Baud rate

Sets baud rate for P3 serial port.

300, 600, 1200, 2400, 4800, **9600**, and 19200. Baud rates higher than 9600 may become unreliable with a PC.

Setpoint Repeater 5703

This unit provides the facility to run a line of drives in speed-lock without the use of a 5720 Quadraloc controller; for accurate speed-holding, encoder feedback is required. Ratioed speed-locking is supported, although the unit is not intended to supplant Quadraloc in applications requiring high accuracy.

A 16-bit signal is passed between drives through a fibre-optic link and the P3 port on each 620 drive. The port operates RS232-compatible signal levels, which the 5703 converts to light for fibre-optic transmission, and from fibre-optic to RS232 for reception.

Hardware

The 5703 is housed in a DIN rail mounted box and is provided with a ribbon cable to connect it to the P3 port. While cable is of a fixed maximum length of 400mm to limit transmission errors, the primary unit to unit interconnection is intended to be achieved by a fibre-optic cable.

The 5703 unit itself is simply an electric signal-to-light converter, and as such does not alter the signal in any way. This is achieved within the software of the 620 converter.

The 5703 is fitted with one fibre-optic receiver and two fibre-optic transmitters. The receiver has a fixed function to receive data from the 'preceding' unit while one of the transmitters sends data to the 'following' unit. The

additional transmitter can be used either to re-transmit the incoming signal or provide a second transmission of the output signal, giving the unit wide functionality. When the link is in the normal right-hand position (assuming the board is mounted with the fibre-optics downward) the second transmitter repeats the output signal. In the left-hand position it repeats the input signal.

$$Output = \left(\frac{Input_n \times Ratio_n + Input_{n-1} \% Ratio_{n-1}}{100\%} \right)_{-limit}^{limit} \times sign_{-1}^{+1}$$

The 5703 can be configured to point to any relevant parameter in the block diagram, the default connections are such that the scaled input is connected to the 'additional speed demand' and the output to the 'speed demand'.

Possible additions include the sending of multiple parameters and the ability for masters to receive as well as transmit data.

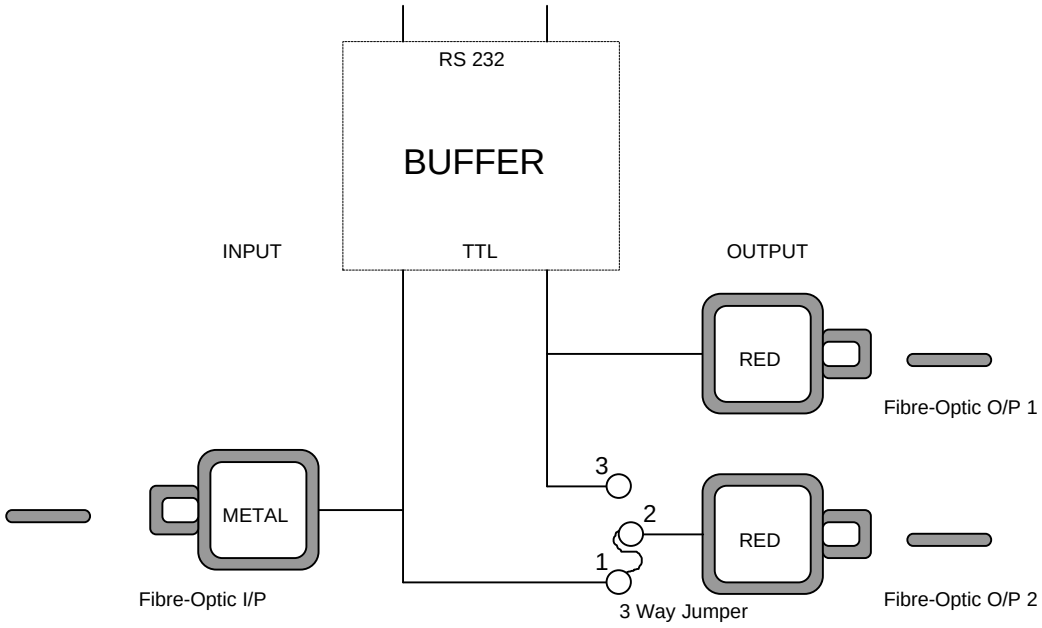

Figure 5.25 5703 Block Diagram

RCV Error

The P3 serial port in the 5703 support mode (i.e. setpoint repeater) receives and transmits information to other 620 controllers. During the receive cycle it checks that the data received is valid. If invalid, it raises an alarm. This is only applicable in the SLAVE mode of operation.

Alarm delay time: 1.5 Secs.

MMI Entries

Setpt. Ratio	Scalar input
Setpt. Sign	Changes sign of input
Scaled Input	Input diagnostic (Raw Input x Scale x Sign)
Raw Input	Raw input diagnostic
Output	Diagnostic of P3 output.

P3 Protocol specification

This describes the protocol used for the drive to drive communications serial link, or "P3 Port". It is commonly used with the 5703 fibre optic isolation interface products for drive to drive communications.

Protocol

The character format is fixed at:

Single parameter, no acknowledgement.

8 Data Bits

1 Stop Bit

No Parity

First char.	n+1	n+2	n+3	End Char.
%	Low Data Byte	High Data Byte	Checksum	<CR>

Table 4 5703 Telegram

% - the percent character. This is the message start character.

Checksum - the sum of The Low and High data bytes

<CR> - Carriage return character. This is the message end character.

If any errors occur during transmission, the message is discarded by the receiver, alarm is generated by the receiver (slave) if too many consecutive errors or time outs occur.

At 19200 Baud, the approximate maximum transmission rate is 1 message every cycle of the block diagram. This is the maximum transmission rate.

PASSWORD

MMI Entries

```
....PASSWORD
......ENTER PASSWORD   [200] =  0x0000
......CHANGE PASSWORD  [201] =  0x0000
```

The 620 Vector Drives have a password system which can be used to prevent unauthorised access to the set-up parameters. Once the user has set a password then the set-up parameters become read-only. Order to change the parameter values the correct password must first be entered.

All drives shipped from the factory have a default password value of 0000.

The **PASSWORD** sub menu has 3 entries as follows:

ENTER PASSWORD	This option is used to enter the password to regain access the set-up parameters. password value entered must match the value previously set up in the **CHANGE PASSWORD** menu to gain access to the set-up parameters.
CHANGE PASSWORD	This option is used to change the password or to initially a user password. a password has been set up, the **PARAMETER SAVE** menu be used to save the password in non-volatile.
CLEAR PASSWORD	This option is used to clear the password value displayed under the **ENTER PASSWORD** menu. this menu is accessed the **ENTER PASSWORD** value is to "**0000**". the **CHANGE PASSWORD** value is-zero then the set-up parameters will be locked.

Example 1: programming of password

1) Access the **CHANGE PASSWORD** menu. display will show:

CHANGE PASSWORD
0x0000

2) Using the up and down arrow keys, set the password value required as a 4 digit hexadecimal number. display will show, for example:

CHANGE PASSWORD
0x1234

3) When you are happy with the password make a note of the value and keep it in a safe place.

4) Press the 'E' key to take you out of the CHANGE PASSWORD menu. Display will show:

5) This is to remind you to save the password along with the other parameters before you remove power from the drive. the 'E' key again to exit the CHANGE PASSWORD menu.

6) Access the **CLEAR PASSWORD** menu and press the 'M' key. Display will show:

CLEAR PASSWORD
PASSWORD CLEARED

7) This indicates that the password value entered above has been locked into the system. **CLEAR PASSWORD** sets the value in the **ENTER PASSWORD** menu to **0x0000**, otherwise the password would still be displayed.

8) The set-up parameters are now locked. to use **PARAMETER SAVE** put the password value in non-volatile memory. you now go back to the **CHANGE PASSWORD** menu the password value is hidden and the display will show:

CHANGE PASSWORD
****

Example 2: set-up parameters when the password is set

1) Access the **ENTER PASSWORD** menu. display will show:

ENTER PASSWORD
0x0000

2) Use the up and down arrow keys to select your password.

3) Press the 'E' key to exit the **ENTER PASSWORD** menu.

4) Access the **SETUP PARAMETERS** menu to make any necessary changes.

5) When all parameter changes have been made come back to the **CLEAR PASSWORD** menu to hide the password value and lock the set-up parameters again.

Example 3: a previously set password

1) Access the **ENTER PASSWORD** menu.

2) Use the up and down arrow keys to enter the existing password value.

3) Leave the **ENTER PASSWORD** menu and access the **CHANGE PASSWORD** menu.

4) Use the up and down arrow keys to select a new password value.

5) Leave the **CHANGE PASSWORD** menu and access the **CLEAR PASSWORD** menu.

6) Press the 'M' key to clear the password value and lock the set-up parameters.

7) Remember to use **SAVE PARAMETERS** to save the new password value in non-volatile memory.

ALARM STATUS

MMI Entries

```
....ALARM STATUS
......HEALTH STORE      [203] =  0x0000
......HEALTH WORD       [217] =  0x0000
......FIRST ALARM       [218] =  0x0000
h.....HEALTH INHIBIT    [219] =  0x0000
```

MENUS

MMI Entries

```
....MENUS
......FULL MENUS        [205] = FALSE
......CONTRAST          [220] =       128
f.....MENU DELAY        [206] =         0
f.....DATA DELAY        [207] =        50
```

Parameters

Full

PARAMETERS SAVE

This menu is used to save all of the drive parameters in the non-volatile memory. The UP arrow as instructed on the second line of the MMI display (UP TO ACTION) to save the drive parameters.

SYSTEM / CONFIGURATION

Software

This shows the software release number. The 620 UDP parameter files are compatible between releases w.x and y.z where z > 1.

Configure I/O

Configure Enable

During the process of reconfiguration there is a danger that Tag numbers will be connected to wrong parameters. To avoid this possibility all configuration links must be temporarily "disconnected" during the configuration process and the flag set to "enabled" to allow the activity. Failure to reset the flag to "disabled" after reconfiguration will cause an alarm to be generated, "Configure Enabled", which will prevent drive operation.

Analogue Inputs

MMI Entries

```
f.......ANALOG INPUTS
f.........ANIN 1 (C3)
f...........CALIBRATION      [248] =    100.00 %
f...........OFFSET           [358] =      0.00 %
f...........MAX VALUE        [249] =    100.00 %
f...........MIN VALUE        [250] =   -100.00 %
f...........DESTINATION TAG  [251] =       196
f...........SCALED INPUT     [390] =     74.51 %
f.........ANIN 3 (F2)
f...........CALIBRATION      [256] =    100.00 %
f...........OFFSET           [360] =      0.00 %
f...........MAX VALUE        [257] =    100.00 %
f...........MIN VALUE        [258] =   -100.00 %
f...........DESTINATION TAG  [259] =       197
f...........SCALED INPUT     [391] =      0.00 %
f.........ANIN 4 (F3)
f...........CALIBRATION      [261] =    100.00 %
```

```
f..........OFFSET           [361] =      0.00 %
f..........MAX VALUE        [262] =    100.00 %
f..........MIN VALUE        [263] =   -100.00 %
f..........DESTINATION TAG  [264] =         0
f..........SCALED INPUT     [392] =      0.01 %
f........ANIN 5 (F4)
f..........CALIBRATION      [266] =    100.00 %
f..........OFFSET           [362] =      0.00 %
f..........MAX VALUE        [267] =    100.00 %
f..........MIN VALUE        [268] =   -100.00 %
f..........DESTINATION TAG  [269] =         0
f..........SCALED INPUT     [393] =      0.00 %
```

Block Diagram

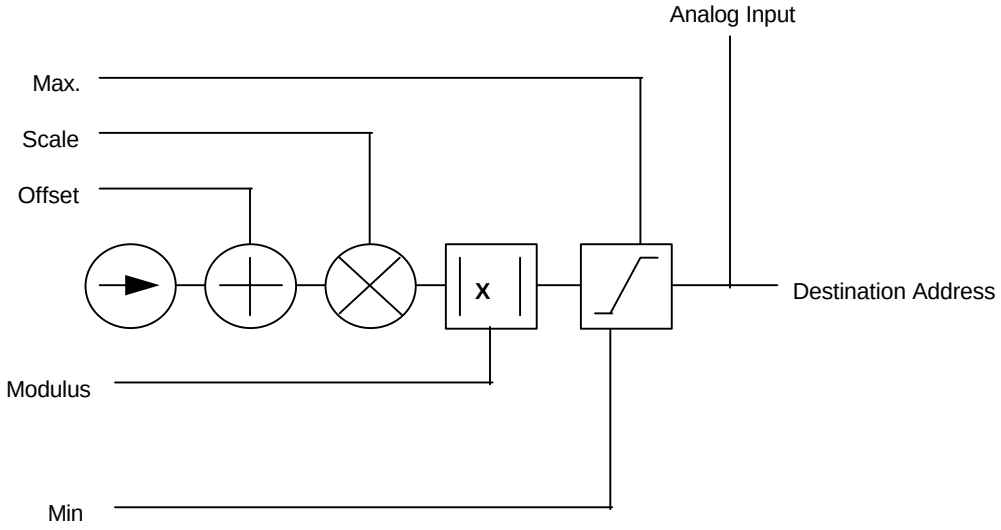

Figure 5.26 Analog I/P

ANIN 1 (C3), ANIN 3 (F2), ANIN 4 ((F3) and ANIN 5 (F4)

CALIBRATION Analogue input scaling ratio.

OFFSET maximum value of scaled analogue input.

MAX. VALUE maximum value of scaled analogue input.

MIN VALUE Minimum value of scaled analogue input.

DESTINATION TAG Destination N° of scaled analogue input value.

SCALED INPUT Diagnostic

ANIN 2 (C4)

Analogue Input 2 (terminal A3) is not reconfigurable. The calibration for this channel is found in **SETUP PARAMETERS::SPEED LOOP::SETPOINTS::RATIO 2 (A3).**

Analogue input 2 is a direct input into the speed loop / current loop and it is scanned synchronously with the current loop (typically every 1.1.mSecs) rather than every micro cycle time. Therefore it should be used for any signal whose response is critical e.g. a trim input from microloc, cut to length applications etc.

CALIBRATION Analogue input scaling ratio.

POS. VALUE maximum value of scaled analogue input.

MIN VALUE minimum value of scaled analogue input.

Analogue Outputs

MMI Entries

```
f.......ANALOG OUTPUTS
f.........ANOUT 1 (C5)
f...........% TO GET 10V     [272] =    100.00 %
f...........OFFSET           [332] =      0.00 %
f...........CALIBRATION      [330] =    100.00 %
f...........MODULUS          [335] = FALSE
f...........ANOUT 1          [354] =      0.00 %
f...........SOURCE TAG       [273] =         7
f.........ANOUT 2 (F5)
f...........% TO GET 10V     [275] =    150.00 %
f...........OFFSET           [333] =      0.00 %
f...........CALIBRATION      [331] =    100.00 %
f...........MODULUS          [336] = FALSE
f...........ANOUT 2          [355] =      0.00 %
f...........SOURCE TAG       [276] =         9
```

Block Diagram

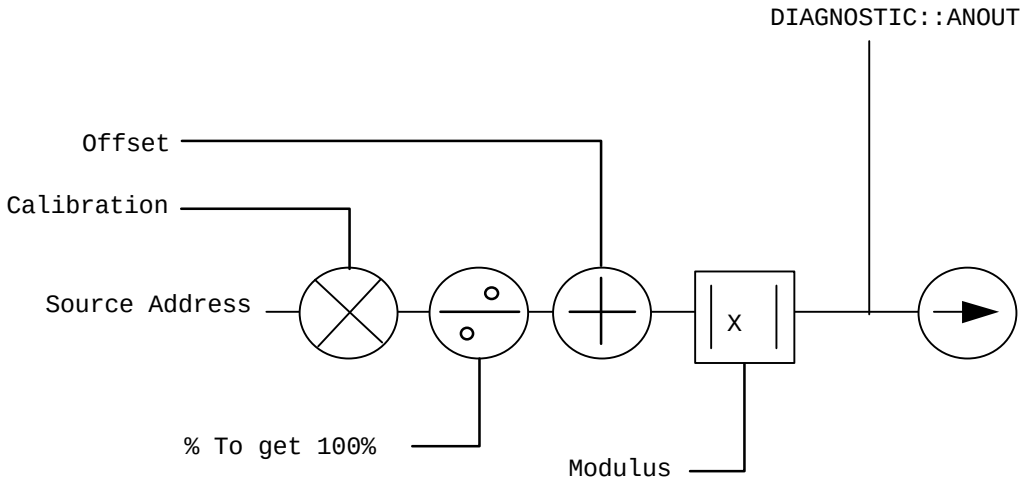

Figure 5.27 Analog O/P Block Diagram

ANOUT 1 (C5) and ANOUT 2 (C6)

% TO GET 10V Scalar value which produces 10 V output.

OFFSET Offset value added to the normal output value after the scalar and before the modulus.

CALIBRATION Output scalar.

MODULUS Unsigned analogue output enable.

SOURCE TAG N° Source of output value.

ANOUT X Diagnostic after scaling block if source tag is non zero else it could be used as a destination tag.

Inputs

Block Diagram

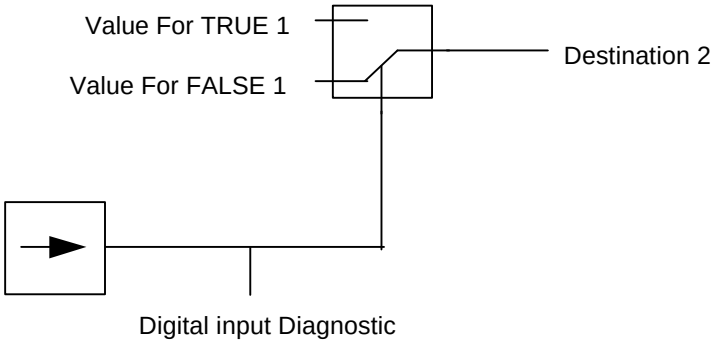

Figure 5.28 Digital Input Block Diagram

The Destination for a digital input can be any valid TAG N°; this means that a digital input can be used to select one of two values for a given parameter. It is also possible to treat the values for TRUE and FALSE as destination Tags from other functions or inputs.

MMI Entries

```
f.......DIGITAL INPUTS
f.........DIGIN 1 (E2)
f...........VALUE FOR TRUE   [279] =      0.01 %
f...........VALUE FOR FALSE  [280] =      0.00 %
f...........OUTPUT           [527] =      0.00 %
f...........DESTINATION TAG  [281] =        57
f.........DIGIN 2 (E3)
f...........VALUE FOR TRUE   [283] =      0.01 %
f...........VALUE FOR FALSE  [284] =      0.00 %
f...........OUTPUT           [528] =      0.00 %
f...........DESTINATION TAG  [285] =        92
f.........DIGIN 3 (E4)
f...........VALUE FOR TRUE   [287] =      0.01 %
f...........VALUE FOR FALSE  [288] =      0.00 %
f...........OUTPUT           [529] =      0.00 %
f...........DESTINATION TAG  [289] =        93
f.........DIGIN 4 (E5)
f...........VALUE FOR TRUE   [523] =      0.01 %
f...........VALUE FOR FALSE  [524] =      0.00 %
f...........OUTPUT           [508] =      0.00 %
f...........DESTINATION TAG  [525] =        94
f...........DIGIN 4 (E5)     [521] = FALSE
f.........DIGIN B6 DEST    [451] =        71
f.........DIGIN B7 DEST    [450] =        70
f.........DIGIN B8 DEST    [452] =        72
```

DIGIN 1 (E2), DIGIN 2 (E3), DIGIN 3 (E4), DIGIN 4 (E5)

VALUE FOR TRUE — Value that Destination TAG assumes when input is TRUE.

VALUE FOR FALSE — Value that Destination TAG assumes when input is FALSE.

OUTPUT — Diagnostic.

DESTINATION TAG — Destination of assumed value.

DIGIN B6

DIGIN B6 DEST — Destination of digital input B6.(JOG by default) see also AUX IO

DIGIN B7

DIGIN B7 DEST — Destination of digital input B7.(START by default) see also AUX IO

DIGIN B8

DIGIN B8 DEST	Destination of digital input B8.(ENABLE by default) see also AUX IO

Digital outputs

Block Diagram

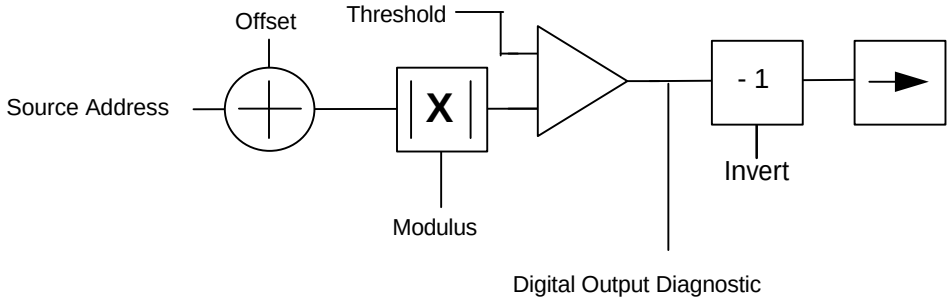

Figure 5.29 Digital Output

```
f.......DIGITAL OUTPUTS
f.........DIGOUT 1
f...........THRESHOLD (>)     [292] =      0.00 %
f...........INPUT             [324] =      0.00 %
f...........OFFSET            [321] =      0.00 %
f...........MODULUS           [293] = FALSE
f...........INVERT            [327] = FALSE
f...........SOURCE TAG        [294] =        17
f.........DIGOUT 2
f...........THRESHOLD (>)     [296] =      0.00 %
f...........INPUT             [325] =      0.00 %
f...........OFFSET            [322] =      0.00 %
f...........MODULUS           [297] = FALSE
f...........INVERT            [328] = FALSE
f...........SOURCE TAG        [298] =        12
f.........DIGOUT 3
f...........THRESHOLD (>)     [300] =      0.00 %
f...........INPUT             [326] =      0.00 %
f...........OFFSET            [323] =      0.00 %
f...........MODULUS           [301] = TRUE
f...........INVERT            [329] = FALSE
f...........SOURCE TAG        [302] =       559
```

DIGOUT 1 (E6), DIGOUT 2 (E7) and DIGOUT 3 (E8)

THRESHOLD (>)	Threshold which the must exceed to set output TRUE.
INPUT	DIAGNOSTIC.
OFFSET	Offset.
MODULUS	Output set true for absolute or modulus of N° value.
INVERT	Select inverted output.
SOURCE TAG	Source TAG of used to set output.

Configure 5703

See also page 5-31 Setpoint Repeater 5703.

MMI Entries

```
f.......CONFIGURE 5703
f.........SOURCE TAG       [304] =       176
f.........DESTINATION TAG  [305] =       371
```

Block diagram

MMI Entries

```
f.......BLOCK DIAGRAM
f.........RAISE/LOWER DEST [307] =         0
f.........RAMP O/P DEST    [308] =       372
f.........PRESET DEST      [111] =       373
f.........S-RAMP DEST      [103] =         0
f.........HOME DEST        [389] =         0
f.........SPT SUM1 OP DEST [345] =        58
f.........SPT SUM2 OP DEST [346] =       176
f.........SPT SUM3 OP DEST [347] =         0
f.........PID O/P DEST     [552] =         0
f.........PID ERROR DEST   [556] =       545
f.........POSITION DEST    [341] =         0
```

Internal links

MMI Entries

```
f.......INTERNAL LINKS
f.........LINK 1 SOURCE    [180] =         0
f.........LINK 1 DEST      [181] =         0
f.........LINK 2 SOURCE    [182] =         0
f.........LINK 2 DEST      [183] =         0
f.........LINK 3 SOURCE    [184] =         0
f.........LINK 3 DEST      [185] =         0
f.........LINK 4 SOURCE    [186] =         0
f.........LINK 4 DEST      [187] =         0
f.........LINK 5 SOURCE    [560] =         0
f.........LINK 5 DEST      [561] =         0
f.........LINK 6 SOURCE    [562] =         0
f.........LINK 6 DEST      [563] =         0
f.........LINK 7 SOURCE    [564] =         0
f.........LINK 7 DEST      [565] =         0
f.........LINK 8 SOURCE    [566] =         0
f.........LINK 8 DEST      [567] =         0
f.........LINK 9 SOURCE    [568] =         0
f.........LINK 9 DEST      [569] =         0
f.........LINK 10 SOURCE   [570] =         0
f.........LINK 10 DEST     [571] =         0
f.........LINK 11 SOURCE   [572] =         0
f.........LINK 11 DEST     [573] =         0
f.........LINK 12 SOURCE   [574] =         0
f.........LINK 12 DEST     [575] =         0
f.........LINK 13 SOURCE   [576] =         0
f.........LINK 13 DEST     [577] =         0
f.........LINK 14 SOURCE   [578] =         0
f.........LINK 14 DEST     [579] =         0
f.........LINK 15 SOURCE   [580] =         0
f.........LINK 15 DEST     [581] =         0
f.........LINK 16 SOURCE   [582] =         0
f.........LINK 16 DEST     [583] =         0
```

The internal links are an extension of the drive's reconfigurability. They allow two categories of connections:

1. Connect an internal output to an internal input directly, without having to come out to the drive terminals and then back in again. This would waste terminal allocation and suffer conversion inaccuracies from analogue to digital and vice-versa.
2. Connect a given input terminal to more than one destination, e.g. select a different value for "Ramp Accel Time" and "Ramp Decel Time" via the same digital input.

Data is copied from source tag to destination tag.