EUROTHERM
DRIVES

HVAC10 Series
AC Drive

Software Product Manual

HA470844 Issue A

Compatible with Version 4.x Software

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WARRANTY

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Eurotherm Drives reserves the right to change the content and product specification without notice.

Cont.2

Safety Information

Requirements

IMPORTANT: Please read this information BEFORE installing the equipment.

Intended Users

This manual is to be made available to all persons who are required to install, configure or service equipment described herein, or any other associated operation.

The information given is intended to highlight safety issues, and to enable the user to obtain maximum benefit from the equipment.

Complete the following table for future reference detailing how the unit is to be installed and used.

INSTALLATION DETAILS	
Serial Number *(see product label)*	
Where installed *(for your own information)*	
Unit used as a: *(refer to Certification for the Drive)*	❑ Component ❑ Relevant Apparatus
Unit fitted:	❑ Wall-mounted ❑ Enclosure

Application Area

The equipment described is intended for industrial motor speed control utilising AC induction or AC synchronous machines.

Personnel

Installation, operation and maintenance of the equipment should be carried out by qualified personnel. A qualified person is someone who is technically competent and familiar with all safety information and established safety practices; with the installation process, operation and maintenance of this equipment; and with all the hazards involved.

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Safety Information

Hazards

WARNING!

This equipment can endanger life through rotating machinery and high voltages.
Failure to observe the following will constitute an ELECTRICAL SHOCK HAZARD.
This is a product of the restricted sales distribution class according to IEC 61800-3.
In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.
This product is designated as "professional equipment" as defined in EN61000-3-2.
Permission of the supply authority shall be obtained before connection to the low voltage supply.

- The equipment must be **permanently earthed** due to the high earth leakage current.
- The drive motor must be connected to an appropriate safety earth.
- The equipment contains high value capacitors which take time to discharge after removal of the mains supply.
- Before working on the equipment, ensure isolation of the mains supply from terminals L1, L2 and L3. Wait for at least 3 minutes for the dc link terminals (DC+ and DC-) to discharge to safe voltage levels (<50V). Measure the DC+ and DC- terminal voltage with a meter to confirm that the voltage is less than 50V.
- Never perform high voltage resistance checks on the wiring without first disconnecting the drive from the circuit being tested.
- When replacing a drive in an application and before returning to use, it is essential that all user defined parameters for the product's operation are correctly installed.
- This equipment contains electrostatic discharge (ESD) sensitive parts. Observe static control precautions when handling, installing and servicing this product.

IMPORTANT: Metal parts may reach a temperature of 90 degrees centigrade in operation.

Application Risk

The specifications, processes and circuitry described herein are for guidance only and may need to be adapted to the user's specific application.

Eurotherm Drives does not guarantee the suitability of the equipment described in this Manual for individual applications.

Risk Assessment

Under fault conditions, power loss or other operating conditions not intended, the equipment may not operate as specified. In particular:

- The motor speed may not be controlled
- The direction of rotation of the motor may not be controlled
- The motor may be energised

Guards

The user must provide guarding and /or additional safety systems to prevent risk of injury and electric shock.

Protective Insulation

- All control and signal terminals are SELV, i.e. protected by double insulation. Ensure all wiring is rated for the highest system voltage.

Note: *Thermal sensors contained within the motor must be double insulated.*

- All exposed metalwork in the Drive is protected by basic insulation and bonding to a safety earth.

RCDs

These are not recommended for use with this product but ,where their use is mandatory, only Type B RCDs should be used.

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PROGRAMMING YOUR APPLICATION

Introducing the Macro

You can program the drive for specific applications.

The drive is supplied with macros (set-ups) which can be used as starting points for application-specific programming. This programming could simply involve the inputting of parameter values, or it may require the making or breaking of programmable links, which is a feature of this unit.

Each macro recalls a pre-programmed set of default parameters and links when it is loaded.

Refer to Chapter 5: "Application Macros" for further information.

Programming with Block Diagrams

Block diagram programming provides a visual method of planning the software to suit your application. There are block diagrams provided at the end of this chapter, each showing the software connections for an application macro. These pages replicate the ConfigED Lite programming screens. ConfigEd Lite is Eurotherm's own programming tool.

The processes performed by a macro are represented as a block diagram, consisting of *function blocks* and *links:*

- Each function block contains the parameters required for setting-up a particular processing feature. Sometimes more than one instance of a function block is provided for a feature, i.e. for multiple digital inputs.
- Software links are used to connect the function blocks. Each link transfers the value of an output parameter to an input parameter of another (or the same) function block.

Each individual block is a processing feature, i.e. it takes the input parameter, processes the information, and makes the result available as one or more output parameters.

Modifying a Block Diagram

Configuration and Parameterisation Modes

There are two modes of operation used while modifying a block diagram: C*onfiguration* and *Parameterisation* modes.

Configuration Mode

In the configuration mode you can modify the links in the function block diagram. You can also change parameter values, as above. This mode is indicated by all the LEDs on the keypad flashing at once. The drive cannot run in this mode.

When you attempt to change a parameter value requiring Configuration Mode to be enabled, the Keypad immediately displays ENABLE CONFIG. Refer to Figure 1-1, page 1-2. Press the **E** key at this point if you do not want to enter Configuration Mode. Press the ▲ (up) key as instructed to enter Configuration Mode. This is indicated by all LEDs flashing.

Parameterisation Mode

DEFAULT

In parameterisation mode you can change parameter values. The drive can be running or stopped. Note that some parameters can only be changed when the drive is stopped. It is not possible to modify the internal links when the drive is in parameterisation mode.

Once in Configuration Mode, to return to Parameterisation Mode simply press the **E** key repeatedly until the Welcome screen is displayed. Press the **E** key again and Configuration Mode will be disabled. This is indicated by LEDs ceasing to flash.

Making and Breaking Links in Configuration Mode

Links can be moved, added or deleted from a block diagram whilst in the Configuration mode. There are 80 links available, each has its own identification number ("link" number). You make a link by setting the link's SOURCE and DESTINATION to be the two parameter names to be linked. The outputs of function blocks are not updated whilst in this mode.

Note: *Menus and parameters are displayed in alphabetical order. NULL is placed between A and Z. Setting both SOURCE and DESTINATION to NULL disables the link.*

The LINK Parameter

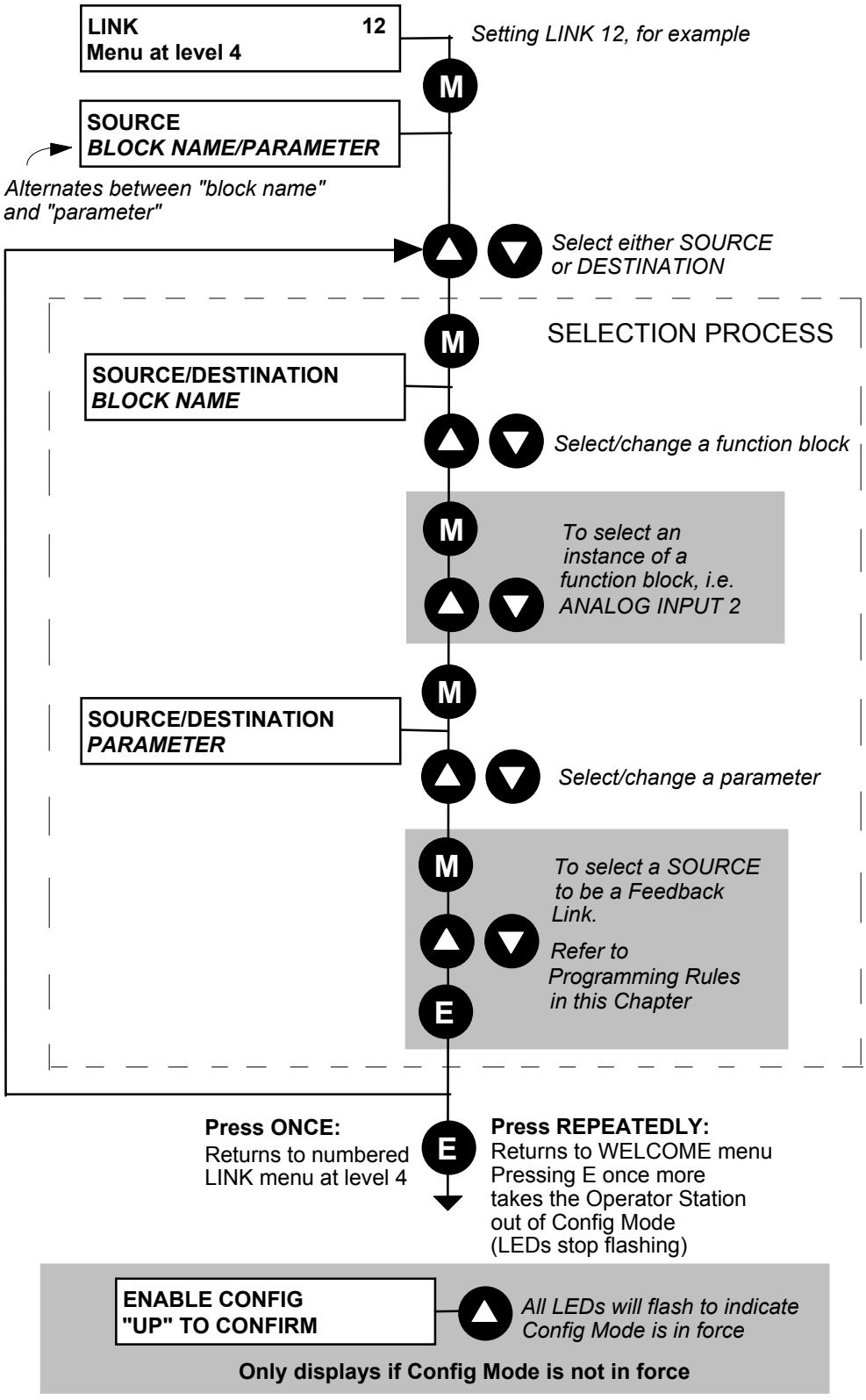
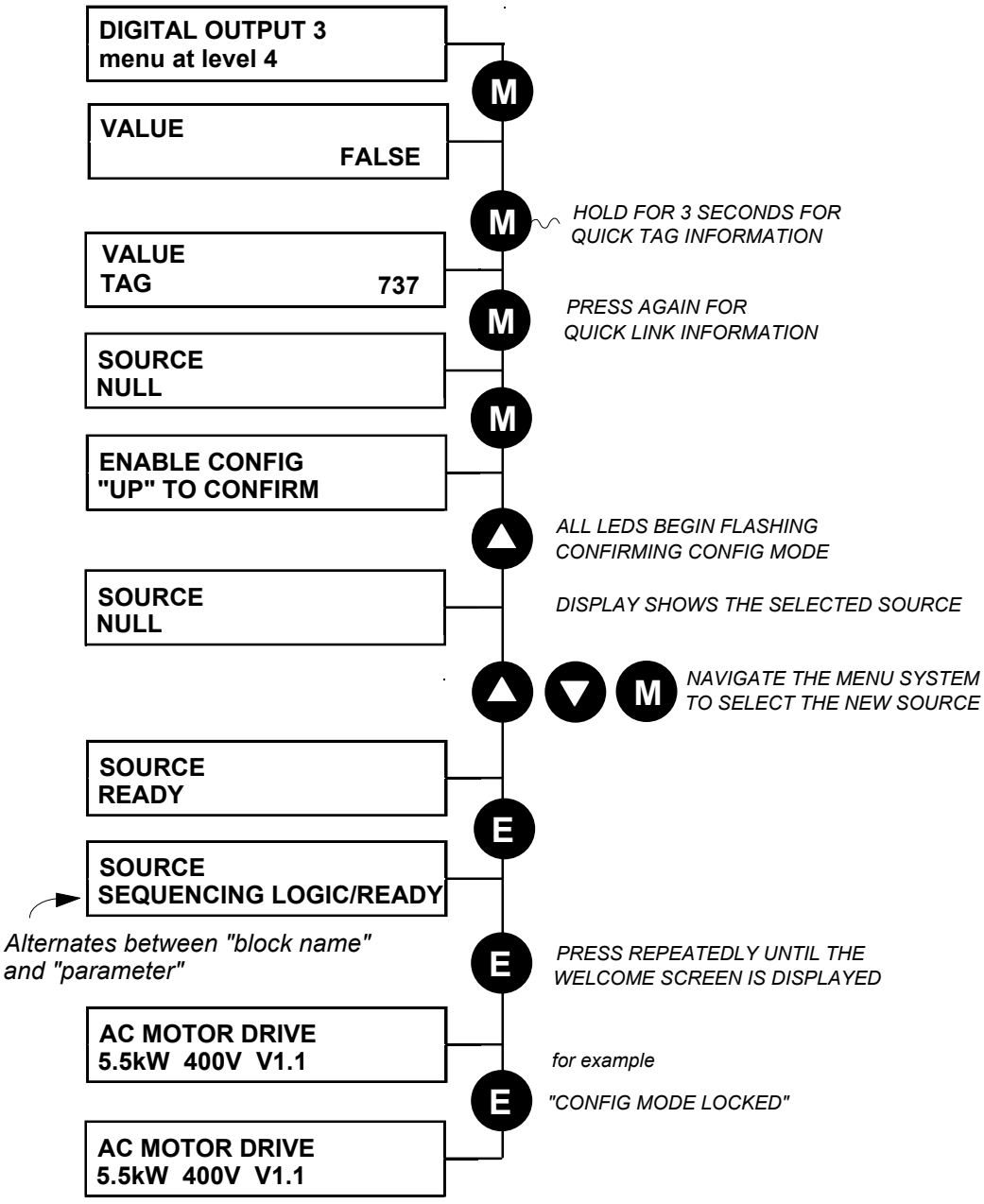


Figure 1-1 Diagram showing Key Presses for Making/Breaking Links

Any Configurable "Destination" Parameter

A similar process can be used to apply or edit a link to any configurable parameter that is to be the intended "destination". The process selects the "source" for the link.

Note: *It is possible for several "destination" parameters to share the same "source".*



Programming Rules

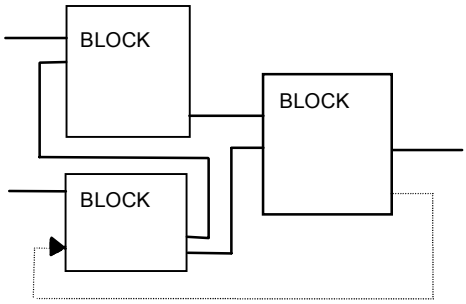
The following rules apply when programming:

Parameterisation Mode

- Function block output parameter values cannot be changed (because they are a result of the function block's processing)
- Function block input parameter values that receive their values from a link cannot be changed (as they will change back to the value they receive from the link when the drive is running).

Configuration Mode

- A link's DESTINATION must be set to an input parameter (only one link per input parameter).
- A link's SOURCE may be set to any parameter. Both input and output parameters can be used as a source.
- Disable a link by setting both DESTINATION and SOURCE to NULL.
- Setting a link's SOURCE to be a *feedback link* forces the link to be executed first. This is used to reduce execution timing delays in a feedback loop situation. A feedback link is indicated by "←" appearing to the right of the source parameter's name.



Feedback Link

Execution Rules

The complete block diagram is executed every 5ms, with individual control blocks executing within 1ms. Just before a function block is executed, all the links that have that block as their destination are executed, thereby copying new values in to the block's parameter inputs. The input parameters are then processed to produce a new set of output parameters. The execution order of the blocks is automatically arranged for minimal delay.

- The output value transferred by a link on execution is clamped to be between the maximum and minimum value for its destination input parameter.
- If a links' SOURCE and DESTINATION parameters have different decimal point positions, there is no automatic adjustment. Use a VALUE FUNCTION block to modify the input into the correct destination format. Refer to the table below for the result of linking different parameters types.

Source Value (the input)	Source Type	Destination Type	Destination Value (the result)
TRUE	Boolean	Real	0.01
FALSE	Boolean	Real	0.00
≥0.005	Real	Boolean	TRUE
≤0.005	Real	Boolean	FALSE
LOCAL ONLY (1)	Enumerated	Real	1.00
2.00	Real	Enumerated	REMOTE ONLY (2) (Note that (2) will not always return Remote Only)

Table 1-1 Execution Rules

Saving Your Modifications

If parameter values or links have been modified or a macro has been loaded, the new settings must be saved. The drive will then retain the new settings during power-down. Refer to the Installation Product Manual, Chapter 5: "The Keypad" - Saving/Restoring/Deleting Your Application.

SETUP Menu - Function Block Descriptions

Note: *To view the SETUP Menu, ADVANCED view level must be selected.*

MMI Menu Map

1 QUICK SETUP
VIEW LEVEL

Understanding the Function Block Description

The following function blocks show the parameter information necessary for programming the drive.

Input parameters are shown on the left hand side, and output parameters are shown on the right hand side of the block.

The diagrams assume that the UK country code is selected and that a 400V 5.5kW Frame C power board is fitted. This is reflected in the values of certain parameters, see "*" and "**" in the table below.

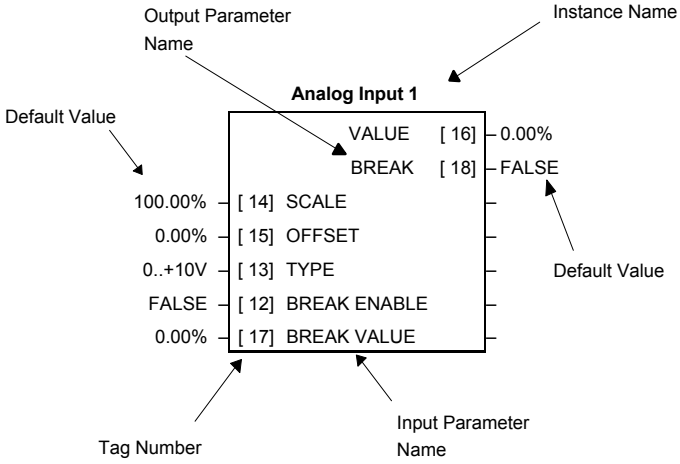


Figure 1-2 Function Block Parameter Information

Instance Name	Names the function block and MMI menu
Default Value	The default value of the unmodified macro, Macro 0
Input/Output Parameter Name	The name shown on ConfigEd Lite
Tag Number	Unique identification used for communications
*	Parameters marked with "*" are set to a value depending upon the "operating frequency" of the drive. Refer to Chapter 2: "Parameter Specification" - Frequency Dependent Defaults; and the Installation Product Manual, Chapter 5: "The Keypad" - Changing the Product Code (3-button reset).
**	Parameters marked with "**" are set to a value depending on the overall "power build " of the drive indicated by the product code. Refer to Chapter 2: "Parameter Specification" - Power Dependent Defaults; and the Installation Product Manual: Chapter 2: "Understanding the Product Code".

Note: *The "Range" for a parameter value is given in the Parameter Description Table on each Function Block page. Ranges for outputs are given as "—.xx %", for example, indicating an indeterminate integer for the value, to two decimal places.*

MMI Menu Maps

The function block descriptions include an easy-find menu showing the menu levels and titles encountered to find the appropriate menu title, and the parameters contained in the menu(s).

Where there is more than one instance, i.e. ANALOG INPUT as illustrated, the parameters shown will be for the last instance.

MMI Menu Map

1 SETUP
2 INPUTS & OUTPUTS
3 ANALOG INPUT
4 ANALOG INPUT 1
4 ANALOG INPUT 2
SCALE
OFFSET
TYPE
BREAK ENABLE
BREAK VALUE
VALUE
BREAK

Function Blocks by Category

The function block descriptions in this chapter are arranged in alphabetical order, however, they are listed below by Category. They each appear as a Menu in the SETUP menu at level 1.

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FLUXING	1-36	SLIP COMP	1-96
FLYCATCHING	1-38	SPEED LOOP	1-99
INJ BRAKING	1-42	STABILISATION	1-103
INVERSE TIME	1-44	TORQUE LIMIT	1-112
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LINEAR RAMP	1-45	RAISE/LOWER	1-82
MINIMUM SPEED	1-52	SKIP FREQUENCIES	1-93
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Winder

COMPENSATION	1-19	TAPER CALC	1-107
DIAMETER CALC	1-23	TORQUE CALC	1-111
SPEED CALC	1-97		

Function Blocks in Alphabetical Order

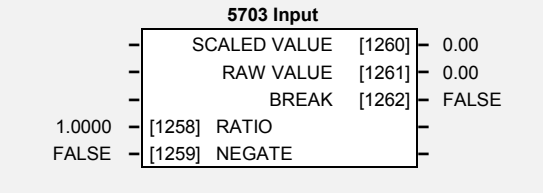
MMI Menu Map

1 SETUP
2 COMMUNICATIONS
3 5703 INPUT
- RATIO
- NEGATE
- SCALED VALUE
- RAW VALUE
- BREAK

5703 INPUT

Supports the receiving of data from a Eurotherm 5703 Setpoint Repeater.

This block is only operational when the SYSTEM PORT (P3) :: MODE parameter is set to 5703. Refer to page 1-106.



Parameter Descriptions

RATIO *Range: -3.0000 to 3.0000 %*

Scaler applied to RAW VALUE to produce SCALED VALUE output.

NEGATE *Range: FALSE / TRUE*

When TRUE, changes the sign of SCALED VALUE

SCALED VALUE *Range: _.xx*

Received value with RATIO and NEGATE applied.

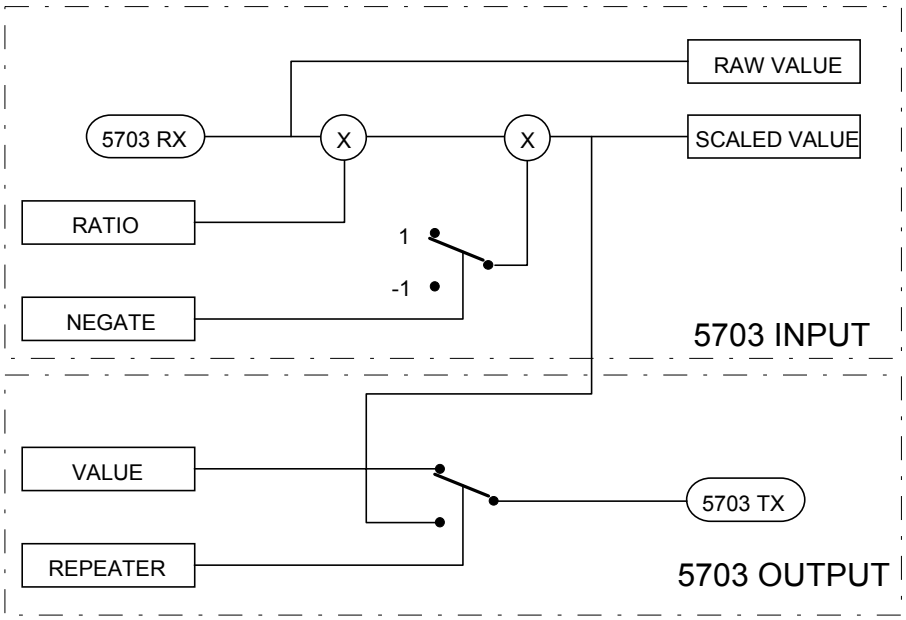
RAW VALUE *Range: _.xx*

Received value before any processing. Reset to zero when there are no valid received messages.

BREAK *Range: FALSE / TRUE*

Set TRUE when there are no valid 5703 messages received during the previous 2 seconds.

Functional Description



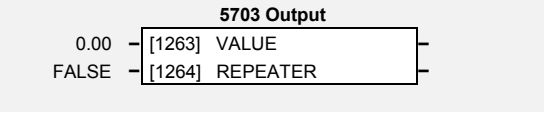
5703 OUTPUT

MMI Menu Map

1 SETUP
2 COMMUNICATIONS
3 5703 OUTPUT
- VALUE
- REPEATER

Supports the sending of data to a Eurotherm 5703 Setpoint Repeater.

This block is only operational when the SYSTEM PORT (P3) :: MODE parameter is set to 5703. Refer to page 1-106.



Parameter Descriptions

VALUE *Range*: *-300.00 to 300.00 %*

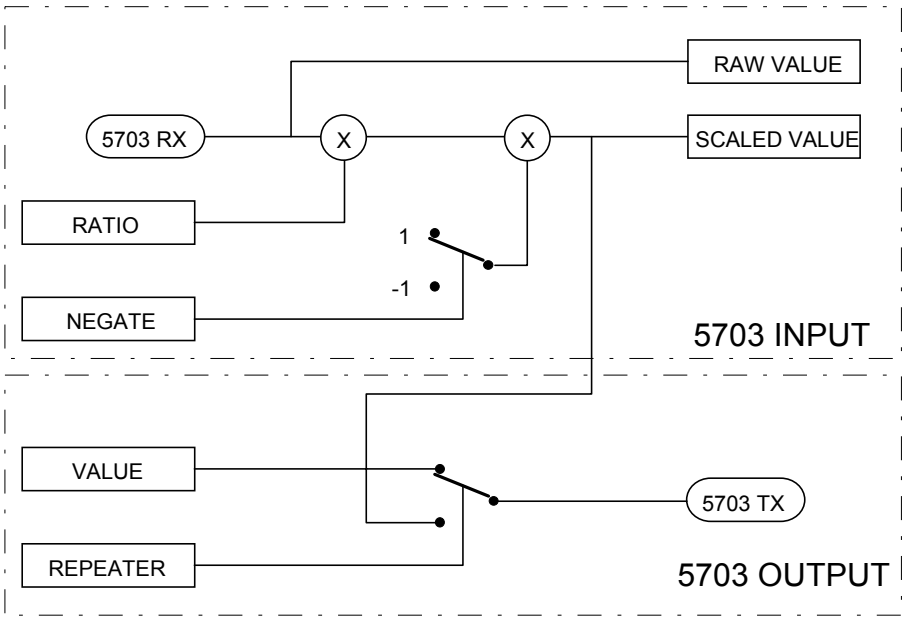
The value to be sent when not configured as a repeater.

REPEATER *Range: FALSE / TRUE*

When TRUE, sends the SCALED VALUE from the 5703 INPUT block instead of the VALUE input.

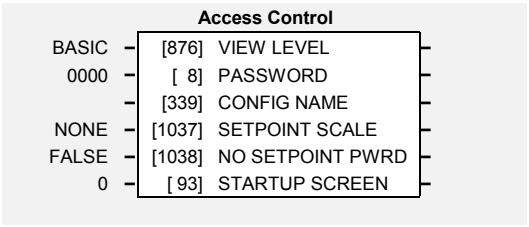
Note: This is performed at a faster rate than the block diagram execution to minimise the transmission delay between drives.

Functional Description



ACCESS CONTROL

This function block contains options associated with keypad password protection, view levels, setpoint display and initial Operator Menu selection.



MMI Menu Map

1 SETUP
2 MENUS
3 ACCESS CONTROL
- VIEW LEVEL
- PASSWORD
- CONFIG NAME
- SETPOINT SCALE
- NO SETPOINT PWRD
- STARTUP SCREEN

Parameter Descriptions

VIEW LEVEL *Range: FALSE / TRUE*

The menu to be displayed by the Keypad. Refer to the Installation Product Manual, Chapter 5: "The Keypad" - Menu Viewing Levels.

Enumerated Value : *View Level*
0 : OPERATOR
1 : BASIC
2 : ADVANCED

PASSWORD *Range: 0000 to FFFF*

Setting a non-zero value enables the password feature.

CONFIG NAME *Range: max length is 16 chars*

When not blank, the string is displayed as the top line of the Welcome screen.

SETPOINT SCALE *Range: See below*

A scaling factor applied to the speed setpoint and feedback displays. Selects a DISPLAY SCALE function block to be applied.

Enumerated Value : *DISPLAY SCALE function block*
0 : NONE
1 : DISPLAY SCALE 1
2 : DISPLAY SCALE 2
3 : DISPLAY SCALE 3
4 : DISPLAY SCALE 4

NO SETPOINT PWRD *Range: FALSE / TRUE*

When TRUE, the local setpoint is not password protected, regardless of the PASSWORD value. When FALSE, the local setpoint is password protected just like all other parameters.

STARUP SCREEN *Range: See below*

Selects which of the Operator Menu parameters will be displayed after the Welcome screen.

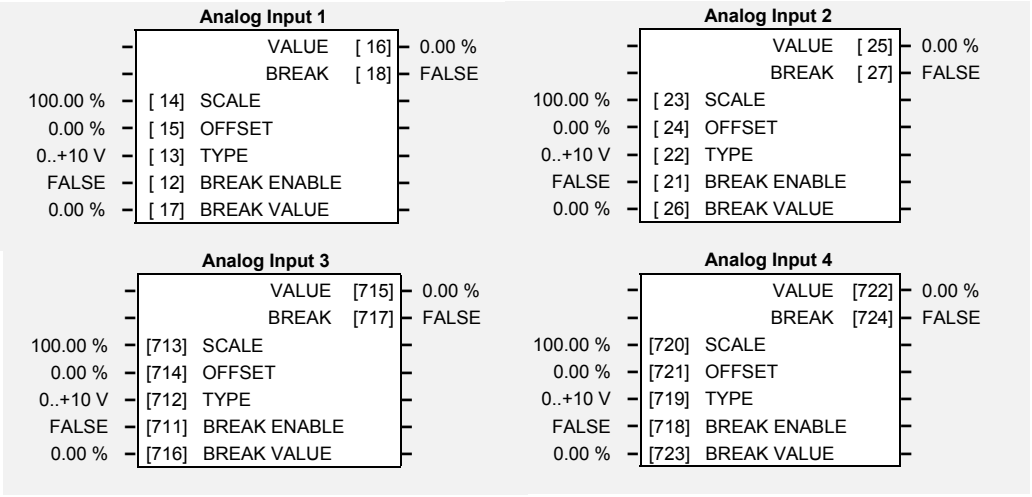
Enumerated Value : *Startup Screen*
0 : selects REMOTE SETPOINT or LOCAL SETPOINT
1 : selects parameter defined by OPERATOR MENU 1
2 : selects parameter defined by OPERATOR MENU 2
: etc.
16 : selects parameter defined by OPERATOR MENU 16

ANALOG INPUT

MMI Menu Map

1 SETUP
2 INPUTS & OUTPUTS
3 ANALOG INPUT
4 ANALOG INPUT 1
4 ANALOG INPUT 2
4 ANALOG INPUT 3
4 ANALOG INPUT 4
- SCALE
- OFFSET
- TYPE
- BREAK ENABLE
- BREAK VALUE
- VALUE
- BREAK

The analog input block converts the input voltage or current into a value expressed as a percentage of a configurable range.



Parameter Descriptions

SCALE

Range: -300.00 to 300.00 %

A scaling factor applied to the raw input. With a scaling factor of 100.00% and an offset of 0.00%, an input equal to the low input range will appear as a value of 0.00%. Similarly, an input equal to the high input range will appear as a value of 100.00%.

OFFSET

Range: -300.00 to 300.00 %

An offset added to the input after the scaling factor has been applied.

TYPE

Range: Enumerated - see below

The input range and type.

- ANALOG INPUT 1 and ANALOG INPUT 2 support all types.
- ANALOG INPUT 3 and ANALOG INPUT 4 are used for voltage measurement only.

An incorrect selection will force the VALUE to be set to zero.

Enumerated Value : *Type*

0 : 0..+10 V
1 : +2..+10 V
2 : 0..+5 V
3 : +1..+5 V
4 : -10..+10 V
5 : 0..20 mA
6 : 4..20 mA
7 : 20..4 mA
8 : 20..0 mA
9 : 0..+20 V

BREAK ENABLE *Range: FALSE / TRUE*

For input types that support sensor break detection (see Functional Description below), this parameter may be used to disable sensor break detection. For input types that do not support break detection, this parameter is FALSE.

BREAK VALUE *Range: -300.00 to 300.00 %*

The value that will appear as the VALUE output when BREAK is TRUE

VALUE *Range: —.xx %*

The input reading with scaling and offset applied.

BREAK *Range: FALSE / TRUE*

Indicates that the input sensor signal is not present. See below for more details on break detection.

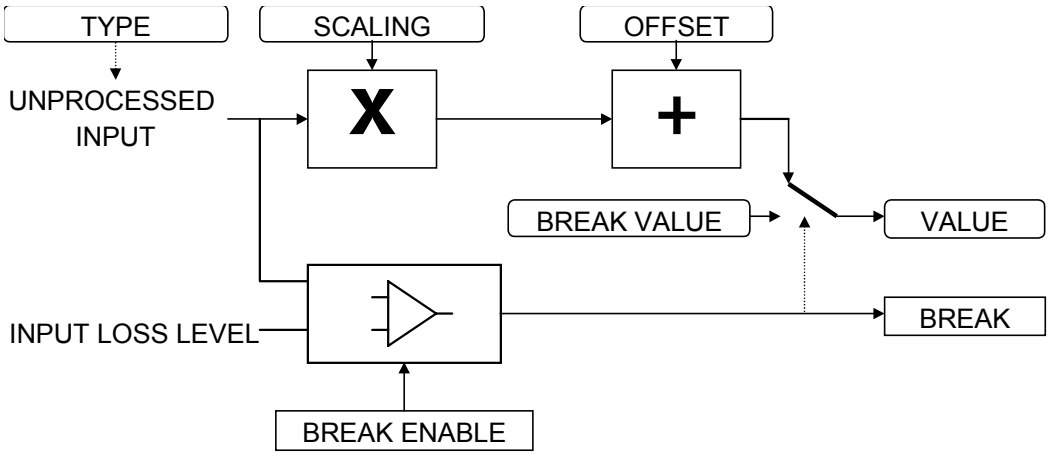
Functional Description

The drive has four analog inputs. There is an analog input function block for each:

ANALOG INPUT 1 is associated with the signal on terminal 2
ANALOG INPUT 2 is associated with the signal on terminal 3
ANALOG INPUT 3 is associated with the signal on terminal 4
ANALOG INPUT 4 is associated with the signal on terminal 5

The input voltage is pre-processed and converted into a numeric value by the analog input electronics of the drive. The analog input function blocks further process this reading so that a value of 0.00% represents an input equal to the low input range, while a value of 100.00% represents an input equal to the high input range. The SCALE and OFFSET factors are then applied as shown to produce a value suitable for use in the application.

The break detect facility may only be used in conjunction with the following hardware ranges: 2 to 10V, 1 to 5V, 4 to 20mA and 20 to 4mA. An input break is defined as an input reading less than either 0.1V or 0.45mA. When an input break has been detected, the VALUE output is forced to be the BREAK VALUE .

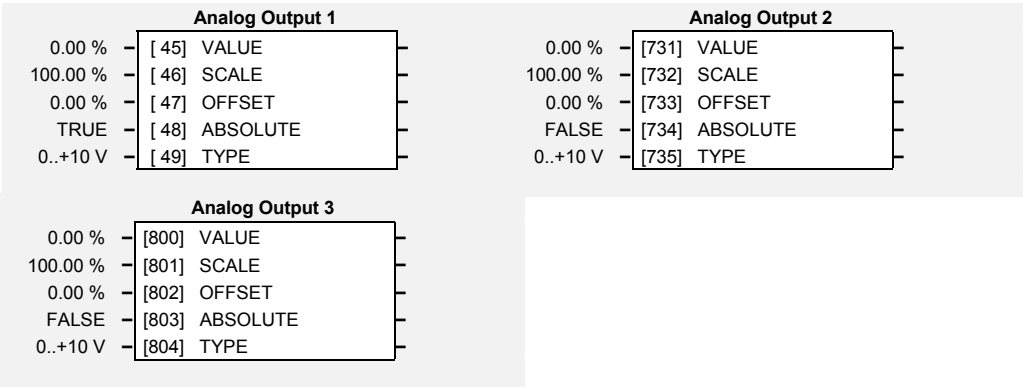


ANALOG OUTPUT

MMI Menu Map

1 SETUP
2 INPUTS & OUTPUTS
3 ANALOG OUTPUT
4 ANALOG OUTPUT 1
4 ANALOG OUTPUT 2
4 ANALOG OUTPUT 3
- VALUE
- SCALE
- OFFSET
- ABSOLUTE
- TYPE

The analog output blocks converts the demand percentage into a form suitable for driving the analog output electronics of the drive.



Parameter Descriptions

VALUE *Range: -300.00 to 300.00 %*

The demanded value to output.

SCALE *Range: -300.00 to 300.00 %*

A scaling factor to apply to VALUE . A scaling factor of 100.00% has no effect.

OFFSET *Range: -300.00 to 300.00 %*

An offset added to VALUE after the scaling factor has been applied. An offset factor of 0.00% has no effect.

ABS *Range: FALSE / TRUE*

When true the output sign is ignored.

TYPE *Range: Enumerated - see below*

The output hardware type, either Volts or Amps.

- ANALOG OUTPUT 1 supports all types, except -10..+10V.
- ANALOG OUTPUT 2 and ANALOG OUTPUT 3 are used as voltage outputs only.

An incorrect selection will force the VALUE to be set to zero.

Enumerated Value : *Type*

0 : 0..+10 V
1 : 0..20 mA
2 : 4..20 mA
3 : -10..+10 V
4 : 20..4 mA
5 : 20..0 mA
6 : +2..+10 V
7 : 0..+5 V
8 : +1..+5 V

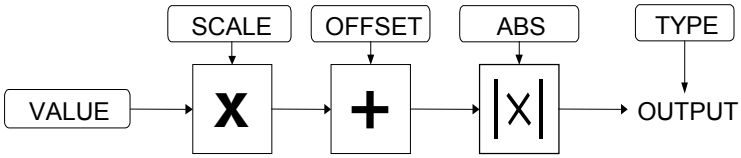
Functional Description

The drive has three analog outputs. There is an ANALOG OUTPUT function block associated with each of these:

ANALOG OUTPUT 1 is associated with terminal 6
ANALOG OUTPUT 2 is associated with terminal 7
ANALOG OUTPUT 3 is associated with terminal 8

The scaling and offset parameters are applied to the demand value as shown.

If ABS is TRUE then the final output is the magnitude of value after being scaled and offset.
If ABS is FALSE then the final output will be limited to be within the range selected by TYPE.

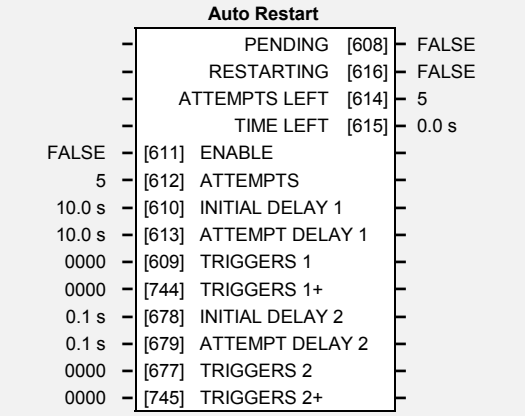


AUTO RESTART

MMI Menu Map

1 SETUP
2 SEQ & REF
3 AUTO RESTART
- ENABLE
- ATTEMPTS
- INITIAL DELAY 1
- ATTEMPT DELAY 1
- TRIGGERS 1
- TRIGGERS 1+
- INITIAL DELAY 2
- ATTEMPT DELAY 2
- TRIGGERS 2
- TRIGGERS 2+
- PENDING
- RESTARTING
- ATTEMPTS LEFT
- TIME LEFT

Auto Restart (or Auto Reset) provides the facility to automatically reset a choice of trip events and restart the drive with a programmed number of attempts, after which, a manual or remote trip reset is required if the drive is not successfully restarted. The number of attempted restarts are recorded. This count is cleared after a trip-free period of operation (5 minutes or 4 x ATTEMPT DELAY 1, whichever is the longer), or after a successful manual or remote trip reset, or by removing the Run signal, or by setting the ENABLE input to this block FALSE.



Parameter Descriptions

ENABLE

Range: FALSE / TRUE

Enables operation of the auto restart feature.

ATTEMPTS

Range: 1 to 10

Determines the number of restarts that will be permitted before requiring an external fault reset.

INITIAL DELAY 1

Range: 0.0 to 600.0 s

Determines the delay for the first restart attempt when the trip is included in TRIGGERS 1 . The delay is measured from all error conditions clearing.

ATTEMPT DELAY 1

Range: 0.0 to 600.0 s

Determines the delay between restart attempts for a trip included in TRIGGERS 1 . The delay is measured from all error conditions clearing.

TRIGGERS 1 and TRIGGERS+ 1

Range: 0000 to FFFF

Allows Auto Restart to be enabled for a selection of trip conditions.

Refer to the Installation Product Manual, Chapter 6: “Hexadecimal Representation of Trips” for an explanation of the four-digit codes.

INITIAL DELAY 2

Range: 0.0 to 600.0 s

Determines the delay for the first restart attempt when the trip is included in TRIGGERS 2 The delay is measured from all error conditions clearing.

ATTEMPT DELAY 2

Range: 0.0 to 600.0 s

Determines the delay between restart attempts for a trip included in TRIGGERS 2 . The delay is measured from all error conditions clearing.

TRIGGERS 2 and TRIGGERS+ 2

Range:0000 to FFFF

Allows Auto Restart to be enabled for a selection of trip conditions.

If a trip is included in both TRIGGERS 1 and TRIGGERS 2, then the times associated with TRIGGERS 1 will take priority.

Refer to the Installation Product Manual, Chapter 6: “Hexadecimal Representation of Trips” for an explanation of the four-digit codes.

PENDING *Range: FALSE / TRUE*

Indicates that an auto restart will occur after the programmed delay.

RESTARTING *Range: FALSE / TRUE*

Indicates that an auto restart is occurring. TRUE for a single block diagram execution cycle.

ATTEMPTS LEFT *Range: —.*

Indicates the number of attempts left before an external fault reset is required.

TIME LEFT *Range: —.x s*

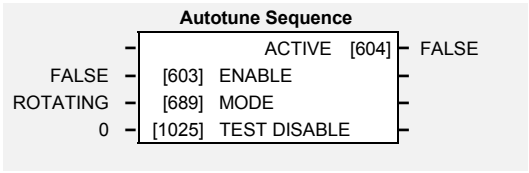
When in the Restarting state, this parameter indicates the time left before an auto restart attempt will be permitted. When non-zero, this value is unaffected by changes to ATTEMPT DELAY 1.

AUTOTUNE

MMI Menu Map

1 SETUP
2 MOTOR CONTROL
3 AUTOTUNE
- ENABLE
- MODE
- TEST DISABLE
- ACTIVE

Designed for SENSORLESS VEC and CLOSED-LOOP VEC Motor Control Modes.



The auto-tune is an automatic test sequence performed by the drive to identify motor model parameters. The motor model is used by the Sensorless Vector and Closed-Loop Vector control modes. You **MUST** perform an auto-tune before operating the drive in either of the Vector control modes.

Refer to the Installation Product Manual, Chapter 4: "Operating the Drive" - Set-up using the Sensorless Vector Fluxing Mode.

Parameter Descriptions

ENABLE *Range: FALSE / TRUE*

Determines whether the Autotune sequence is operational or not. The Autotune sequence is operational when set to TRUE and the drive is run. Refer to the Installation Product Manual, Chapter 4: "Operating the Drive" - The Autotune Feature.

MODE *Range: Enumerated - see below*

Selects the Autotune operating mode. Refer to the Installation Product Manual, Chapter 4: "Operating the Drive" – The Autotune Feature.

Enumerated Value : *Mode*

0 : ROTATING
1 : STATIONARY

TEST DISABLE *Range: 0 to 3*

This parameter expands on the MMI to show four tests. Each test can be individually disabled by setting to TRUE.

Enumerated Value : *Mode*

0 : STATOR RES
1 : LEAKAGE IND
2 : ENCODER DIR
3 : MAG CURRENT

ACTIVE *Range: FALSE / TRUE*

This indicates the current state of the Autotune sequence. The Autotune sequence is operational when displaying TRUE.

Functional Description

The autotune sequence identifies the following motor parameters:-

- Per-phase stator resistance (STATOR RES)
- Per-phase leakage inductance (LEAKAGE INDUC)
- Per-phase mutual inductance (MUTUAL INDUC)
- Rotor time constant (ROTOR TIME CONST)
- No-load magnetising line current (MAG CURRENT)
- The encoder direction (ENCODER INVERT)

The Rotating autotune sequence rotates the motor up to the user-programmed MAX SPEED (SETPOINT SCALE function block) in order to identify these parameters.

The Stationary autotune sequence does not rotate the motor and requires the correct value of Magnetising Current to be entered.

The values of the above are stored in the MOTOR DATA function block. Autotune will overwrite any previous entry made for these parameters.

Autotune can only be initiated from the "stopped" condition. When the test is complete, the stack is disabled and ENABLE is set to FALSE.

BRAKE CONTROL

MMI Menu Map

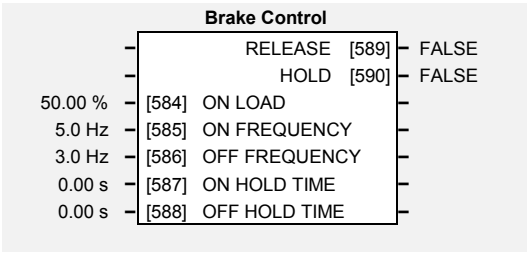
1 SETUP

2 HOIST/LIFT

3 BRAKE CONTROL

- ON LOAD
- ON FREQUENCY
- OFF FREQUENCY
- ON HOLD TIME
- OFF HOLD TIME
- RELEASE
- HOLD

This is used to control electro-mechanical motor brakes in hoist and lift applications.



Parameter Descriptions

ON LOAD *Range: 0.00 to 150.00 %*

Load level at which the external motor brake is released.

ON FREQUENCY *Range: 0.0 to 500.0 Hz*

The output electrical frequency at which the external motor brake is released.

OFF FREQUENCY *Range: 0.0 to 500.0 Hz*

The output electrical frequency at which the external motor brake is applied.

ON HOLD TIME *Range: 0.00 to 60.00 s*

Sets the duration of the pulse output on HOLD when RELEASE becomes TRUE.

OFF HOLD TIME *Range: 0.00 to 60.00 s*

Sets the duration of the pulse output on HOLD when RELEASE becomes FALSE.

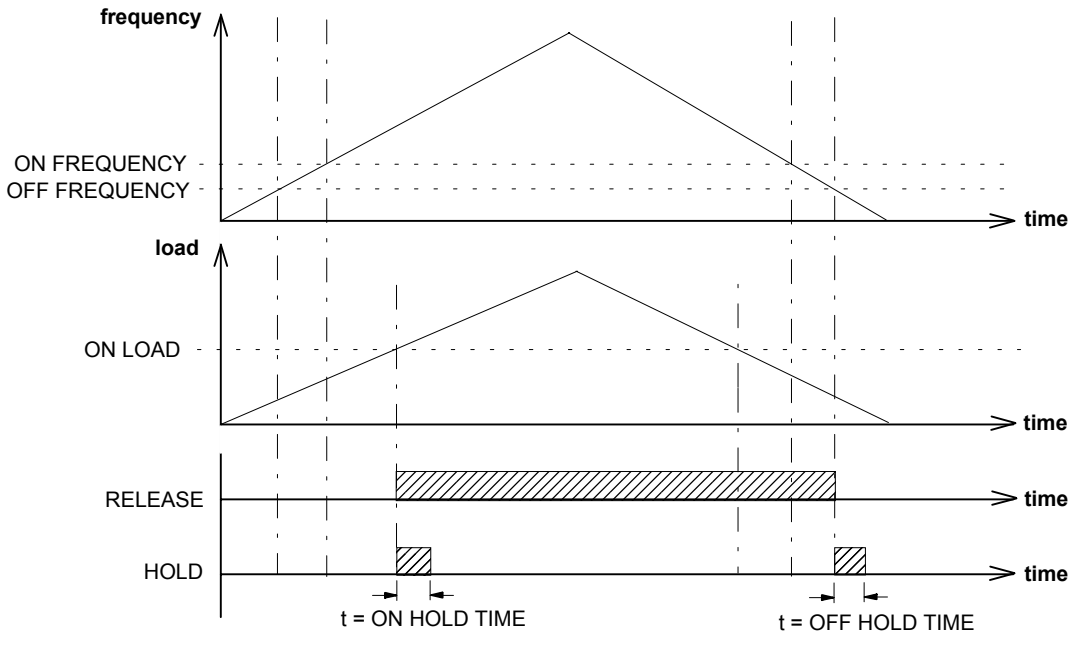
RELEASE *Range: FALSE / TRUE*

Boolean output providing a signal to operate the brake delay. Note RELEASE is forced FALSE if the drive is not in Run mode, or if Autotune, Flycatching or Injection Braking are active.

HOLD *Range: FALSE / TRUE*

Becomes TRUE when the brake is toggled On or Off by the function block, and remains TRUE for the duration set by OFF HOLD TIME or ON HOLD TIME.

Functional Description



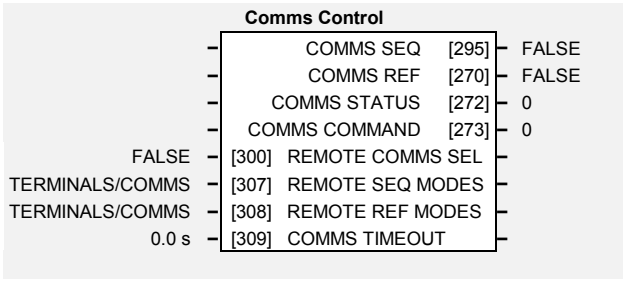
COMMS CONTROL

MMI Menu Map

1 SETUP
2 SEQ & REF
3 COMMS CONTROL
- REMOTE COMMS SEL
- REMOTE SEQ MODES
- REMOTE REF MODES
- COMMS TIMEOUT
- COMMS SEQ
- COMMS REF
- COMMS STATUS
- COMMS COMMAND

This block switches between Remote Terminal and Remote Comms operating modes.

The drive must be in Remote mode for selection to be made - REMOTE mode is enabled in the LOCAL CONTROL function block (REF MODES) and selected by the Keypad. Refer to the outputs of the LOCAL CONTROL function block for the mode in use.



Parameter Descriptions

REMOTE COMMS SEL

Range: FALSE / TRUE

Selects the type of remote communications mode:

0 : FALSE, and in REMOTE mode then control is from the terminals.
1 : TRUE, and in REMOTE mode then control is from the communications.

REMOTE SEQ MODES

Range: Enumerated - see below

Selects the type of remote sequencing mode:

Enumerated Value : *Mode*

0 : TERMINALS/COMMS
1 : TERMINALS ONLY
2 : COMMS ONLY

REMOTE REF MODES

Range: Enumerated - see below

Selects the type of remote reference mode:

Enumerated Value : *Mode*

0 : TERMINALS/COMMS
1 : TERMINALS ONLY
2 : COMMS ONLY

COMMS TIMEOUT

Range: 0.0 to 600.0 s

Sets the maximum time allowed between refreshing the COMMS COMMAND parameter. The drive will trip if this time is exceeded. Set the time to 0.00 seconds to disable this feature.

COMMS SEQ

Range: FALSE / TRUE

Diagnostic indicating if operating in Remote Sequencing Comms Mode.
If FALSE (0), the drive may be in Local Sequencing mode or Remote Sequencing Terminal mode.

COMMS REF

Range: FALSE / TRUE

Diagnostic indicating if operating in Remote Reference Comms Mode.

If FALSE (0), the drive may be in Local Reference mode or Remote Reference Terminal mode.

COMMS STATUS

Range: 0000 to FFFF

Diagnostic showing the 16-bit Status word as seen by the communications.
Refer to Chapter 4: “Sequencing Logic”.

COMMS COMMAND

Range: 0000 to FFFF

Diagnostic showing the 16-bit Command as written by the communications.
Refer to Chapter 4: “Sequencing Logic”.

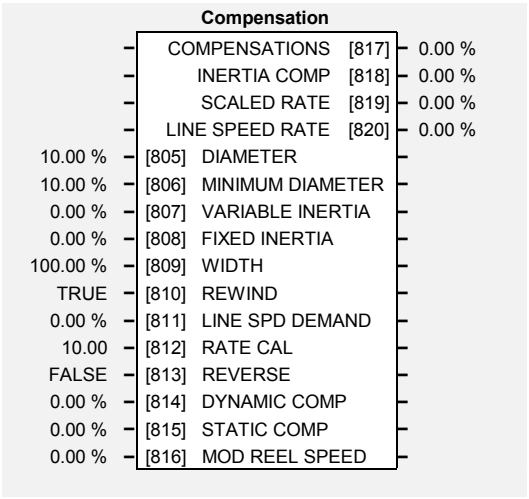
COMPENSATION

MMI Menu Map

- 1 SETUP
- 2 WINDER
- 3 COMPENSATION
  - DIAMETER
  - MINIMUM DIAMETER
  - VARIABLE INERTIA
  - FIXED INERTIA
  - WIDTH
  - REWIND
  - LINE SPD DEMAND
  - RATE CAL
  - REVERSE
  - DYNAMIC COMP
  - STATIC COMP
  - MOD REEL SPEED
  - COMPENSATIONS
  - INERTIA COMP
  - SCALED RATE
  - LINE SPEED RATE

This function block calculates the torque required to accelerate the mechanical inertia.

This block is used in Macro 4.



Parameter Descriptions

DIAMETER *Range: 0.00 to 100.00 %*

Calculated diameter from diameter calculator.

MINIMUM DIAMETER *Range: 0.00 to 100.00 %*

Min Diameter from diameter calculator.

VARIABLE INERTIA *Range: 0.00 to 100.00 %*

The Variable Inertia is the Inertia of reel.

FIXED INERTIA *Range: 0.00 to 100.00 %*

This is the inertia of the motor, gearbox and core.

WIDTH *Range: 0.00 to 100.00 %*

The width input sets the web width and scales the variable inertia.

REWIND *Range: FALSE / TRUE*

Selects between unwind and re-wind. Selected to REWIND when TRUE.

LINE SPD DEMAND *Range: -100.00 to 100.00 %*

Line Speed demand is differentiated to calculate the rate of change of speed for inertia compensation.

RATE CAL *Range: -300.00 to 300.00*

Scales differentiated LINE SPD DEMAND

REVERSE *Range: FALSE / TRUE*

Sets the direction of the line speed.

DYNAMIC COMP *Range: 0.00 to 300.00 %*

The compensation required to drive the winder at full speed.

STATIC COMP *Range: 0.00 to 300.00 %*

The compensation required to drive the winder at minimum speed (zero)

MOD REEL SPEED *Range: 0.00 to 300.00 %*

Reel speed feedback.

COMPENSATIONS *Range: —.00 %*

Total open loop torque compensation.

INERTIA COMP *Range: —.00 %*

Unscaled inertia compensation diagnostic.

SCALED RATE *Range: —.00 %*

Scaled rate diagnostic.

LINE SPEED RATE *Range: —.00 %*

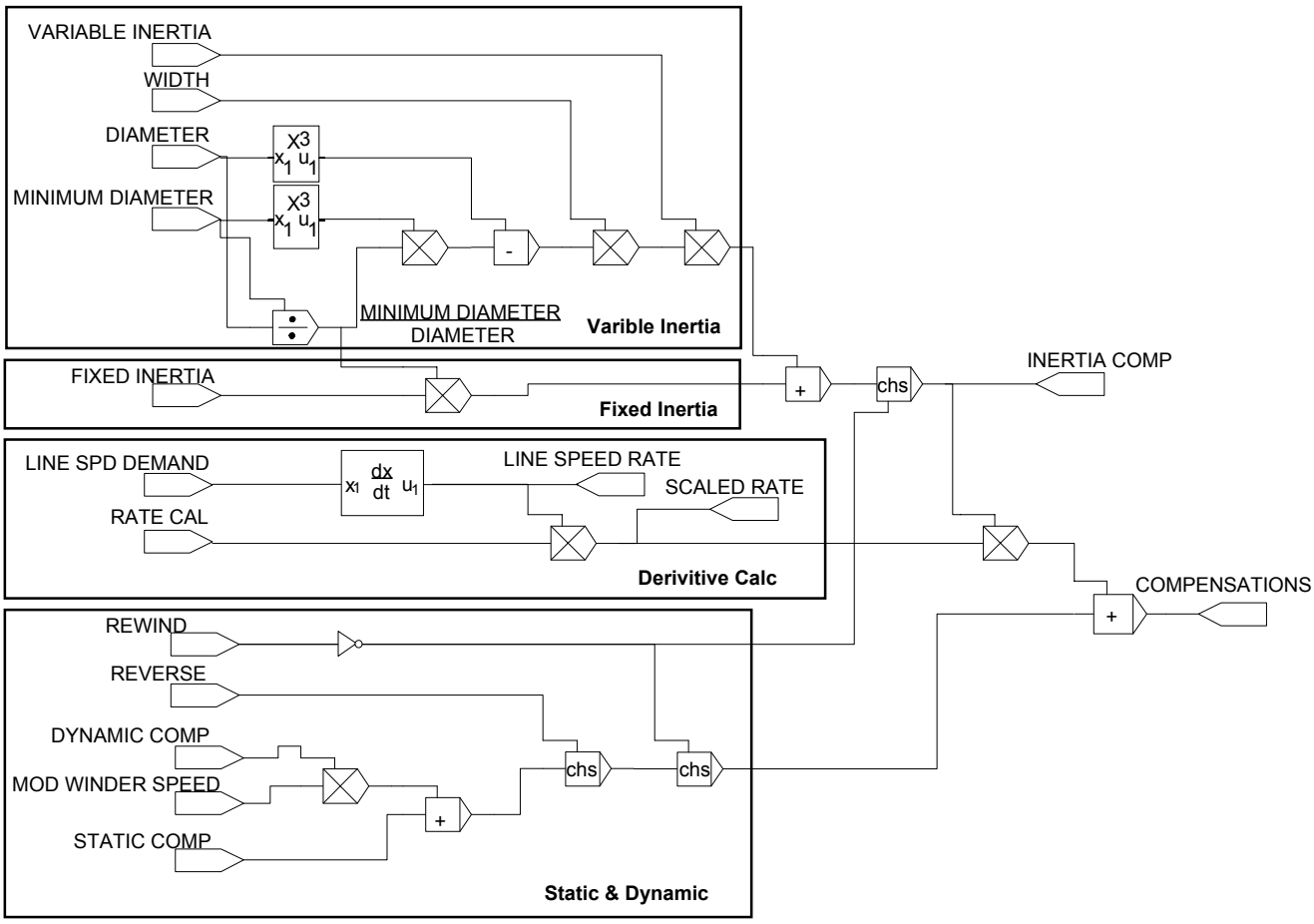
Differential of line speed.

Functional Description

The FIXED INERTIA is the inertia of the motor, gearbox and core. The VARIABLE INERTIA is the inertia of the roll. A WIDTH input is available for setting the web width.

The total inertia (INERTIA COMP) is multiplied by the scaled acceleration rate to produce the torque demand. The polarity is set by the unwind/re-wind selection.

Accelerating a rewind requires additional torque in the same direction as the tension producing torque, whereas an unwind will require accelerating torque in the opposite direction to the tension torque. The acceleration rate comes from the line speed demand input. The line speed demand input is differentiated to produce a rate.

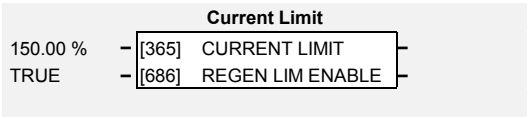


CURRENT LIMIT

MMI Menu Map

1 SETUP
2 MOTOR CONTROL
3 CURRENT LIMIT
- CURRENT LIMIT
- REGEN LIM ENABLE

Designed for all Motor Control Modes.



This function block allows you to set the maximum level of motor rated current (as a % of the user-set MOTOR CURRENT) which is allowed to flow before current limit action occurs. If the measured motor current exceeds the current limit value with a motoring load, the motor speed is reduced to shed the excess load. If the measured motor current exceeds the current limit value with a regenerating load, the motor speed is increased up to a maximum of MAX SPEED (SETPOINT SCALE function block).

Parameter Descriptions

CURRENT LIMIT *Range: 0.00 to 150.00 %*

This parameter sets the level of motor current, as a % of MOTOR CURRENT (refer to the MOTOR DATA function block) at which the drive begins to take current limit action.

Refer also to “Quadratic/Constant Torque Selection”, page 1-125.

REGEN LIM ENABLE *Range: FALSE / TRUE*

This parameter enables or disables regenerative current limit action.

Note that this parameter only works in open-loop VOLTS / Hz motor control mode.

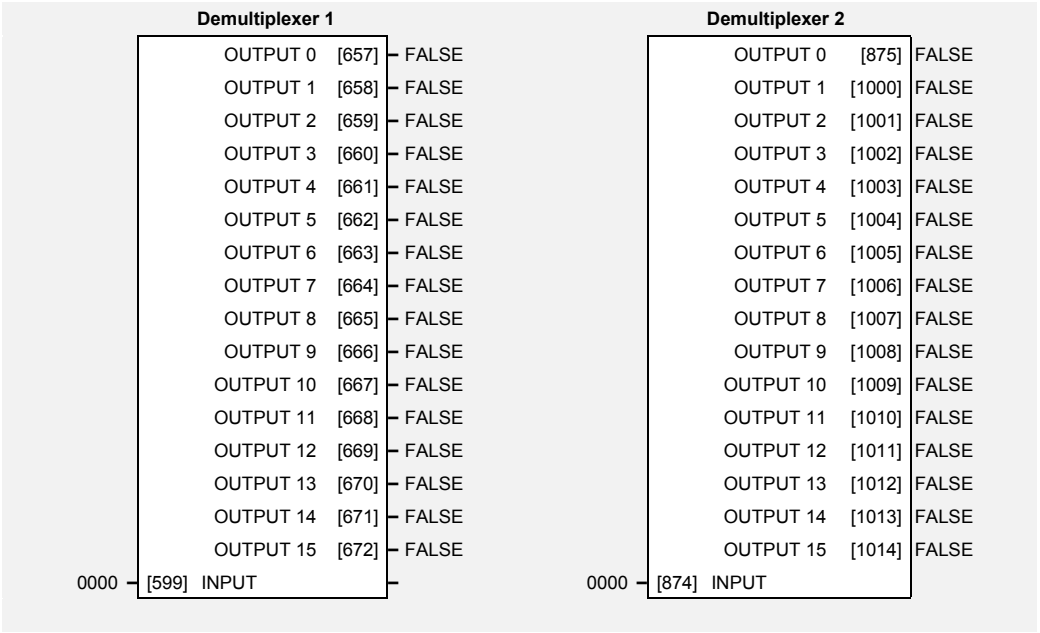
DEMULTIPLEXER

MMI Menu Map

1 SETUP
2 MISCELLANEOUS
3 DEMULTIPLEXER
4 DEMULTIPLEXER 1
4 DEMULTIPLEXER 2
- INPUT
- OUTPUT 0
- OUTPUT 1
- OUTPUT 2
- OUTPUT 3
- OUTPUT 4
- OUTPUT 5
- OUTPUT 6
- OUTPUT 7
- OUTPUT 8
- OUTPUT 9
- OUTPUT 10
- OUTPUT 11
- OUTPUT 12
- OUTPUT 13
- OUTPUT 14
- OUTPUT 15

The demultiplexer function block splits the input word into 16 individual bits.

This may be used to extract the individual trip bits from the ACTIVE TRIPS parameter, for example.



Parameter Descriptions

INPUT *Range: 0000 to FFFF*

The input to be split into its component bits.

OUTPUT 0 TO OUTPUT 15 *Range: FALSE / TRUE*

Each output returns the corresponding bit of the 16 bit input word.

DIAMETER CALC

MMI Menu Map

1 SETUP

2 WINDER

3 DIAMETER CALC

- DIAMETER HOLD
- PRESET ENABLE
- SELECT CORE 2
- SEL EXT DIAMETER
- TENSION ENABLE
- CORE 1
- CORE 2
- DIAMETER TC
- EXT DIAMETER
- LINE SPEED
- MINIMUM DIAMETER
- MINIMUM SPEED
- REEL SPEED
- CURRENT CORE
- DIAMETER
- MOD LINE SPEED
- MOD REEL SPEED

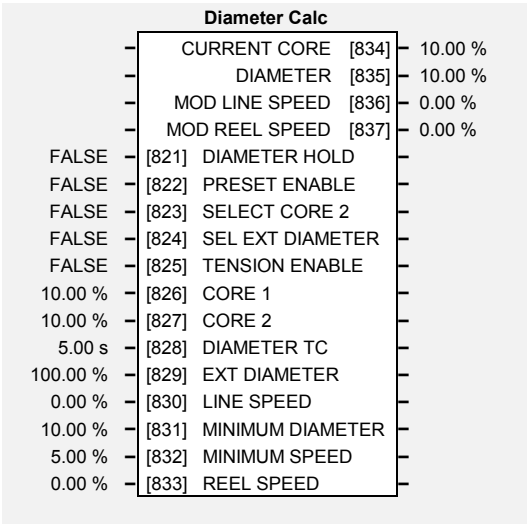
This block calculates reel diameter by dividing line speed by winder speed for centre wind applications.

The line and winder speeds are forced to be of positive sign, independent of the input speed sign. This ensures that the calculated diameter is always positive.

The line speed input should be the actual web speed from the previous section motor speed (the next section in the case of an unwind).

The winder speed is the spindle motor speed.

Refer to Macro 4.



Parameter Descriptions

DIAMETER HOLD *Range: FALSE / TRUE*

Freezes the output of the filter when TRUE.

PRESET ENABLE *Range: FALSE / TRUE*

Presets the filter to core or external diameter. Enabled when TRUE.

SELECT CORE 2 *Range: FALSE / TRUE*

Selects between CORE 1 and CORE2 for use when PRESET ENABLE is TRUE. CORE 1 is selected when FALSE. CORE 2 is selected when TRUE.

SEL EXT DIAMETER *Range: FALSE / TRUE*

Selects external diameter input for PRESET ENABLE when TRUE.

TENSION ENABLE *Range: FALSE / TRUE*

Enables Tension Control.

CORE 1 *Range: 0.00 to 120.00 %*

Core size as a percentage of the maximum diameter.

CORE 2 *Range: 0.00 to 120.00 %*

Alternative core size (as a percentage of the maximum diameter).

DIAMETER TC *Range: 0.00 to 300.00 s*

Filter time constant for DIAMETER output.

EXT DIAMETER *Range: 0.00 to 120.00 %*

External diameter input.

LINE SPEED *Range: -110.00 to 110.00 %*

Line speed input.

MINIMUM DIAMETER *Range: 0.00 to 120.00 %*

Sets the smallest reel diameter (calculated diameter value at full (100%) line speed and full (100%) winder speed).

MINIMUM SPEED *Range: 0.00 to 110.00 %*

The threshold below which the diameter output is held.

REEL SPEED *Range: -110.00 to 110.00 %*

Reel speed feedback.

CURRENT CORE *Range: —.00 %*

Diagnostic indicating the currently selected core size.

DIAMETER *Range: —.00 %*

Diameter output.

MOD LINE SPEED *Range: —.00 %*

Modulus of line speed.

MOD REEL SPEED *Range: —.00 %*

Modulus of reel speed.

Functional Description

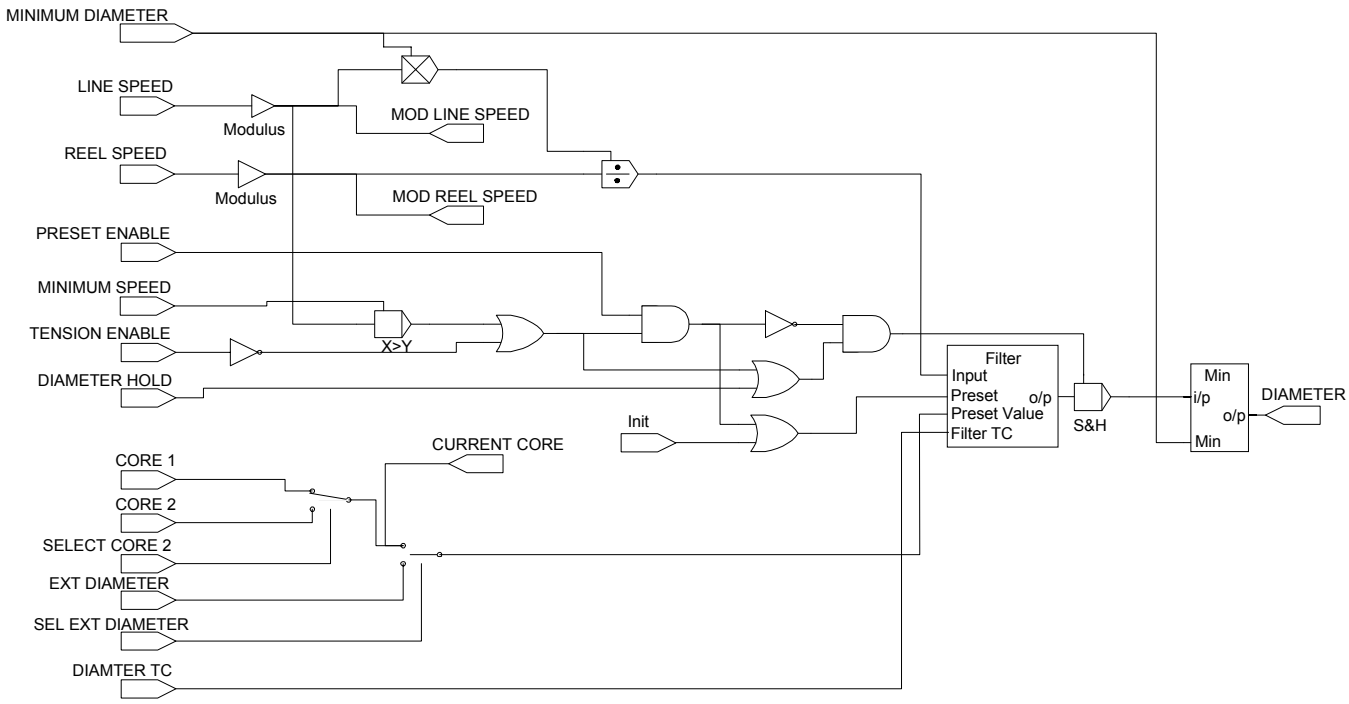
This function block performs the diameter calculation used by the other function blocks to enable the control of centre wind applications.

The diameter is calculated by dividing the absolute value of LINE SPEED by the absolute value of REEL SPEED. This result is scaled by the MINIMUM DIAMETER parameter. The filtered output tracks the diameter when TENSION ENABLE is True and LINE SPEED is above MINIMUM SPEED, otherwise the diameter is held at its current value.

When the diameter is held, a preset value is used as both the input and output of the filter. This is the value of CORE 1 or CORE 2, or the value of EXTERNAL DIAMETER.

The preset value is also loaded into the filter whenever the block diagram is restarted.

Note: *The diameter calculator will only operate with the web under some tension. The diameter filter prevents the diameter from changing quickly in the case of web break situations. The diameter output is clamped at the minimum diameter constant value.*

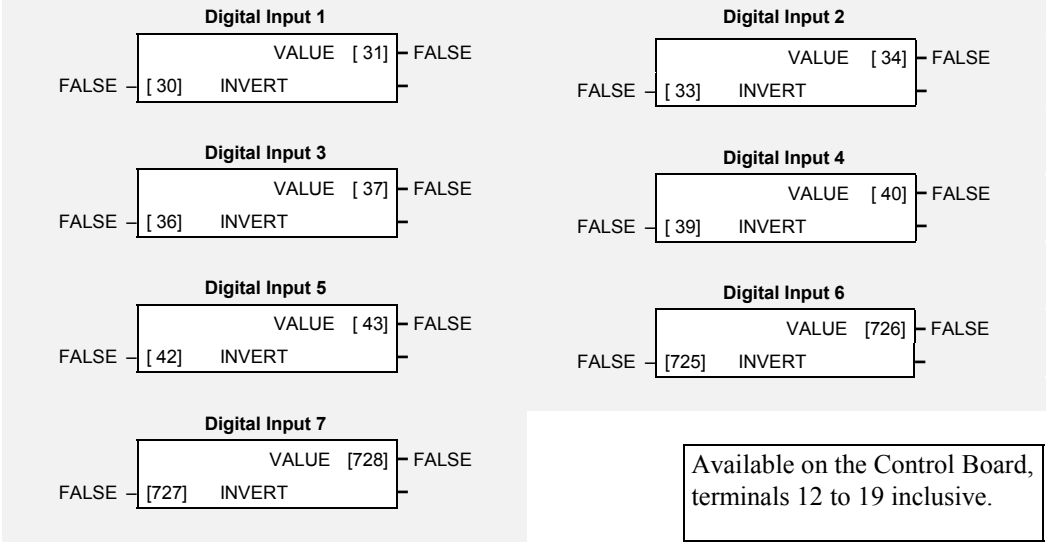

MINIMUM DIAMETER
LINE SPEED
Modulus
MOD LINE SPEED
REEL SPEED
Modulus
MOD REEL SPEED
PRESET ENABLE
MINIMUM SPEED
TENSION ENABLE
X>Y
DIAMETER HOLD
Init
CURRENT CORE
CORE 1
CORE 2
SELECT CORE 2
EXT DIAMETER
SEL EXT DIAMETER
DIAMTER TC
Filter
Input
Preset
o/p
Preset Value
Filter TC
S&H
Min
i/p
o/p
Min
DIAMETER

DIGITAL INPUT

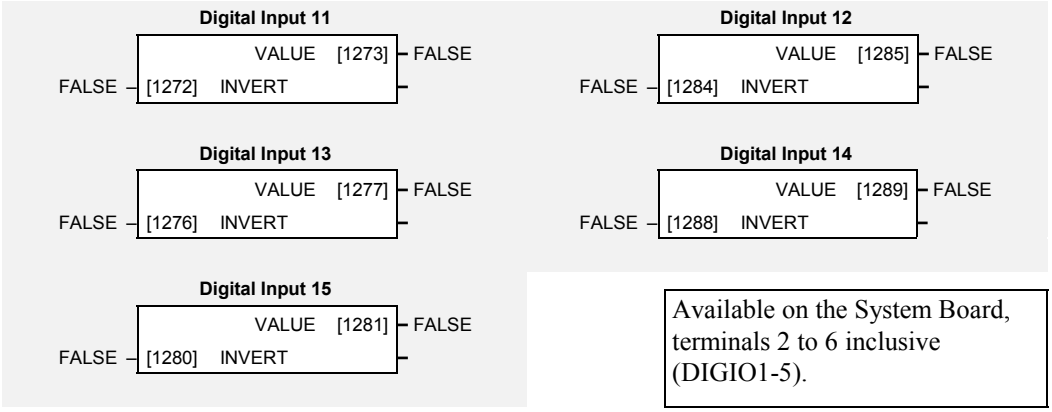
MMI Menu Map

1 SETUP
2 INPUTS & OUTPUTS
3 DIGITAL INPUT
4 DIGITAL INPUT 1
4 DIGITAL INPUT 2
4 DIGITAL INPUT 3
4 DIGITAL INPUT 4
4 DIGITAL INPUT 5
4 DIGITAL INPUT 6
4 DIGITAL INPUT 7
4 DIGITAL INPUT 11
4 DIGITAL INPUT 12
4 DIGITAL INPUT 13
4 DIGITAL INPUT 14
4 DIGITAL INPUT 15
- INVERT
- VALUE

The digital input block converts the physical input voltage to TRUE or FALSE control signals.



Available on the Control Board, terminals 12 to 19 inclusive.



Available on the System Board, terminals 2 to 6 inclusive (DIGIO1-5).

Parameter Descriptions

INVERT *Range: FALSE / TRUE*

Controls the optional inversion of the VALUE output.

VALUE *Range: FALSE / TRUE*

The TRUE or FALSE input, (after any inversion).

Functional Description

There is a DIGITAL INPUT function block associated with each of the following terminals:

The Control Board has seven configurable digital inputs:

DIGITAL INPUT 1 is associated with terminal 12
DIGITAL INPUT 2 is associated with terminal 13
DIGITAL INPUT 3 is associated with terminal 14
DIGITAL INPUT 4 is associated with terminal 15
DIGITAL INPUT 5 is associated with terminal 16
DIGITAL INPUT 6 is associated with terminal 17
DIGITAL INPUT 7 is associated with terminal 18

Note: *Terminal 19 is permanently configured as the EXTERNAL TRIP input. Refer to I/O TRIPS, page 1-43.*

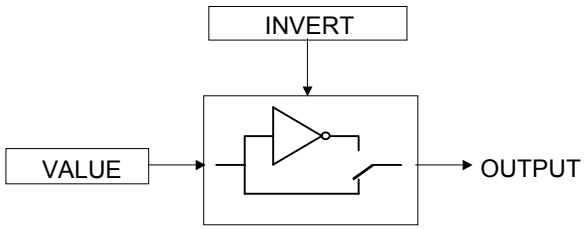
DIGITAL INPUT 8 is associated with terminal 19

The System Board (optional) has 5 configurable digital inputs/outputs (DIGIO 1 to 5).

Each DIGIO can be configured to operate as either a Digital Input or a Digital Output.

Refer to DIGITAL OUTPUT, page 1-28.

The input electronics of the drive converts the input signal to a TRUE or FALSE logic value. The digital input block takes this value and optionally inverts it before providing the VALUE output.

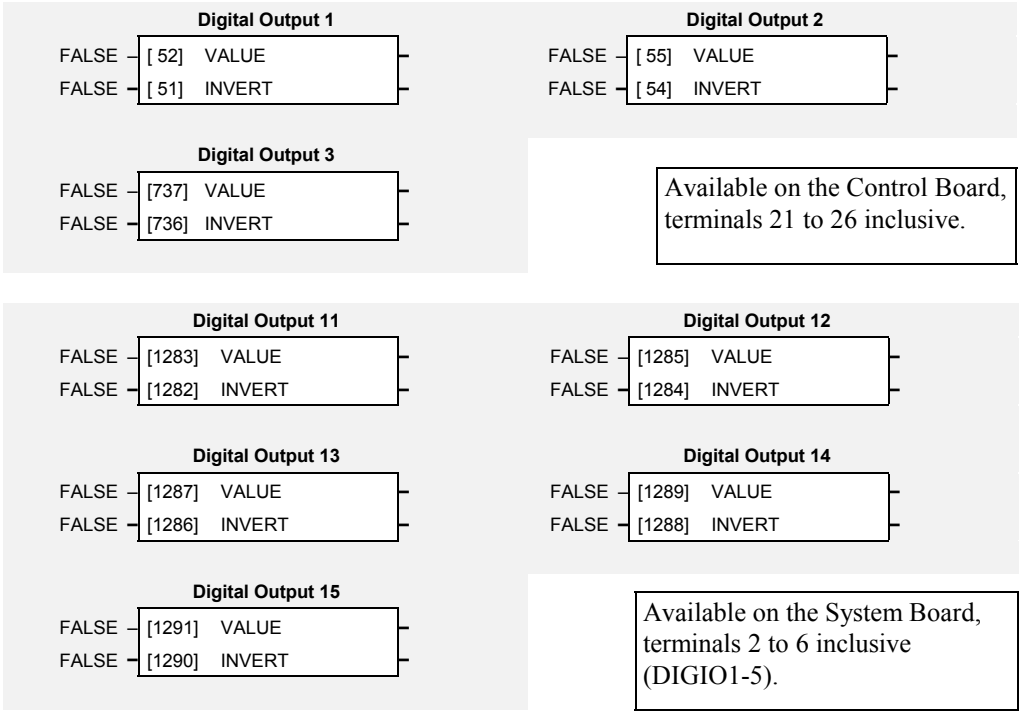


DIGITAL OUTPUT

MMI Menu Map

1 SETUP
2 INPUTS & OUTPUTS
3 DIGITAL OUTPUT
4 DIGITAL OUTPUT 1
4 DIGITAL OUTPUT 2
4 DIGITAL OUTPUT 3
4 DIGITAL OUTPUT 11
4 DIGITAL OUTPUT 12
4 DIGITAL OUTPUT 13
4 DIGITAL OUTPUT 14
4 DIGITAL OUTPUT 15
- VALUE
- INVERT

The digital output block converts a logic TRUE or FALSE demand to a physical output signal.



Parameter Descriptions

VALUE *Range: FALSE / TRUE*

The TRUE or FALSE output demand.

INVERT *Range: FALSE / TRUE*

Controls the optional inversion of the VALUE output.

Functional Description

There is a DIGITAL OUTPUT function block associated with each of the following terminals:

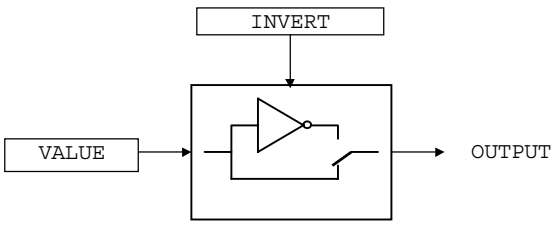
The Control Board has three digital outputs (volt-free relay contacts):

DIGITAL OUTPUT 1 is associated with terminals 21 & 22
DIGITAL OUTPUT 2 is associated with terminals 23 & 24
DIGITAL OUTPUT 3 is associated with terminals 25 & 26

The System Board (optional) has 5 configurable digital inputs/outputs (DIGIO 1 to 5):

DIGITAL OUTPUT 11 is associated with DIGIO1, terminal block A, terminal 2
DIGITAL OUTPUT 12 is associated with DIGIO2, terminal block A, terminal 3
DIGITAL OUTPUT 13 is associated with DIGIO3, terminal block A, terminal 4
DIGITAL OUTPUT 14 is associated with DIGIO4, terminal block A, terminal 5
DIGITAL OUTPUT 15 is associated with DIGIO5, terminal block A, terminal 6

The default status for these 5 DIGIO is to act as inputs. Setting either VALUE or INVERT to TRUE will individually configure the block to be an output. Note that because INVERT reverses the output logic, setting both VALUE and INVERT to TRUE will configure the block to be an input.



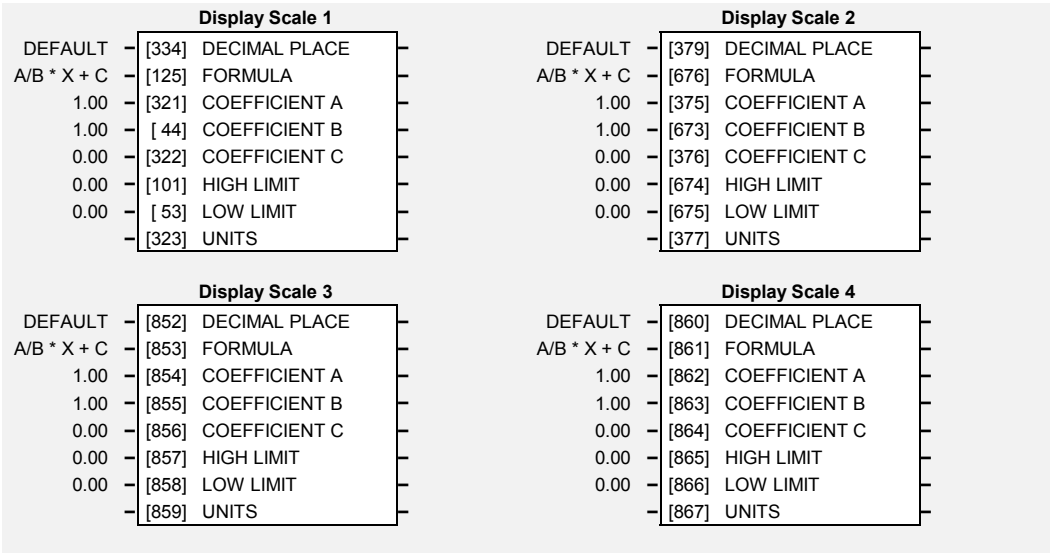
Also refer to DIGITAL INPUT, page 1-26.

DISPLAY SCALE

MMI Menu Map

1 SETUP
2 MENUS
3 DISPLAY SCALE
4 DISPLAY SCALE 1
4 DISPLAY SCALE 2
4 DISPLAY SCALE 3
4 DISPLAY SCALE 4
- DECIMAL PLACE
- FORMULA
- COEFFICIENT A
- COEFFICIENT B
- COEFFICIENT C
- HIGH LIMIT
- LOW LIMIT
- UNITS

These function blocks are used to enter the scaling factors and formulae. The scaling is optionally applied to the SPEED SETPOINT and OPERATOR MENU displays.



Parameter Descriptions

DECIMAL PLACE

Range: See below

Select the position of the decimal point.

Enumerated Value : Position

0 : DEFAULT
1 : X.XXXX
2 : X.XXX
3 : X.XX
4 : X.X
5 : X.

FORMULA

Range: See below

Enumerated Value : Formula

0 : A/B * X + C
1 : A/B * (X+C)
2 : A/(B * X) + C
3 : A/(B * (X+C))

COEFFICIENT A

Range: -300.00 to 300.00

Coefficient used as defined by the formula.

COEFFICIENT B

Range: -300.00 to 300.00

Coefficient used as defined by the formula.

COEFFICIENT C

Range: -300.00 to 300.00

Coefficient used as defined by the formula.

HIGH LIMIT

Range: -300.00 to 300.00

Use high limit to set a maximum value on the Keypad. Setting the HIGH LIMIT lower than or equal to the LOW LIMIT makes the parameter “read-only”.

LOW LIMIT

Range: -300.00 to 300.00

Use low limit to set a minimum value on the Keypad. Setting the HIGH LIMIT higher than or equal to the HIGH LIMIT makes the parameter “read-only”.

UNITS

Range: max length is 6 chars

A 6 character label that is displayed as the parameter units.

Functional Description

The display scale feature may be used together with the OPERATOR MENU block to customise the display of any parameter within the drive.

For display purposes, the parameter is modified according to the formula chosen. For editing purposes, the inverse formula is applied to the displayed value to calculate the value to be used.

The coefficients, formula and units are only applied to floating point parameters.

Character Sets

The table below lists the characters supported by the software in decimal and hexadecimal.

	HEX	DEC		HEX	DEC		HEX	DEC		HEX	DEC		HEX	DEC		HEX	DEC
	20	32	0	30	48	@	40	64	P	50	80	′	60	96	p	70	112
!	21	33	1	31	49	A	41	65	Q	51	81	a	61	97	q	71	113
"	22	34	2	32	50	B	42	66	R	52	82	b	62	98	r	72	114
#	23	35	3	33	51	C	43	67	S	53	83	c	63	99	s	73	115
$	24	36	4	34	52	D	44	68	T	54	84	d	64	100	t	74	116
%	25	37	5	35	53	E	45	69	U	55	85	e	65	101	u	75	117
&	26	38	6	36	54	F	46	70	V	56	86	f	66	102	v	76	118
'	27	39	7	37	55	G	47	71	W	57	87	g	67	103	w	77	119
(	28	40	8	38	56	H	48	72	X	58	88	h	68	104	x	78	120
)	29	41	9	39	57	I	49	73	Y	59	89	i	69	105	y	79	121
*	2A	42	:	3A	58	J	4A	74	Z	5A	90	j	6A	106	z	7A	122
+	2B	43	;	3B	59	K	4B	75	[	5B	91	k	6B	107	{	7B	123
,	2C	44	<	3C	60	L	4C	76				l	6C	108	|	7C	124
-	2D	45	=	3D	61	M	4D	77	]	5D	93	m	6D	109	}	7D	125
.	2E	46	>	3E	62	N	4E	78	^	5E	94	n	6E	110			
/	2F	47	?	3F	63	O	4F	79	_	5F	95	o	6F	111	■	0	0

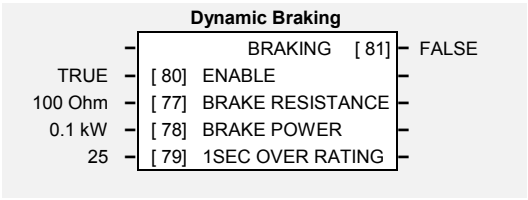
DYNAMIC BRAKING

MMI Menu Map

1 SETUP
2 MOTOR CONTROL
3 DYNAMIC BRAKING
- ENABLE
- BRAKE RESISTANCE
- BRAKE POWER
- 1SEC OVER RATING
- BRAKING

Designed for all Motor Control Modes.

The dynamic braking function block controls the rate at which energy from a regenerating motor is dumped into a resistive load. This dumping prevents the dc link voltage reaching levels which would cause an Overvoltage trip.



Parameter Descriptions

ENABLE *Range: FALSE / TRUE*

Enables operation of the dynamic braking block.

BRAKE RESISTANCE *Range:1 to 1000 Ohm*

The value of the load resistance.

BRAKE POWER *Range: 0.1 to 510.0 kW*

The power that the load resistance may continually dissipate.

1SEC OVER RATING *Range: 1 to 40*

Multiplier that may be applied to BRAKE POWER for power overloads lasting no more than 1 second.

BRAKING *Range: FALSE / TRUE*

A read-only parameter indicating the state of the brake switch.

Functional Description

When enabled, the DYNAMIC BRAKING block monitors the internal dc link voltage every milli-second and sets the state of the brake switch accordingly.

The dynamic braking block provides a control signal that is used by the SLEW RATE LIMIT block. This causes the setpoint to be temporarily frozen whenever the dynamic brake is operating because the dc link voltage exceeds the internal comparison level. This allows the stop rate to be automatically tuned to the characteristics of the load, motor, drive and brake resistor.

The DYNAMIC BRAKING block operates even when the motor output is not enabled. This allows the block to continually monitor the energy dumped into the braking resistor, and the energy dissipated across the brake switch. With this information the drive is able to deduce the loading on the brake resistor. Optional trips may be enabled should the switch or resistor be loaded beyond its capabilities.

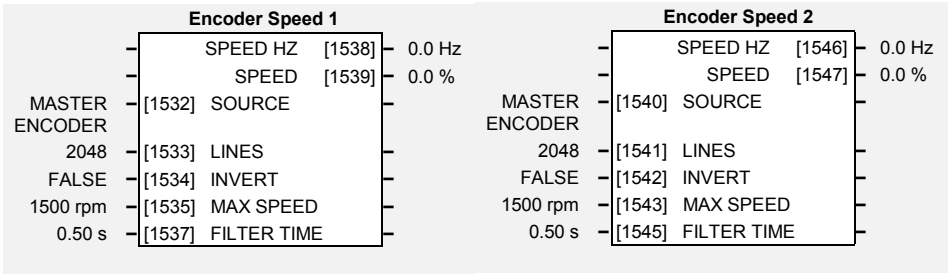
Refer also to the Installation Product Manual, Chapter 10: “Application Notes” - Dynamic Braking.

ENCODER SPEED

MMI Menu Map

1 SETUP
2 SYSTEM BOARD
3 ENCODER SPEED
- SOURCE
- LINES
- INVERT
- MAX SPEED
- FILTER TIME
- SPEED HZ
- SPEED

Designed for use with the System Board option, all Motor Control Modes.



This block allows Speed Feedback to be measured using a quadrature endcoder when the System Board option is fitted.

Parameter Descriptions

SOURCE *Range: See below*

Determines the encoder channel from which the speed is calculated.

Enumerated Value : Source

0 : MASTER ENCODER
1 : SLAVE ENCODER

LINES *Range: 1 to 32767*

The number of lines must be set to match the type of encoder being used. Incorrect setting of this parameter will result in an erroneous speed measurement.

INVERT *Range: FALSE/TRUE*

When TRUE, changes the sign of the measured speed and the direction of the position count.

MAX SPEED *Range: 0 to 32000 rpm*

Sets the 100 % value in RPM. Refer to SPEED below.

FILTER TIME *Range: 0.00 to 300.00 s*

Filter time constant for SPEED HZ and SPEED % outputs. Setting to zero will remove the filter.

SPEED Hz *Range: —. rpm*

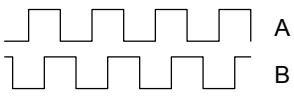
Speed Feedback in Hertz.

SPEED *Range: —.x %*

$$\text{SPEED \%} = \frac{\text{SPEED Hz x 60}}{\text{MAX SPEED}} \text{ x 100}$$

Functional Description

A quadrature encoder uses 2 input signals (A and B), phase shifted by a quarter of a cycle (90°). Direction is obtained by looking at the combined state of A and B.



Speed is calculated using the following function:

$$\text{SPEED HZ} = \text{filter}\left[\frac{\text{CountsPerSecond}}{\text{Lines x 4}}, \text{FilterTime}\right]$$

where counts per second are the number of edges received from the encoder. There are 4 counts per line.

FEEDBACKS

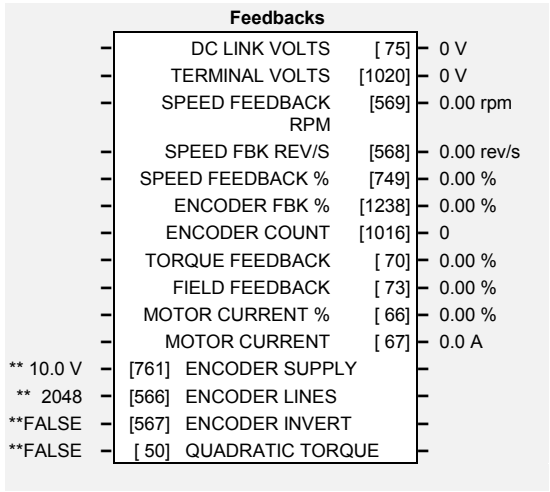
MMI Menu Map

1 SETUP
2 MOTOR CONTROL
3 FEEDBACKS
- ENCODER SUPPLY
- ENCODER LINES
- ENCODER INVERT
- QUADRATIC TORQUE
- DC LINK VOLTS
- TERMINAL VOLTS
- SPEED FBK RPM
- SPEED FBK REV/S
- SPEED FBK %
- ENCODER FBK %
- ENCODER COUNT
- TORQUE FEEDBACK
- FIELD FEEDBACK
- MOTOR CURRENT &
- MOTOR CURRENT A

Designed for all Motor Control Modes.

The FEEDBACKS block allows you to view speed feedback and motor current related diagnostics. It also allows you to setup the encoder parameters, if one is fitted. These are ENCODER SUPPLY, ENCODER LINES and ENCODER INVERT. An encoder requires the 6054 Speed Feedback Technology Option.

It also contains parameters for setting up the encoder used with the 6054 option.



Parameter Descriptions

ENCODER SUPPLY

Range: 10.0 to 20.0V

Set this approximately to the supply voltage required by the Tech Box encoder, if supported.

ENCODER LINES

Range: 250 to 32767

The number of lines must be set to match the type of encoder being used. Incorrect setting of this parameter will result in an erroneous speed measurement.

ENCODER INVERT

Range: FALSE/TRUE

Used to match the encoder direction to the motor direction. When TRUE, it changes the sign of the measured speed and the direction of the position count.

It is necessary to set up this parameter when in CLOSED-LOOP VEC mode, as the encoder direction must be correct for this mode to operate.

QUADRATIC TORQUE

Range: FALSE/TRUE

When TRUE, selects higher continuous ratings with less overload capability. Quadratic Torque operation is especially suited to fan or pump applications.

DC LINK VOLTS

Range: —. V

This shows the voltage on the dc link capacitors.

TERMINAL VOLTS

Range: —. V

This shows the rms voltage, between phases, applied by the drive to the motor terminals. This should be 90% of MOTOR VOLTS at base speed if the motor is unloaded.

SPEED FEEDBACK RPM

Range: —.xx rpm

This parameter changes according to the CONTROL MODE (MOTOR DATA function block):

- In CLOSED-LOOP VEC mode the parameter shows the mechanical speed of the motor shaft in revolutions per minute as calculated from the Encoder Technology Box.
- In SENSORLESS VEC mode the parameter shows the calculated mechanical speed of the motor shaft in revolutions per minute.

SPEED FEEDBACK REV/S *Range: —.xx rev/s*

This parameter changes according to the CONTROL MODE (MOTOR DATA function block):

- In CLOSED-LOOP VEC mode the parameter shows the mechanical speed of the motor shaft in revolutions per second as calculated from the Encoder Technology Box.
- In SENSORLESS VEC mode the parameter shows the calculated mechanical speed of the motor shaft in revolutions per second.
- In VOLTS / Hz mode, the parameter shows the motor synchronous speed in revolutions per second.

SPEED FEEDBACK % *Range: —.xx %*

This parameter changes according to the CONTROL MODE (MOTOR DATA function block):

- In CLOSED-LOOP VEC mode the parameter shows the mechanical speed of the motor shaft as a percentage of the user maximum speed setting (MAX SPEED in the SETPOINT SCALE function block) as calculated from the Encoder Technology Box.
- In SENSORLESS VEC mode the parameter shows the calculated mechanical speed of the motor shaft as a percentage of the user maximum speed setting (MAX SPEED in the SETPOINT SCALE function block).
- In VOLTS / Hz mode, the parameter shows the electrical drive output frequency as a percentage of the user maximum speed setting (MAX SPEED in the SETPOINT SCALE function block).

ENCODER FBK % *Range: —.xx %*

This parameter shows the mechanical speed of the motor shaft, calculated from the Encoder Technology Box, as a percentage of the user maximum speed setting (MAX SPEED in the SETPOINT SCALE function block).

ENCODER COUNT *Range: —.*

(increments/decrements @ 4 x line rate, i.e. 1 revolution = 4000 for a 1000 line encoder) This is a 16-bit register which is incremented or decremented by the pulses from the encoder. It is useful to check that the encoder is operating, and to measure the encoder lines, if this is not known. Rotate the motor shaft through 1 revolution and note the difference between readings at the start and finish. The difference should be 4 times the encoder lines. For greater accuracy, rotate the shaft through several revolutions.

The direction of count is unaffected by ENCODER INVERT.

TORQUE FEEDBACK *Range: —.xx %*

Shows the estimated motor torque, as a percentage of rated motor torque.

FIELD FEEDBACK *Range: —.xx %*

A value of 100% indicates the motor is operating at rated magnetic flux (field).

MOTOR CURRENT % *Range: —.xx %*

This diagnostic contains the level of rms line current being drawn from the drive and is seen as a % of the MOTOR CURRENT parameter setting in the MOTOR DATA function block.

MOTOR CURRENT *Range: —.xx A*

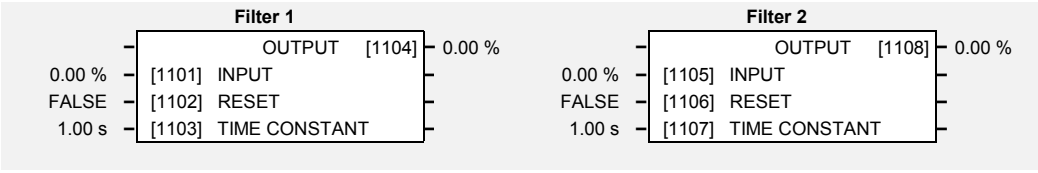
This diagnostic contains the level of rms line current being drawn from the drive.

MMI Menu Map

1 SETUP
2 SETPOINT FUNCS
3 FILTER
4 FILTER 1
4 FILTER 2
- INPUT
- RESET
- TIME CONSTANT
- OUTPUT

FILTER

This function block contains two, simple order filters of the type: $\frac{1}{1 + ST}$



Parameter Descriptions

INPUT *Range: -300.00 to 300.00 %*

Filter input.

RESET *Range: FALSE / TRUE*

If TRUE, the output is set equal to the input and the filter is disabled.

TIME CONSTANT *Range: 0.00 to 300.00 s*

Time constant. If less than 0.05s the filter is disabled.

OUTPUT *Range: —.00 %*

Filtered output.

FLUXING

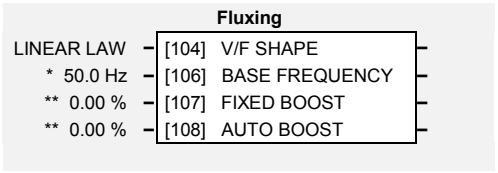
MMI Menu Map

1 SETUP

2 MOTOR CONTROL

3 FLUXING
- V/F SHAPE
- BASE FREQUENCY
- FIXED BOOST
- AUTO BOOST

Designed for VOLTS/Hz motor Control Mode.



This function block allows user parameterisation of the conventional (volts/hertz) fluxing strategy of the drive. This is achieved though two flexible Volts-to-frequency templates. Starting torque performance can also be tailored through the FIXED BOOST and AUTO BOOST parameters.

Parameter Descriptions

V/F SHAPE

Range: Enumerated - see below

This parameter determines the type of volts to frequency template is used to flux the motor. The choices of this parameter are:

Enumerated Value : *V/F Shape*

0 : LINEAR LAW
1 : FAN LAW

BASE FREQUENCY

Range: 7.5 to 500.0 Hz

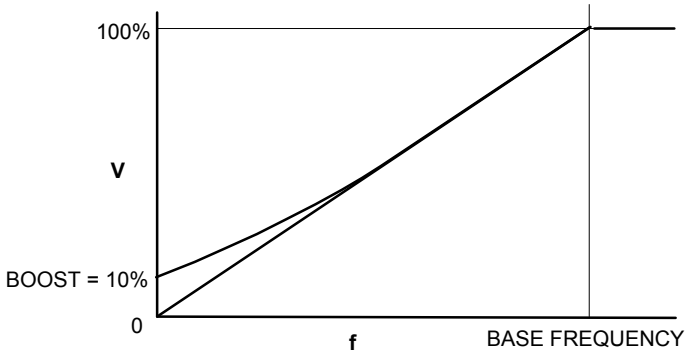
This parameter determines the frequency at which maximum output volts is generated. Below base frequency, the volts will vary with frequency as determined by the V/F SHAPE parameter. Above base frequency, the volts will saturate at the maximum value. Refer to MOTOR DATA (BASE FREQUENCY parameter), page 1-53.

Refer to Chapter 2: “Parameter Specification” - Frequency Dependent Defaults

FIXED BOOST

Range: 0.00 to 25.00 %

This parameter allows for no-load stator resistance voltage drop compensation. This correctly fluxes the motor (under no-load conditions) at low output frequencies, thereby increasing available motor torque. Fixed boost can be set in addition to auto boost.



AUTO BOOST

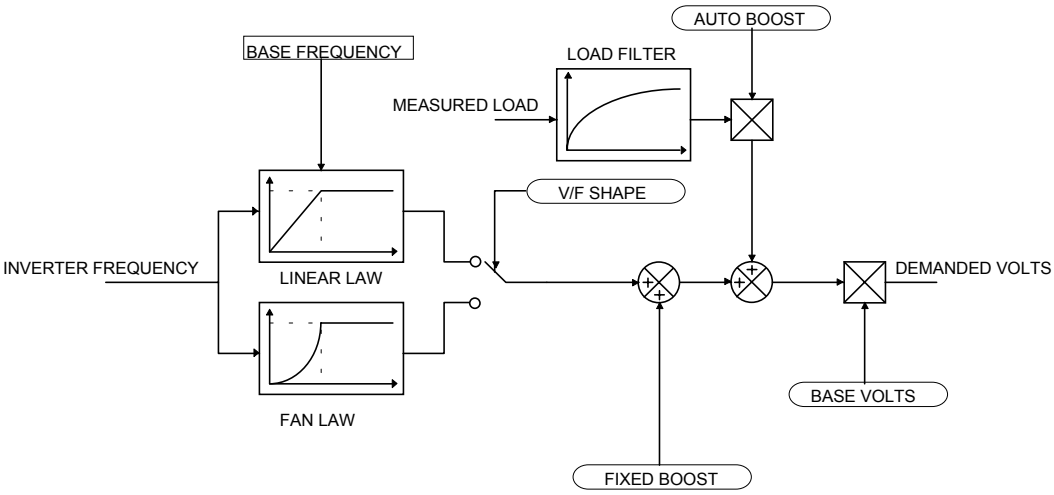
Range: 0.00 to 25.00 %

This parameter allows for load dependent stator resistance voltage drop compensation. This correctly fluxes the motor (under load conditions) at low output frequencies, thereby increasing available motor torque. Auto boost can be set in addition to fixed boost.

The value of the AUTO BOOST parameter determines level of additional volts supplied to the motor for 100% load.

Setting the value of auto boost too high can cause the drive to enter current limit. If this occurs, the drive will be unable to ramp up in speed. Reducing the value of auto boost will eliminate this problem.

Functional Description



The function block allows the user to parameterise the drive's conventional V/F motor fluxing scheme. Two V/F shapes are available, LINEAR LAW and FAN LAW:

- Linear Law V/F shape should be used in applications requiring constant motor torque though out the speed range (e.g. machine tools or hoists).
- Fan Law V/F shape provides extra energy savings for fan or pump applications.

For either of these V/F shapes the BASE FREQUENCY, which is the value of drive output frequency at which maximum output volts is provided, can be set by the user.

Correct no-load motor fluxing at low drive output frequencies can be achieved by setting the FIXED BOOST parameter.

Correct motor fluxing under load conditions is achieved by setting the AUTO BOOST parameter.

The motor is correctly fluxed when the FIELD FBK diagnostic in the FEEDBACKS function block reads 100.0% .

FLYCATCHING

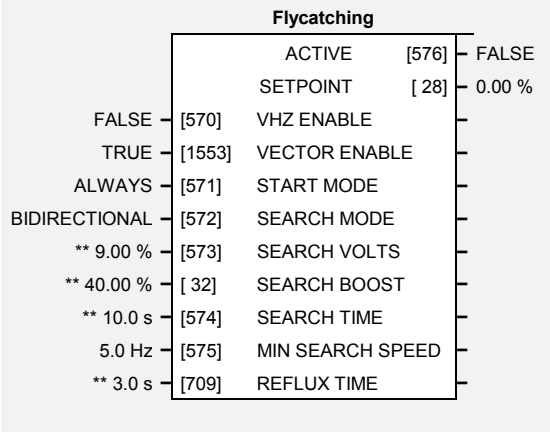
MMI Menu Map

1 SETUP
2 MOTOR CONTROL
3 FLY CATCHING
- VHZ ENABLE
- VECTOR ENABLE
- START MODE
- SEARCH MODE
- SEARCH VOLTS
- SEARCH BOOST
- SEARCH TIME
- MIN SEARCH SPEED
- REFLUX TIME
- ACTIVE
- SETPOINT

Designed for all Motor Control Modes.

This block performs a directional speed search. It allows the drive to seamlessly catch a spinning motor before controlling the motor to the desired setpoint.

This is especially useful for large inertia fan loads, where drafts in building air ducts can cause a fan to `windmill'.



Parameter Descriptions

VHZ ENABLE *Range: FALSE / TRUE*

Enables flycatching in Volts/Hz Control mode when TRUE.

VECTOR ENABLE *Range: FALSE / TRUE*

Enables flycatching in Vector Control mode when TRUE.

START MODE *Range: Enumerated - see below*

The mode of operation for the flycatching sequence software.

Enumerated Value : *Start Mode*

0 : ALWAYS
1 : TRIP OR POWERUP
2 : TRIP

SEARCH MODE *Range: Enumerated - see below*

The type of speed search carried out by the flycatching sequence.

Enumerated Value : *Search Mode*

0 : BIDIRECTIONAL
1 : UNIDIRECTIONAL

SEARCH VOLTS *Range: 0.00 to 100.00 %*

The percentage level of the search volts applied to the motor during the speed search phase of the flycatching sequence. Increasing this parameter improves the accuracy of the discovered motor speed but increases the braking influence of the speed search on the rotating motor.

SEARCH BOOST *Range: 0.00 to 50.00 %*

The level of search boost applied to the motor during the speed search phase of the flycatching sequence.

SEARCH TIME *Range: 0.1 to 60.0 s*

The search rate during the speed search phase of the flycatching sequence. Performing the flycatching speed search too quickly can cause the drive to inaccurately identify the motor speed. Refluxing at an inaccurate motor speed can cause the drive to trip on overvoltage. If this occurs, increasing this parameter will reduce the risk of tripping.

MIN SEARCH SPEED *Range: 0.0 to 500.0 Hz*

The lowest search speed before the speed search phase of the flycatching sequence is considered to have failed.

REFLUX TIME *Range: 0.1 to 20.0 s*

The rate of rise of volts from the search level to the working level after a successful speed search. Refluxing the motor too quickly can cause the drive to trip on either overvoltage or overcurrent. In either case, increasing this parameter will reduce the risk of tripping.

ACTIVE *Range: FALSE / TRUE*

A diagnostic output indicating whether the flycatching sequence is active.

SETPOINT *Range xxx.xx %*

This diagnostic output is the setpoint caught at the end of a successful flycatching sequence.

Functional Description

The flycatching function enables the drive to be restarted smoothly into a spinning motor. It applies small search voltages to the motor whilst ramping the drive frequency from maximum speed to zero. When the motor load goes from motoring to regenerating, the speed search has succeeded and is terminated. If the search frequency falls below the minimum search speed, the speed search has failed and the drive will ramp to the speed setpoint from zero.

The flycatching sequence can be triggered by different starting conditions:

ALWAYS:	All starts (after controlled or uncontrolled stop, or after a power-up)
TRIP or POWER-UP:	After uncontrolled stop, i.e. trip or coast, or after a power-up
TRIP:	After uncontrolled stop, i.e. trip or coast

The type of speed sequence may be Bidirectional or Unidirectional:

Bidirectional

Initially, the search is performed in the direction of the speed setpoint. If the drive fails to identify the motor speed in this direction, a second speed search is performed in the reverse direction.

Unidirectional

The search is performed only in the direction of the speed setpoint.

HOME

MMI Menu Map

1 SETUP

2 MISCELLANEOUS

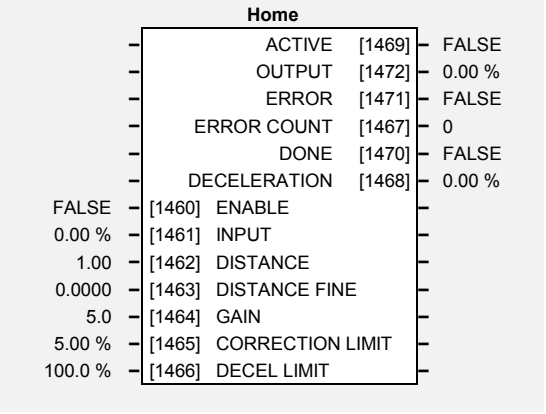
3 HOME

- ENABLE
- INPUT
- DISTANCE
- DISTANCE FINE
- GAIN
- CORRECTION LIMIT
- DECEL LIMIT
- ACTIVE
- OUTPUT
- ERROR
- ERROR COUNT
- DONE
- DECELERATION

This function block uses a position loop to stop the drive in a set distance.

The distance is set in revolutions based on the number of lines on the encoder, usually from a mark at a fixed distance from the home position.

For accurate positioning the drive must be in closed loop vector mode, if the drive is in any other mode then an open loop home algorithm will be used.



Parameter Descriptions

ENABLE

Range: FALSE / TRUE

ENABLE going from FALSE to TRUE latches the current position and time and initiates a position home operation. If set to FALSE then INPUT is passed straight through to OUTPUT. ENABLE must be held TRUE throughout the homing process, returning it to FALSE aborts the home function.

INPUT

Range: -300.00 to 300.00 %

The input to the block from REFERENCE :: SPEED DEMAND.

DISTANCE

Range: 0.00 to 300.00

Sets the homing distance in revolutions, a revolution calculated from the number of lines on the encoder and maximum speed (see MOTOR DATA for more information on these parameters).

DISTANCE FINE

Range: 0.0000 to 1.0000

Fine adjustment of homing distance. The actual homing distance is the sum of DISTANCE and DISTANCE FINE.

GAIN

Range: 0.0 to 1000.0

In closed loop homing, GAIN is used to stabilise the closed loop position trim signal. A value of zero disables closed loop homing.

CORRECTION LIMIT

Range: 0.00 to 100.00 %

Sets the maximum value of the closed loop position trim signal.

DECEL LIMIT

Range: 0.0 to 3000.0 %

Sets the maximum allowable deceleration for closed loop homing. The actual required deceleration is calculated from the value of the input and homing distance when the block is enabled. If this is exceeded then the block will perform an open loop home with the calculated deceleration.

The HOME function block will only operate efficiently if the controller is operating within its capabilities i.e. not limiting.

If the Deceleration limit is exceeded then the ERROR output will be set.

ACTIVE

Range: FALSE / TRUE

Active is set TRUE whenever the block is enabled.

OUTPUT

Range: _.xx

This is connected directly to INPUT if the block is not enabled. When enabled, OUTPUT is ramped to zero at a calculated rate to bring the motor to rest in a defined distance. OUTPUT is connected to SETPOINT SCALE :: INPUT, this will override the REFERENCE RAMP block.

ERROR *Range: FALSE / TRUE*

Set TRUE if the maximum deceleration rate exceeded. Set FALSE if the block is not enabled.

ERROR COUNT *Range: _.*

This diagnostic is only valid in closed loop mode and shows the actual position error in encoder counts. It is this error that is used to correct for positional errors in the speed setpoint generation.

DONE *Range: FALSE / TRUE*

Set TRUE when the position has been reached or the output is at zero in open loop operation.

DECELERATION *Range: _.xx*

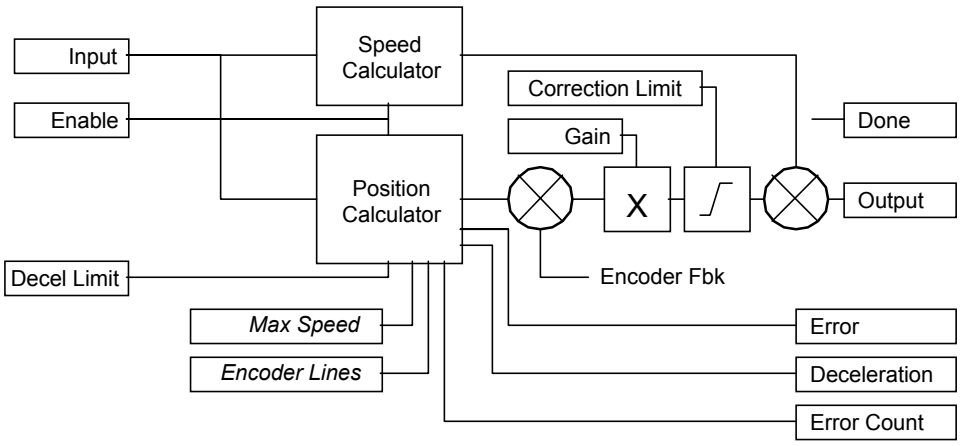
A diagnostic showing the actual deceleration used during the current / last home operation.

Functional Description

It is intended that homing be used to bring the motor to reset from a low speed (10%) over a relatively small distance (1 revolution). To achieve this the input should be connected to Reference :: Speed Demand and the output to Setpoint Scale :: Input, this will override the reference ramp.

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

The homing distance is the stopping distance in encoder pulses.



Possible Causes of Homing Errors

Take the example of lift (elevator) with the following parameters

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

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

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

Typically the worst case levelling error will therefore be:

0.08 * (cycle time of lift controller + cycle time of the vector drive)
= 0.08 * (10+5)

= 1.2mm.

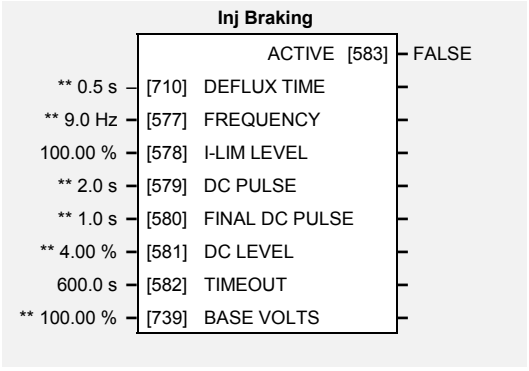
INJ BRAKING

MMI Menu Map

1 SETUP
2 MOTOR CONTROL
3 INJ BRAKING
- INJ DEFLUX TIME
- INJ FREQUENCY
- INJ I-LIM LEVEL
- INJ DC PULSE
- INJ FINAL DC
- INJ DC LEVEL
- INJ TIMEOUT
- INJ BASE VOLTS
- INJ ACTIVE

Designed for VOLTS/Hz Motor Control Mode.

The injection braking block provides a method of stopping spinning induction motors without returning the kinetic energy of the motor and load back in to the dc link of the drive. This is achieved by running the motor highly inefficiently so that all the energy stored in the load is dissipated in the motor. Thus, high inertia loads can be stopped without the need for an external dynamic braking resistor.



Parameter Descriptions

DEFLUX TIME *Range: 0.1 to 20.0 s*

Determines the time in which the drive defluxes the motor prior injection braking.

FREQUENCY *Range: 1.0 to 480.0 Hz*

Determines the maximum frequency applied to the motor for the low frequency injection braking mode. It is also clamped internally so as never to exceed 50% of base speed value.

I-LIM LEVEL *Range: 50.00 to 150.00 %*

Determines the level of motor current flowing during low frequency injection braking.

DC PULSE *Range: 0.0 to 100.0 s*

Determines the duration of the dc pulse applied to the motor when injection braking is required for motor speeds below 20% of base speed. The actual dc pulse time applied to the motor is dependent on the ratio of initial motor speed to 20% of base speed.

FINAL DC PULSE *Range: 0.0 to 10.0 s*

Determines the duration of the final dc holding pulse applied to the motor after either low frequency injection braking or timed dc pulse.

DC LEVEL *Range: 0.00 to 25.00 %*

Determines the level of dc pulse applied to the motor during either the timed or final dc pulse.

TIMEOUT *Range: 0.0 to 600.0 s*

Determines the maximum amount of time the sequence is allowed to remain in the low frequency injection braking state.

BASE VOLTS *Range: 0.00 to 115.47 %*

Determines the maximum volts at base speed applied to the motor during injection braking.

ACTIVE *Range: FALSE / TRUE*

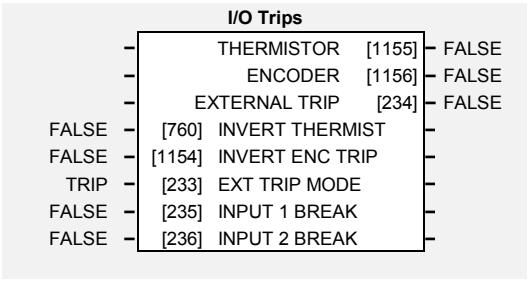
Indicates the state of the drive. TRUE when injection braking.

I/O TRIPS

MMI Menu Map

1 SETUP
2 TRIPS
3 I/O TRIPS
- INVERT THERMIST
- INVERT ENC TRIP
- EXT TRIP MODE
- INPUT 1 BREAK
- INPUT 2 BREAK
- THERMISTOR
- ENCODER
- EXTERNAL TRIP

This function block is designed to operate in conjunction with the Analog and Digital Input function blocks to trip the drive on a loss of setpoint input or safety control input.



Parameter Descriptions

INVERT THERMIST *Range: FALSE / TRUE*

Inverts the sense of the motor thermistor input. The default FALSE is normally-closed/low impedance.

INVERT ENC TRIP *Range: FALSE / TRUE*

Inverts the sense of the encoder fail input on the encoder Technology Box. FALSE for normally-closed.

EXT TRIP MODE *Range: TRIP /COAST*

When set to TRIP, DIN8 (EXT TRIP) will trip the drive when +24V is not present, causing EXTERNAL TRIP to be displayed on the MMI.

When set to COAST the drive will not trip, but “coasts to stop” when +24V is not present.

INPUT 1 BREAK *Range: FALSE / TRUE*

A general purpose signal designed to be internally wired to the function block ANALOG INPUT 1, BREAK parameter. When this signal goes TRUE this causes an INPUT 1 BREAK trip to occur, (unless this trip is disabled within the TRIPS STATUS function block, see the DISABLE TRIPS parameter).

This parameter is not saved in the drive’s non-volatile memory and thus is reset to the default setting at power-up.

INPUT 2 BREAK *Range: FALSE / TRUE*

A general purpose signal designed to be internally wired to the function block ANALOG INPUT 2, BREAK parameter. When this signal goes TRUE this causes an INPUT 2 BREAK trip to occur, (unless this trip is disabled within the TRIPS STATUS function block, see the DISABLE TRIPS parameter).

This parameter is not saved in the drive’s non-volatile memory and thus is reset to the default setting at power-up.

THERMISTOR *Range: FALSE / TRUE*

The current state of the motor thermistor trip input, modified by INVERT THERMIST input.

ENCODER *Range: FALSE / TRUE*

The current state of the encoder Technology Box error trip input. TRUE is tripped.

EXTERNAL TRIP *Range: FALSE / TRUE*

The current state of the External Trip input (terminal 19). Note that this input is inverted, so is TRUE if 0V is on the terminal.

Functional Description

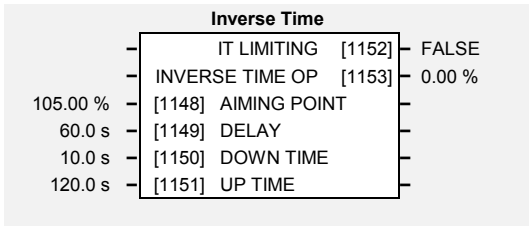
The I/O TRIPS function block allows trips to be generated by signals on the input terminals of the drive. Refer to the Installation Product Manual, Chapter 6 for a description of the trips supported by the drive.

INVERSE TIME

MMI Menu Map

1 SETUP
2 MOTOR CONTROL
3 INVERSE TIME
- AIMING POINT
- DELAY
- DOWN RATE
- UP RATE
- IT LIMITING
- INVERSE TIME OP

Designed for all Motor Control Modes.



The purpose of the inverse time is to automatically reduce the drive current limit in response to prolonged overload conditions. As the motor current exceeds the AIMING POINT level, the excess current is integrated. Up to 150.0 % rated motor current is allowed to flow for a period defined by the DELAY parameter. At this point the inverse time current limit is ramped down from 150.0 % to the level defined by AIMING POINT. The rate at which the inverse time current limit is ramped to the AIMING POINT is defined by DOWN TIME.

Once the overload condition is removed, the inverse time current limit level is ramped back toward the 150.0 % level at a rate defined by UP TIME.

In Quadratic Torque mode, the allowed overload is reduced to 115.0 % for 60.0 s before inverse time current limit action occurs.

Parameter Descriptions

AIMING POINT *Range: 50.00 to 150.00%*

Determines the final level of the inverse time current limit after a period of prolonged motor overload

DELAY *Range: 5.0 to 60.0s*

Determines the maximum allowed overload duration for 150.0 % motor current (110.0% in QUADRATIC TORQUE mode) before inverse time current limit action is taken.

Refer also to “Quadratic/Constant Torque Selection”, page 1-125.

DOWN TIME *Range: 1.0 to 10.0s*

Determines the rate at which the inverse time current limit is ramped to the AIMING POINT after a period of prolonged overload.

UP TIME *Range: 1.0 to 600.0s*

Determines the rated at which the inverse time current limit is ramped back to 150.0 % (110.0 % in QUADRATIC TORQUE mode) once the overload is removed.

IT LIMITING *Range: FALSE / TRUE*

This diagnostic indicates if the inverse time current limit is active.

INVERSE TIME OP *Range: —.00 %*

This diagnostic indicates the present level of the inverse time current limit.

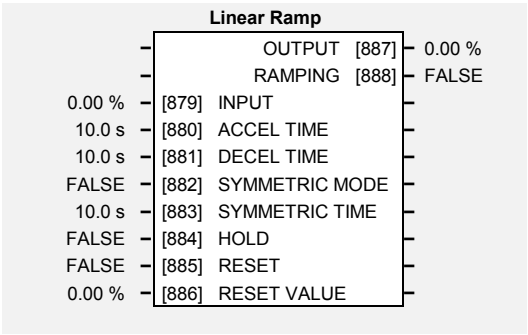
LINEAR RAMP

MMI Menu Map

1 SETUP
2 SETPOINT FUNCS
3 LINEAR RAMP
- INPUT
- ACCEL TIME
- DECEL TIME
- SYMMETRIC MODE
- SYMMETRIC TIME
- HOLD
- RESET
- RESET VALUE
- OUTPUT
- RAMPING

This function block limits the rate of change of an input.

Refer to REFERENCE RAMP, page 1-87.



Parameter Descriptions

INPUT *Range: -300.00 to 300.00%*

Ramp input.

ACCEL TIME *Range: 0.0 to 3000.0 s*

The time that the drive will take to ramp the setpoint, from 0.00% to 100.00%.

DECEL TIME *Range: 0.0 to 3000.0 s*

The time that the drive will take to ramp the setpoint, from 100.00% to 0.00%.

SYMMETRIC MODE *Range: FALSE / TRUE*

Select whether to use the ACCEL TIME and DECEL TIME pair of ramp rates, or to use the SYMETRIC RATE parameter to define the ramp rate for the drive.

SYMMETRIC TIME *Range: 0.0 to 3000.0 s*

The time that the drive will take to ramp from 0.00% to 100.00% and from 100.00% to 0.00% when SYMMETRIC MODE is TRUE.

HOLD *Range FALSE / TRUE*

When TRUE the output of the ramp is held at its last value.

RESET *Range: FALSE / TRUE*

If TRUE, the output is made equal to the input.

RESET VALUE *Range: -300.00 to 300.00 %*

The value that the output is set to while RESET is TRUE.

OUTPUT *Range: —.00 %*

The ramp output.

RAMPING *Range: FALSE / TRUE*

This is set TRUE when ramping.

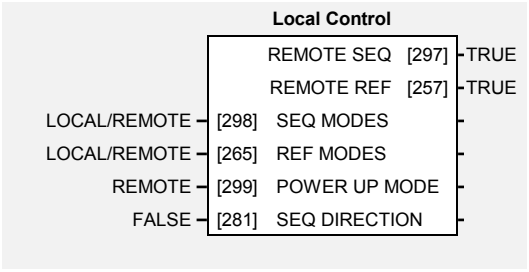
LOCAL CONTROL

MMI Menu Map

1 SETUP
2 SEQ & REF
3 LOCAL CONTROL
- SEQ MODES
- REF MODES
- POWER UP MODE
- SEQ DIRECTION
- REMOTE SEQ
- REMOTE REF

This block allows the available modes of Local and Remote operation to be customised. It also indicates the selected mode.

You can only switch between Local and Remote modes using the Keypad. Refer to the Installation Product Manual, Chapter 5: "The Keypad" - The L/R Key.



Parameter Descriptions

SEQ MODES *Range: Enumerated - see below*

Allows the source of sequencing commands to be selected. Local is the Keypad, Remote is an external signal. The modes supported are:

Enumerated Value : *Seq Mode*

0 : LOCAL/REMOTE
1 : LOCAL ONLY
2 : REMOTE ONLY

REF MODES *Range: Enumerated - see below*

Allows the source of the reference signal to be selected. Local is the Keypad, Remote is an external signal. The modes supported are:

Enumerated Value : *Ref Mode*

0 : LOCAL/REMOTE
1 : LOCAL ONLY
2 : REMOTE ONLY

POWER UP MODE *Range: Enumerated - see below*

Allows the power-up operating mode of the drive to be selected. Local is the Keypad, Remote is an external signal, Automatic is the same mode as at power-down. The modes supported are:

Enumerated Value : *Power Up Mode*

0 : LOCAL
1 : REMOTE
2 : AUTOMATIC

SEQ DIRECTION *Range: FALSE / TRUE*

When TRUE, direction is a Sequencing command.

When FALSE, direction is a Reference command.

REMOTE SEQ *Range: FALSE / TRUE*

This parameter indicates the present source of the sequencing commands.

REMOTE REF *Range: FALSE / TRUE*

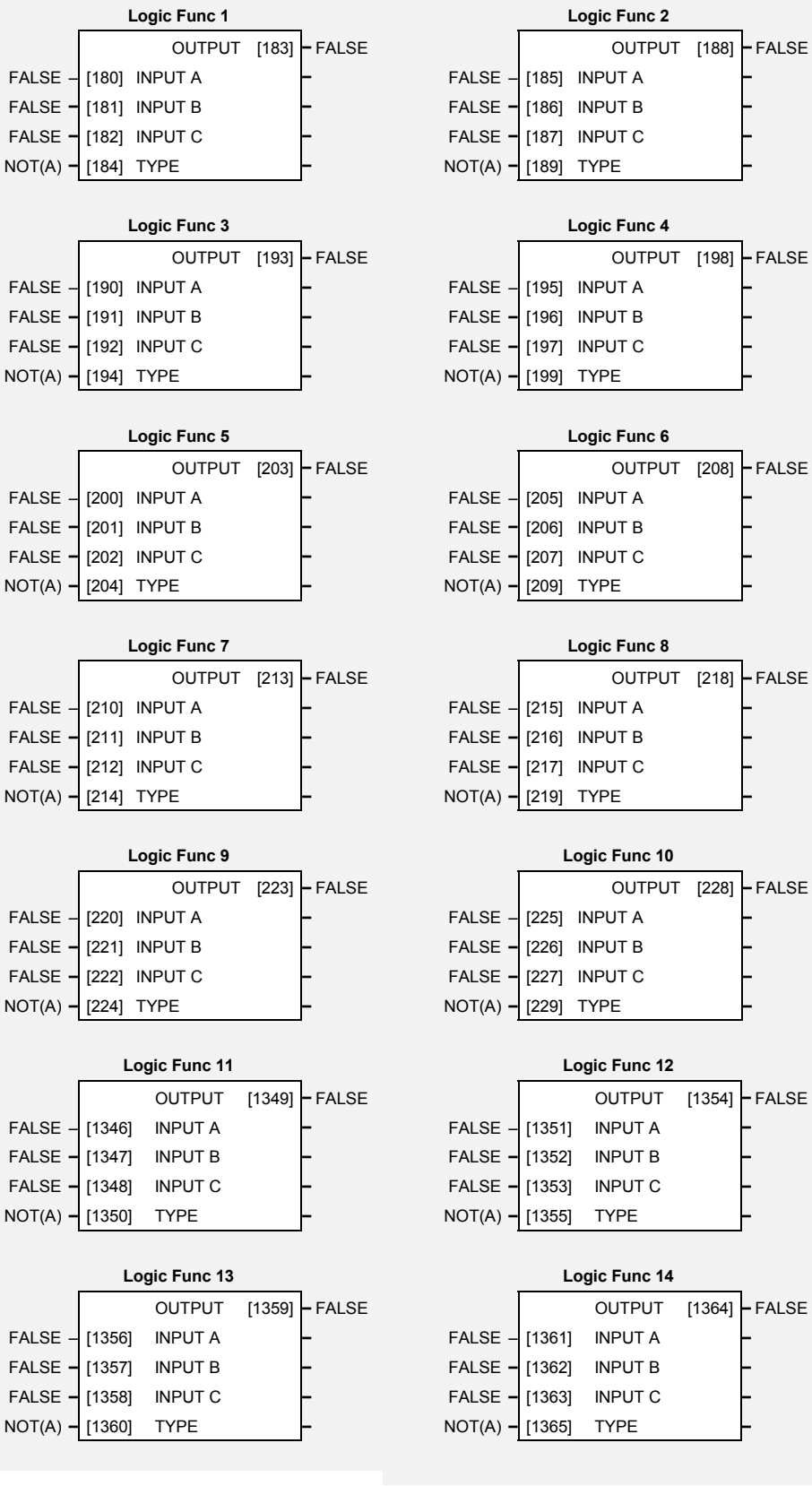
This parameter indicates the present source of the reference signal.

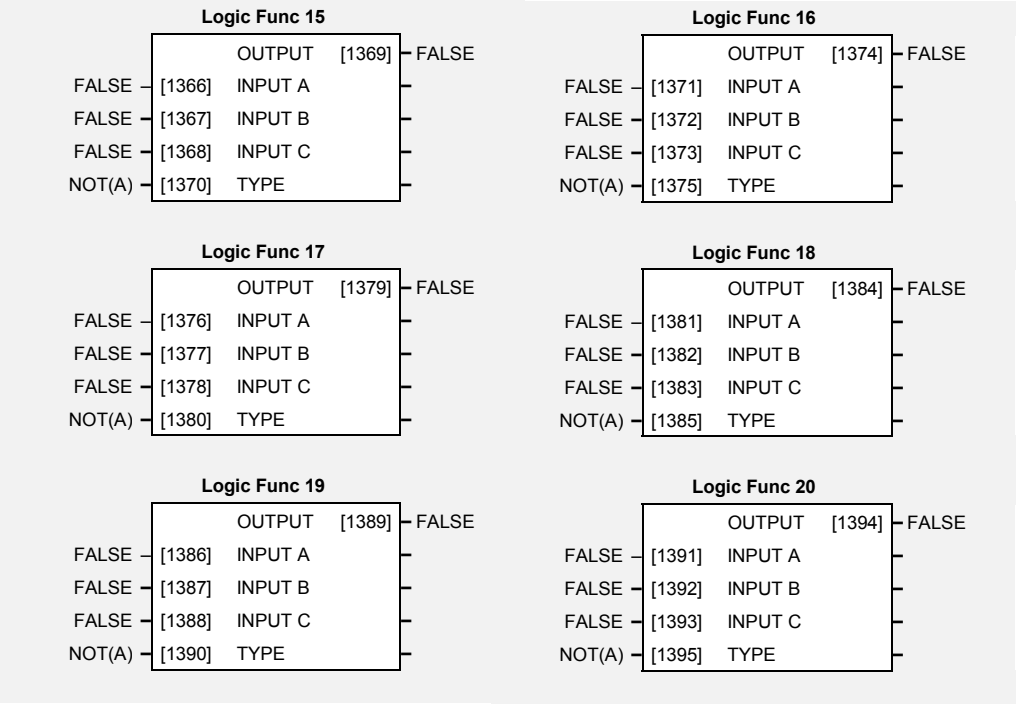
LOGIC FUNCTION

These generic function blocks can be configured to perform one of a number of simple functions upon a fixed number of inputs.

MMI Menu Map

1 SETUP
2 MISCELLANEOUS
3 LOGIC FUNC
4 LOGIC FUNC 1
4 LOGIC FUNC 2
4 LOGIC FUNC 3
4 LOGIC FUNC 4
4 LOGIC FUNC 5
4 LOGIC FUNC 6
4 LOGIC FUNC 7
4 LOGIC FUNC 8
4 LOGIC FUNC 9
4 LOGIC FUNC 10
- INPUT A
- INPUT B
- INPUT C
- TYPE
- OUTPUT





Parameter Descriptions

INPUT A *Range: FALSE / TRUE*

General purpose logic input.

INPUT B *Range: FALSE / TRUE*

General purpose logic input.

INPUT C *Range: FALSE / TRUE*

General purpose logic input.

TYPE *Range: Enumerated - see below*

The operation to be performed on the three inputs to produce the output value. The operations that can be selected are:

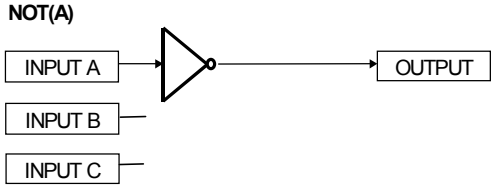
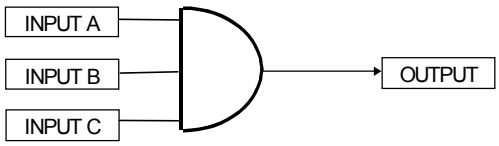
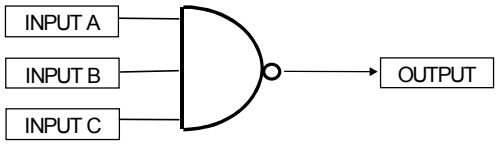
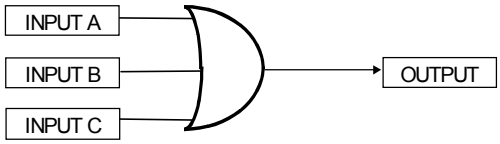
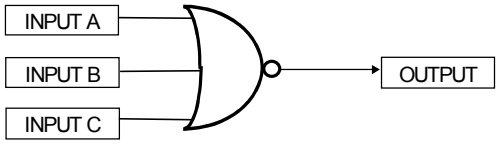
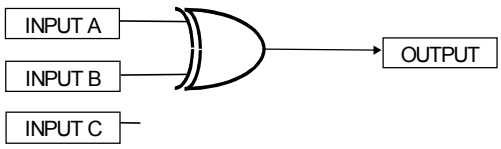
Enumerated Value : *Type*

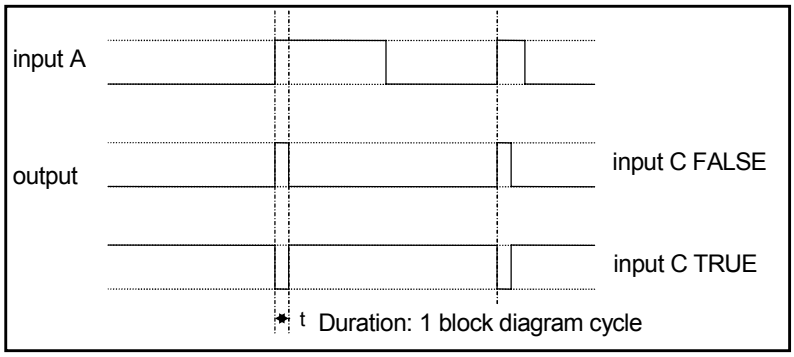
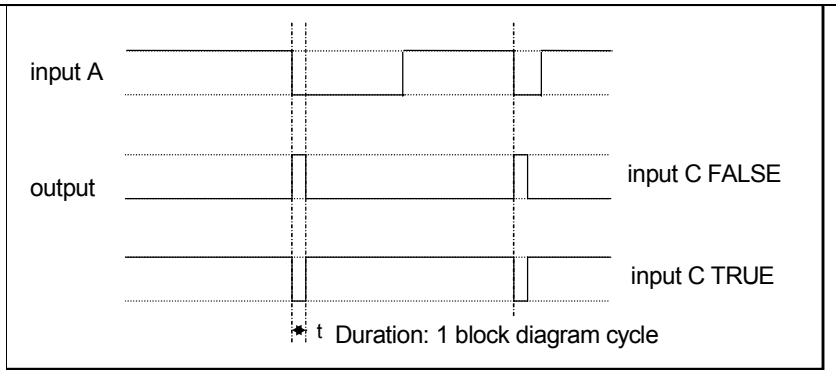
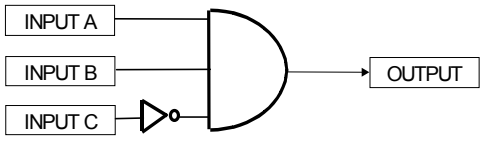
0 : NOT(A)
1 : AND(A,B,C)
2 : NAND(A,B,C)
3 : OR(A,B,C)
4 : NOR(A,B,C)
5 : XOR(A,B)
6 : 0-1 EDGE(A)
7 : 1-0 EDGE(A)
8 : AND(A,B,!C)
9 : OR(A,B,!C)
10 : S FLIP-FLOP
11 : R FLIP-FLOP

OUTPUT *Range: FALSE / TRUE*

The result of performing the selected operation on the inputs.

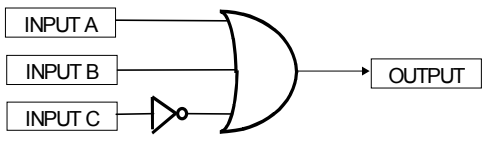
Functional Description

Operation	Description	
NOT(A)	**NOT(A)** 	If INPUT A is TRUE the OUTPUT is FALSE, otherwise the OUTPUT is TRUE.
AND(A,B,C)	**AND(A,B,C)** 	If A and B and C are all TRUE then the OUTPUT is TRUE, otherwise the OUTPUT is FALSE.
NAND(A,B,C)	**NAND(A,B,C)** 	If A and B and C are all TRUE then the OUTPUT is FALSE, otherwise the OUTPUT is TRUE.
OR(A,B,C)	**OR(A,B,C)** 	If at least one of A or B or C is TRUE then the OUTPUT is TRUE, otherwise the OUTPUT is FALSE.
NOR(A,B,C)	**NOR(A,B,C)** 	If at least one of A or B or C is TRUE then the OUTPUT is FALSE, otherwise the OUTPUT is TRUE.
XOR(A,B)	**XOR(A,B)** 	If A and B are the same, (both TRUE or both FALSE), then the output is FALSE, otherwise the output is TRUE.

Operation	Description
0-1 EDGE(A)	 **Rising Edge Trigger** Input B is not used. This function outputs a pulse of 5ms duration when INPUT A to the block becomes TRUE. When INPUT C is TRUE, the output is inverted.
1-0 EDGE(A)	 **Falling Edge Trigger** Input B is not used. This function outputs a pulse of 20ms duration when INPUT A to the block becomes FALSE. When INPUT C is TRUE, the output is inverted.
AND(A,B,!C)	**AND(A,B,!C)**  Refer to the Truth Table. FALSE = 0, TRUE = 1.

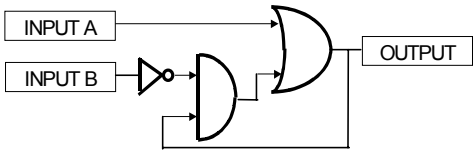
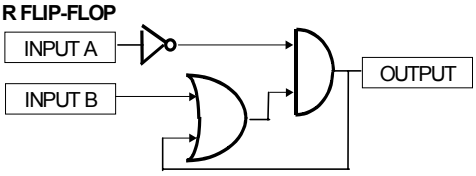
Input State

A	B	C	Output State
0	0	0	**0**
0	0	1	**0**
0	1	0	**0**
0	1	1	**0**
1	0	0	**0**
1	0	1	**0**
1	1	0	**1**
1	1	1	**0**

OR(A,B,!C)	**OR(A,B,!C)**  Refer to the Truth Table. FALSE = 0, TRUE = 1.

Input State

A	B	C	Output State
0	0	0	**1**
0	0	1	**0**
0	1	0	**1**
0	1	1	**1**
1	0	0	**1**
1	0	1	**1**
1	1	0	**1**
1	1	1	**1**

Operation	Description	
S FLIP-FLOP	**S FLIP-FLOP** 	This is a set dominant flip-flop. INPUT A functions as *set,* and INPUT B as *reset* .
R FLIP-FLOP	**R FLIP-FLOP** 	This is a reset dominant flip-flop. INPUT A functions as *reset,* and INPUT B as *set* .

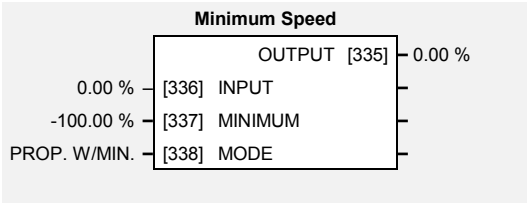
MINIMUM SPEED

MMI Menu Map

1 SETUP
2 SETPOINT FUNCS
3 MINIMUM SPEED
- INPUT
- MINIMUM
- MODE
- OUTPUT

The minimum speed block is used to determine how the drive will follow a reference. There are two modes

1. Proportional : minimum limit
2. Linear : between min and max.



Parameter Descriptions

INPUT *Range: -300.00 to 300.00 %*

The input for this block.

MINIMUM *Range: -100.00 to 100.00 %*

This parameter determines the minimum output value from this block

MODE *Range: Enumerated - see below*

This parameter represents the operating mode of the block. There are two modes:

Enumerated Value : *Operating Mode*

0 : PROP. W/MIN.
1 : LINEAR

OUTPUT *Range: —.xx %*

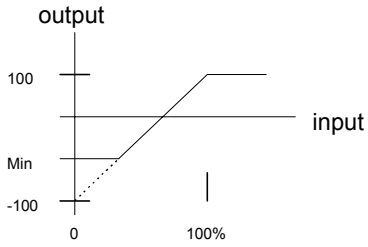
The output is determined by the MODE selected, see below.

Functional Description

There are two operating modes for the MINIMUM SPEED block:

Proportional with Minimum

In this mode the MINIMUM SPEED block behaves like a simple clamp. The minimum value has the valid range -100% to 100% and the output is always greater than or equal to the minimum value.

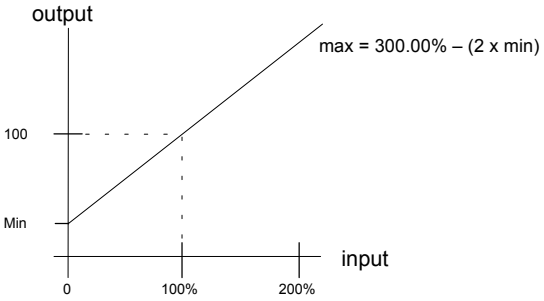


Linear

In this mode the MINIMUM SPEED block first clamps the input to zero then rescales the input such that the output goes linearly between minimum and 100% for an input that goes from 0 to 100%.

Note the constraints:-

min >= 0
input >= 0
max = 100%



MOTOR DATA

MMI Menu Map

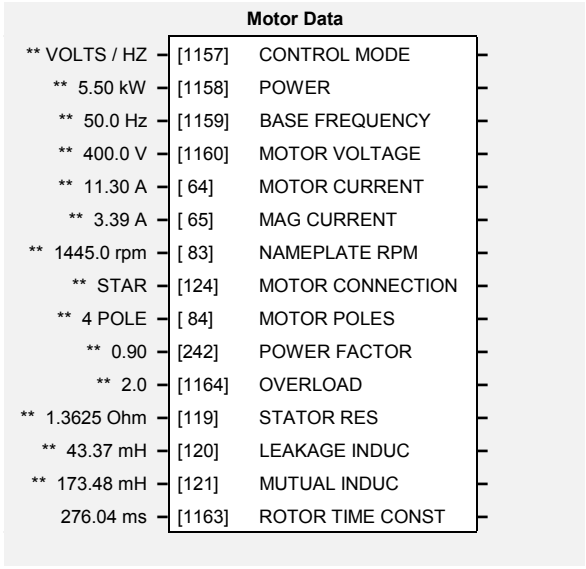
1 SETUP
2 MOTOR CONTROL
3 MOTOR DATA
- CONTROL MODE
- POWER
- BASE FREQUENCY
- MOTOR VOLTAGE
- MOTOR CURRENT
- MAG CURRENT
- NAMEPLATE RPM
- MOTOR CONNECTION
- MOTOR POLES
- POWER FACTOR
- OVERLOAD
- STATOR RES
- LEAKAGE INDUC
- MUTUAL INDUC
- ROTOR TIME CONST

Designed for all Motor Control Modes.

In this function block you enter the details of the motor under control and any available motor nameplate information.

The Autotune feature will determine the MAG CURRENT, STATOR RES, LEAKAGE INDUC, MUTUAL INDUC and ROTOR TIME CONST motor model parameter.

The OVERLOAD parameter determines the allowed level of motor overload. This can be especially useful when operating with motors smaller than the drive rating.



Parameter Descriptions

CONTROL MODE *Range: Enumerated - see below*

Determines the main method of motor control used by the drive.

Enumerated Value : Control Mode

0 : VOLTS / HZ
1 : SENSORLESS VEC
2 : CLOSED-LOOP VEC

POWER *Range*: *0.00 to 355.00kW*

This parameter contains the motor nameplate power.

BASE FREQUENCY *Range*: *7.5 to 500.0Hz*

This parameter contains the motor nameplate base frequency. Refer to FLUXING, page 1-36.

MOTOR VOLTAGE *Range: 0.0 to 575.0V*

This parameter contains the motor nameplate voltage at base frequency. Refer to VOLTAGE CONTROL, page 1-123.

MOTOR CURRENT *Range: 0.00 to 595.00A*

This parameter contains the motor nameplate full-load line current.

MAG CURRENT *Range*: *0.00 to 595.00A*

This parameter contains the motor model no-load line current as determined by the auto-tune.

NAMEPLATE RPM *Range: 0.0 to 32000.0 rpm*

This parameter contains the motor nameplate full-load rated speed. This is the motor speed in rpm at base frequency minus full load slip.

MOTOR CONNECTION *Range: Enumerated - see below*

This parameter contains the motor nameplate connection.

Enumerated Value : *Motor Connection*

0 : DELTA
1 : STAR

MOTOR POLES *Range: Enumerated - see below*

This parameter contains the motor nameplate pole-pairs.

Enumerated Value : *Motor Poles*

0 : 2 pole
1 : 4 pole
2 : 6 pole
3 : 8 pole
4 : 10 pole
5 : 12 pole

POWER FACTOR *Range: 0.50 to 0.99*

This parameter contains the motor nameplate full-load power factor.

OVERLOAD *Range*: *1.0 to 5.0*

This parameter contains the allowable motor overload factor. It is used to match the drive current measurement range to the motor. The drive is set up so that the **Motor Current x Overload** can be measured up to a maximum of 2 x the drive constant torque current rating.

The OVERLOAD parameter has no effect on the current, inverse time or torque limits.

STATOR RES *Range: 0.00 to 250.00 Ohm*

This parameter contains the motor model per-phase stator resistance as determined by Autotune.

LEAKAGE INDUC *Range: 0.0 to 300.0 mH*

This parameter contains the motor model per-phase leakage inductance as determined by Autotune.

MUTUAL INDUC *Range: 0.0 to 3000.0 mH*

This parameter contains the motor model per-phase mutual inductance as determined by Autotune.

ROTOR TIME CONST *Range: 10.00 to 3000.00*

This parameter contains the motor model rotor time constant as determined by Autotune.

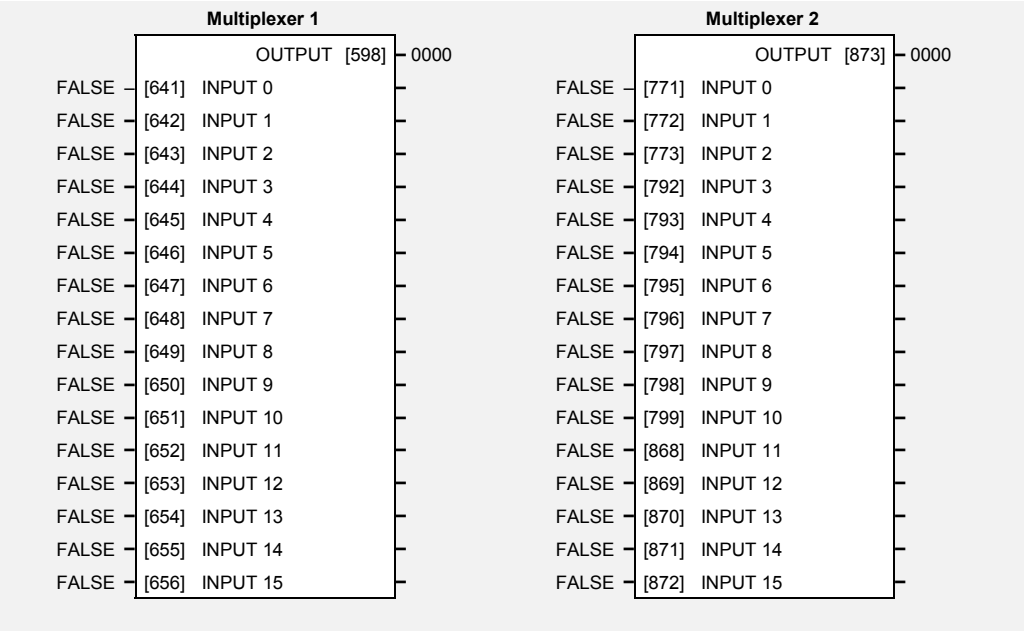
MULTIPLEXER

MMI Menu Map

1 SETUP
2 MISCELLANEOUS
3 MULTIPLEXER
4 MULTIPLEXER 1
4 MULTIPLEXER 2
- INPUT 0
- INPUT 1
- INPUT 2
- INPUT 3
- INPUT 4
- INPUT 5
- INPUT 6
- INPUT 7
- INPUT 8
- INPUT 9
- INPUT 10
- INPUT 11
- INPUT 12
- INPUT 13
- INPUT 14
- INPUT 15
- OUTPUT

Each block collects together 16 Boolean input values into a single word.

For example, one may be used to set and clear individual bits within a word such as the TRIGGERS 1 word for the AUTO RESTART function block.



Parameter Descriptions

INPUT 0 TO INPUT 15 *Range: FALSE / TRUE*

The Boolean inputs to be assembled into a single word.

OUTPUT *Range: 0000 to FFFF*

The resulting word.

OP STATION

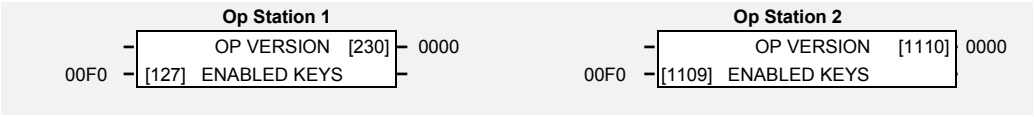
MMI Menu Map

1 SETUP
2 MENUS
3 OP STATION
4 OP STATION 1
4 OP STATION 2
- ENABLED KEYS
- OP VERSION

The operator station blocks allow the operation of the Keypad control keys to be customised.

OP STATION 1 is associated with the Keypad port.

OP STATION 2 is associated with the Communications port (P3).



Parameter Descriptions

ENABLED KEYS

Range: 0000 to FFFF

The following keys on the Keypad can be enabled or disabled separately. The combination produces the parameter setting as in the table below.

Parameter Setting	RUN	L/R	JOG	DIR
0000	-	-	-	-
0010	-	-	-	ENABLED
0020	-	-	ENABLED	-
0030	-	-	ENABLED	ENABLED
0040	-	ENABLED	-	-
0050	-	ENABLED	-	ENABLED
0060	-	ENABLED	ENABLED	-
0070	-	ENABLED	ENABLED	ENABLED
0080	ENABLED	-	-	-
0090	ENABLED	-	-	ENABLED
00A0	ENABLED	-	ENABLED	-
00B0	ENABLED	-	ENABLED	ENABLED
00C0	ENABLED	ENABLED	-	-
00D0	ENABLED	ENABLED	-	ENABLED
00E0	ENABLED	ENABLED	ENABLED	-
00F0	ENABLED	ENABLED	ENABLED	ENABLED

OP VERSION

Range: 0000 to FFFF

Displays the software version of the Keypad. It is cleared to 0000 if no Keypad is connected.

OPERATOR MENU

These function blocks are used to configure the Operator menu. This feature provides quick access to frequently used parameters. Any parameter may be "promoted" to the Operator menu, and the parameter is then automatically saved on power-down.

In addition, parameters displayed in the Operator menu may be given a different name, and may be rescaled for display using the DISPLAY SCALE function blocks.

MMI Menu Map

- 1 SETUP
- 2 MENUS
- 3 OPERATOR MENU
- 4 OPERATOR MENU 1
- 4 OPERATOR MENU 2
- 4 OPERATOR MENU 3
- 4 OPERATOR MENU 4
- 4 OPERATOR MENU 5
- 4 OPERATOR MENU 6
- 4 OPERATOR MENU 7
- 4 OPERATOR MENU 8
- 4 OPERATOR MENU 9
- 4 OPERATOR MENU 10
- 4 OPERATOR MENU 11
- 4 OPERATOR MENU 12
- 4 OPERATOR MENU 13
- 4 OPERATOR MENU 14
- 4 OPERATOR MENU 15
- 4 OPERATOR MENU 16
  - PARAMETER
  - NAME
  - SCALING
  - READ ONLY
  - IGNORE PASSWORD

Operator Menu 1

NULL	[74]	PARAMETER
	[324]	NAME
NONE	[1039]	SCALING
FALSE	[1040]	READ ONLY
FALSE	[1041]	IGNORE PASSWORD

Operator Menu 2

NULL	[371]	PARAMETER
	[378]	NAME
NONE	[1042]	SCALING
FALSE	[1043]	READ ONLY
FALSE	[1044]	IGNORE PASSWORD

Operator Menu 3

NULL	[626]	PARAMETER
	[1045]	NAME
NONE	[1046]	SCALING
FALSE	[1047]	READ ONLY
FALSE	[1048]	IGNORE PASSWORD

Operator Menu 4

NULL	[627]	PARAMETER
	[1049]	NAME
NONE	[1050]	SCALING
FALSE	[1051]	READ ONLY
FALSE	[1052]	IGNORE PASSWORD

Operator Menu 5

NULL	[628]	PARAMETER
	[1053]	NAME
NONE	[1054]	SCALING
FALSE	[1055]	READ ONLY
FALSE	[1056]	IGNORE PASSWORD

Operator Menu 6

NULL	[629]	PARAMETER
	[1057]	NAME
NONE	[1058]	SCALING
FALSE	[1059]	READ ONLY
FALSE	[1060]	IGNORE PASSWORD

Operator Menu 7

NULL	[630]	PARAMETER
	[1061]	NAME
NONE	[1062]	SCALING
FALSE	[1063]	READ ONLY
FALSE	[1064]	IGNORE PASSWORD

Operator Menu 8

NULL	[631]	PARAMETER
	[1065]	NAME
NONE	[1066]	SCALING
FALSE	[1067]	READ ONLY
FALSE	[1068]	IGNORE PASSWORD

Operator Menu 9

NULL	[632]	PARAMETER
	[1069]	NAME
NONE	[1070]	SCALING
FALSE	[1071]	READ ONLY
FALSE	[1072]	IGNORE PASSWORD

Operator Menu 10

NULL	[633]	PARAMETER
	[1073]	NAME
NONE	[1074]	SCALING
FALSE	[1075]	READ ONLY
FALSE	[1076]	IGNORE PASSWORD

Operator Menu 11

NULL	[634]	PARAMETER
	[1077]	NAME
NONE	[1078]	SCALING
FALSE	[1079]	READ ONLY
FALSE	[1080]	IGNORE PASSWORD

Operator Menu 12

NULL	[635]	PARAMETER
	[1081]	NAME
NONE	[1082]	SCALING
FALSE	[1083]	READ ONLY
FALSE	[1084]	IGNORE PASSWORD

Operator Menu 13

NULL	[636]	PARAMETER
	[1085]	NAME
NONE	[1086]	SCALING
FALSE	[1087]	READ ONLY
FALSE	[1088]	IGNORE PASSWORD

Operator Menu 14

NULL	[637]	PARAMETER
	[1089]	NAME
NONE	[1090]	SCALING
FALSE	[1091]	READ ONLY
FALSE	[1092]	IGNORE PASSWORD

Operator Menu 15

NULL	[638]	PARAMETER
	[1093]	NAME
NONE	[1094]	SCALING
FALSE	[1095]	READ ONLY
FALSE	[1096]	IGNORE PASSWORD

Operator Menu 16

NULL	[639]	PARAMETER
	[1097]	NAME
NONE	[1098]	SCALING
FALSE	[1099]	READ ONLY
FALSE	[1100]	IGNORE PASSWORD

Parameter Descriptions

PARAMETER *Range: 0 to 1999*

Enter the parameter to be displayed in the Operator menu. The parameter may be selected by first choosing the block that the parameter is within, then choosing the parameter itself.

NAME *Range:16 characters maximum*

Enter your customised parameter name, the maximum length is 16 characters. If this name is left blank, then default parameter name will be used.

SCALING *Range: See below*

Selects a DISPLAY SCALE function block to be applied to the value of PARAMETER.

Enumerated Value : DISPLAY SCALE function block

0 : NONE
1 : DISPLAY SCALE 1
2 : DISPLAY SCALE 2
3 : DISPLAY SCALE 3
4 : DISPLAY SCALE 4

READ ONLY *Range: FALSE / TRUE*

When TRUE, this entry in the Operator Menu will not be adjustable.

IGNORE PASSWORD *Range: FALSE / TRUE*

When TRUE, this entry in the Operator Menu may be adjusted regardless of the password protection feature.

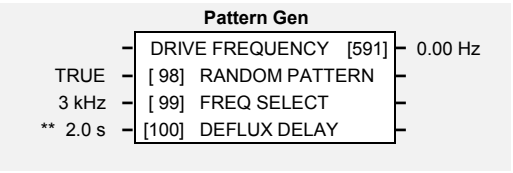
PATTERN GEN

MMI Menu Map

1 SETUP
2 MOTOR CONTROL
3 PATTERN GEN
- RANDOM PATTERN
- FREQ SELECT
- DEFLUX DELAY
- DRIVE FREQUENCY

Designed for all Motor Control Modes.

The pattern generator function block allows you to configure the drive PWM (Pulse Width Modulator) operation.



Parameter Descriptions

RANDOM PATTERN

Range: FALSE / TRUE

This parameter selects between random pattern (quiet motor noise) or the more conventional fixed carrier PWM strategies. When TRUE, random pattern is enabled.

FREQ SELECT

Range: Enumerated - see below

This parameter selects the base switching frequency of the output power stack. The choices of switching frequency are:

Enumerated Value : *Frequency*

0 : 3 kHz
1 : 6 kHz
Note: Currently only 3kHz operation is allowed.

The higher the switching frequency, the lower the level of motor audible noise. However, this is only achieved at the expense of increased drive losses.

Refer also to “Quadratic/Constant Torque Selection”, page 1-125.

DEFLUX DELAY

Range: 0.1 to 10.0 s

Sets the minimum allowed delay between disabling and then re-enabling PWM production (i.e. stopping and starting the drive).

DRIVE FREQUENCY

Range: —.x Hz

The drive output frequency.

Functional Description

The drive provides a unique quiet pattern PWM strategy in order to reduce audible motor noise. The user is able to select between the quite pattern or the more conventional fixed carrier frequency method. With the quiet pattern strategy selected (random pattern enabled), audible motor noise is reduced to a dull hiss.

In addition, the user is able to select the PWM carrier frequency. This is the main switching frequency of the power output stage of the drive. A high setting of carrier frequency (e.g. 6kHz) reduces audible motor noise but only at the expense of higher drive losses and smooth motor rotation at low output frequencies. A low setting of carrier frequency (e.g. 3kHz), reduces drive losses but increases audible motor noise.

PHASE AUTO GEAR

MMI Menu Map

1 SETUP
2 SYSTEM BOARD
3 PHASE AUTO GEAR
- RESET
- ENABLE
- HOLD
- NOM MASTER LEN
- NOM SLAVE LENGTH
- TOLERANCE
- INITIAL REPEATS
- INITIAL FILTER
- FILTER
- RESET COUNTERS
- SLAVE MARKS
- MASTER MARKS
- MISSED S MARKS
- MISSED M MARKS
- FALSE S MARKS
- FALSE M MARKS
- EXT MARK MASTER
- EXT MARK SLAVE
- GEAR CORRECTION
- MASTER LENGTH
- SLAVE LENGTH
- READY

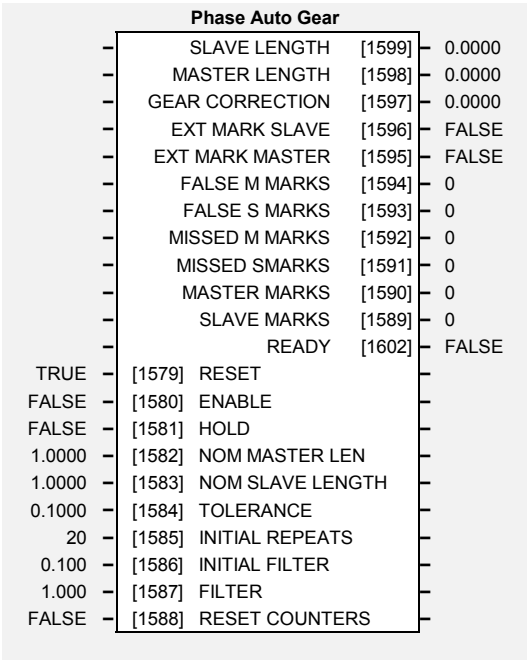
Designed for use with the System Board.

This function block calculates the gear ratio between the master and slave shafts from the relative repeat lengths calculated from the marker inputs.

The relative repeat lengths are then used to calculate the relative velocities of the master and slave in order to synchronise them; without this, register control is not possible.

Included in this block is logic for discriminating against missing and false (premature) marks (Windowing).

The results of the gearing calculation are filtered and then applied using the Gearing in the Phase Control Block.



Parameter Descriptions

SLAVE LENGTH *Range: —.0000*

Connect to GEAR B in the PHASE CONFIGURE function block. See MASTER LENGTH below.

MASTER LENGTH *Range: —.0000*

Connect to GEAR B in the PHASE CONFIGURE function block.

Length is calculated by measuring the distance between good marks and filtering the result. Two filter time constants are available: the first is to allow minimal filtering during the start-up phase, and the second is typically higher to allow the smooth tracking of any changes to web length. The length outputs are persistent as long as no RESET is applied. The last calculated value is saved on power-down.

GEAR CORRECTION *Range: —.0000*

A gear correction factor diagnostic, calculated by dividing SLAVE LENGTH by MASTER LENGTH.

EXT MARK SLAVE *Range: FALSE / TRUE*

Diagnostic, displays the state of the Slave Mark input.

EXT MARK MASTER *Range: FALSE / TRUE*

Diagnostic, displays the state of the Master Mark input.

FALSE M MARKS *Range: 0 -*

Diagnostic counter for false (early) marks. False marks are those that occur before the window is open.

FALSE S MARKS *Range: 0 -*

Diagnostic counter for false (early) marks. False marks are those that occur before the window is open.

MISSED M MARKS *Range: 0 -*

Diagnostic counter for missing (late) marks. Missing marks are those that occur after the window.

MISSED S MARKS *Range: 0 -*

Diagnostic counter for missing (late) marks. Missing marks are those that occur after the window.

MASTER MARKS *Range: 0 -*

Diagnostic counter for valid marks. If the block is not in reset, length is calculated when a new valid mark has arrived.

SLAVE MARKS *Range: 0 -*

Diagnostic counter for valid marks. If the block is not in reset, length is calculated when a new valid mark has arrived.

READY *Range: FALSE / TRUE*

This is set FALSE by reset or power-on. It goes TRUE after the initial repeat counter is passed.

RESET *Range: FALSE / TRUE*

If TRUE, then the length counters are reset to zero. The length outputs are set to their nominal values and the repeat counter is reset setting the filter time constant to INITIAL FILTER. When the function block comes out of reset, the counters and length calculation will become active again.

ENABLE *Range: FALSE / TRUE*

If FALSE, then the length counters are reset to zero. RESET and ENABLE are functionally equivalent. RESET being the inverse of ENABLE.

HOLD *Range: FALSE / TRUE*

If TRUE the length calculation is suspended and the last outputs are held..

NOM MASTER LEN *Range: 0.0000 to 100.0000*

The nominal length to the next required mark.

NOM SLAVE LENGTH *Range: 0.0000 to 100.0000*

The nominal length to the next required mark.

INITIAL REPEATS

The number of valid marks that must be seen on both channels before the block is “READY” during which time the Initial Filter Value is used.

INITIAL FILTER *Range: —.000*

The length filter value used during the start-up phase (while the block is not “READY”) See also “FILTER”

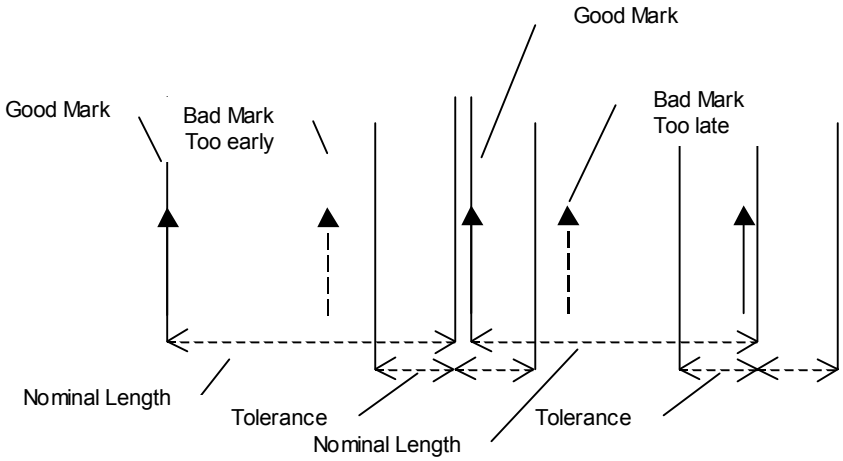
FILTER *Range: —.000*

The filter is run only when a new valid mark has arrived (this ties the filter Tc to the number of marks per second, and not time).

RESET COUNTERS *Range: FALSE / TRUE*

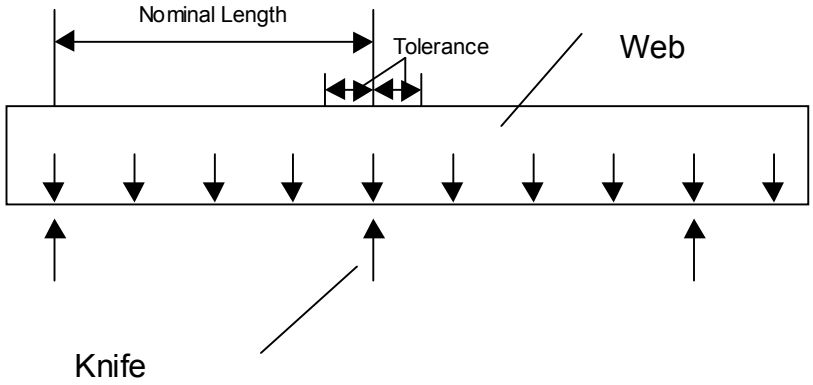
Resetting the counters (TRUE) clears the error counters but **does not** clear the repeat counters and so leaves the filter Tc unchanged.

Functional Description



Setting a window using the nominal repeat length and tolerance eliminates rogue marks. The window opens before the expected arrival point and remains open until a mark arrives. If the new mark is inside the window it is accepted and a new mark is looked for, otherwise it is rejected.

This form of windowing allows for the rejection of repetitive marks that fall regularly between repeats on the other channel. An example of this would be a knife that cut every N marks on the web. In this case it would not matter which mark the knife synchronised to.



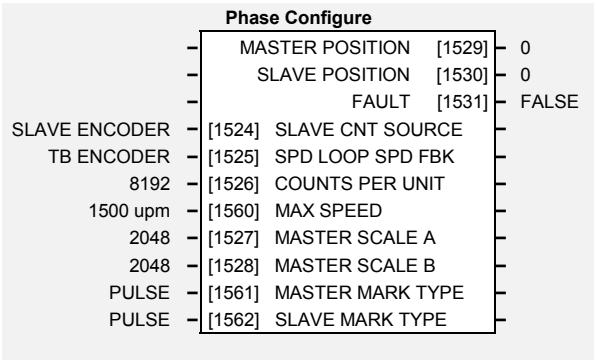
This form of windowing will not work as a means of discriminating against noise between marks. If used in a system like this, a missing mark may result in the system synchronising to the noise. For more complex forms of mark discrimination, an intelligent eye must be used.

PHASE CONFIGURE

MMI Menu Map

1 SETUP
2 SYSTEM BOARD
3 PHASE CONFIGURE
- SLAVE CNT SOURCE
- SPD LOOP SPD FBK
- COUNTS PER UNIT
- MAX SPEED
- MASTER SCALE A
- MASTER SCALE B
- MASTER MARK TYPE
- SLAVE MARK TYPE
- MASTER POSITION
- SLAVE POSITION
- FAULT

Designed for use with the System Board.



This function block configures the Encoder functions for use with a dual encoder. The parameters in this block allow you to set up which encoder inputs are used for which function, as well as the normalisation parameters.

The slave axis is defined as the axis that the controller is controlling. The "Master" axis also known as the "Reference" axis is the axis that is used as the setpoint, or the axis that the slave follows.

Note: *Without the System Board fitted, the SLAVE CNT SOURCE may be set to TB ENCODER. This will allow all blocks that rely on the Slave Encoder only to function as expected. The MARK inputs* ***do not*** *function without a System Board.*

Parameter Descriptions

SLAVE CNT SOURCE

Range: Enumerated – see below

The slave encoder counter may be "clocked" using either the SLAVE ENCODER encoder quadrature input or the TB ENCODER TechBox encoder quadrature input. The counter is used for the calculation of the slave position.

Enumerated Value : Slave Count Source
0 : SLAVE ENCODER
1 : TB ENCODER
2 : DISABLE

SPD LOOP SPD FBK

Range: Enumerated – see below

The slave axis may use either the SLAVE ENCODER encoder quadrature input or the TB ENCODER TechBox encoder quadrature input for its speed feedback source for closed loop speed control.

The speed feedback encoder should always be directly mounted to the motor that the controller is powering. The speed feedback encoder may be different from the encoder used for position control i.e. the SLAVE CNT SOURCE.

Enumerated Value : Speed Loop Speed Feedback
0 : SLAVE ENCODER
1 : TB ENCODER

COUNTS PER UNIT

Range: 0 to 32767

This parameter sets the global scaling of position setpoint and feedback. For example, if you wished to work in revolutions and had a 2048 line encoder on the slave then you would set "COUNTS PER UNIT" to 2048*4 = 8192. This is the number of lines per revolution times 4, it is times 4 because there are 2 edges (1 rising and 1 falling) from both the A and B input of a quadrature encoder.

MAX SPEED

Range: 0 to 32000 upm

This is used to scale the velocity feed forward terms from the PHASE INCH, PHASE MOVE and PHASE REGISTER blocks. It is important that this matches the full speed of the drive.

MASTER SCALE A *Range: -30000 to 30000*

The master encoder counts are scaled by MASTER SCALE A and MASTER SCALE B where A is the multiplier and B is the divisor.

$$MasterPosition = ActualPosition \times \left(\frac{MasterScaleA}{MasterScaleB} \right)$$

It is not possible to scale the slave encoder.

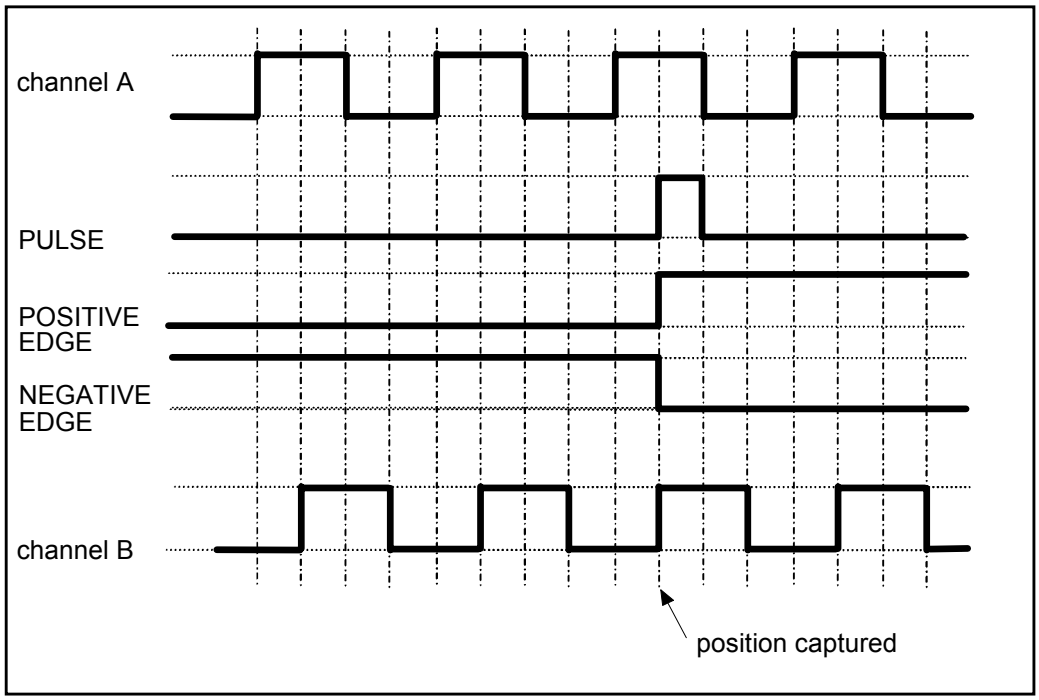
MASTER SCALE B *Range: -30000 to 30000*

Slave encoder scaling parameter, see MASTER SCALE A

MASTER MARK TYPE *Range: See below*

Selects the mark type. As used to capture master/slave position.

Enumerated Value : *Mark Type*
0 : PULSE
1 : POSITIVE EDGE
2 : NEGATIVE EDGE



SLAVE MARK TYPE *Range: See below*

See MASTER MARK TYPE above.

MASTER POSITION *Range: —.*

Diagnostic output in encoder counts from the master quadrature encoder. This is the scaled master counter value and will wrap around from maximum positive to minimum negative if the counter overflows.

SLAVE POSITION *Range: — .*

Diagnostic output in encoder counts from the slave quadrature encoder. This is the raw counter value and will wrap around from maximum positive to minimum negative if the counter overflows.

FAULT *Range:* NONE / OVERFLOW

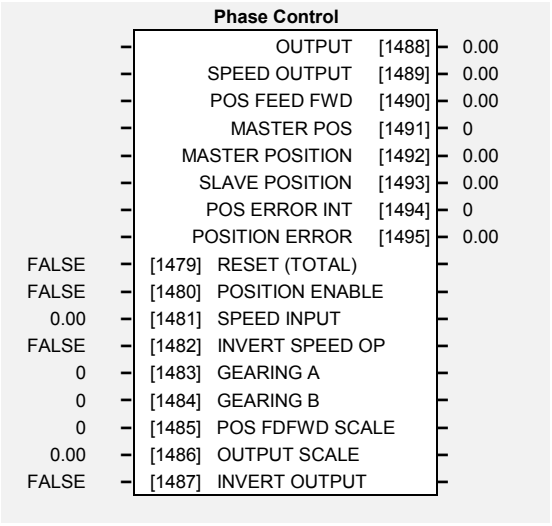
This is a general error flag used by the under lying encoder function blocks. The error will be set to OVERFLOW if the position error counter overflows and counts are lost.

PHASE CONTROL

MMI Menu Map

1 SETUP
2 SYSTEM BOARD
3 PHASE CONTROL
- RESET (TOTAL)
- POSITION ENABLE
- SPEED INPUT
- INVERT SPEED OP
- GEARING A
- GEARING B
- POS FDFWD SCALE
- OUTPUT SCALE
- INVERT OUTPUT
- OUTPUT
- SPEED OUTPUT
- POS FEED FWD
- MASTER POS
- MASTER POSITION
- SLAVE POSITION
- POS ERROR INT
- POSITION ERROR

This is the principal phase function block and controls the error generation as well as the feed-forward calculation.



Parameter Descriptions

RESET (TOTAL)
Range: FALSE / TRUE

Total Reset, disables both the SPEED OUPUT and PHASE LOOP, see POSITION ENABLE.

POSITION ENABLE
Range: FALSE / TRUE

The position enable input. Enables the operation of the accumulator. If set FALSE, then the accumulator is set to zero and any phase information is reset. See also RESET (TOTAL).

SPEED INPUT
Range: —.xx

Input to the speed feed-forward calculator, to obtain good phase locking it is important that this input is used. The speed input will usually be the master line speed, this input should be set such that the slave will follow the master even with the phase loop disabled.

INVERT SPEED OP
Range: FALSE / TRUE

Invert the speed output.

GEARING A
Range: -30000 to 30000

Gearing allows the slave to run at a ratio of the master speed / position.

$$MasterPosition = ActualMasterPosition \times \left(\frac{GearingA}{GearingB} \right)$$

$$SpeedOutput = SpeedInput \times \left(\frac{GearingA}{GearingB} \right)$$

GEARING B
Range: -30000 to 30000

See Gearing A

POS FDFWD SCALE
Range: -300.00 to 300.00

Scale position feed-forward. Scaled with PHASE CONFIG::MAX SPEED. This feed forward works only for position setpoint changes and is designed to reduce the following error of the system by predicting the torque required to accelerate the motor.

OUTPUT SCALE
Range: 0.00 to 300.00

Scales the position output.

INVERT OUTPUT
Range: FALSE / TRUE

Inverts the position output.

OUTPUT *Range: —.xx*

Position output used for PHASE PID. Note: The output of this block contains valid information beyond the final decimal place, the information is passed to PHASE PID and is used for maximum precision.

SPEED OUTPUT *Range: —.xx*

Speed output, used for PHASE PID:: FEED FWD input. Includes POS FEED FWD.

POS FEED FWD *Range: —.xx*

Position feed-forward output.

MASTER POS *Range: —.*

Geared Master position as a scaled integer.

MASTER POSITION *Range: —.xx*

Geared Master position scaled in encoder units.

SLAVE POSITION *Range: —.xx*

Slave position scaled in encoder units.

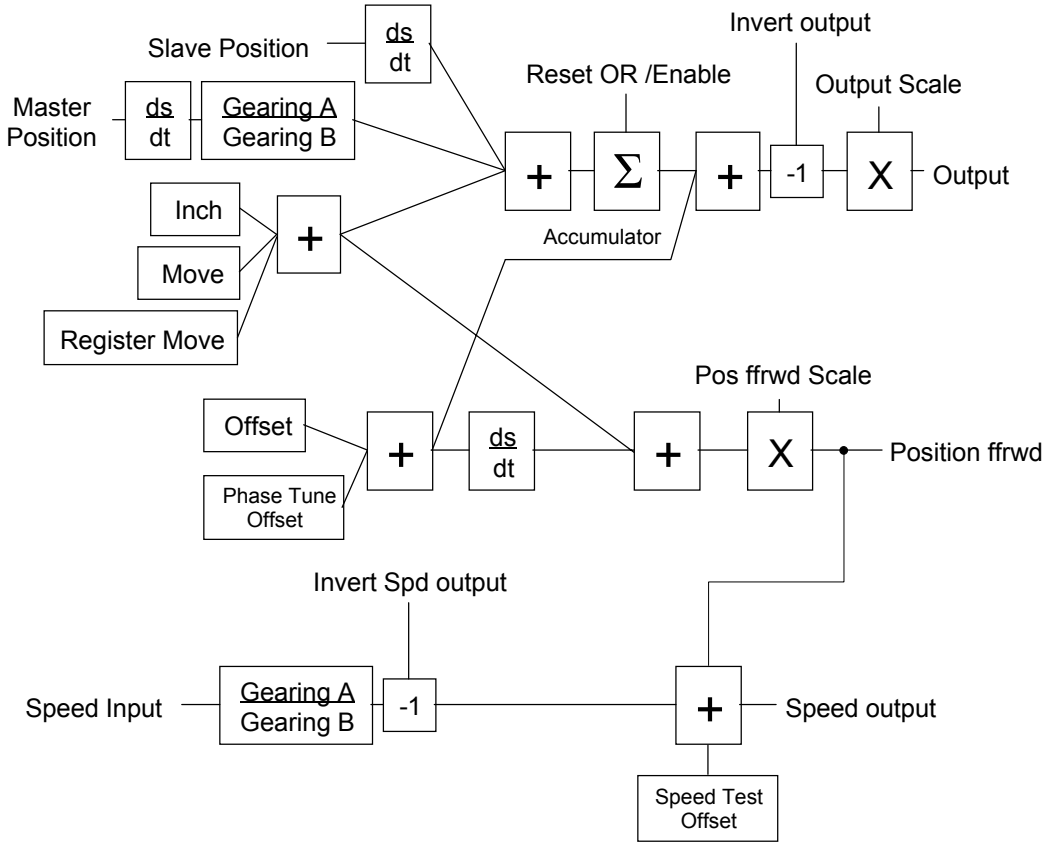
POS ERROR INT *Range: —.*

Position error scaled in scaled counts.

POSITION ERROR *Range: —.xx*

Position error scaled in encoder units.

Functional Description

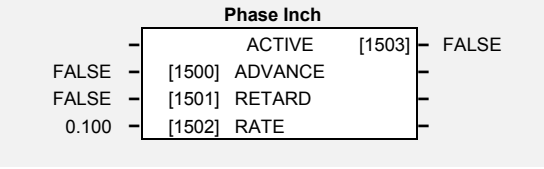


PHASE INCH

MMI Menu Map

1 SETUP
2 SYSTEM BOARD
3 PHASE INCH
- ADVANCE
- RETARD
- RATE
- ACTIVE

When in Phase control, the Phase Inch function block may be used to advance or retard the relative position on the slave axis with respect to the master axis. This is achieved by feeding extra counts into the position error calculator at a rate given by RATE in units per second.



If Register Mode is enabled, the MARK OFFSET is also effected.

ADVANCE and RETARD are usually linked to operator controlled, momentary-action push buttons.

Parameter Descriptions

ADVANCE *Range: FALSE / TRUE*

While TRUE, counts are added to the error calculator at a rate give by RATE. Note: if both ADVANCE and RETARD are TRUE then no action is taken.

RETARD *Range: FALSE / TRUE*

While TRUE, counts are subtracted from the error calculator at a rate given by RATE.

RATE *Range: 0.001 to 30.000*

The rate at which counts are added to the Error calculator. A rate of 0.05 with a system scaled in revolutions would cause the drive to advance at a rate of 0.05 revolutions a second with respect to the master.

ACTIVE *Range: FALSE / TRUE*

This diagnostic displays TRUE while Advance or Retard actions are active.

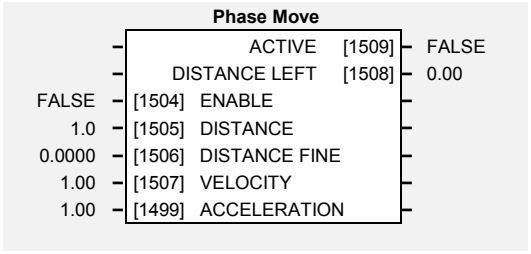
PHASE MOVE

MMI Menu Map

1 SETUP
2 SYSTEM BOARD
3 PHASE MOVE
- ENABLE
- DISTANCE
- DISTANCE FINE
- VELOCITY
- ACCELERATION
- ACTIVE
- DISTANCE LEFT

This is a simple trapezoidal relative move function, which acts on each rising edge of the Enable input. The slave shaft is moved a fixed distance at a rate given by the VELOCITY parameter. A move must be complete before a new move will be registered.

If Register Mode is enabled, the MARK OFFSET is also effected.



Parameter Descriptions

ENABLE *Range:* FALSE / TRUE

If the function block is not already Active, ENABLE starts the Move operation when going from FALSE to TRUE.

DISTANCE *Range:* -3000.0 to 3000.0

The course distance that the move command will add to the phase loop.

DISTANCE FINE *Range:* -1.0000 to 1.0000

Additional distance to allow fine control of position.

VELOCITY *Range:* 0.10 to 3000.00

The maximum velocity at which the distance is added to the phase loop, set in units per second.

ACCELERATION *Range:* 0.10 to 3000.00

The acceleration at which the distance is added to the phase loop, set in units per second².

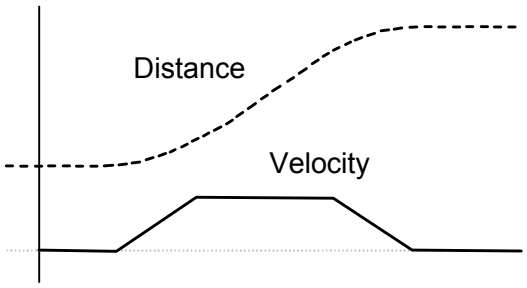
ACTIVE *Range:* FALSE / TRUE

TRUE while the block is Active, i.e. the move distance is none zero.

DISTANCE LEFT *Range: —.xx*

Diagnostic showing the distance remaining before the move is complete.

Functional Description

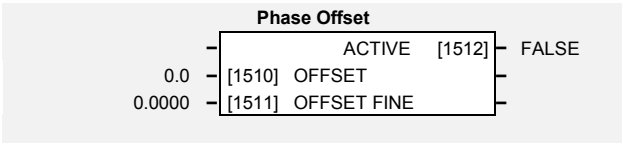


PHASE OFFSET

MMI Menu Map

1 SETUP
2 SYSTEM BOARD
3 PHASE OFFSET
- OFFSET
- OFFSET FINE
- ACTIVE

The Offset function block adds an offset to the error calculator.



$$PhaseOutput = Error + Offset + OffsetFine$$

Parameter Descriptions

OFFSET *Range: -3000.0 to 3000.0*

A course offset added to the phase error, allowing an absolute phase correction to be applied. The Offset is added to the Phase at a maximum rate of +/-32768 counts.

OFFSET FINE *Range: -1.0000 to 1.0000*

Additional correction added to OFFSET to allow fine control of position.

ACTIVE *Range: FALSE / TRUE*

TRUE while offset count is being added.

PHASE PID

MMI Menu Map

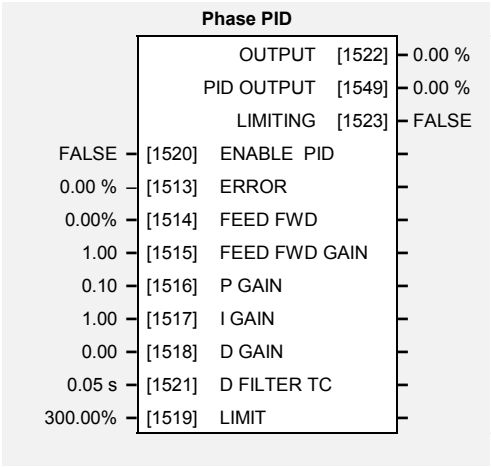
1 SETUP

2 SYSTEM BOARD

3 PHASE PID

- ERROR
- FEED FWD
- FEED FWD GAIN
- P GAIN
- I GAIN
- D GAIN
- LIMIT
- ENABLE PID
- D FILTER TC
- OUTPUT
- PID OUTPUT
- LIMITING

This function block is an alternative, simplified version of the process PID controller.



Parameter Descriptions

OUTPUT *Range: __.xx%*

Output of the PHASE PID function block.

PID OUTPUT *Range: __.xx%*

Output of PID without FEED FWD.

LIMITING *Range: FALSE / TRUE*

This output is TRUE if the OUTPUT is at the LIMIT value.

ENABLE PID *Range: FALSE / TRUE*

This parameter globally resets the PID output and integral term when FALSE.
This parameter must be TRUE for the PID to operate.

ERROR *Range: -300.00 to 300.00 %*

Error input to the PHASE PID block.

FEED FWD *Range: -300.00 to 300.00 %*

Feed forward input to the PHASE PID block.

FEED FWD GAIN *Range: -300.00 to 300.00*

Feed forward gain of the PHASE PID block.

P GAIN *Range: 0.00 to 100.00*

The proportional gain of the PHASE PID block.

I GAIN *Range: 0.00 to 100.00*

The integral gain of the PHASE PID block.

D GAIN *Range: 0.00 to 100.00*

The derivative gain of the PHASE PID block.

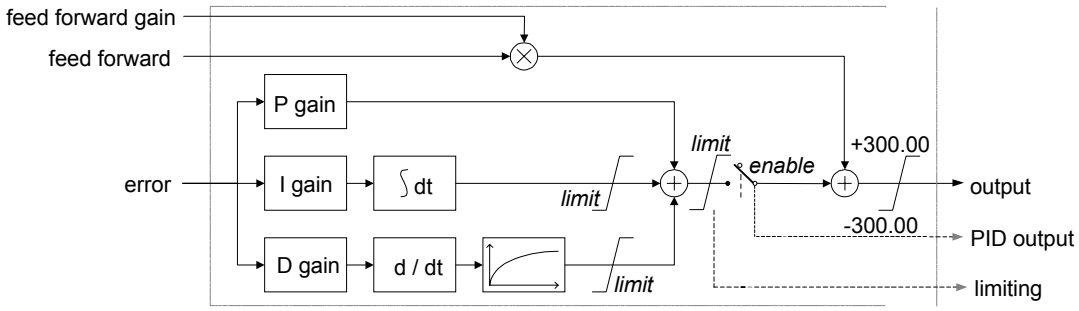
D FILTER TC *Range: 0.05 to 10.00 s*

In order to help attenuate high frequency noise on the derivative term, a first order lag has been provided. This parameter determines the filter time constant.

LIMIT *Range: 0.00 to 300.00%*

This parameter determines the maximum positive and negative excursion (Limit) of the PID output.

Functional Description



- Functions as P, PI, PD and PID with filtering.
- Single symetric limit on output.

PID Stage

The formula which describes the action of the PID in the 'S' domain is as follows:

$$PID = K_P + \frac{K_i}{S} + K_D \frac{S}{1 + S T_F}$$

where: K_P is the proportional gain
K_i is the integral gain
K_D is the derivative gain
T_F is the filter time constant

PHASE REGISTER

MMI Menu Map

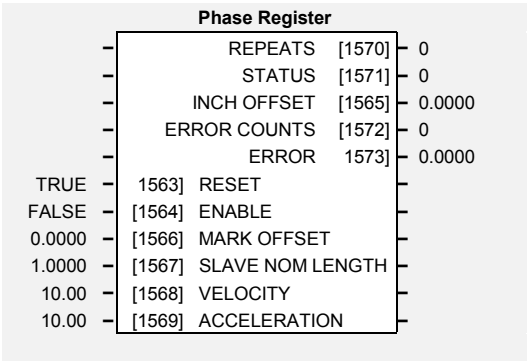
1 SETUP
2 WINDER
3 PHASE REGISTER
- RESET
- ENABLE
- MARK OFFSET
- SLAVE NOM LENGTH
- VELOCITY
- ACCELERATION
- REPEATS
- STATUS
- INCH OFFSET
- ERROR COUNTS
- ERROR

Designed for use with System Board, V1.2 only.

The register loop takes master and slave marks in and attempts to align them.

Corrections are applied to the slave access by means of trapezoidal move. In this way, the total error may be corrected within a repeat.

The rate at which the move takes place is set by the VELOCITY and ACCELERATION parameters.



Note: *The System Board version is identified by SYSTEM OPTION::VERSION.*

Parameter Descriptions

REPEATS

Range: —.

Diagnostic counter of valid mark master/slave pairs.

STATUS

Range: —.

Displays the current mode, RESET or ALIGN. When in RESET, the outputs and counters are reset. When in ALIGN, a correction is applied after each new pair of marks have arrived, assuming that the previous correction has been completed.

INCH OFFSET

Range: —.xxxx %

Offset as generated by INCH and MOVE blocks. This is summed with MARK OFFSET to calculate the real offset. INCH OFFSET is only zeroed with a RESET. INCH OFFSET is persistent and so its value will be retained on power-down.

ERROR COUNTS

Range: —.

Error, given in slave encoder counts.

ERROR

Range: —.00

Error, given in units (sometimes so small that it does not register, hence ERROR COUNTS)

RESET

Range: FALSE / TRUE

Disables the block and prevents any corrections taking place. Reset also resets the Inch Offset value leaving.

ENABLE

Range: FALSE / TRUE

When TRUE, corrections are made. When FALSE, corrections are prevented from taking place, but the diagnostic outputs are computed.

MARK OFFSET

Range: -100.0000 to 100.0000

Offsets the slave mark by this fixed distance. The total of the offset is the sum of the offset variable and internal Inch Offset variable. The Inch Offset is calculated from the output of the inch function block and the move function block. Inch offset and offset are both persistent.

SLAVE NOM LENGTH

Range: 0.0000 to 100.0000

The nominal repeat length in units. The nominal length is usually the slave length and is used to calculate the maximum allowed correction.

VELOCITY

Range: 0.10 to 300.00 %

The maximum velocity in % (of PHASE CONFIGURE::MAX SPEED) /s that the correction will be applied.

ACCELERATION

Range: 0.01 to 3000.00 %

The maximum acceleration/deceleration in % (of PHASE CONFIGURE::MAX SPEED) /s² that the correction will be applied.

Functional Description

The registration loop works using an Instantaneous Registration technique. The error in counts is measured between master and slave marks. This error is then added to the slave position to correct the error. The correction is applied using a move function to limit disturbance to the machine. Ideally the move should be completed before the next mark pair is due.

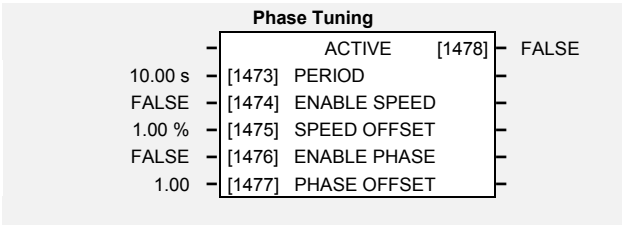
The correction is limited to ± nominal length / 2.

PHASE TUNING

MMI Menu Map

1 SETUP
2 SYSTEM BOARD
3 PHASE TUNING
- PERIOD
- ENABLE SPEED
- SPEED OFFSET
- ENABLE PHASE
- PHASE OFFSET
- ACTIVE

The Tuning function block provides a means of injecting a speed offset or a phase offset in the form of a square wave to assist the tuning of the speed and phase loops. It would be unusual for both tests to be active together.



Parameter Descriptions

PERIOD *Range: 0.10 to 300.00 s*

The square wave period in seconds.

ENABLE SPEED *Range: FALSE / TRUE*

Enables SPEED OFFSET to be added to the SPEED INPUT (of the Phase Control function block).

SPEED OFFSET *Range: -300.00 to 300.00 %*

The speed offset value.

ENABLE PHASE *Range: FALSE / TRUE*

Enable PHASE OFFSET to be added to the POSITION OUTPUT (of the Phase Control function block).

PHASE OFFSET *Range: -300.00 to 300.00*

Phase offset value. Small values should be used to prevent the torque loop from saturating.

ACTIVE *Range: FALSE / TRUE*

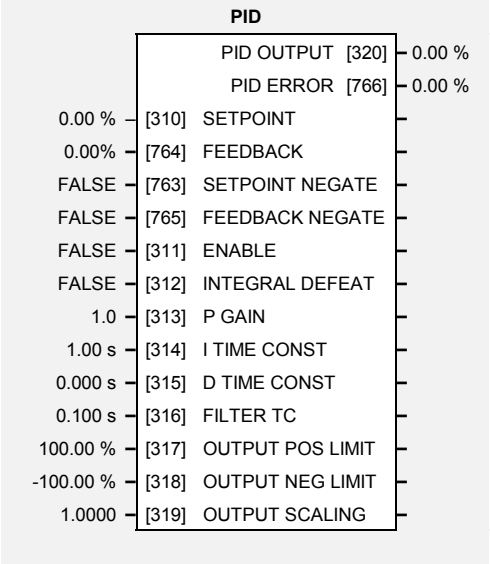
Diagnostic. TRUE when either ENABLE SPEED or ENABLE PHASE are active.

PID

MMI Menu Map

1 SETUP
2 SETPOINT FUNCS
3 PID
- SETPOINT
- FEEDBACK
- SETPOINT NEGATE
- FEEDBACK NEGATE
- ENABLE
- INTEGRAL DEFEAT
- GAIN
- I TIME CONSTANT
- D TIME CONSTANT
- FILTER TC
- OUTPUT POS LIMIT
- OUTPUT NEG LIMIT
- OUTPUT SCALING
- PID OUTPUT
- PID ERROR

This function block allows the drive to be used in applications requiring a trim to the setpoint, depending on feedback from an external measurement device. Typically this will be used for process control, i.e. pressure or flow.



Parameter Descriptions

SETPOINT *Range: -300.00 to 300.00 %*

An input to the PID block.

FEEDBACK *Range: -300.00 to 300.00 %*

An input to the PID block.

SETPOINT NEGATE *Range: FALSE / TRUE*

Changes the sign of SETPOINT.

FEEDBACK NEGATE *Range: FALSE / TRUE*

Changes the sign of FEEDBACK.

ENABLE *Range: FALSE / TRUE*

This parameter globally resets the PID output and integral term when FALSE. This parameter must be TRUE for the PID to operate.

INTEGRAL DEFEAT *Range: FALSE / TRUE*

This parameter resets the PID integral term when TRUE.

P GAIN *Range: 0.0 to 100.0*

This parameter is the true proportional gain of the PID controller. With a P gain of zero, the PID output would be zero.

I TIME CONST *Range: 0.01 to 100.00 s*

The integral time constant of the PID controller.

D TIME CONST *Range: 0.000 to 10.000 s*

The derivative time constant of the PID controller.

FILTER TC *Range: 0.000 to 10.000 s*

In order to help attenuate high frequency noise on the PID output, a first order output filter has been provided. This parameter determines the output filter time constant.

OUTPUT POS LIMIT *Range: 0.00 to 105.00 %*

This parameter determines the maximum positive excursion (Limit) of the PID output.

OUTPUT NEG LIMIT *Range: -105.00 to 0.00 %*

This parameter determines the maximum negative excursion (Limit) of the PID output.

OUTPUT SCALING *Range: -3.0000 to 3.0000*

This parameter represents an overall scaling factor which is applied after the PID positive and negative limit clamps.

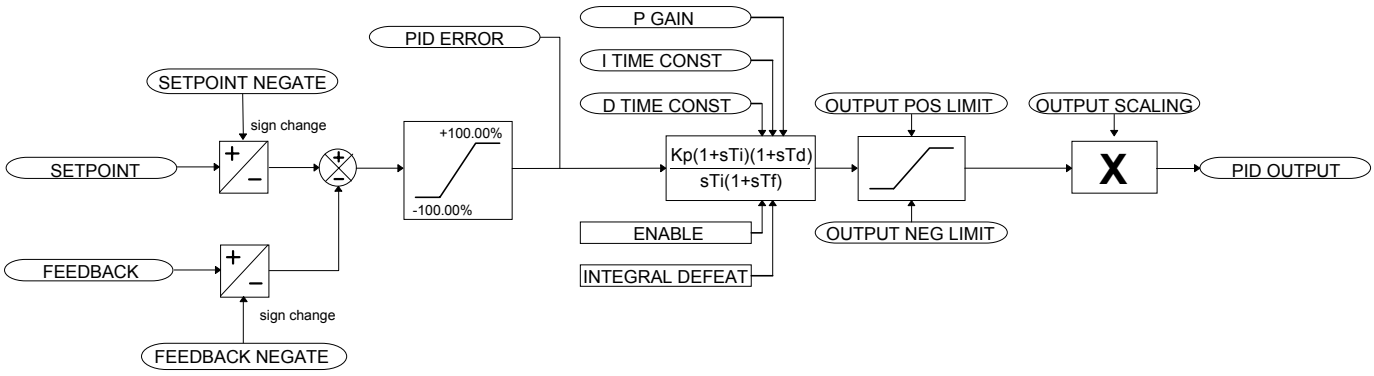
PID OUTPUT *Range: —.xx %*

The output of the PID function.

PID ERROR *Range: —.xx %*

The result of SETPOINT - FEEDBACK, clamped to between ± 100.00%.

Functional Description



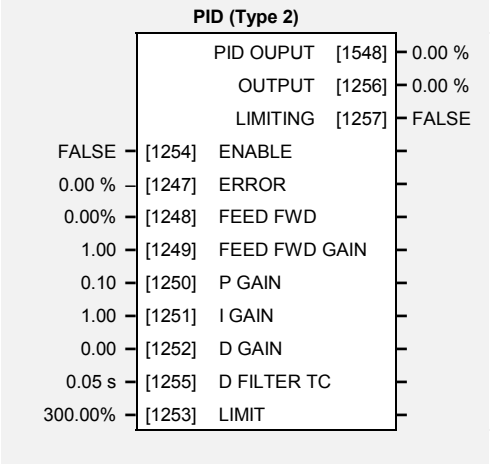
For an application that requires closed loop control, the error term may be derived from the setpoint and feedback using a value function block. This error term is then used by the PID. The output of the PID may be used to trim the demand setpoint via the SPEED TRIM parameter in the REFERENCE function block.

PID (TYPE 2)

MMI Menu Map

1 SETUP
2 SETPOINT FUNCS
3 PID (TYPE 2)
- ENABLE
- ERROR
- FEED FWD
- FEED FWD GAIN
- P GAIN
- I GAIN
- D GAIN
- D FILTER TC
- LIMIT
- OUTPUT
- PID OUTPUT
- LIMITING

This function block is an alternative, simplified version of the process PID controller. The function block is suitable for general closed-loop control and is typically used in phase control applications.



Parameter Descriptions

ERROR *Range: -300.00 to 300.00 %*

Error input to the PID (TYPE 2) block.

FEED FWD *Range: -300.00 to 300.00 %*

Feed forward input to the PID (TYPE 2) block.

FEED FWD GAIN *Range: -300.00 to 300.00*

Feed forward gain of the PID (TYPE 2) block.

P GAIN *Range: 0.00 to 100.00*

The proportional gain of the PID (TYPE 2) block.

I GAIN *Range: 0.00 to 100.00*

The integral gain of the PID (TYPE 2) block.

D GAIN *Range: 0.00 to 100.00*

The derivative gain of the PID (TYPE 2) block.

LIMIT *Range: 0.00 to 300.00%*

This parameter determines the maximum positive and negative excursion (Limit) of the PID output.

ENABLE *Range: FALSE / TRUE*

This parameter globally resets the PID output and integral term when FALSE.
This parameter must be TRUE for the PID to operate.

D FILTER TC *Range: 0.05 to 10.00 s*

In order to help attenuate high frequency noise on the derivative term, a first order lag has been provided. This parameter determines the filter time constant.

OUTPUT *Range: __.xx%*

Output of the PID (TYPE 2) function block.

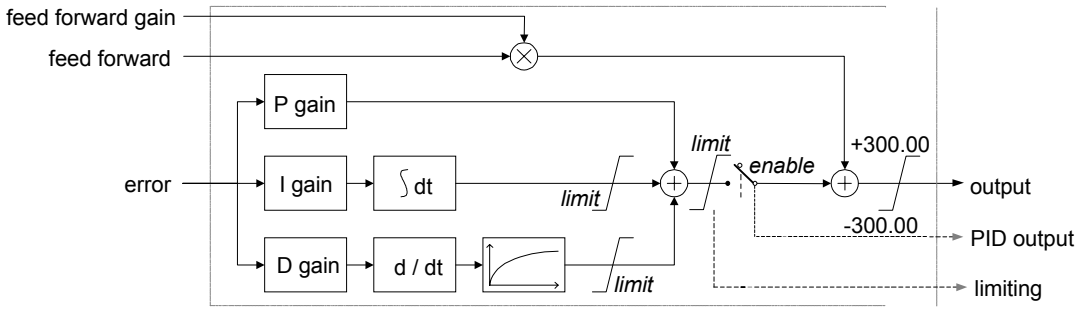
PID OUTPUT *Range: __.xx%*

Output of PID without FEED FWD

LIMITING *Range: FALSE / TRUE*

This output is TRUE if the OUTPUT is at the LIMIT value.

Functional Description



- Functions as P, PI, PD and PID with filtering.
- Single symetric limit on output.

PID Stage

The formula which describes the action of the PID in the 'S 'domain is as follows:

$$PID = K_P + \frac{K_i}{S} + K_D \frac{S}{1 + S T_F}$$

where: K_P is the proportional gain
K_i is the integral gain
K_D is the derivative gain
T_F is the filter time constant

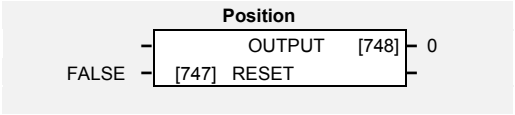
POSITION

MMI Menu Map

1 SETUP
2 MISCELLANEOUS
3 POSITION
- RESET
- OUTPUT

The Position function block counts the encoder position from reset.

The output will count 4 x the number of lines on the encoder per revolution.



Parameter Descriptions

RESET

Range: FALSE / TRUE

Resets the position count to zero when TRUE.

OUTPUT

Range: —.

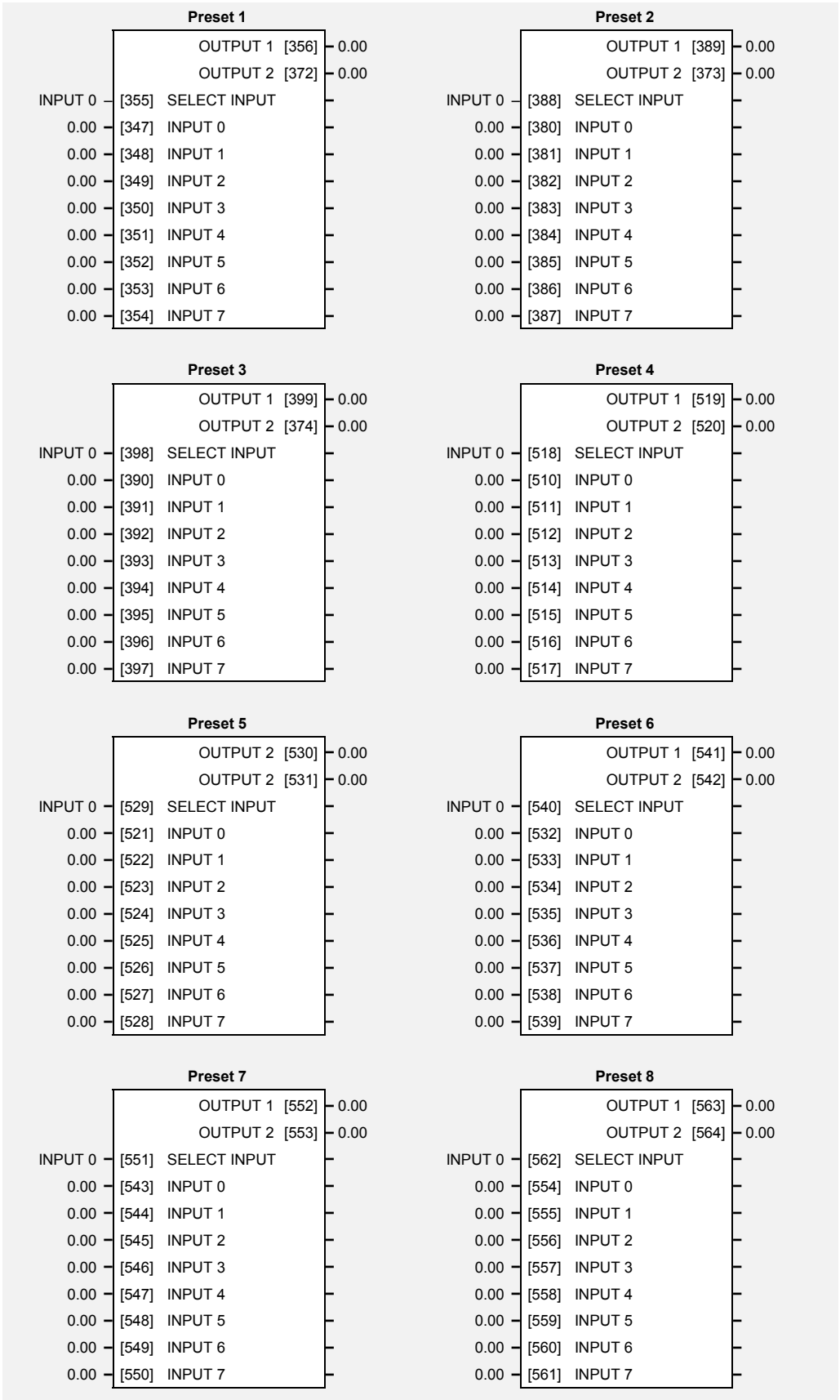
The number of counts on the encoder since the block was last reset. The output is preserved during power-down of the drive.

PRESET

MMI Menu Map

- 1 SETUP
- 2 SETPOINT FUNCS
- 3 PRESET
- 4 PRESET 1
- 4 PRESET 2
- 4 PRESET 3
- 4 PRESET 4
- 4 PRESET 5
- 4 PRESET 6
- 4 PRESET 7
- 4 PRESET 8
  - SELECT INPUT
  - INPUT 0
  - INPUT 1
  - INPUT 2
  - INPUT 3
  - INPUT 4
  - INPUT 5
  - INPUT 6
  - INPUT 7
  - OUTPUT 1
  - OUTPUT 2

The drive has eight Preset function blocks. They are used to select a value from one of eight inputs, depending on the value of another input. A second output is provided to allow the block to be used as two banks of four inputs.



Parameter Descriptions

SELECT INPUT *Range: Enumerated - see below*

Determines which of the inputs is routed to OUTPUT 1 . In addition, if SELECT INPUT is in the range 0 to 3, INPUT 4 to INPUT 7 respectively is routed to OUTPUT 2.

Enumerated Value : *Select Input*

0 : INPUT 0
1 : INPUT 1
2 : INPUT 2
3 : INPUT 3
4 : INPUT 4
5 : INPUT 5
6 : INPUT 6
7 : INPUT 7

INPUT 0 TO INPUT 7 *Range: -300.00 to 300.00*

Inputs to the Preset block.

OUTPUT 1 *Range: —.xx*

Selected input.

OUTPUT 2 *Range: —.xx*

Selected input (if SELECT INPUT is in the correct range).

Functional Description

The Preset function block is a de-multiplexer.

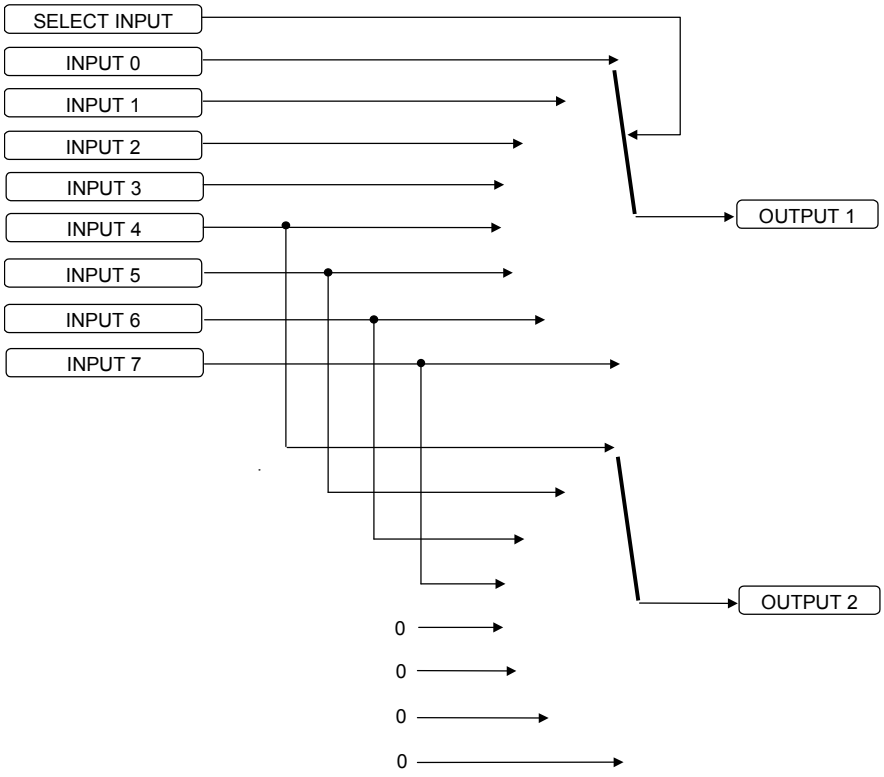
OUTPUT 1 and OUTPUT 2 return the values at selected inputs set by SELECT INPUT.

OUTPUT 2 returns the value of a different input to OUTPUT 1 , i.e:

if SELECT INPUT = 0 then OUTPUT 1 = INPUT 0, OUTPUT 2 = INPUT 4

if SELECT INPUT = 1 then OUTPUT 1 = INPUT 1, OUTPUT 2 = INPUT 5 etc.

When SELECT INPUT is set to 4, 5, 6 or 7, OUTPUT 2 will return a value of zero.



POWER LOSS CNTRL

MMI Menu Map

1 SETUP

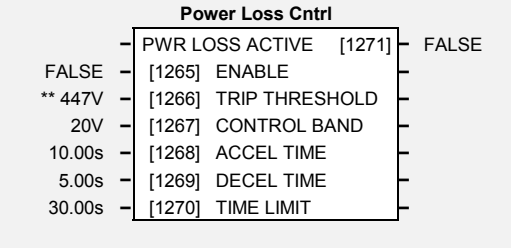
2 MOTOR CONTROL

POWER LOSS CNTRL

Designed for all Motor Control Modes.

This function block controls the behaviour of the drive during a power outage

When enabled, the drive attempts to keep the dc link high by regeneratively recovering the kinetic energy in the motor load in the event of mains supply loss.



This is achieved by ramping the speed setpoint to zero during the power outage. If during the outage the supply returns, the speed setpoint is automatically ramped back to the speed setpoint.

When disabled, the drive will trip on UNDERVOLTS if the mains supply is removed.

Parameter Descriptions

ENABLE *Range: FALSE / TRUE*

When TRUE, the Power Loss Ride-Through functionality is enabled.

TRIP THRESHOLD *Range: 0V to 1000V*

Determines the dc link volts at which the Power Loss Ride-Through sequence is triggered.

CONTROL BAND *Range: 0V to 1000V*

Sets the dc link voltage above the TRIP THRESHOLD at which the setpoint Ramp to Stop is paused. If the dc link volts remain above this level for a period greater than 500ms, the setpoint is ramped back to the speed demand.

ACCEL TIME *Range: 0.01 to 300.00s*

Determines the time in which the speed setpoint is ramped back to the speed demand. This is expressed as the time to ramp from zero to MAX SPEED.

DECEL TIME *Range: 0.01 to 300.00s*

Determines the time in which the speed setpoint is ramped to zero. This is expressed as the time to ramp from MAX SPEED to zero.

TIME LIMIT *Range: 0.00 to 300.00s*

Determines the maximum allowed time of the Power Loss Ride-Through sequence. Once timeout is reached, the drive is allowed to Coast to Stop and eventually trip on UNDERVOLTS.

PWR LOSS ACTIVE *Range: FALSE / TRUE*

This diagnostic is set to TRUE while the Power Loss Ride-Through sequence is active.

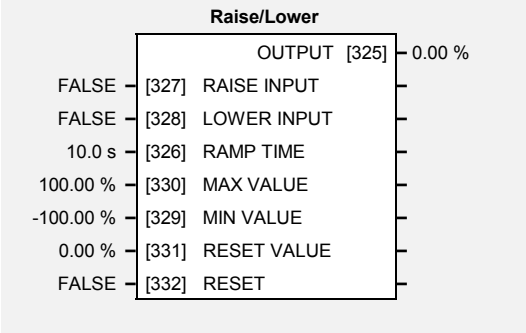
RAISE/LOWER

MMI Menu Map

1 SETUP
2 SETPOINT FUNCS
3 RAISE/LOWER
- RAISE INPUT
- LOWER INPUT
- RAMP TIME
- MAX VALUE
- MIN VALUE
- RESET VALUE
- RESET
- OUTPUT

This function block acts as an internal motorised potentiometer (MOP).

The OUTPUT is preserved during the power-down of the drive.



Parameter Descriptions

RAISE INPUT *Range: FALSE / TRUE*

When TRUE causes OUTPUT to ramp up.

LOWER INPUT *Range: FALSE / TRUE*

When TRUE causes OUTPUT to ramp down.

RAMP TIME *Range: 0.0 to 600.0 s*

Rate of change of the OUTPUT . Defined as time to change from 0.00% to 100.00% . Note that the raise and lower rates are always the same.

MAX VALUE *Range: -300.00 to 300.00 %*

The maximum value to which OUTPUT will ramp up to.

MIN VALUE *Range: -300.00 to 300.00 %*

The minimum value to which OUTPUT will ramp down to.

RESET VALUE *Range: -300.00 to 300.00 %*

The value the OUTPUT is set to when RESET is TRUE.

RESET *Range: FALSE / TRUE*

When TRUE, forces OUTPUT to track RESET VALUE .

OUTPUT *Range: —.xx %*

The ramped output. This parameter is persistent, that is, it is saved throughout a power failure.

Functional Description

The table below describes how OUTPUT is controlled by the RAISE INPUT, LOWER INPUT and RESET inputs.

RESET	RAISE INPUT	LOWER INPUT	Action
TRUE	Any	Any	OUTPUT tracks RESET VALUE
FALSE	TRUE	FALSE	OUTPUT ramps up to MAX VALUE at RAMP TIME
FALSE	FALSE	TRUE	OUTPUT ramps down to MIN VALUE at RAMP TIME
FALSE	FALSE	FALSE	OUTPUT not changed. *
FALSE	TRUE	TRUE	OUTPUT not changed. *

* If OUTPUT is greater than MAX VALUE the OUTPUT will ramp down to MAX VALUE at RAMP TIME. If OUTPUT is less than MIN VALUE the OUTPUT will ramp up to MIN VALUE at RAMP TIME.

IMPORTANT: If MAX VALUE is less than or equal to MIN VALUE, then OUTPUT is set to MAX VALUE.

REFERENCE

MMI Menu Map

1 SETUP

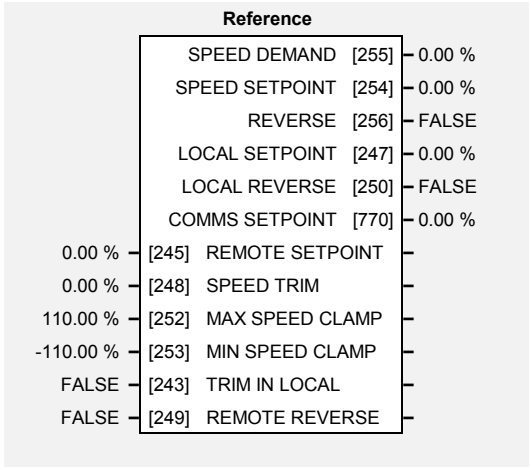
2 SEQ & REF

3 REFERENCE

- REMOTE SETPOINT
- SPEED TRIM
- MAX SPEED CLAMP
- MIN SPEED CLAMP
- TRIM IN LOCAL
- REMOTE REVERSE
- SPEED DEMAND
- SPEED SETPOINT
- REVERSE
- LOCAL SETPOINT
- LOCAL REVERSE
- COMMS SETPOINT

This function block holds all the parameters concerning the generation of the setpoint reference.

The generation of reference setpoint is described in the Installation Product Manual, Chapter 4: "Operating the Drive" - Control Philosophy.



Parameter Descriptions

REMOTE SETPOINT *Range: -300.00 to 300.00 %*

This is the target reference that the drive will ramp to in remote reference mode (not including trim), direction is taken from REMOTE REVERSE and the sign of REMOTE SETPOINT.

SPEED TRIM *Range: -300.00 to 300.00 %*

The trim is added to the ramp output in remote mode (or if TRIM IN LOCAL is TRUE) to form SPEED DEMAND . The trim is typically connected to the output of a PID in a closed loop system.

MAX SPEED CLAMP *Range: 0.00 to 110.00 %*

Maximum value for SPEED DEMAND.

MIN SPEED CLAMP *Range: -110.00 to 0.00 %*

Minimum value for SPEED DEMAND.

TRIM IN LOCAL *Range: FALSE / TRUE*

When TRUE, SPEED TRIM is always added to the ramp output. When FALSE, SPEED TRIM is added only to Remote mode.

REMOTE REVERSE *Range: FALSE / TRUE*

Demanded direction when in Remote Reference mode. This is usually connected directly to the Sequencing Logic.

SPEED DEMAND *Range: —.x %*

Indicates actual speed demand. This is the input to the frequency controller.

SPEED SETPOINT *Range: —.x %*

Indicates target speed. This will be equal to either LOCAL SETPOINT, REMOTE SETPOINT, JOG SETPOINT or COMMS SETPOINT. (Refer to the REFERENCE JOG function block for the JOG SETPOINT parameter).

REVERSE *Range: FALSE / TRUE*

Indicates demanded direction. This may not be the actual direction as no account of setpoint sign is taken.

LOCAL SETPOINT *Range: —.xx %*

Indicates the Keypad setpoint. It is always a positive quantity; saved on power down. Direction is taken from LOCAL REVERSE.

LOCAL REVERSE *Range: FALSE / TRUE*

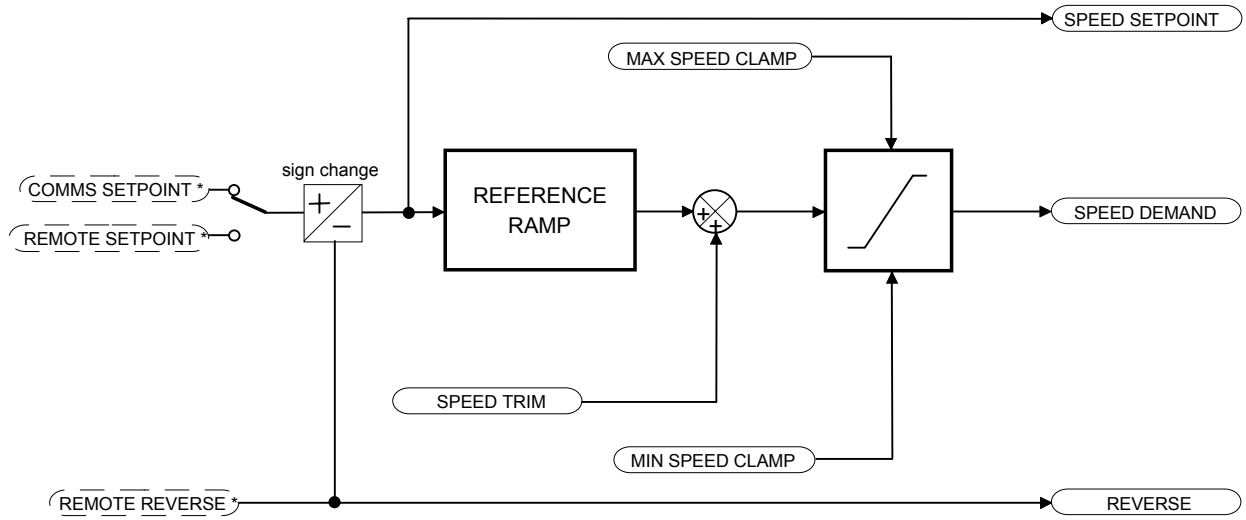
Indicates demanded direction in Local Reference mode, saved on power down.

COMMS SETPOINT *Range: —.xx %*

This setpoint is the target reference that the drive will ramp to in Remote Reference Comms mode (not including trim). The direction is always positive, i.e. forward.

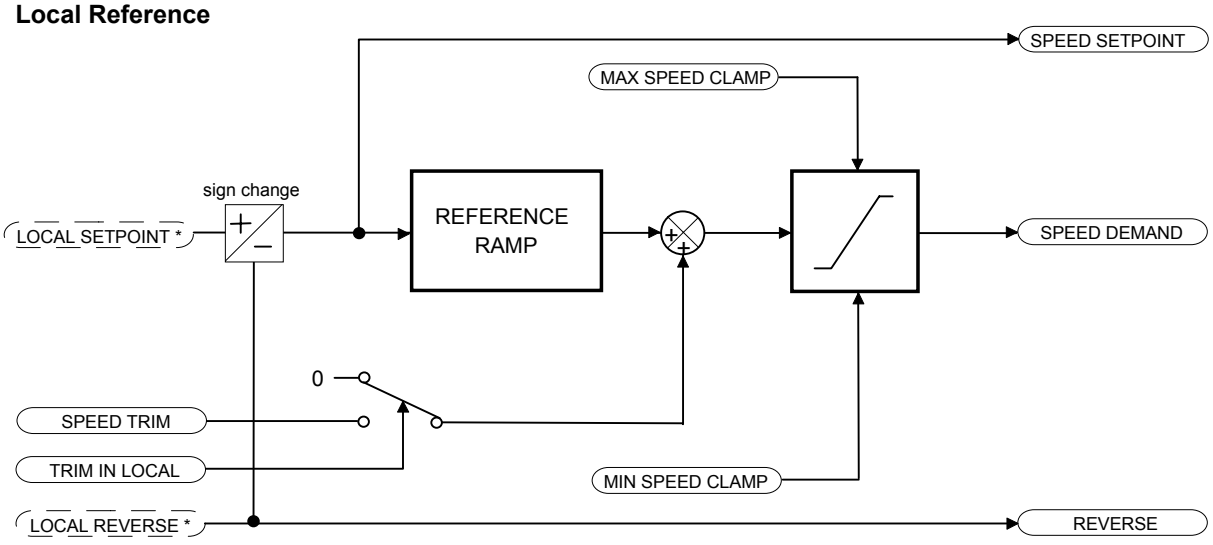
Functional Description

Remote Reference



* Set only from Comms using tag 269 (readable as tag 770 in block diagram)
REMOTE SETPOINT if Remote Reference Terminal mode
COMMS SETPOINT if Remote Reference Comms mode
(Mode is selectable in COMMS CONTROL block)

Local Reference



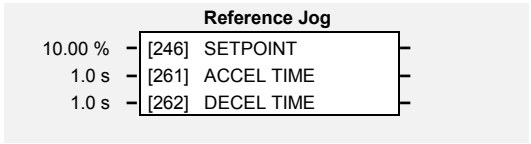
* Set only from the Operator Station

REFERENCE JOG

MMI Menu Map

1 SETUP
2 SEQ & REF
3 REFERENCE JOG
- SETPOINT
- ACCEL TIME
- DECEL TIME

This block holds all the parameters that concern the Jog functionality on the drive.



Parameter Descriptions

SETPOINT *Range: -100.00 to 100.00 %*

The setpoint is the target reference that the drive will ramp to.

ACCEL TIME *Range: 0.0 to 3000.0 s*

The jog mode acceleration time.

DECEL TIME *Range: 0.0 to 3000.0 s*

The jog mode deceleration time.

Functional Description

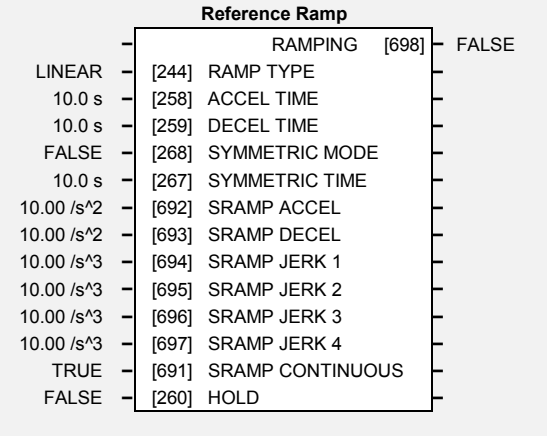
The REFERENCE JOG function block is used to configure the action of the drive when used in jog mode. The various operating modes are described in more detail in the Installation Product Manual, Chapter 4: “Operating the Drive” - The Start/Stop Mode Explained.

REFERENCE RAMP

MMI Menu Map

1 SETUP
2 SEQ & REF
3 REFERENCE RAMP
- RAMP TYPE
- ACCEL TIME
- DECEL TIME
- SYMMETRIC MODE
- SYMMETRIC TIME
- SRAMP ACCEL
- SRAMP DECEL
- SRAMP JERK 1
- SRAMP JERK 2
- SRAMP JERK 3
- SRAMP JERK 4
- SRAMP CONTINUOUS
- HOLD
- RAMPING

This function block forms part of the reference generation. It provides the facility to control the rate at which the drive will respond to a changing setpoint demand.



Parameter Descriptions

RAMP TYPE

Range: Enumerated - see below

Select the ramp type:

Enumerated Value : *Ramp Type*

0 : LINEAR
1 : S

ACCEL TIME

Range: 0.0 to 3000.0 s

The time that the drive will take to ramp the setpoint, from 0.00% to 100.00%.

DECEL TIME

Range: 0.0 to 3000.0 s

The time that the drive will take to ramp the setpoint, from 100.00% to 0.00%.

SYMETRIC MODE

Range: FALSE / TRUE

Select whether to use the ACCEL TIME and DECEL TIME pair of ramp rates, or to use the SYMETRIC RATE parameter to define the ramp rate for the drive.

SYMETRIC TIME

Range: 0.0 to 3000.0 s

The time that the drive will take to ramp from 0.00% to 100.00% and from 100.00% to 0.00% when SYMETRIC MODE is TRUE.

SRAMP ACCEL

Range: 0.00 to 100.00 /s²

Sets the acceleration rate in units of percent per second², i.e. if the full speed of the machine is 1.25m/s then the acceleration will be:

1.25 x 75.00% = 0.9375m/s²

SRAMP DECEL

Range: 0.00 to 100.00 /s²

This functions in the same way as SRAMP ACCEL above.

SRAMP JERK 1 *Range: 0.00 to 100.00 %*

Rate of change of acceleration for the first segment of the curve in units per second³, i.e. if the full speed of the machine is 1.25m/s then the acceleration will be:
1.25 x 50.00% = 0.625m/s³

SRAMP JERK 2 *Range: 0.00 to 100.00 %*

Rate of change of acceleration in units of percent per second³ for segment 2.

SRAMP JERK 3 *Range: 0.00 to 100.00 %*

Rate of change of acceleration in units of percent per second³ for segment 3.

SRAMP JERK 4 *Range: 0.00 to 100.00 %*

Rate of change of acceleration in units of percent per second³ for segment 4.

SRAMP CONTINUOUS *Range: FALSE / TRUE*

When TRUE, and S ramp is selected in RAMP TYPE, forces a smooth transition if the speed setpoint is changed when ramping. The curve is controlled by the SRAMP ACCEL and SRAMP JERK 1 to SRAMP JERK 4 parameters. When FALSE, there is an immediate transition from the old curve to the new curve.

RAMP HOLD *Range: FALSE / TRUE*

When TRUE the output of the ramp is held at its last value.

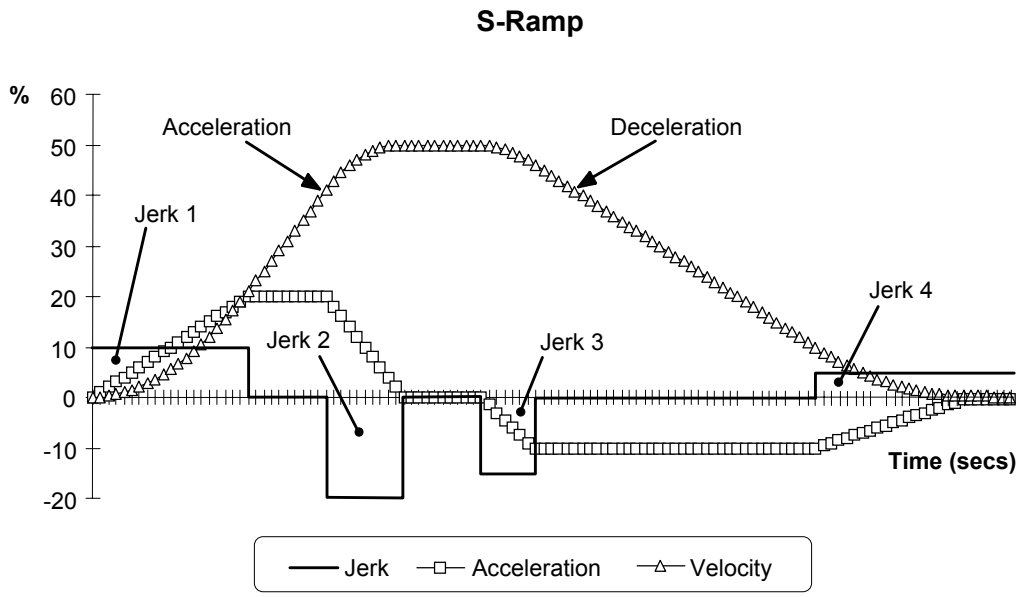
RAMPING *Range: FALSE / TRUE*

Set TRUE when ramping.

Functional Description

Installation Product Manual, Chapter 4: "Operating the Drive" - Starting and Stopping Methods, describes the use of the system ramp.

The ramp output takes the form shown below.



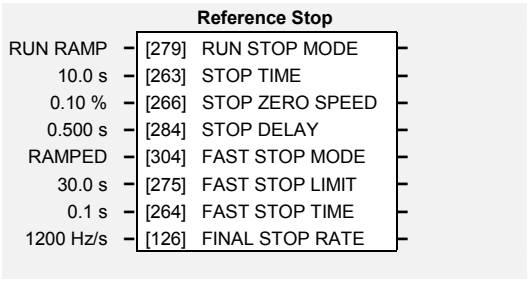
REFERENCE STOP

MMI Menu Map

1 SETUP
2 SEQ & REF
3 REFERENCE STOP
- RUN STOP MODE
- STOP TIME
- STOP ZERO SPEED
- STOP DELAY
- FAST STOP MODE
- FAST STOP LIMIT
- FAST STOP TIME
- FINAL STOP RATE

This function block holds all the parameters concerning the stopping method of the drive.

The stopping methods of the drive are described in more detail in the Installation Product Manual, Chapter 4: “Operating the Drive” - Starting and Stopping Methods..



Parameter Descriptions

RUN STOP MODE

Range: Enumerated - see below

Selects stopping mode that the controller will use once the run command has been removed. The choices are:

Enumerated Value : *Stopping Mode*

0 : RUN RAMP
1 : COAST
2 : DC INJECTION
3 : STOP RAMP

When RUN RAMP is selected the drive will decelerate using the reference ramp deceleration time, provided it is non zero. When COAST is selected the motor will free-wheel. When DC INJECTION is selected the motor is stopped by applying dc current. When STOP RAMP is selected the motor will decelerate in STOP TIME.

STOP TIME

Range: 0.0 to 600.0 s

Rate at which the demand is ramped to zero after the ramp has been quenched.

STOP ZERO SPEED

Range: 0.00 to 100.00 %

Threshold for zero speed detection used by stop sequences.

STOP DELAY

Range: 0.000 to 30.000 s

Sets the time at which the drive holds zero speed before quenching after a normal stop or a jog stop. This may be particularly useful if a mechanical brake requires time to operate at zero speed, or for jogging a machine to position.

FAST STOP MODE

Range: Enumerated - see below

Selects stopping mode used during a fast stop, two options ramped or coast.

Enumerated Value : *Stopping Mode*

0 : RAMPED
1 : COAST

FAST STOP LIMIT

Range: 0.0 to 3000.0 s

Maximum time that the drive will try to Fast Stop, before quenching.

FAST STOP TIME

Range: 0.0 to 600.0 s

Rate at which the SPEED DEMAND is ramped to zero (see REFERENCE function block)

FINAL STOP RATE

Range: 12 to 4800 Hz/s

Rate at which any internally generated setpoint trims are removed. For example, the trim due to the slip compensation block.

SEQUENCING LOGIC

MMI Menu Map

1 SETUP

2 SEQ & REF

3 SEQUENCING LOGIC

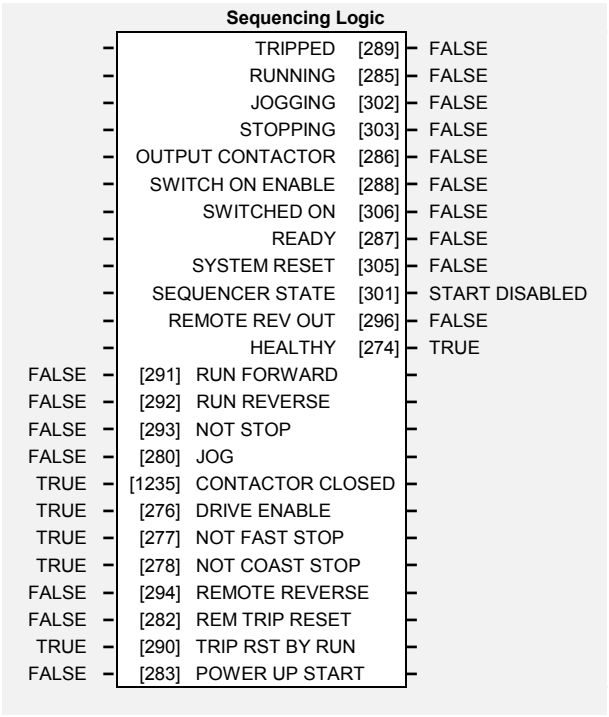
- RUN FORWARD
- RUN REVERSE
- NOT STOP
- JOG
- CONTACTOR CLOSED
- DRIVE ENABLE
- NOT FAST STOP
- NOT COAST STOP
- REMOTE REVERSE
- REM TRIP RESET
- TRIP RST BY RUN
- POWER UP START
- TRIPPED
- RUNNING
- JOGGING
- STOPPING
- OUTPUT CONTACTOR
- SWITCH ON ENABLE
- SWITCHED ON
- READY
- SYSTEM RESET
- SEQUENCER STATE
- REMOTE REV OUT
- HEALTHY

This function block contains all the parameters relating to the sequencing (start and stop) of the drive.

Before the drive will respond to the RUN FWD, RUN REV or JOG parameters (cause the drive to run or jog), the parameters DRIVE ENABLE, NOT FAST STOP and NOT COAST STOP need to be set to TRUE. In addition, the drive needs to be healthy (HEALTHY is TRUE). The drive will only respond to RUN FWD, RUN REV and JOG if the drive is in the Remote Sequencing mode.

If RUN FWD and RUN REV are TRUE, both are ignored and the drive will stop.

A detailed description of the sequencer states, as indicated by the MAIN SEQ STATE parameter, is described in Chapter 4. The sequence logic is described in the Installation Product Manual, Chapter 4: “Operating the Drive” - Selecting Local or Remote Control.



Parameter Descriptions

RUN FWD *Range: FALSE / TRUE*

Setting this parameter to TRUE causes the drive to run in the forward direction.

RUN REV *Range: FALSE / TRUE*

Setting this parameter to TRUE causes the drive to run in the reverse direction.

NOT STOP *Range: FALSE / TRUE*

Setting this parameter TRUE will latch the RUN FWD or RUN REV commands. Once latched, they can be reset to FALSE and the drive will continue to run. Setting NOT STOP to FALSE causes the run commands to be unlatched.

JOG *Range: FALSE / TRUE*

Setting this parameter TRUE causes the drive to run at the speed set by JOG SETPOINT (refer to the REFERENCE JOG function block). Once jogging, setting JOG to FALSE causes the drive to ramp to zero.

CONTACTOR CLOSED *Range: FALSE / TRUE*

Feedback used to indicate that the external contactor has been closed. It must be TRUE for the sequencer to proceed from the SWITCHED ON state to the READY STATE, refer to SEQUENCER STATE.

DRIVE ENABLE *Range: FALSE / TRUE*

This provides a means of electronically inhibiting drive operation. Whilst running, setting this parameter to FALSE disables the drive operation and causes the motor to coast.

NOT FAST STOP *Range: FALSE / TRUE*

Whilst running or jogging, setting this parameter to FALSE causes the drive to ramp to zero. The rate is set by FAST STOP RATE in the STOP function block. The action of setting NOT FAST STOP to TRUE is latched. The drive cannot be restarted until fast stop is completed.

NOT COAST STOP *Range: FALSE / TRUE*

Setting this parameter to FALSE disables the drive operation and causes the motor to coast. The action of setting this parameter to TRUE is latched. The drive can not be restarted until the coast stop is completed.

REMOTE REVERSE *Range: FALSE / TRUE*

For remote setpoints, setting this parameter TRUE inverts the demanded direction of motor rotation.

REM TRIP RESET *Range: FALSE / TRUE*

On a transition to TRUE, this input clears latched trips.

TRIP RST BY RUN *Range: FALSE / TRUE*

This allows the rising edge of run command to clear latched trips.

POWER UP START *Range: FALSE / TRUE*

If TRUE, this allows the drive to go directly to run mode if in remote and a run command is present. If FALSE, a low to high transition of the run command is required.

TRIPPED *Range: FALSE / TRUE*

Indicates that there is a latched trip present.

RUNNING *Range: FALSE / TRUE*

Indicates that that the drive is in the enabled state.

JOGGING *Range: FALSE / TRUE*

Indicates that the drive is in the JOG mode.

STOPPING *Range: FALSE / TRUE*

Indicates that the drive is stopping.

OUTPUT CONTACTOR *Range: FALSE / TRUE*

Output to be used to drive an external contactor in the motor output. This contactor is normally closed unless a Trip condition has occurred or the drive goes into the re-configuration mode.

SWITCH ON ENABLE *Range: FALSE / TRUE*

Sometimes referred to as READY TO SWITCH ON, this parameter indicates that the drive will accept a run command.

SWITCHED ON *Range: FALSE / TRUE*

Run accepted. Waiting for CONTACTOR CLOSED and deflux to be completed

READY *Range: FALSE / TRUE*

Indicates that the drive's power stack is operable and the drive will run if enabled.

SYSTEM RESET *Range: FALSE / TRUE*

TRUE for a single block diagram execution cycle after the drive enters either RUN or JOG mode.

SEQUENCER STATE *Range: Enumerated - see below*

This parameter indicates the current sequencing state:

Enumerated Value : *State*

0 : START DISABLED
1 : START ENABLED
2 : SWITCHED ON
3 : READY
4 : ENABLED
5 : F-STOP ACTIVE
6 : TRIP ACTIVE
7 : TRIPPED

Refer to Chapter 4: "Sequencing Logic States".

REMOTE REV OUT *Range: FALSE / TRUE*

This parameter indicates the current state of remote direction and RUN REV. Note - this is the demanded direction, not the actual direction.

HEALTHY *Range: FALSE / TRUE*

Set FALSE when the drive trips, and set TRUE when the run command is removed.

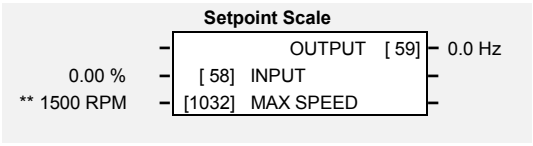
SETPOINT SCALE

MMI Menu Map

1 SETUP
2 MOTOR CONTROL
3 SETPOINT SCALE
- INPUT
- MAX SPEED
- OUTPUT

Designed for all Motor Control Modes.

This function block simply converts the way the setpoint is expressed from being a percentage of the MAX SPEED to an absolute frequency in electrical Hertz.



Parameter Descriptions

INPUT *Range: -300.00 to 300.00 %*

The setpoint delivered by the re-wired function block portion of the drive's application.

MAX SPEED *Range: 0 to 32000 rpm*

The physical motor speed equivalent to a setpoint demand of 100.00%. Note that although INPUT may be set between ±300%, the input value is clamped before being used to ±110%. Hence, the greatest input speed which can be demanded is ±110% of MAX SPEED.

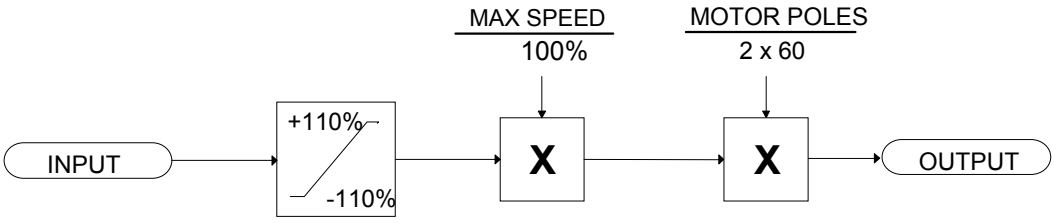
Refer to Chapter 2: "Parameter Specification" - Frequency Dependent Defaults

OUTPUT *Range: —.x %*

$$\text{Output} = \frac{\text{max speed x input}}{100\%} \times \frac{\text{number of motor poles}}{2} \times \frac{1}{60}$$

Functional Description

The setpoint scale block changes the format in which the setpoint is expressed. The function blocks on the input side of this block process the setpoint as a percentage of maximum RPM. The function blocks on the output side of this block process the setpoint as an absolute frequency of rotation of the electric field in Hertz.



SKIP FREQUENCIES

MMI Menu Map

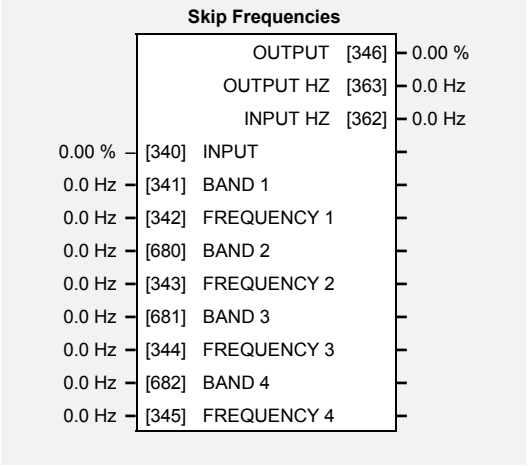
1 SETUP

2 SETPOINT FUNCS

3 SKIP FREQUENCIES

- INPUT
- BAND 1
- FREQUENCY 1
- BAND 2
- FREQUENCY 2
- BAND 3
- FREQUENCY 3
- BAND 4
- FREQUENCY 4
- OUTPUT
- OUTPUT Hz
- INPUT Hz

This function block may be used to prevent the drive operating at frequencies that cause mechanical resonance in the load.



Parameter Descriptions

INPUT *Range: -300.00 to 300.00 %*

The value of the block input in %.

BAND 1 *Range: 0.0 to 480.0 Hz*

The width of each skip band in Hz.

FREQUENCY 1 *Range: 0.0 to 480.0 Hz*

This parameter contains the centre frequency of each skip band in Hz.

BAND 2 *Range: 0.0 to 480.0 Hz*

The width of each skip band in Hz.

FREQUENCY 2 *Range: 0.0 to 480.0 Hz*

This parameter contains the centre frequency of each skip band in Hz.

BAND 3 *Range: 0.0 to 480.0 Hz*

The width of each skip band in Hz.

FREQUENCY 3 *Range: 0.0 to 480.0 Hz*

This parameter contains the centre frequency of each skip band in Hz.

BAND 4 *Range: 0.0 to 480.0 Hz*

The width of each skip band in Hz.

FREQUENCY 4 *Range: 0.0 to 480.0 Hz*

This parameter contains the centre frequency of each skip band in Hz.

OUTPUT *Range: —.xx %*

Diagnostic on the output of the function block in %

OUTPUT HZ *Range: —.x Hz*

Diagnostic on the output of the function block in Hz

INPUT HZ *Range: —.x Hz*

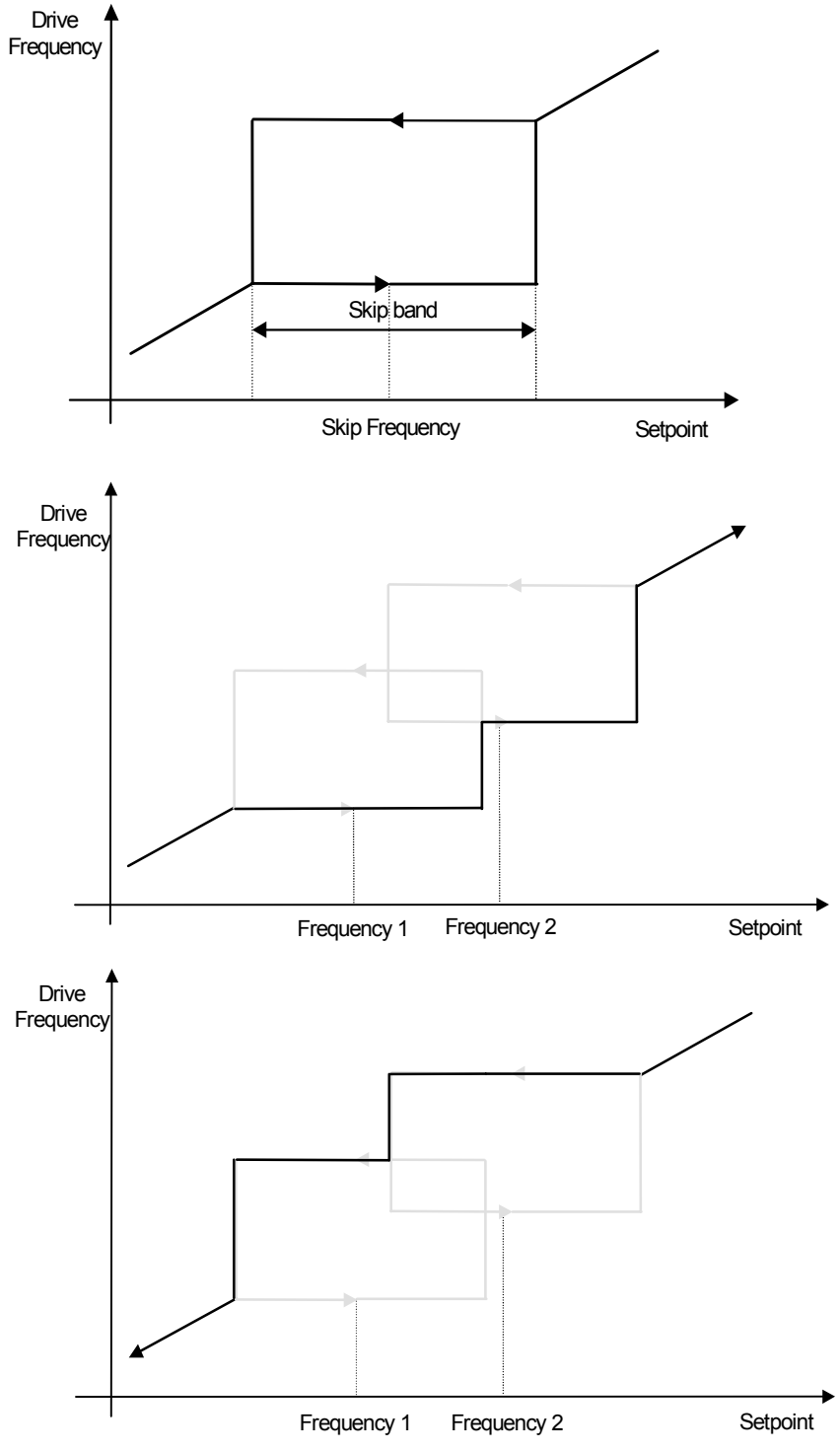
Diagnostic on the input of the function block in Hz

Functional Description

Four programmable skip frequencies are available to avoid resonances within the mechanical system. Enter the value of frequency that causes the resonance using the "FREQUENCY" parameter and then programme the width of the skip band using its "BAND" parameter. The drive will then avoid sustained operation within the forbidden band as shown in the diagram. The skip frequencies are symmetrical and thus work in forward and reverse.

Note: *Setting the FREQUENCY to 0 disables the corresponding band.*
Setting the BAND to 0 causes the value of BAND 1 to be used for this band.

The behaviour of this function block is illustrated below.



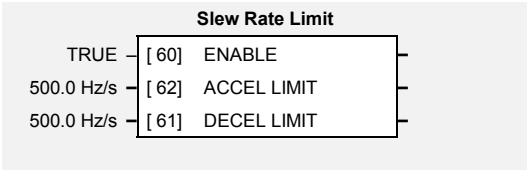
SLEW RATE LIMIT

MMI Menu Map

1 SETUP
2 MOTOR CONTROL
3 SLEW RATE LIMIT
- ENABLE
- ACCEL LIMIT
- DECEL LIMIT

Designed for all Motor Control Modes.

This function block prevents over-current and over-voltage faults occurring due to a rapidly changing setpoint.



Parameter Descriptions

ENABLE *Range: FALSE / TRUE*

When this parameter is FALSE, this function block is disabled and the setpoint is unaffected by this function block.

ACCEL LIMIT *Range: 1.0 to 1200.0 Hz/s*

The maximum rate at which the setpoint may accelerate away from zero.

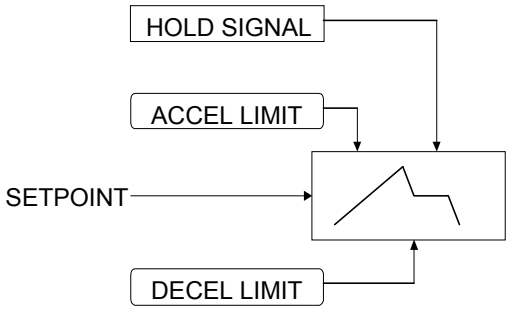
DECEL LIMIT *Range: 1.0 to 1200.0 Hz/s*

The maximum rate at which the setpoint may decelerate towards zero.

Functional Description

The SLEW RATE LIMIT block obtains the setpoint from the output of the application, correctly scaled by the SETPOINT SCALE block. The rate of change limits are applied and the setpoint is then passed on for further processing.

When the braking block determines that the internal dc link voltage is too high it issues a Hold signal. This causes the SLEW RATE LIMIT block to hold the setpoint at its current value. This typically lasts for only 1ms, time for the excess energy to be dumped into the braking resistor.



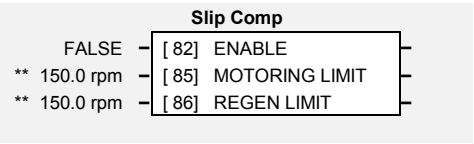
SLIP COMP

MMI Menu Map

1 SETUP
2 MOTOR CONTROL
3 SLIP COMP
- ENABLE
- MOTORING LIMIT
- REGEN LIMIT

Designed for VOLTS/Hz motor Control Mode.

The slip compensation function block allows the drive to maintain motor speed in the presence of load disturbances.



Parameter Descriptions

ENABLE *Range: FALSE / TRUE*

For the slip compensation to be operational this must be TRUE.

MOTORING LIMIT *Range: 0.0 to 600.0 rpm*

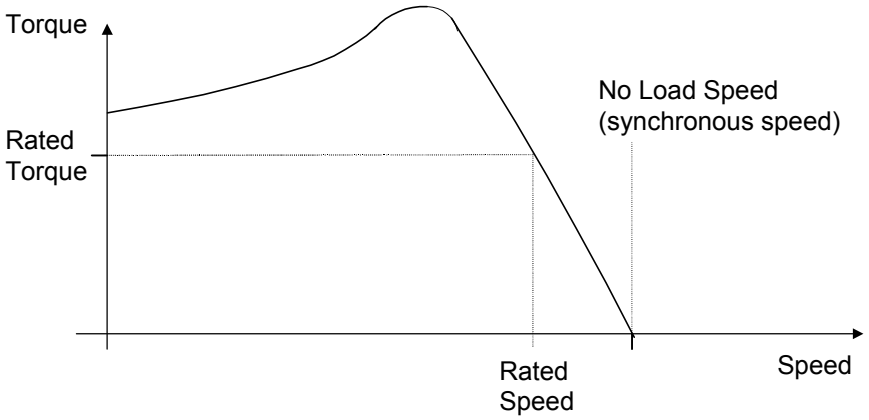
The maximum trim that will be produced by the slip compensation block when the motor is driving the load (motoring).

REGEN LIMIT *Range: 0.0 to 600.0 rpm*

The maximum trim that will be produced by the slip compensation block when the motor is being driven by the load, (regenerating).

Functional Description

Based on the rated speed, the no load speed and the rated load of the motor, the slip compensation block adjusts the demand frequency to compensate for any speed slippage resulting from the load.



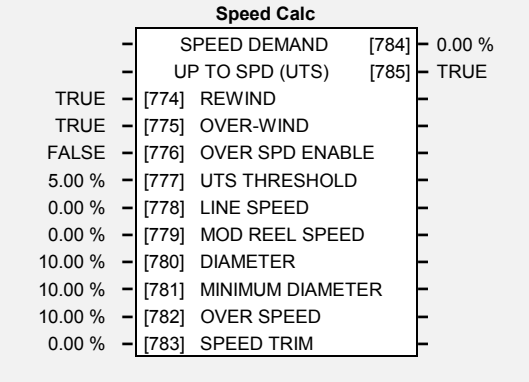
SPEED CALC

MMI Menu Map

1 SETUP
2 WINDER
3 SPEED CALC
- REWIND
- OVER-WIND
- OVER SPD ENABLE
- UTS THRESHOLD
- LINE SPEED
- MOD REEL SPEED
- DIAMETER
- MINIMUM DIAMETER
- OVER SPEED
- SPEED TRIM
- SPEED DEMAND
- UP TO SPD (UTS)

In this function block line speed is summed with the over speed input (only if in open-loop mode) and the closed loop trim (for closed loop winders) from the PID output SPEED TRIM. The combined speed demand is divided by the diameter to produce the SPEED DEMAND to the drive.

Refer to Macro 4.



Parameter Descriptions

REWIND *Range: FALSE / TRUE*

The Rewind mode is selected when TRUE.

OVER-WIND *Range: FALSE / TRUE*

The Overwind mode is selected when TRUE.

OVER SPD ENABLE *Range: FALSE / TRUE*

When TRUE, Over Speed is enabled which saturates the speed loop.

UTS THRESHOLD *Range: 0.00 to 110.00 %*

Threshold level which defines the state of UP TO SPD (UTS).

LINE SPEED *Range: 0.00 to 110.00 %*

Actual line speed (from the DIAMETER CALC function block).

MOD REEL SPEED *Range: 0.00 to 110.00 %*

The absolute value of the WINDER SPEED (from the DIAMETER CALC function block).

DIAMETER *Range: 0.00 to 110.00 %*

The diameter input (from the DIAMETER CALC function block).

MINIMUM DIAMETER *Range: 0.00 to 120.00 %*

The minimum diameter input (from the DIAMETER CALC function block).

OVER SPEED *Range: -100.00 to 120.00 %*

A value of over speed which, when added to the calculated speed, will saturate the speed loop.

SPEED TRIM *Range: -100.00 to 110.00 %*

An additional speed loop input.

SPEED DEMAND *Range: —.00 %*

The speed demand output.

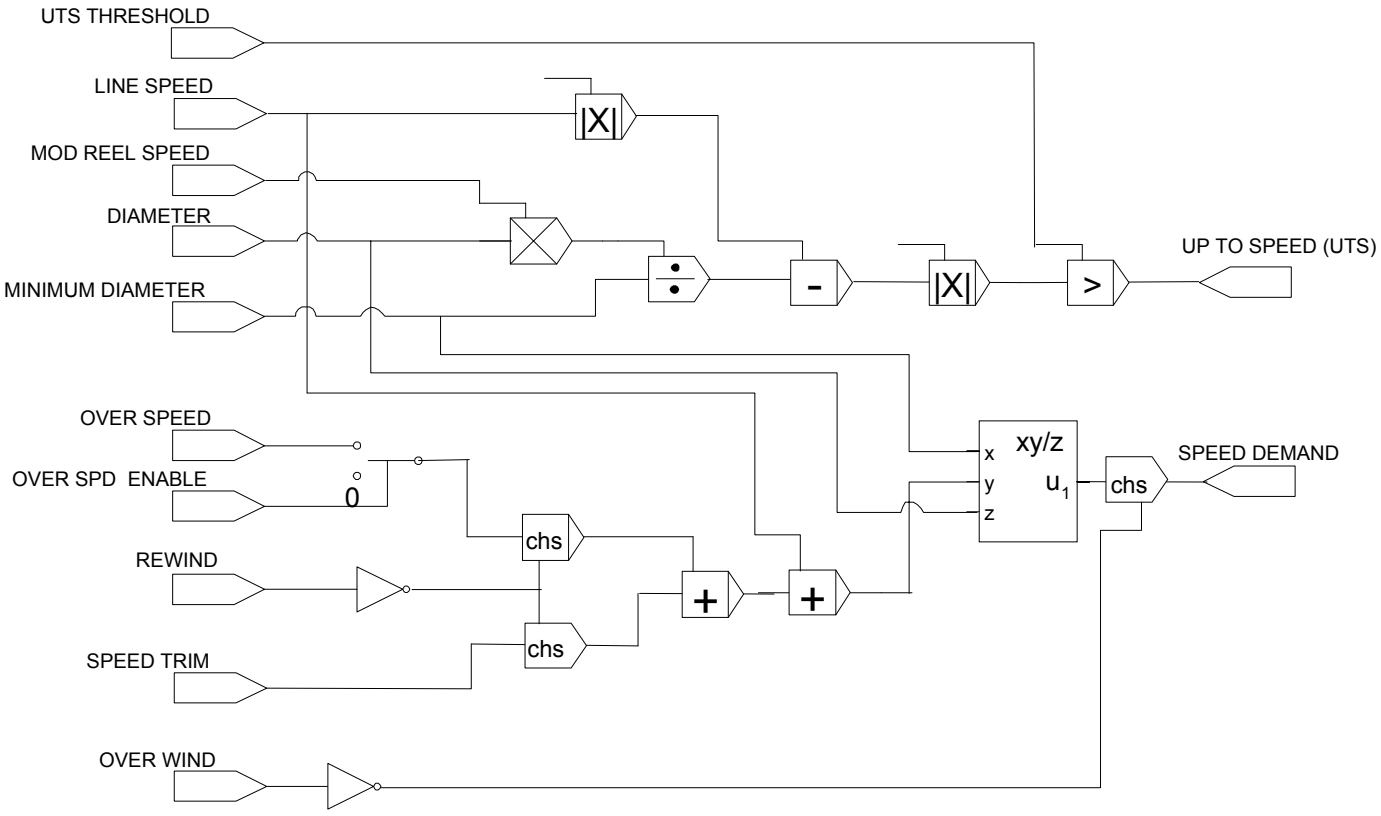
UP TO SPD (UTS) *Range: FALSE / TRUE*

The up-to-speed detector compares LINE SPEED with MOD REEL SPEED multiplied by DIAMETER. When they are the same, within the UTS THRESHOLD, then UP TO SPD (UTS) is TRUE.

Functional Description

The speed demand calculator takes its reference from the line speed setpoint.

The polarity is determined by OVER-WIND , this is positive for Over (OVER-WIND = TRUE).



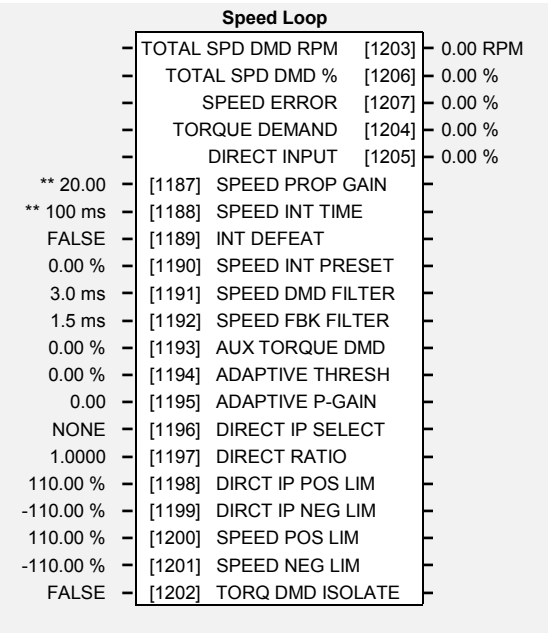
SPEED LOOP

MMI Menu Map

1 SETUP
2 MOTOR CONTROL
3 SPEED LOOP
- SPEED PROP GAIN
- SPEED INT TIME
- INT DEFEAT
- SPEED INT PRESET
- SPEED DMD FILTER
- SPEED FBK FILTER
- AUX TORQUE DMD
- ADAPTIVE THRESH
- ADAPTIVE P-GAIN
- DIRECT IP SELECT
- DIRECT RATIO
- DIRCT IP POS LIM
- DIRCT IP NEG LIM
- SPEED POS LIM
- SPEED NEG LIM
- TORQ DMD ISOLATE
- TOTAL SPEED RPM
- TOTAL SPEED %
- SPEED ERROR
- TORQUE DEMAND
- DIRECT INPUT

Designed for SENSORLESS VEC and CLOSED-LOOP VEC Motor Control Modes.

This function block controls the speed of the motor by comparing the actual speed to the demanded speed, and applying more or less torque in response to the error.



Fixed Inputs and Outputs

Speed Demand

This is connected to the output of the SETPOINT SCALE function block.

Speed Feedback

The speed feedback is derived from the encoder when the Control Mode is configured as CLOSED-LOOP VEC. When configured as SENSORLESS VEC, the speed feedback is calculated from the voltages and currents in the motor.

Torque Demand

The output of the SPEED LOOP function block is a torque demand. This torque demand is passed on to the TORQUE LIMIT function block, which causes the torque to be generated in the motor.

Parameter Descriptions

SPEED PROP GAIN *Range: 0.00 to 300.00*

Sets the proportional gain of the loop.
Speed error (revolutions per second) x proportional gain = torque percent.

SPEED INT TIME *Range: 1 to 15000 ms*

This is the integral time constant of the speed loop. A speed error which causes the proportional term to produce a torque demand T, will cause the integral term to also ramp up to a torque demand T after a time equal to “speed int time”.

INT DEFEAT *Range: FALSE / TRUE*

When TRUE, the integral term does not operate.

SPEED INT PRESET *Range: -500.00 to 500.00 %*

The integral term will be preset to this value when the drive starts.

SPEED DMD FILTER *Range: 0.0 to 14.0 ms*

The speed demand is filtered to reduce ripple. The filter is first order with time constant equal to the value of this parameter.

SPEED FBK FILTER *Range: 0.0 to 15.0 ms*

The speed feedback is filtered to reduce ripple, such as that caused by low line count encoders. The filter is first order with time constant equal to the value of this parameter.

AUX TORQUE DMD *Range: -300.00 to 300.00 %*

When the drive is operating in speed control mode, the value of this parameter is added on to the torque demand produced by the speed loop PI. When the drive is operating in torque control mode (i.e. “torque demand isolate is TRUE) the speed loop PI does not operate, and the torque demand becomes the sum of this parameter plus the DIRECT INPUT (if selected).

ADAPTIVE THRESH *Range: 0.00 to 10.00 %*

This function is not implemented.

ADAPTIVE P-GAIN *Range: 0.00 to 300.00*

This function is not implemented.

DIRECT IP SELECT *Range: See below*

The direct input to the speed loop is an analog input which is sampled synchronously with the speed loop. This ensures that the speed loop always has the most up-to-date value of the input, allowing it to respond faster. Any one of the four analog inputs can be selected as the direct input. If NONE is selected, the input is set to zero. When not in use, it should be disabled by selecting NONE.

0 : NONE
1 : ANIN 1
2 : ANIN 2
3 : ANIN 3
4 : ANIN 4

DIRECT RATIO *Range: -10.0000 to 10.0000*

The Direct Input is multiplied by this parameter.

DIRCT IP POS LIM *Range: -110.00 to 110.00 %*

This limits the upper value of the Direct Input.

DIRCT IP NEG LIM *Range: -110.00 to 110.00 %*

This limits the lower value of the Direct Input.

SPEED POS LIM *Range: -110.00 to 110.00 %*

This sets the upper limit of the speed demand.

SPEED NEG LIM *Range: -110.00 to 110.00 %*

This sets the lower limit of the speed demand.

TORQ DMD ISOLATE *Range: FALSE / TRUE*

Selects between Speed Control mode and Torque Control mode. When TRUE, (Torque Control mode) the torque demand output from the speed loop block is the sum of the Direct Input plus the AUX TORQUE DMD parameter.

TOTAL SPD DMD RPM *Range: —.xx rpm*

This diagnostic shows the final values of the speed demand obtained after summing all sources. This is the value which is presented to the speed loop.

TOTAL SPD DMD % *Range: —.00 %*

This diagnostic shows the final values of the speed demand obtained after summing all sources. This is the value which is presented to the speed loop.

SPEED ERROR *Range: —.00 %*

Shows the difference between the demanded speed and the actual speed.

TORQUE DEMAND *Range: —.00 %*

Shows the demanded motor torque as a percentage of rated motor torque.

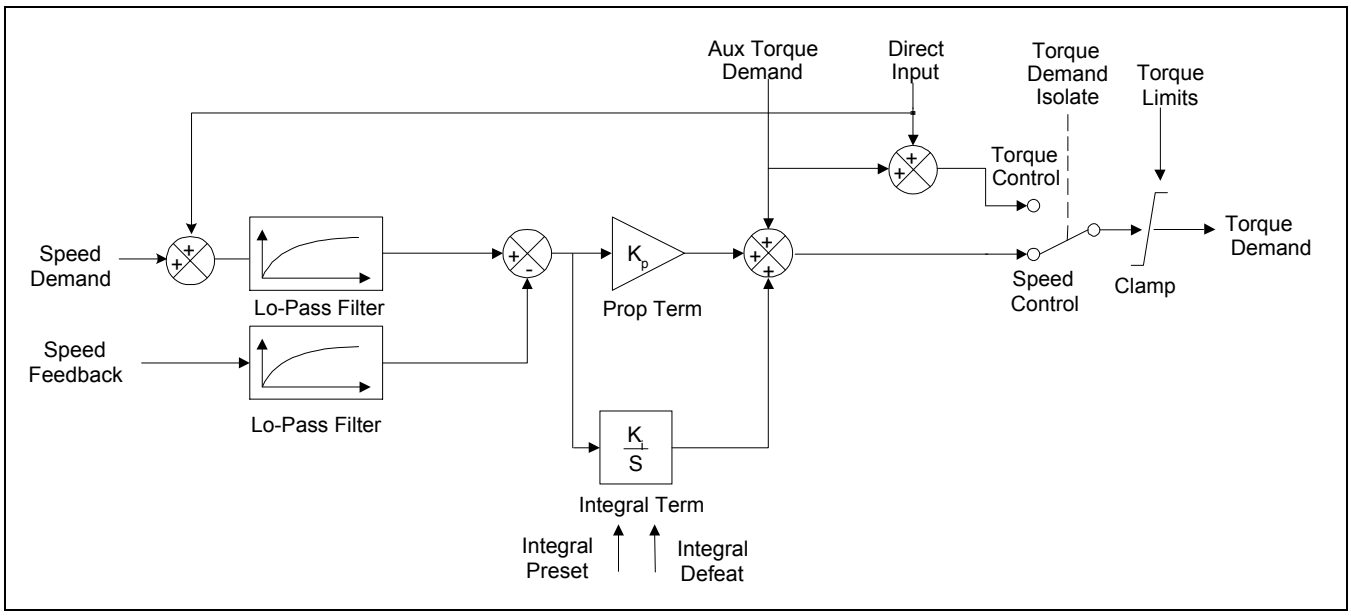
DIRECT INPUT *Range: —.00 %*

Shows the value of the Direct Input, after scaling and clamping.

Functional Description

The speed error (speed demand minus speed feedback) is calculated and processed via a proportional + integral (PI) controller. The output of the PI controller is a torque demand, which is passed directly to the torque control block.

The speed demand is derived from the Setpoint Scale block. The speed feedback is derived from the encoder when the drive is in CLOSED-LOOP VEC mode. This mode gives the best control, as the feedback is fast and accurate. When the drive is in SENSORLESS VEC mode, the speed feedback is calculated from the voltages and currents in the motor.



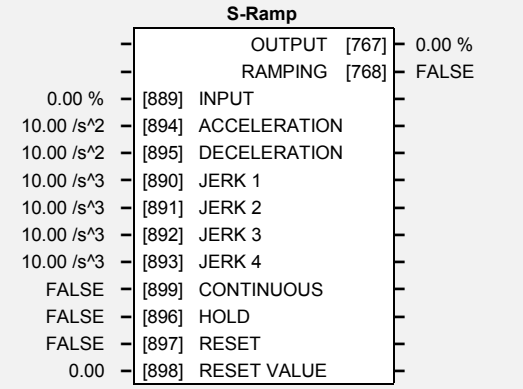
S-RAMP

MMI Menu Map

1 SETUP
2 SETPOINT FUNCS
3 S-RAMP
- INPUT
- ACCELERATION
- DECELERATION
- JERK 1
- JERK 2
- JERK 3
- JERK 4
- CONTINUOUS
- HOLD
- RESET
- RESET VALUE
- OUTPUT
- RAMPING

This function block limits the rate of change of an input by limiting the acceleration and jerk.

Refer to REFERENCE RAMP, page 1-87.



Parameter Descriptions

INPUT *Range: -100.00 to 100.00 %*

Ramp input.

ACCELERATION *Range: 0.00 to 100.00 /s²*

Sets the acceleration rate in units of percent per second², i.e. if the full speed of the machine is 1.25m/s then the acceleration will be:

1.25 x 75.00% = 0.9375m/s²

DECELERATION *Range: 0.00 to 100.00 /s²*

This functions in the same way as ACCELERATION above.

JERK 1 to JERK 4 *Range: 0.00 to 100.00 /s³*

Rate of change of acceleration for the relevant segment of the curve, i.e. JERK 1 is for segment 1, etc.

CONTINUOUS *Range: FALSE / TRUE*

When TRUE, it forces a smooth transition if the speed point is changed when ramping. The curve is controlled by the ACCELERATION and JERK 1 to JERK 4 parameters. When FALSE, there is an immediate transition from the old curve to the new curve.

HOLD *Range: FALSE / TRUE*

When TRUE, the output of the ramp is held at its last value.

RESET *Range: FALSE / TRUE*

If TRUE, the output is made equal to the input.

RESET VALUE *Range: -100.00 to 100.00*

The value that the output is set to while RESET is TRUE.

OUTPUT *Range: —.00 %*

The ramp output.

RAMPING *Range: FALSE / TRUE*

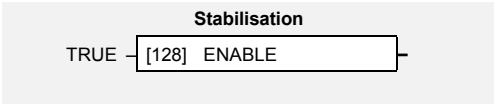
This is set TRUE when ramping.

STABILISATION

MMI Menu Map

1 SETUP
2 MOTOR CONTROL
3 STABILISATION
ENABLE

Designed for VOLTS/Hz motor Control Mode.



Enabling this function reduces the problem of unstable running in induction motors. This can be experienced at approximately half full speed, and under low load conditions.

Parameter Descriptions

ENABLE

Range: FALSE / TRUE

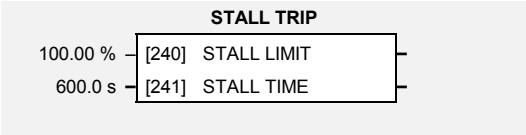
Enables (or disables) the stabilisation function.

STALL TRIP

MMI Menu Map

1 SETUP
2 TRIPS
3 STALL TRIP
- STALL LIMIT
- STALL TIME

The function block protects the motor from damage that may be caused by continuous operation beyond specification.



Parameter Descriptions

STALL LIMIT *Range: 50.00 to 150.00 %*

The load limit beyond which the stall trip monitoring becomes active.

STALL TIME *Range: 0.1 to 3000.0 s*

The time after which a stall condition will cause a trip.

Functional Description

If the estimated load exceeds the STALL LIMIT for a time greater than STALL TIME then the stall trip will become active. The timer is reset whenever the estimated load is less than the STALL LIMIT.

Refer to the Installation Product Manual, Chapter 6 for a description of the trips supported by the drive.

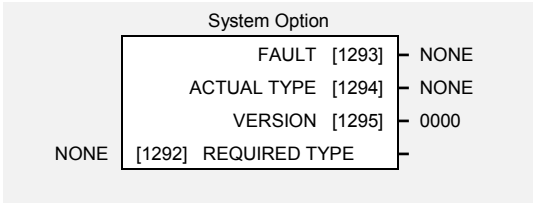
MMI Menu Map

1 SETUP
2 INPUTS & OUTPUTS
3 SYSTEM OPTION
- REQUIRED TYPE
- FAULT
- ACTUAL TYPE
- VERSION

SYSTEM OPTION

This function block is used to select the System Board option required.

If a System Board is fitted, the block reports the type, version and working status of the option.



If a System Board is present when defaults are loaded, the REQUIRED TYPE parameter is automatically set.

Parameter Descriptions

REQUIRED TYPE

Range: Enumerated - see below

Selects the type of System Board option required to be fitted for the application to operate correctly.

Enumerated Value : Option Type

0 : NONE
1 : DUAL ENCODER
2 : TYPE 2
3 : TYPE 3
4 : TYPE 4
5 : TYPE 5
6 : TYPE 6
7 : TYPE 7
8 : TYPE 8

FAULT

Range: Enumerated - see below

The fault state of the System Board Option.

Enumerated Value : Fault State

0 : NONE
1 : PARAMETER VALUE
2 : TYPE MISMATCH
3 : SELFTEST
4 : HARDWARE
5 : MISSING

ACTUAL TYPE

Range: 0000 to FFFF

The type of System Board option fitted.

Enumerated Value : Option Type

0 : NONE
1 : DUAL ENCODER
2 : TYPE 2
3 : TYPE 3
4 : TYPE 4
5 : TYPE 5
6 : TYPE 6
7 : TYPE 7
8 : TYPE 8

VERSION

Range: 0000 to FFFF

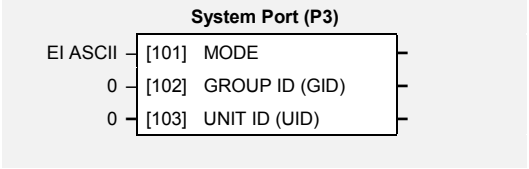
The version of the System Board Option. If no option is fitted, or it is faulty, then the version is reset to zero.

SYSTEM PORT (P3)

MMI Menu Map

1 SETUP
2 COMMUNICATIONS
3 SYSTEM PORT (P3)
- MODE
- GROUP ID (GID)
- UNIT ID (UID)

The unisolated RS232 programming port(s) allows for connection to the Keypad, or to a personal computer for drive configuration and storage of parameters. The parameters below are used to identify the drive to the controlling software.



The port uses the Eurotherm standard EI BISYNCH ASCII protocol.

Parameter Descriptions

MODE *Range: 0 to 1*

Selects the P3 port to operate with the Keypad (EI ASCII), or a Eurotherm 5703 Setpoint Repeater.
This parameter must be set to 5703 for the 5703 INPUT and 5703 OUTPUT function blocks to operate. Refer to pages 1-7 and 1-8.

Note: *The P3 port always operates in the EI ASCII mode when in Configuration Mode.*

Enumerated Value : Mode

0 : EI ASCII
1 : 5703

GROUP ID (GID) *Range: 0 to 9*

The Eurotherm protocol group identity address.

UNIT ID (UID) *Range: 0 to 15*

The Eurotherm protocol unit identity address

Functional Description

The unit will always respond to GID = 0 and UID = 0, as this is the "broadcast" address used by the Keypad.

Note: *The Technology Option uses a different port and address. It does not respond to the "broadcast" address.*

TAPER CALC

MMI Menu Map

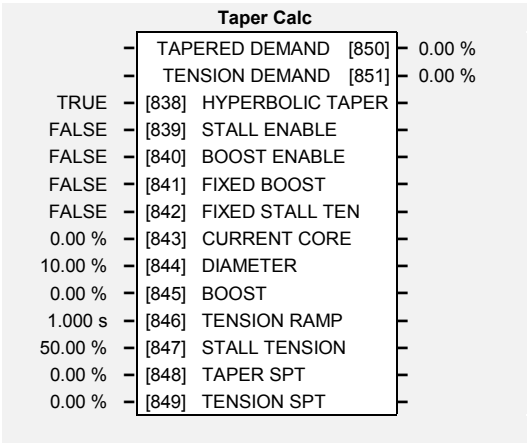
1 SETUP
2 WINDER
3 TAPER CALC
- HYPERBOLIC TAPER
- STALL ENABLE
- BOOST ENABLE
- FIXED BOOST
- FIXED STALL TEN
- CURRENT CORE
- DIAMETER
- BOOST
- TENSION RAMP
- STALL TENSION
- TAPER SPT
- TENSION SPT
- TAPERED DEMAND
- TENSION DEMAND

This function block profiles tension demand with reel diameter for centre wind applications.

This special block processes the tension and taper set points to produce a composite tension demand value as the diameter builds.

The TENSION DEMAND value is used to set the motor current. This must be connected to the DIAMETER and MINIMUM DIAMETER parameters in the SPEED CALC function block.

Refer to Macro 4.



Parameter Descriptions

HYPERBOLIC TAPER

Range: FALSE / TRUE

If set TRUE, a Hyperbolic Taper profile is applied which reduces the diameter more quickly near the core and less as the diameter approaches the full roll.

If set FALSE, a Linear Taper profile is applied which linearly reduces the tension as the diameter increases.

STALL ENABLE

Range: FALSE / TRUE

When TRUE, the tension demand is either:

STALL TENSION if FIXED STALL TEN is TRUE

or STALL TENSION x TENSION SPT if FIXED STALL TEN is FALSE

When FALSE, Stall Tension is disabled.

BOOST ENABLE

Range: FALSE / TRUE

When TRUE, the tension demand is either:

BOOST if FIXED BOOST is TRUE

or BOOST x TENSION SPT if FIXED BOOST is FALSE

When FALSE, Boost is disabled.

FIXED BOOST

Range: FALSE / TRUE

When TRUE and BOOST ENABLE is TRUE, then the tension demand is the value of BOOST.

FIXED STALL TEN

Range: FALSE / TRUE

When TRUE and STALL ENABLE is TRUE, then the tension demand is the value of STALL TENSION.

CURRENT CORE

Range: 0.00 to 120.00 %

The current core size (from the DIAMETER CALC function block).

DIAMETER

Range: 0.00 to 120.00 %

The calculated diameter (from the DIAMETER CALC function block).

BOOST

Range: -200.00 to 200.00 %

Sets a fixed boost, enabled by FIXED BOOST.

TENSION RAMP *Range: 0.000 to 300.000 s*

The time taken for TENSION SPT to change from 0 to 100%.

STALL TENSION *Range: -100.00 to 100.00 %*

Sets a fixed stall tension, enabled by FIXED STALL TEN.

TAPER SPT *Range: -100.00 to 100.00 %*

The taper setpoint input.

TENSION SPT *Range: -200.00 to 200.00 %*

The tension setpoint input.

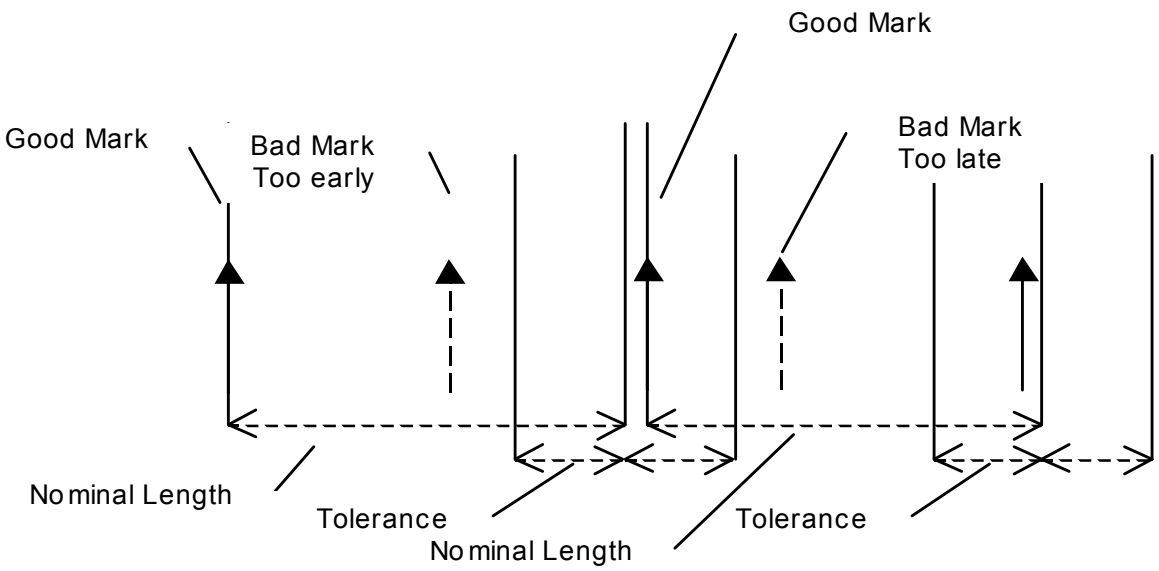
TAPERED DEMAND *Range: —.00 %*

The tapered demand diagnostic.

TENSION DEMAND *Range: —.00 %*

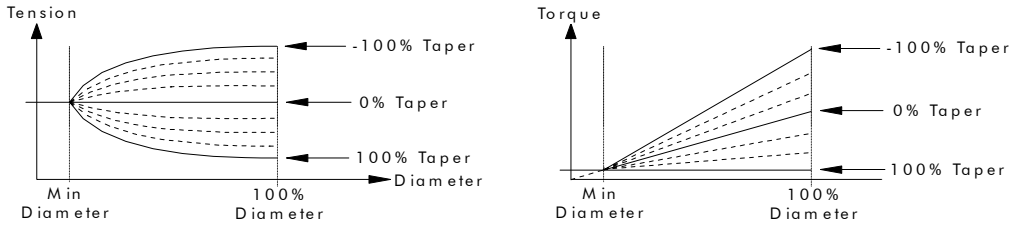
The tension demand diagnostic.

Functional Description



Hyperbolic Taper

A fixed hyperbolic taper characteristic is supplied with this block which has gives the following tension characteristics:-



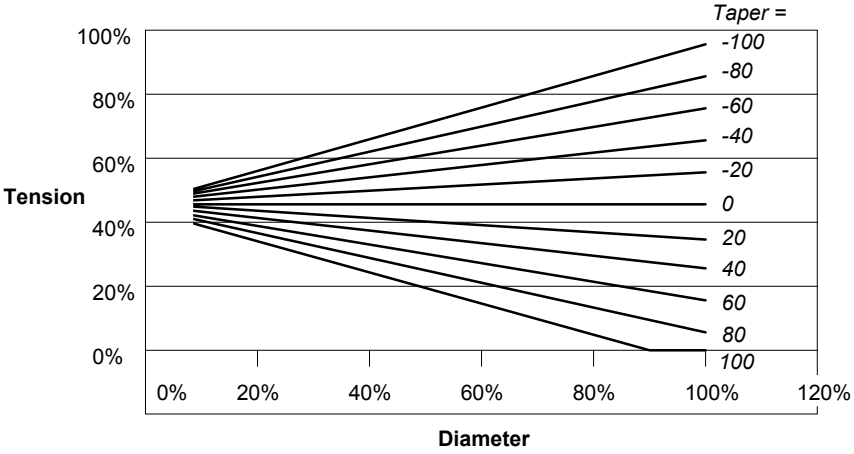
- If the Taper input is 0% this gives a constant tension characteristic with diameter.
- If the taper input is between 0 and 100%, this gives tension falling with increasing diameter. This is sometimes known as negative taper.
- If the taper input is between 0 and -100%, this gives tension rising with increasing diameter. This is sometimes known as positive taper.

All taper characteristics start at the tension setpoint, at minimum diameter.

The following equation shows the actual taper calculation (ignoring boost and stall).

$$\text{Tapered Demand} = \text{Tension Spt} \times \left\{ 100\% - \text{Taper} \times \left(1 - \frac{\text{Core}}{\text{Diameter}} \right) \right\}$$

Linear Taper



$$\text{Tapered Demand} = \text{Tension Spt} \times \{100\% - \text{Taper} \times (\text{Diameter - Core})\}$$

TEC OPTION

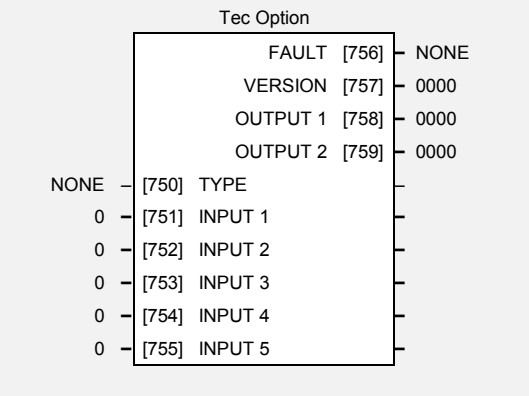
MMI Menu Map

1 SETUP
2 COMMUNICATIONS
3 TEC OPTION
- TYPE
- INPUT 1
- INPUT 2
- INPUT 3
- INPUT 4
- INPUT 5
- FAULT
- VERSION
- OUTPUT 1

This function block is used to configure the inputs and outputs of the various Technology Options that can be fitted. The Technology Option provides a communications interface for external control of the drive.

If a Technology Option is present when defaults are loaded, the TYPE parameter is automatically set. The parameter names change when the selection for the TYPE parameter matches the Technology Option fitted.

Refer to the appropriate Technology Option Technical Manual supplied with the option for further details.



Parameter Descriptions

TYPE

Range: Enumerated - see below

Selects the type of Technology Option.

Enumerated Value : Technology Option

0 : NONE
1 : RS485
2 : PROFIBUS
3 : LINK
4 : DEVICE NET
5 : CAN OPEN
6 : LONWORKS
7 : TYPE 7
8 : TYPE 8
9 : TYPE 9
10 : TYPE 10
11 : TYPE 11
12 : TYPE 12
13 : TYPE 13
14 : TYPE 14
15 : TYPE 15

INPUT 1 to INPUT 5

Range: -32768 to 32767

The use of these input parameters depends on the type of Technology Option fitted. Refer to the Technology Option Technical Manual.

FAULT

Range: Enumerated - see below

The fault state of the Technology Option.

Enumerated Value : Fault State

0 : NONE
1 : PARAMETER VALUE
2 : TYPE MISMATCH
3 : SELFTEST
4 : HARDWARE
5 : MISSING

VERSION

Range: 0000 to FFFF

The version of the Technology Option. If no option is fitted then the version is reset to zero.

OUTPUT 1 and OUTPUT 2

Range: 0000 to FFFF

The use of these output parameters depends on the type of Technology Option fitted. Refer to the Technology Option Technical Manual.

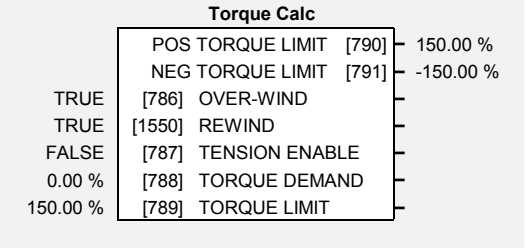
TORQUE CALC

MMI Menu Map

1 SETUP
2 WINDER
3 TORQUE CALC
- OVER-WIND
- REWIND
- TENSION ENABLE
- TORQUE DEMAND
- TORQUE LIMIT
- POS TORQUE LIMIT
- NEG TORQUE LIMIT

This function block interfaces the calculated winder tension demand to the torque loop, for open-loop centre wind applications.

Refer to Macro 4.



Parameter Descriptions

OVER-WIND *Range: FALSE / TRUE*

Overwind mode selected when TRUE.

REWIND *Range: FALSE / TRUE*

The Rewind mode is selected when TRUE.

TENSION ENABLE *Range: FALSE / TRUE*

Set FALSE, the drive is speed controlled with the speed compensated by the roll diameter to provide the roll surface speed matched to line speed. This also provides jog with constant surface speed. In this mode the diameter can be preset. This mode is used when the web is not connected to the winder.

Set TRUE, the closed loop trim PID trim is enabled to maintain tension or dancer position. The diameter is calculated as the roll builds up (or builds down for an unwind).

TORQUE DEMAND *Range: -200.00 to 200.00 %*

The tension demand input (usually calculated by the TAPER CALC function block).

TORQUE LIMIT *Range: 0.00 to 200.00 %*

The torque limit applied when TENSION ENABLE is set FALSE.

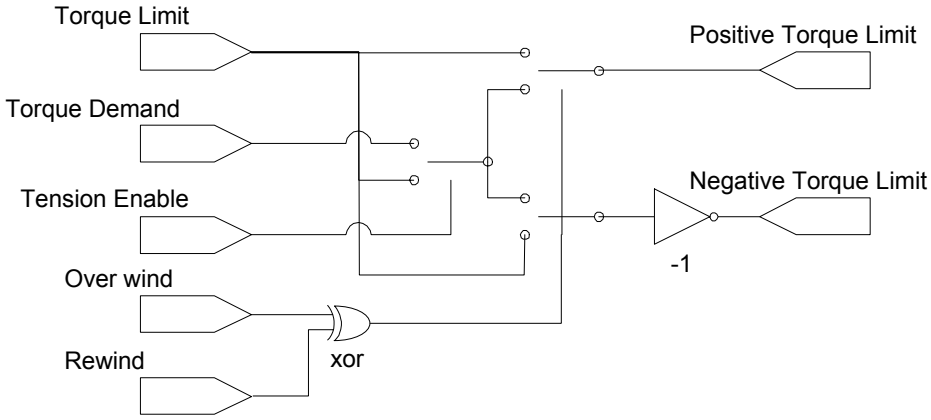
POS TORQUE LIMIT *Range: —.00 %*

The positive torque limit when TENSION ENABLE is FALSE.

NEG TORQUE LIMIT *Range: —.00 %*

The negative torque limit when TENSION ENABLE is FALSE.

Functional Description



The torque calculator controls web tension by limiting the torque that the controller can produce, this must be used in conjunction with the SPEED CALC function block, which ensures that the speed loop is saturated.

This combination of saturated speed loop and torque limits ensures that, in the event of a web break, the reel will remain under speed control and be limited in speed to:

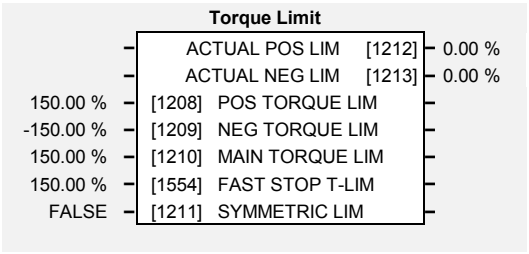
calculated winder speed + over speed.

TORQUE LIMIT

MMI Menu Map

1 SETUP
2 MOTOR CONTROL
3 TORQUE LIMIT
- POS TORQUE LIM
- NEG TORQUE LIM
- MAIN TORQUE LIM
- FAST STOP T-LIM
- SYMMETRIC LIM
- ACTUAL POS LIM
- ACTUAL NEG LIM

Designed for all Motor Control Modes.



This function block allows you to set the maximum level of motor rated torque which is allowed before torque limit action occurs.

If the estimated motor torque is greater than the ACTUAL POS LIM value, the motor speed is controlled to maintain the torque at this level. A similar situation occurs if the estimated motor torque is less that the ACTUAL NEG LIM value.

The torque limit function block has separate positive and negative torque limits. In addition, a symmetric main torque limit is also provided.

The lowest positive and negative torque limits (including any current limit or inverse time current limit action) is indicated in the ACTUAL POS LIM and ACTUAL NEG LIM diagnostic. These are the final limits used to limit motor torque.

Parameter Descriptions

POS TORQUE LIM *Range: -300.00 to 300.00 %*

This parameter sets the maximum allowed level of positive motor torque.

NEG TORQUE LIM *Range: -300.00 to 300.00 %*

This parameter sets the maximum allowed level of negative motor torque

MAIN TORQUE LIM *Range: 0.00 to 300.00 %*

This parameter sets the symmetric limit on the maximum allowed motor torque.

FAST STOP T-LIM *Range: 0.00 to 300.00 %*

This parameter sets the torque limit used during a Fast Stop.

SYMMETRIC LIM *Range: FALSE / TRUE/*

When TRUE, the NEG TORQUE LIM is forced to reflect the POS TORQUE LIM parameter.

ACTUAL POS LIM *Range: —.00 %*

This diagnostic indicates the final actual positive torque limit including any current limit or inverse time current limit action.

ACTUAL NEG LIM *Range: —.00 %*

This diagnostic indicates the final actual negative torque limit including any current limit or inverse time current limit action.

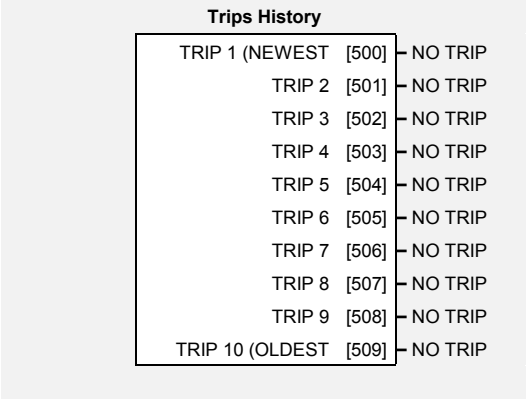
TRIPS HISTORY

MMI Menu Map

1 SETUP
2 TRIPS
3 TRIPS HISTORY
- TRIP 1 (NEWEST)
- TRIP 2
- TRIP 3
- TRIP 4
- TRIP 5
- TRIP 6
- TRIP 7
- TRIP 8
- TRIP 9
- TRIP 10 (OLDEST)

This function block records the last ten trips that caused the drive to stop.

To do this, it stores the value of the FIRST TRIP parameter, tag number 6, taken from the TRIPS STATUS function block.



Parameter Descriptions

TRIP 1 (NEWEST) *Range: Enumerated*

Records the most recent trip that caused the drive to stop. The values that this (and the parameters below) may take are the same as tag number 6, FIRST TRIP, detailed in the TRIPS STATUS function block.

TRIP 2 *Range: As above*

Records the second most recent trip that caused the drive to stop.

TRIP 3 *Range: As above*

Records the third most recent trip that caused the drive to stop.

TRIP 4 *Range: As above*

Records the fourth most recent trip that caused the drive to stop.

TRIP 5 *Range: As above*

Records the fifth most recent trip that caused the drive to stop.

TRIP 6 *Range: As above*

Records the sixth most recent trip that caused the drive to stop.

TRIP 7 *Range: As above*

Records the seventh most recent trip that caused the drive to stop.

TRIP 8 *Range: As above*

Records the eighth most recent trip that caused the drive to stop.

TRIP 9 *Range: As above*

Records the ninth most recent trip that caused the drive to stop.

TRIP 10 (OLDEST) *Range: As above*

Records the tenth most recent trip that caused the drive to stop.

Functional Description

This function block provides a view of the ten most recent trips that caused the drive to stop. Every time a new trip occurs this is entered as TRIP 1 (NEWEST and the other recorded trips are moved down. If more than ten trips have occurred since the drive was configured then only the ten most recent trips will be available for inspection.

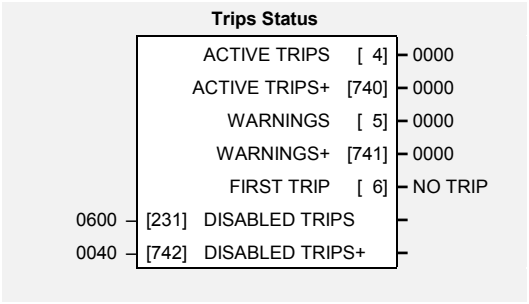
These parameters are preserved through a power failure.

TRIPS STATUS

MMI Menu Map

1 SETUP
2 TRIPS
3 TRIPS STATUS
- DISABLED TRIPS
- DISABLED TRIPS+
- ACTIVE TRIPS
- ACTIVE TRIPS+
- TRIP WARNINGS
- TRIP WARNINGS+
- FIRST TRIP

The drive supports advanced and flexible trip logic to support monitoring of the drive itself, the motor and the load. This function block provides a view into the current trip condition(s) and allows some trips to be disabled.



Parameter Descriptions

DISABLED TRIPS and DISABLED TRIPS+ *Range: 0000 to FFFF*

Indicates which trips have been disabled. Not all trips may be disabled, the DISABLED TRIPS mask is ignored for trips that cannot be disabled. See below for which trips may be disabled and how this parameter is formed.

ACTIVE TRIPS and ACTIVE TRIPS+ *Range: 0000 to FFFF*

Indicates which trips are currently active. These parameters are a coded representation of the trip status. See below for a description of how this parameter is formed.

WARNINGS and WARNINGS+ *Range: 0000 to FFFF*

Indicates which conditions are likely to cause a trip. These parameters are a coded representation of the warning status. See below for a description of how this parameter is formed.

FIRST TRIP *Range: Enumerated – see table below*

From when a trip occurs until that trip is reset, this parameter indicates the trip source. When several trips have occurred, this parameter indicates the first one that was detected.

Functional Description

The tables below shows the possible parameter values for FIRST TRIP, and the TRIPS HISTORY function block.

The ACTIVE TRIPS, WARNINGS, DISABLED TRIPS, TRIGGERS 1 and TRIGGERS 2 parameters use a four digit hexadecimal number to identify individual trips. Each trip has a unique corresponding number as shown below.

Trip Name (MMI)	Value	Mask	User Disable	Auto-restart
NO TRIP	0	0x0000	N/A	N/A
OVERVOLTAGE	1	0x0001	No	Yes
UNDERVOLTAGE	2	0x0002	No	Yes
OVERCURRENT	3	0x0004	No	Yes
HEATSINK	4	0x0008	No	Yes
EXTERNAL TRIP	5	0x0010	No	Yes
INPUT 1 BREAK	6	0x0020	Yes	Yes
INPUT 2 BREAK	7	0x0040	Yes	Yes
MOTOR STALLED	8	0x0080	Yes	Yes
TRIP 9 (Reserved)	9	0x0100	No	No
BRAKE RESISTOR	10	0x0200	Yes	Yes
BRAKE SWITCH	11	0x0400	Yes	Yes
OP STATION	12	0x0800	Yes	Yes
LOST COMMS	13	0x1000	Yes	Yes
CONTACTOR FBK	14	0x2000	Yes	Yes
SPEED FEEDBACK	15	0x4000	Yes	Yes
AMBIENT TEMP	16	0x8000	No	Yes
MOTOR OVERTEMP	17	0x0001	Yes	Yes
CURRENT LIMIT	18	0x0002	No	Yes

Trip Name (MMI)	Value	Mask +	User Disable	Auto-restart
TRIP 19 (Reserved)	19	0x0004	No	No
24V FAILURE	20	0x0008	Yes	Yes
LOW SPEED OVER I	21	0x0010	No	Yes
TRIP 22 (Reserved)	22	0x0020	No	No
ENCODER 1 FAULT	23	0x0040	Yes	Yes
DESAT (OVER I)	24	0x0080	No	Yes
VDC RIPPLE	25	0x0100	No	Yes
BRAKE SHORT CCT	26	0x0200	No	Yes
OVERSPEED	27	0x0400	Yes	Yes
TRIP 28 (Reserved)	28	0x0800	No	No
TRIP 29 (Reserved)	29	0x1000	No	No
TRIP 30 (Reserved)	30	0x2000	No	No
UNKNOWN	31	0x4000	No	Yes
OTHER	32	0x8000	No	Yes
MAX SPEED LOW	33	0x8000	N/A	N/A
MAINS VOLTS LOW	34	0x8000	N/A	N/A
NOT AT SPEED	35	0x8000	N/A	N/A
MAG CURRENT FAIL	36	0x8000	N/A	N/A
NEGATIVE SLIP F	37	0x8000	N/A	N/A
TR TOO LARGE	38	0x8000	N/A	N/A
TR TOO SMALL	39	0x8000	N/A	N/A
MAX RPM DATA ERR	40	0x8000	N/A	N/A
STACK TRIP	41	0x8000	N/A	N/A
LEAKGE L TIMEOUT	42	0x8000	N/A	N/A
POWER LOSS STOP	43	0x0002	No	Yes

The ACTIVE TRIPS+, WARNINGS+, DISABLED TRIPS+, TRIGGERS+ 1 and TRIGGERS+ 2 parameters use a four digit hexadecimal number to identify individual trips. Each trip has a unique corresponding number as shown below.

Decimal number	Display
10	A
11	B
12	C
13	D
14	E
15	F

Hexadecimal Representation of Trips

When more than one trip is to be represented at the same time then the trip codes are simply added together to form the value displayed. Within each digit, values between 10 and 15 are displayed as letters A to F

For example referring to the tables above, if the ACTIVE TRIPS parameter is **02A8,** then this represents:

a "**2**" in digit 3

an "8" and a "2" in digit 2
(8+2 = 10, displayed as **A**)

an "**8**" in digit 1

This in turn represents the active trips BRAKE RESISTOR, MOTOR STALLED, INPUT 1 BREAK and HEATSINK TEMP, (an unlikely situation).

In the same way, the ACTIVE TRIPS + parameter displaying **02A8** would represent CURRENT LIMIT, DESAT (OVER I), TRIP 22 and 24V failure, (another unlikely situation).

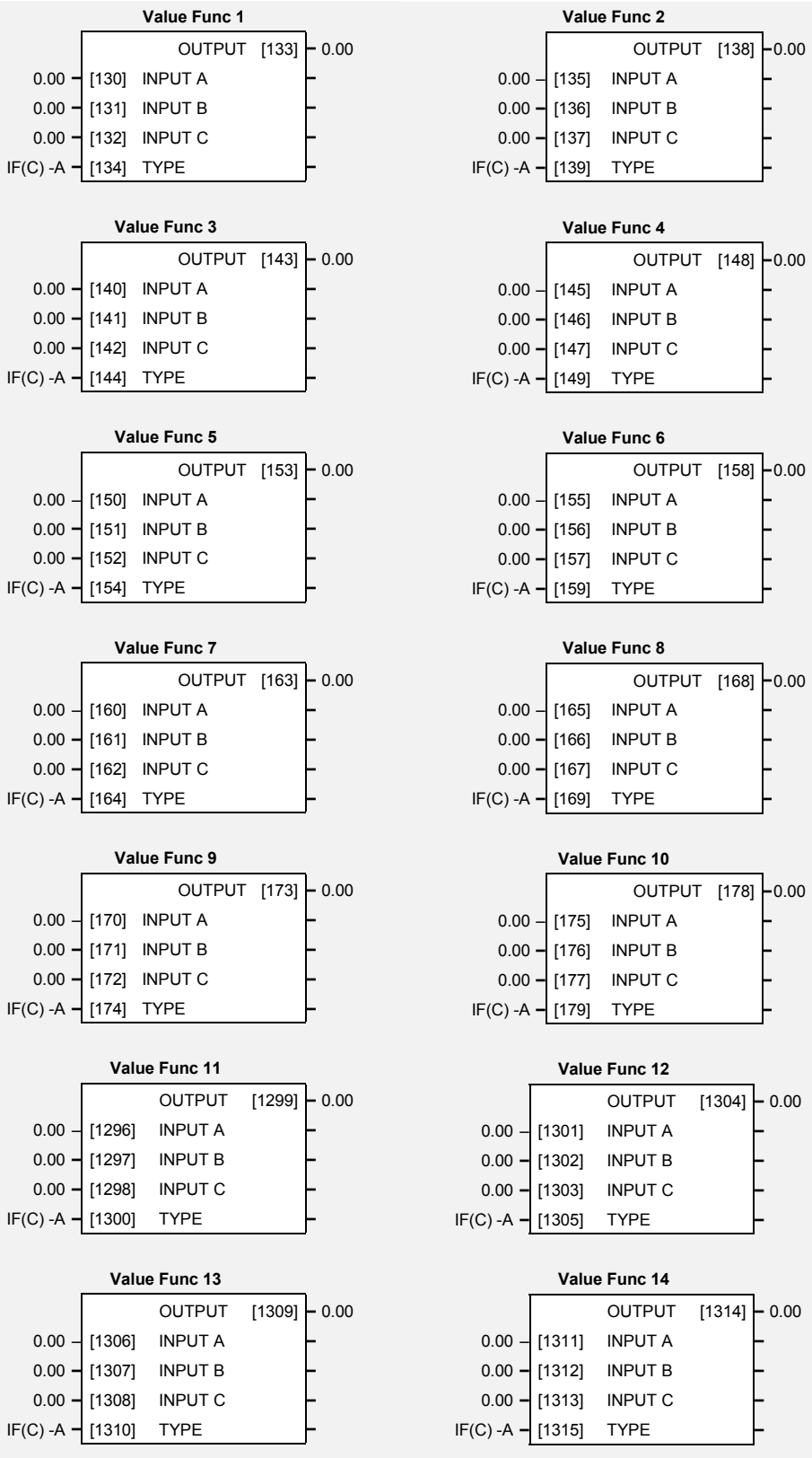
Note: *The hexadecimal value is used over comms, however, pressing the **M** key whilst displaying the hexadecimal trip value will show the list of all trips and their current values.*

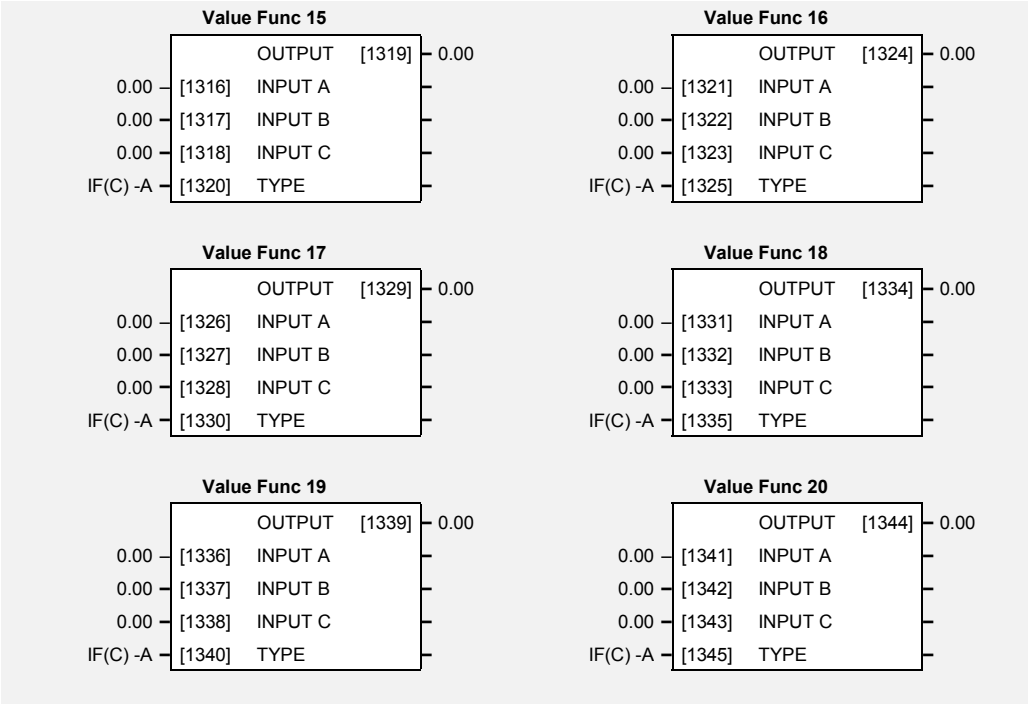
VALUE FUNCTION

The value function blocks can be configured to perform one of a number of functions upon a fixed number of inputs.

MMI Menu Map

- 1 SETUP
- 2 MISCELLANEOUS
- 3 VALUE FUNC
- 4 VALUE FUNC 1
- 4 VALUE FUNC 2
- 4 VALUE FUNC 3
- 4 VALUE FUNC 4
- 4 VALUE FUNC 5
- 4 VALUE FUNC 6
- 4 VALUE FUNC 7
- 4 VALUE FUNC 8
- 4 VALUE FUNC 9
- 4 VALUE FUNC 10
  - INPUT A
  - INPUT B
  - INPUT C
  - TYPE
  - OUTPUT





Boolean inputs and outputs are
Outputs: FALSE = 0.00, TRUE = 0.01
Inputs: -0.005 < x < 0.005 = FALSE, Else TRUE

Parameter Descriptions

INPUT A *Range: -32768.00 to 32767.00*
General purpose input.

INPUT B *Range: -32768.00 to 32767.00*
General purpose input.

INPUT C *Range: -32768.00 to 32767.00*
General purpose input.

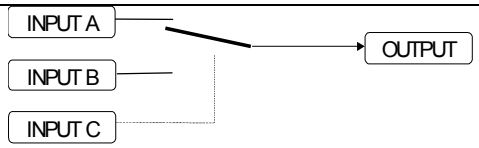
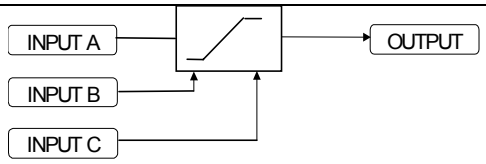
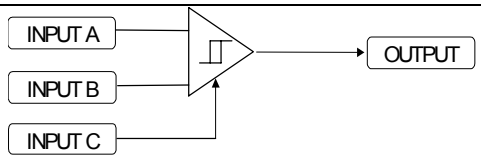
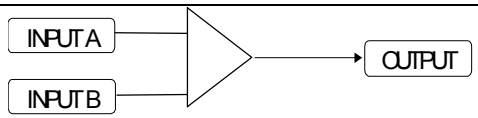
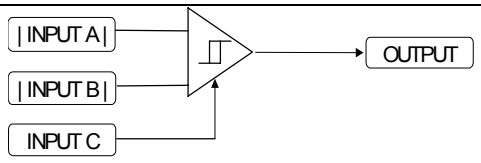
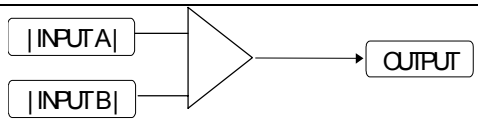
TYPE *Range: Enumerated - see below*
The operation to be performed on the three inputs to produce the output value.

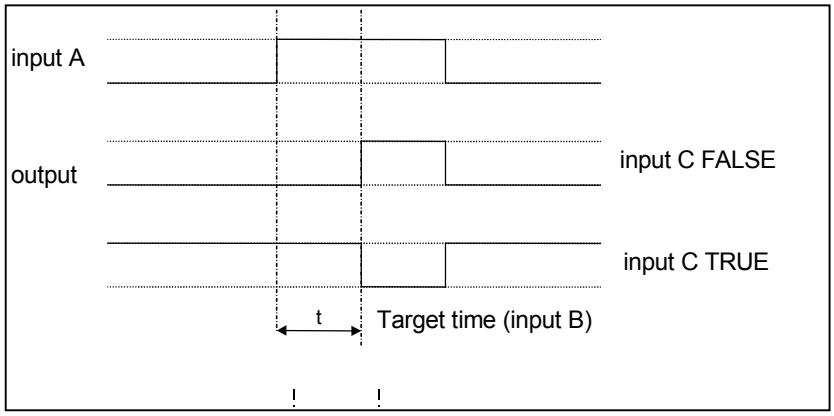
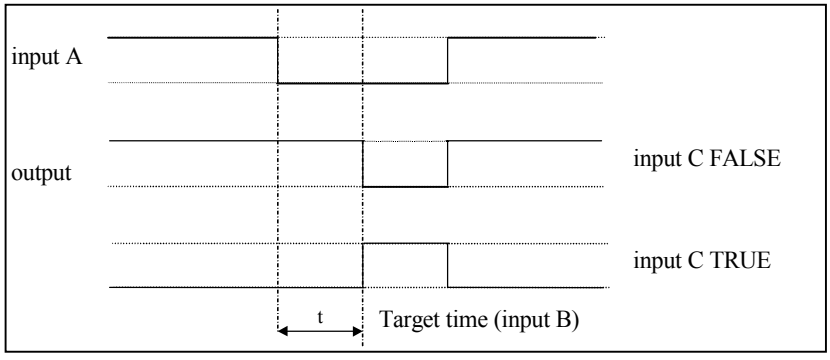
Enumerated Value : *Type*
0 : IF(C) -A
1 : ABS(A+B+C)
2 : SWITCH(A,B)
3 : (A*B)/C
4 : A+B+C
5 : A-B-C
6 : B<=A<=C
7 : A>B+/-C
8 : A>=B
9 : ABS(A)>B+/-C
10 : ABS(A)>=B
11 : A(1+B)
12 : IF(C) HOLD(A)
13 : BINARY DECODE
14 : ON DELAY
15 : OFF DELAY
16 : TIMER
17 : MINIMUM PULSE
18 : PULSE TRAIN
19 : WINDOW
20 : UP/DWN COUNTER
21 : (A*B)/C ROUND
22 : WINDOW NO HYST

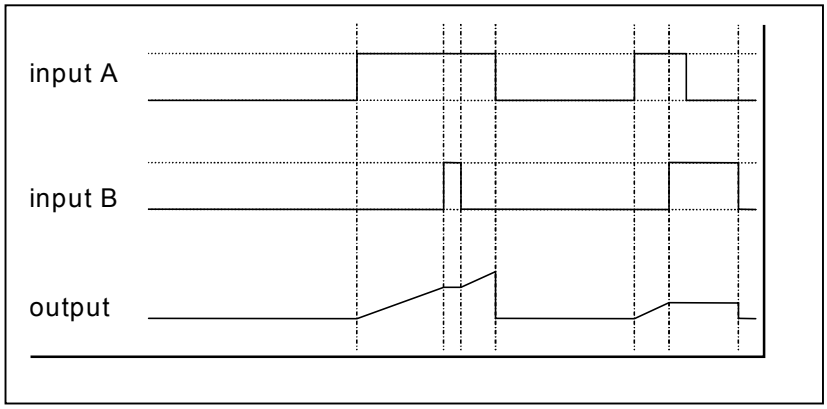
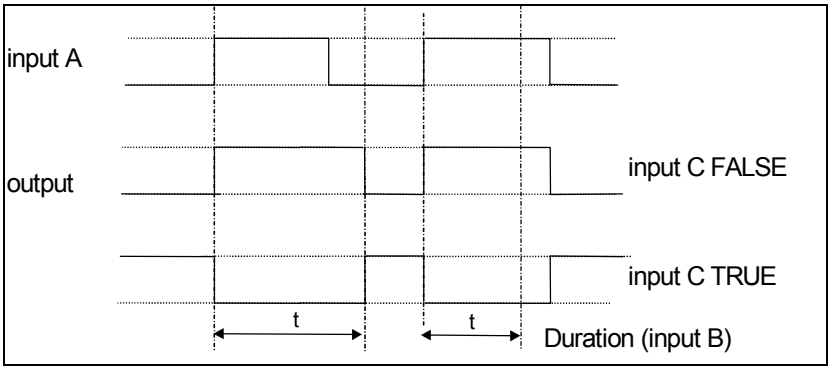
OUTPUT *Range: —.xx*
The result of performing the selected operation on the inputs.

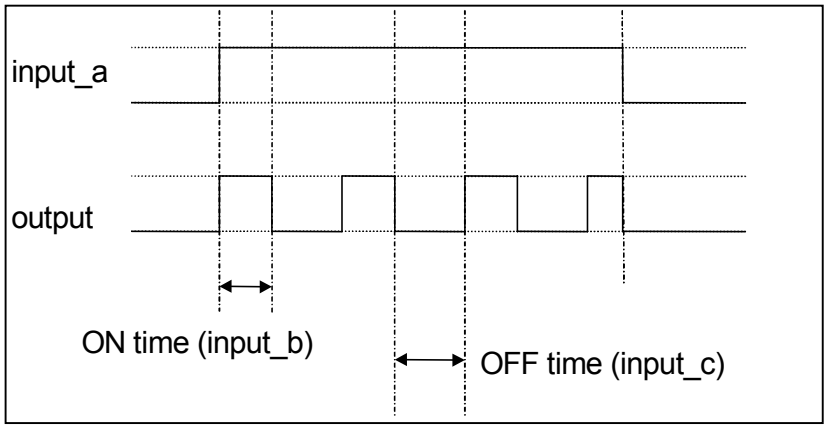
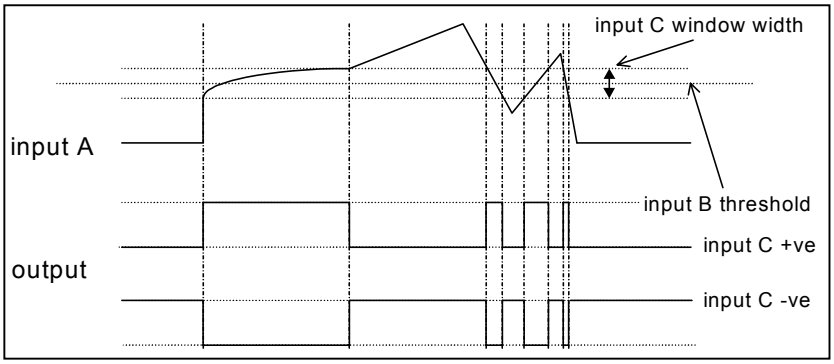
Functional Description

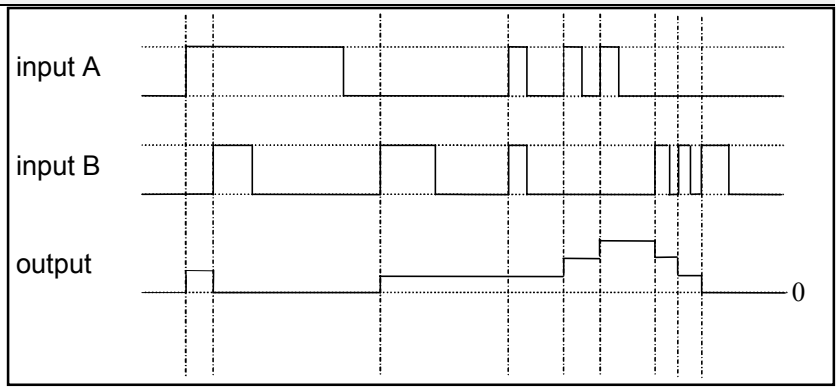
OUTPUT is generated from the inputs according to the operation type selected. The output is always limited to be within the range -32768.00 to +32767.00.

Operation	Description
IF(C) -A	If INPUT C is not zero the OUTPUT is minus INPUT A, otherwise the OUTPUT is the same as INPUT A.
ABS(A+B+C)	The OUTPUT is set to the absolute value of INPUT A + INPUT B + INPUT C.
SWITCH(A,B)	 If INPUT C is zero the OUTPUT is set to INPUT A, otherwise the output is set to INPUT B
(A*B)/C	The OUTPUT is set to (INPUT A * INPUT B) / (INPUT C). The algorithm compensates for the remainder term.
A+B+C	The OUTPUT is set to (INPUT A + INPUT B + INPUT C).
A-B-C	The OUTPUT is set to (INPUT A - INPUT B - INPUT C).
B <= A <= C	 The OUTPUT is set to the value of INPUT A, limited to between a maximum value of INPUT C and a minimum value of INPUT B. If INPUT B is greater than INPUT C the output is undefined.
A>B+/-C	 The OUTPUT is TRUE if INPUT A is greater than INPUT B + INPUT C. The OUTPUT is FALSE if INPUT A is less than INPUT B - INPUT C. Otherwise the OUTPUT is unchanged. In this way the block acts as a simple comparator with a comparison level of INPUT B and a hysteresis band equal to +/- INPUT C.
A>=B	 The OUTPUT is TRUE if INPUT A is greater than or equal to INPUT B, otherwise the OUTPUT is FALSE.
ABS(A)> ABS(B)+/-C	 The OUTPUT is TRUE if the magnitude of INPUT A is greater than or equal to the magnitude of INPUT B - INPUT C. The OUTPUT is FALSE if the magnitude of INPUT A is less than the magnitude of INPUT B - INPUT C. Otherwise the OUTPUT is unchanged. In this way the block acts as a magnitude comparator with a comparison level of INPUT B and a hysteresis band equal to +/- INPUT C.
ABS(A)> =ABS(B)	 The OUTPUT is TRUE if the magnitude of INPUT A is greater than or equal to the magnitude of INPUT B, otherwise the OUTPUT is FALSE.
A(1+B)	The OUTPUT is set to INPUT A + (INPUT A * INPUT B / 100.00).

Operation	Description
IF(C) HOLD A	If INPUT C is zero, the OUTPUT is set to INPUT A, otherwise the OUTPUT is unchanged. On powering up the drive, the output will be pre-loaded with the last saved value of input B.
BINARY DECODE	The OUTPUT is set according to which of the INPUTs are non-zero. INPUT C / INPUT B / INPUT A / OUTPUT 0 / 0 / 0 / 0.00 0 / 0 / ≠0 / 1.00 0 / ≠0 / 0 / 2.00 0 / ≠0 / ≠0 / 3.00 ≠0 / 0 / 0 / 4.00 ≠0 / 0 / ≠0 / 5.00 ≠0 / ≠0 / 0 / 6.00 ≠0 / ≠0 / ≠0 / 7.00 In the above table, ≠0 indicates that the corresponding input is not zero.
ON DELAY	 A programmable delay between receiving and outputting a Boolean TRUE signal. INPUT A becoming TRUE starts the delay timer. INPUT B sets the duration of the delay in seconds. At the end of the duration, OUTPUT becomes TRUE unless INPUT A has reverted to FALSE. Setting INPUT C to TRUE (≠0) inverts the output.
OFF DELAY	 A programmable delay between receiving and outputting a Boolean FALSE signal. INPUT A becoming FALSE starts the delay timer. INPUT B sets the duration of the delay in seconds. Setting INPUT C to TRUE (≠0) inverts the output. At the end of the duration, OUTPUT becomes FALSE unless INPUT A has reverted to TRUE.

Operation	Description
TIMER	 Times the period elapsed from when INPUT A is set TRUE and held TRUE, to when INPUT B becomes TRUE. OUTPUT is the duration of the timer in seconds, starting from zero. If INPUT B is TRUE, the value for OUTPUT is held until INPUT B is released. If on release INPUT A is still TRUE, the timer will continue from the held value. Setting INPUT A and INPUT B to FALSE resets the timer. INPUT C is not used.
MINIMUM PULSE	 Creates an output of adjustable minimum time when INPUT A is TRUE. (INPUT A is assumed to be a sequence of TRUE pulses and FALSE off periods.) INPUT B sets the length of the minimum pulse required in seconds. INPUT C inverts the output when TRUE. The duration of the pulse is *at least* the period set by INPUT B.

Operation	Description
PULSE TRAIN	 Creates a pulsed FALSE / TRUE output of programmable frequency. INPUT A enables the pulse train when TRUE, disables when FALSE. INPUT B sets the length of the *on* part of the pulse in seconds. INPUT C sets the length of the *off* part of the pulse in seconds.
WINDOW	 This function outputs TRUE when INPUT A is within a programmable range, and FALSE otherwise. INPUT B sets the threshold of the window to be monitored. INPUT C defines the range of the window around the threshold. When the value of INPUT A is inside the window, the window expands by 0.01 to avoid flutter on output if noisy, i.e. if INPUT B = 5 and INPUT C = 4 then the range is 3 to 7, expanded to 2.5 to 7.5 when the value if INPUT A is inside the window. If INPUT C is set to zero, the output will only be TRUE if INPUT A is exactly equal to INPUT B (this is fulfilled in the default condition when inputs A, B & C are all zero) If INPUT C is set to a negative value, its absolute value defines the window range, and the output is inverted.

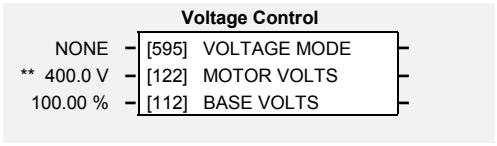
Operation	Description
UP/DOWN COUNTER	 INPUT A provides a rising edge trigger to increment the output count by one. INPUT B provides a rising edge trigger to decrement the output count by one. INPUT C holds the output at zero. The output starts at zero. The output is limited at ±300.00.
(A*B)/C ROUND	The OUTPUT is set to (INPUT A * INPUT B) / (INPUT C). This is the same as (A*B)/C (enumerated value 3) except that the result is rounded.
WINDOW NO HYST	This is the same as WINDOW (enumerated value 19) except that there is no hysteresis when inside the `window'. Thus, from the diagram given in WINDOW, if INPUT B = 5 and INPUT C = 4 then the range is 3 to 7.

VOLTAGE CONTROL

MMI Menu Map

1 SETUP
2 MOTOR CONTROL
3 VOLTAGE CONTROL
- VOLTAGE MODE
- MOTOR VOLTS
- BASE VOLTS

Designed for VOLTS/Hz motor Control Mode.



This function block allows the motor output volts to be controlled in the presence of dc link voltage variations. This is achieved by controlling the level of PWM modulation as a function of measured dc link volts. The dc link volts may vary either due to supply variations or regenerative braking by the motor.

Three control modes are available, None, Fixed and Automatic.

Parameter Descriptions

VOLTAGE MODE

Range: Enumerated - see below

Set to NONE, no attempt is made to control the PWM modulation depth for variations in dc link voltage.

Set to FIXED, the drive's output volts are maintained, regardless of variations in the dc link voltage. The drive's product code sets the default value for demanded maximum output voltage (see MOTOR VOLTS below).

Set to AUTOMATIC, the voltage is controlled as above, but the output voltage is allowed to rise smoothly as dc link volts vary. This allows the motor to be overfluxed during deceleration, thereby increasing braking performance.

Enumerated Value : *Voltage Mode*

0 : NONE
1 : FIXED
2 : AUTOMATIC

MOTOR VOLTS

Range: 0.0 to 575.0 V

This is the rated motor voltage at base speed. This parameter is used in conjunction with the VOLTAGE MODE parameter above when set to FIXED. Refer to MOTOR DATA, page 1-53.

BASE VOLTS

Range: 0.00 to 115.47 %

This parameter directly scales the output of the voltage control function block, thus allowing further scaling of the drive output volts if required.

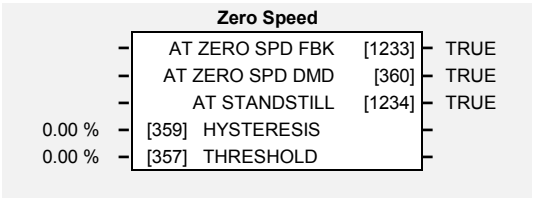
Refer also to "Quadratic/Constant Torque Selection", page 1-125.

ZERO SPEED

MMI Menu Map

1 SETUP
2 SETPOINT FUNCS
3 ZERO SPEED
- HYSTERESIS
- THRESHOLD
- AT ZERO SPD FBK
- AT ZERO SPD DMD
- AT STANDSTILL

This function block detects when the speed is at or close to zero. HYSTERESIS and THRESHOLD are user-definable.



Parameter Descriptions

HYSTERISIS

Range: 0.00 to 300.00 %

Provides a hysteresis band about which the outputs are stable.

IF the hysteresis value is >= to the Threshold
THEN the level is set to 2 x the hysteresis value and the Off level is set to zero,
ELSE the On level = Threshold + Hysteresis and the Off level = Threshold - Hysteresis.

THRESHOLD

Range: 0.00 to 300.00 %

The nominal level below which the outputs are set.

AT ZERO SPD FBK

Range: FALSE / TRUE

Speed feedback. TRUE when at zero speed feedback, as defined by THRESHOLD and HYSTERESIS.

IF (abs(speed feedback)) > On Level at zero speed = FALSE
ELSE if (abs(speed feedback)) <= Off Level at zero speed = TRUE
ELSE at zero speed is unchanged

AT ZERO SPD DMD

Range: FALSE / TRUE

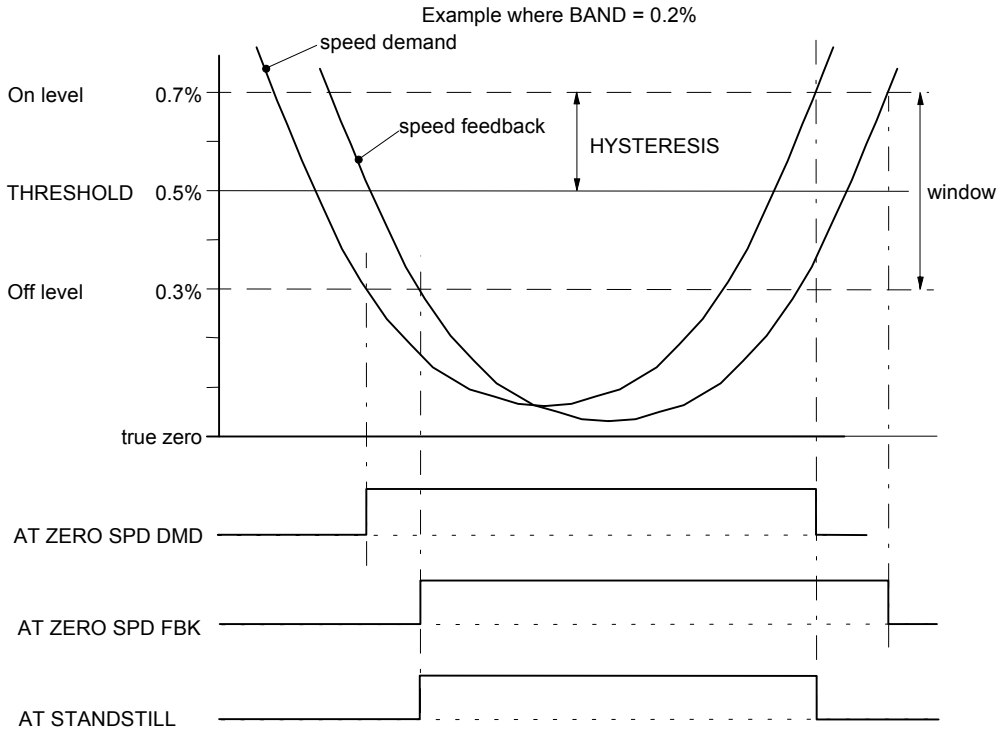
Speed demand. TRUE when at zero speed demand, as defined by THRESHOLD and HYSTERESIS.

AT STANDSTILL

Range: FALSE / TRUE

TRUE when both AT ZERO SPD FBK and AT ZERO SPD DMD are TRUE.

Functional Description



Quadratic/Constant Torque Selection

MMI Menu Map

1 SETUP
- QUADRATIC TORQUE

or
MMI Menu Map

1 SETUP
2 MOTOR CONTROL
3 FEEDBACKS
- QUADRATIC TORQUE

When selecting or de-selecting Quadratic Torque mode, several parameter values and their limits are modified.

The parameters affected are shown in the table below.

Note: *When changing to or from Quadratic Torque mode, you will be requested to confirm your actions on the MMI. This is intended to remind you of the effects detailed below.*

Change from CONSTANT TORQUE to QUADRATIC TORQUE			
Function Block	**Parameter**	**Set to**	**Note**
PATTERN GEN	FREQ SELECT	3 kHz	Cannot be changed
INVERSE TIME	DELAY	60.0 s	High Limit 60.0 s
INVERSE TIME	Max Overload Level	110.0 %	Internal Parameter
CURRENT LIMIT	CURRENT LIMIT	100.0 %	High Limit set 110.0 %
VOLTAGE CONTROL	BASE VOLTS	115.0 %	High Limit 115.47 %

Change from QUADRATIC TORQUE to CONSTANT TORQUE			
Function Block	**Parameter**	**Set to**	**Note**
PATTERN GEN	FREQ SELECT	3 kHz	Can be changed
INVERSE TIME	DELAY	60.0 s	High Limit 60.0 s
INVERSE TIME	Max Overload Level	150.0 %	Internal Parameter
CURRENT LIMIT	CURRENT LIMIT	150.0 %	High Limit set 150.0 %
VOLTAGE CONTROL	BASE VOLTS	100.0 %	High Limit 115.47 %

PARAMETER SPECIFICATION

The headings for the Tag No. table are described below.

Tag	A numeric identification of the parameter. It is used to identify the source and destinations of internal links.
Name	The parameter name as it appears on the MMI.
Block	The menu page and function block under which the parameter is stored.
Type	REAL Floating point value INT Integer value BOOL A Boolean (bit) representing FALSE or TRUE ENUM An enumerated value representing a selection STRING An ASCII string TAG A value representing a choice of TAG D_TAG A value representing a choice of Destination tag as an internal link S_TAG A value representing a choice of Source tag as an internal link WORD 16 Bit hexadecimal number
Range	This varies with parameter type: REAL, INT The upper and lower limits of the parameter BOOL 0 = FALSE, 1 = TRUE ENUM A list of possible selections for that parameter STRING Specified number of characters TAG The tag number of any parameter D_TAG The tag number of an input parameter S_TAG The tag number of an input or output parameter. WORD 0000 to FFFF (hexadecimal) ***Note:*** ***Decimal Places:*** *"—" signifies an indeterminable number of units. An "x" signifies a decimal place, e.g. —.xx % could represent 100.00 %.*
ID	Serial Communications Mnemonic: Refer to Chapter 3: "Serial Communications"
Notes	You can record your application's settings here. Output parameters are not saved in non-volatile memory unless indicated. 1. This input parameter is not saved in non-volatile memory. 2. This parameter is automatically saved in non-volatile memory. 3. This parameter forms part of the motor configuration. 4. This parameter is not adjustable from the keypad. 5. This parameter cannot be the destination of a link. 6. This parameter cannot be the source of a link. 7. This input parameter can only be written to when the drive is stopped. 8. This input parameter can only be written to when the drive is in configuration mode. 9. This input parameter is not writable from serial comms. 10. This parameter uses special scaling rules when accessed using certain Comms options of the 6053 Technology Box. Refer to page 2-33.

Specification Table: Tag Name Order

TAG	MMI Name	Block
79	1SEC OVER RATING	DYNAMIC BRAKING
48	ABSOLUTE	ANALOG OUTPUT 1
734	ABSOLUTE	ANALOG OUTPUT 2
803	ABSOLUTE	ANALOG OUTPUT 3
62	ACCEL LIMIT	SLEW RATE LIMIT
880	ACCEL TIME	LINEAR RAMP
1268	ACCEL TIME	POWER LOSS CNTRL
261	ACCEL TIME	REFERENCE JOG
258	ACCEL TIME	REFERENCE RAMP
1499	ACCELERATION	PHASE MOVE
1569	ACCELERATION	PHASE REGISTER
894	ACCELERATION	S-RAMP
604	ACTIVE	AUTOTUNE
576	ACTIVE	FLYCATCHING
1469	ACTIVE	HOME
583	ACTIVE	INJ BRAKING
1503	ACTIVE	PHASE INCH
1509	ACTIVE	PHASE MOVE
1512	ACTIVE	PHASE OFFSET
1478	ACTIVE	PHASE TUNING
4	ACTIVE TRIPS	TRIPS STATUS
740	ACTIVE TRIPS+	TRIPS STATUS
1213	ACTUAL NEG LIM	TORQUE LIMIT
1212	ACTUAL POS LIM	TORQUE LIMIT
1294	ACTUAL TYPE	SYSTEM OPTION
1195	ADAPTIVE P-GAIN	SPEED LOOP
1194	ADAPTIVE THRESH	SPEED LOOP
1500	ADVANCE	PHASE INCH
1148	AIMING POINT	INVERSE TIME
1234	AT STANDSTILL	ZERO SPEED
360	AT ZERO SPD DMD	ZERO SPEED
1233	AT ZERO SPD FBK	ZERO SPEED
613	ATTEMPT DELAY 1	AUTO RESTART
679	ATTEMPT DELAY 2	AUTO RESTART
612	ATTEMPTS	AUTO RESTART
614	ATTEMPTS LEFT	AUTO RESTART
108	AUTO BOOST	FLUXING
1193	AUX TORQUE DMD	SPEED LOOP
341	BAND 1	SKIP FREQUENCIES
680	BAND 2	SKIP FREQUENCIES
681	BAND 3	SKIP FREQUENCIES
682	BAND 4	SKIP FREQUENCIES
106	BASE FREQUENCY	FLUXING
1159	BASE FREQUENCY	MOTOR DATA
739	BASE VOLTS	INJ BRAKING
112	BASE VOLTS	VOLTAGE CONTROL
845	BOOST	TAPER CALC
840	BOOST ENABLE	TAPER CALC
78	BRAKE POWER	DYNAMIC BRAKING
77	BRAKE RESISTANCE	DYNAMIC BRAKING
81	BRAKING	DYNAMIC BRAKING
1262	BREAK	5703 INPUT
18	BREAK	ANALOG INPUT 1
27	BREAK	ANALOG INPUT 2
717	BREAK	ANALOG INPUT 3
724	BREAK	ANALOG INPUT 4
12	BREAK ENABLE	ANALOG INPUT 1
21	BREAK ENABLE	ANALOG INPUT 2
711	BREAK ENABLE	ANALOG INPUT 3
718	BREAK ENABLE	ANALOG INPUT 4
17	BREAK VALUE	ANALOG INPUT 1
26	BREAK VALUE	ANALOG INPUT 2
716	BREAK VALUE	ANALOG INPUT 3
723	BREAK VALUE	ANALOG INPUT 4
321	COEFFICIENT A	DISPLAY SCALE 1
375	COEFFICIENT A	DISPLAY SCALE 2
854	COEFFICIENT A	DISPLAY SCALE 3
862	COEFFICIENT A	DISPLAY SCALE 4
44	COEFFICIENT B	DISPLAY SCALE 1
673	COEFFICIENT B	DISPLAY SCALE 2
855	COEFFICIENT B	DISPLAY SCALE 3
863	COEFFICIENT B	DISPLAY SCALE 4
322	COEFFICIENT C	DISPLAY SCALE 1
376	COEFFICIENT C	DISPLAY SCALE 2
856	COEFFICIENT C	DISPLAY SCALE 3
864	COEFFICIENT C	DISPLAY SCALE 4
273	COMMS COMMAND	COMMS CONTROL
270	COMMS REF	COMMS CONTROL
295	COMMS SEQ	COMMS CONTROL
770	COMMS SETPOINT	REFERENCE
272	COMMS STATUS	COMMS CONTROL
309	COMMS TIMEOUT	COMMS CONTROL
817	COMPENSATIONS	COMPENSATION
339	CONFIG NAME	ACCESS CONTROL
1235	CONTACTOR CLOSED	SEQUENCING LOGIC
899	CONTINUOUS	S-RAMP
1267	CONTROL BAND	POWER LOSS CNTRL
1157	CONTROL MODE	MOTOR DATA
826	CORE 1	DIAMETER CALC
827	CORE 2	DIAMETER CALC
1465	CORRECTION LIMIT	HOME
1526	COUNTS PER UNIT	PHASE CONFIGURE
834	CURRENT CORE	DIAMETER CALC
843	CURRENT CORE	TAPER CALC
365	CURRENT LIMIT	CURRENT LIMIT
1521	D FILTER TC	PHASE PID
1255	D FILTER TC	PID (TYPE 2)
1518	D GAIN	PHASE PID
1252	D GAIN	PID (TYPE 2)
315	D TIME CONSTANT	PID
581	DC LEVEL	INJ BRAKING
75	DC LINK VOLTS	FEEDBACKS
579	DC PULSE	INJ BRAKING
1466	DECEL LIMIT	HOME
61	DECEL LIMIT	SLEW RATE LIMIT
881	DECEL TIME	LINEAR RAMP
1269	DECEL TIME	POWER LOSS CNTRL
262	DECEL TIME	REFERENCE JOG
259	DECEL TIME	REFERENCE RAMP
1468	DECELERATION	HOME
895	DECELERATION	S-RAMP
334	DECIMAL PLACE	DISPLAY SCALE 1
379	DECIMAL PLACE	DISPLAY SCALE 2
852	DECIMAL PLACE	DISPLAY SCALE 3
860	DECIMAL PLACE	DISPLAY SCALE 4
100	DEFLUX DELAY	PATTERN GEN
710	DEFLUX TIME	INJ BRAKING
1149	DELAY	INVERSE TIME
401	DESTINATION	LINK 1

TAG	MMI Name	Block
419	DESTINATION	LINK 10
421	DESTINATION	LINK 11
423	DESTINATION	LINK 12
425	DESTINATION	LINK 13
427	DESTINATION	LINK 14
429	DESTINATION	LINK 15
431	DESTINATION	LINK 16
433	DESTINATION	LINK 17
435	DESTINATION	LINK 18
437	DESTINATION	LINK 19
403	DESTINATION	LINK 2
439	DESTINATION	LINK 20
441	DESTINATION	LINK 21
443	DESTINATION	LINK 22
445	DESTINATION	LINK 23
447	DESTINATION	LINK 24
449	DESTINATION	LINK 25
451	DESTINATION	LINK 26
453	DESTINATION	LINK 27
455	DESTINATION	LINK 28
457	DESTINATION	LINK 29
405	DESTINATION	LINK 3
459	DESTINATION	LINK 30
461	DESTINATION	LINK 31
463	DESTINATION	LINK 32
465	DESTINATION	LINK 33
467	DESTINATION	LINK 34
469	DESTINATION	LINK 35
471	DESTINATION	LINK 36
473	DESTINATION	LINK 37
475	DESTINATION	LINK 38
477	DESTINATION	LINK 39
407	DESTINATION	LINK 4
479	DESTINATION	LINK 40
481	DESTINATION	LINK 41
483	DESTINATION	LINK 42
485	DESTINATION	LINK 43
487	DESTINATION	LINK 44
489	DESTINATION	LINK 45
491	DESTINATION	LINK 46
493	DESTINATION	LINK 47
495	DESTINATION	LINK 48
497	DESTINATION	LINK 49
409	DESTINATION	LINK 5
499	DESTINATION	LINK 50
1401	DESTINATION	LINK 51
1403	DESTINATION	LINK 52
1405	DESTINATION	LINK 53
1407	DESTINATION	LINK 54
1409	DESTINATION	LINK 55
1411	DESTINATION	LINK 56
1413	DESTINATION	LINK 57
1415	DESTINATION	LINK 58
1417	DESTINATION	LINK 59
411	DESTINATION	LINK 6
1419	DESTINATION	LINK 60
1421	DESTINATION	LINK 61
1423	DESTINATION	LINK 62
1425	DESTINATION	LINK 63
1427	DESTINATION	LINK 64
1429	DESTINATION	LINK 65
1431	DESTINATION	LINK 66
1433	DESTINATION	LINK 67
1435	DESTINATION	LINK 68

TAG	MMI Name	Block
1437	DESTINATION	LINK 69
413	DESTINATION	LINK 7
1439	DESTINATION	LINK 70
1441	DESTINATION	LINK 71
1443	DESTINATION	LINK 72
1445	DESTINATION	LINK 73
1447	DESTINATION	LINK 74
1449	DESTINATION	LINK 75
1451	DESTINATION	LINK 76
1453	DESTINATION	LINK 77
1455	DESTINATION	LINK 78
1457	DESTINATION	LINK 79
415	DESTINATION	LINK 8
1459	DESTINATION	LINK 80
417	DESTINATION	LINK 9
805	DIAMETER	COMPENSATION
835	DIAMETER	DIAMETER CALC
780	DIAMETER	SPEED CALC
844	DIAMETER	TAPER CALC
821	DIAMETER HOLD	DIAMETER CALC
828	DIAMETER TC	DIAMETER CALC
1199	DIRCT IP NEG LIM	SPEED LOOP
1198	DIRCT IP POS LIM	SPEED LOOP
1205	DIRECT INPUT	SPEED LOOP
1196	DIRECT IP SELECT	SPEED LOOP
1197	DIRECT RATIO	SPEED LOOP
231	DISABLE TRIPS	TRIPS STATUS
742	DISABLE TRIPS+	TRIPS STATUS
1462	DISTANCE	HOME
1505	DISTANCE	PHASE MOVE
1463	DISTANCE FINE	HOME
1506	DISTANCE FINE	PHASE MOVE
1508	DISTANCE LEFT	PHASE MOVE
1470	DONE	HOME
1150	DOWN TIME	INVERSE TIME
276	DRIVE ENABLE	SEQUENCING LOGIC
591	DRIVE FREQUENCY	PATTERN GEN
814	DYNAMIC COMP	COMPENSATION
611	ENABLE	AUTO RESTART
603	ENABLE	AUTOTUNE
80	ENABLE	DYNAMIC BRAKING
1460	ENABLE	HOME
1580	ENABLE	PHASE AUTO GEAR
1504	ENABLE	PHASE MOVE
1520	ENABLE	PHASE PID
1564	ENABLE	PHASE REGISTER
311	ENABLE	PID
1254	ENABLE	PID (TYPE 2)
1265	ENABLE	POWER LOSS CNTRL
60	ENABLE	SLEW RATE LIMIT
82	ENABLE	SLIP COMP
128	ENABLE	STABILISATION
1476	ENABLE PHASE	PHASE TUNING
1474	ENABLE SPEED	PHASE TUNING
127	ENABLED KEYS	OP STATION 1
1109	ENABLED KEYS	OP STATION 2
1156	ENCODER	I/O TRIPS
1016	ENCODER COUNT	FEEDBACKS
1238	ENCODER FBK %	FEEDBACKS
567	ENCODER INVERT	FEEDBACKS
566	ENCODER LINES	FEEDBACKS
761	ENCODER SUPPLY	FEEDBACKS
1471	ERROR	HOME
1513	ERROR	PHASE PID

2-4 Parameter Specification

TAG	MMI Name	Block
1573	ERROR	PHASE REGISTER
1247	ERROR	PID (TYPE 2)
1572	ERROR (COUNTS)	PHASE REGISTER
1467	ERROR COUNT	HOME
829	EXT DIAMETER	DIAMETER CALC
1595	EXT MARK MASTER	PHASE AUTO GEAR
1596	EXT MARK SLAVE	PHASE AUTO GEAR
233	EXT TRIP MODE	I/O TRIPS
234	EXTERNAL TRIP	I/O TRIPS
1594	FALSE M MARKS	PHASE AUTO GEAR
1593	FALSE S MARKS	PHASE AUTO GEAR
275	FAST STOP LIMIT	REFERENCE STOP
304	FAST STOP MODE	REFERENCE STOP
264	FAST STOP TIME	REFERENCE STOP
1554	FAST STOP T-LIM	TORQUE LIMIT
1531	FAULT	PHASE CONFIGURE
1293	FAULT	SYSTEM OPTION
756	FAULT	TEC OPTION
1498	FEATURES	SYSTEM OPTION
1514	FEED FWD	PHASE PID
1248	FEED FWD	PID (TYPE 2)
1515	FEED FWD GAIN	PHASE PID
1249	FEED FWD GAIN	PID (TYPE 2)
764	FEEDBACK	PID
765	FEEDBACK NEGATE	PID
73	FIELD FEEDBACK	FEEDBACKS
1587	FILTER	PHASE AUTO GEAR
316	FILTER TC	PID
1537	FILTER TIME	ENCODER SPEED 1
1545	FILTER TIME	ENCODER SPEED 2
580	FINAL DC PULSE	INJ BRAKING
126	FINAL STOP RATE	REFERENCE STOP
6	FIRST TRIP	TRIPS STATUS
107	FIXED BOOST	FLUXING
841	FIXED BOOST	TAPER CALC
808	FIXED INERTIA	COMPENSATION
842	FIXED STALL TEN	TAPER CALC
125	FORMULA	DISPLAY SCALE 1
676	FORMULA	DISPLAY SCALE 2
853	FORMULA	DISPLAY SCALE 3
861	FORMULA	DISPLAY SCALE 4
99	FREQ SELECT	PATTERN GEN
577	FREQUENCY	INJ BRAKING
342	FREQUENCY 1	SKIP FREQUENCIES
343	FREQUENCY 2	SKIP FREQUENCIES
344	FREQUENCY 3	SKIP FREQUENCIES
345	FREQUENCY 4	SKIP FREQUENCIES
1464	GAIN	HOME
313	GAIN	PID
1597	GEAR CORRECTION	PHASE AUTO GEAR
1483	GEARING A	PHASE CONTROL
1484	GEARING B	PHASE CONTROL
102	GROUP ID (GID)	SYSTEM PORT (P3)
274	HEALTHY	SEQUENCING LOGIC
101	HIGH LIMIT	DISPLAY SCALE 1
674	HIGH LIMIT	DISPLAY SCALE 2
857	HIGH LIMIT	DISPLAY SCALE 3
865	HIGH LIMIT	DISPLAY SCALE 4
590	HOLD	BRAKE CONTROL
884	HOLD	LINEAR RAMP
1581	HOLD	PHASE AUTO GEAR
260	HOLD	REFERENCE RAMP
896	HOLD	S-RAMP
838	HYPERBOLIC TAPER	TAPER CALC

TAG	MMI Name	Block
359	HYSTERISIS	ZERO SPEED
1517	I GAIN	PHASE PID
1251	I GAIN	PID (TYPE 2)
314	I TIME CONSTANT	PID
1041	IGNORE PASSWORD	OPERATOR MENU 1
1076	IGNORE PASSWORD	OPERATOR MENU 10
1080	IGNORE PASSWORD	OPERATOR MENU 11
1084	IGNORE PASSWORD	OPERATOR MENU 12
1088	IGNORE PASSWORD	OPERATOR MENU 13
1092	IGNORE PASSWORD	OPERATOR MENU 14
1096	IGNORE PASSWORD	OPERATOR MENU 15
1100	IGNORE PASSWORD	OPERATOR MENU 16
1044	IGNORE PASSWORD	OPERATOR MENU 2
1048	IGNORE PASSWORD	OPERATOR MENU 3
1052	IGNORE PASSWORD	OPERATOR MENU 4
1056	IGNORE PASSWORD	OPERATOR MENU 5
1060	IGNORE PASSWORD	OPERATOR MENU 6
1064	IGNORE PASSWORD	OPERATOR MENU 7
1068	IGNORE PASSWORD	OPERATOR MENU 8
1072	IGNORE PASSWORD	OPERATOR MENU 9
578	I-LIM LEVEL	INJ BRAKING
1565	INCH OFFSET	PHASE REGISTER
818	INERTIA COMP	COMPENSATION
610	INITIAL DELAY 1	AUTO RESTART
678	INITIAL DELAY 2	AUTO RESTART
1586	INITIAL FILTER	PHASE AUTO GEAR
1585	INITIAL REPEATS	PHASE AUTO GEAR
599	INPUT	DEMULTIPLEXER 1
874	INPUT	DEMULTIPLEXER 2
1101	INPUT	FILTER 1
1105	INPUT	FILTER 2
1461	INPUT	HOME
879	INPUT	LINEAR RAMP
336	INPUT	MINIMUM SPEED
58	INPUT	SETPOINT SCALE
340	INPUT	SKIP FREQUENCIES
889	INPUT	S-RAMP
641	INPUT 0	MULTIPLEXER 1
771	INPUT 0	MULTIPLEXER 2
347	INPUT 0	PRESET 1
380	INPUT 0	PRESET 2
390	INPUT 0	PRESET 3
510	INPUT 0	PRESET 4
521	INPUT 0	PRESET 5
532	INPUT 0	PRESET 6
543	INPUT 0	PRESET 7
554	INPUT 0	PRESET 8
642	INPUT 1	MULTIPLEXER 1
772	INPUT 1	MULTIPLEXER 2
348	INPUT 1	PRESET 1
381	INPUT 1	PRESET 2
391	INPUT 1	PRESET 3
511	INPUT 1	PRESET 4
522	INPUT 1	PRESET 5
533	INPUT 1	PRESET 6
544	INPUT 1	PRESET 7
555	INPUT 1	PRESET 8
751	INPUT 1	TEC OPTION
235	INPUT 1 BREAK	I/O TRIPS
651	INPUT 10	MULTIPLEXER 1
799	INPUT 10	MULTIPLEXER 2
652	INPUT 11	MULTIPLEXER 1
868	INPUT 11	MULTIPLEXER 2
653	INPUT 12	MULTIPLEXER 1

TAG	MMI Name	Block
869	INPUT 12	MULTIPLEXER 2
654	INPUT 13	MULTIPLEXER 1
870	INPUT 13	MULTIPLEXER 2
655	INPUT 14	MULTIPLEXER 1
871	INPUT 14	MULTIPLEXER 2
656	INPUT 15	MULTIPLEXER 1
872	INPUT 15	MULTIPLEXER 2
643	INPUT 2	MULTIPLEXER 1
773	INPUT 2	MULTIPLEXER 2
349	INPUT 2	PRESET 1
382	INPUT 2	PRESET 2
392	INPUT 2	PRESET 3
512	INPUT 2	PRESET 4
523	INPUT 2	PRESET 5
534	INPUT 2	PRESET 6
545	INPUT 2	PRESET 7
556	INPUT 2	PRESET 8
752	INPUT 2	TEC OPTION
236	INPUT 2 BREAK	I/O TRIPS
644	INPUT 3	MULTIPLEXER 1
792	INPUT 3	MULTIPLEXER 2
350	INPUT 3	PRESET 1
383	INPUT 3	PRESET 2
393	INPUT 3	PRESET 3
513	INPUT 3	PRESET 4
524	INPUT 3	PRESET 5
535	INPUT 3	PRESET 6
546	INPUT 3	PRESET 7
557	INPUT 3	PRESET 8
753	INPUT 3	TEC OPTION
645	INPUT 4	MULTIPLEXER 1
793	INPUT 4	MULTIPLEXER 2
351	INPUT 4	PRESET 1
384	INPUT 4	PRESET 2
394	INPUT 4	PRESET 3
514	INPUT 4	PRESET 4
525	INPUT 4	PRESET 5
536	INPUT 4	PRESET 6
547	INPUT 4	PRESET 7
558	INPUT 4	PRESET 8
754	INPUT 4	TEC OPTION
646	INPUT 5	MULTIPLEXER 1
794	INPUT 5	MULTIPLEXER 2
352	INPUT 5	PRESET 1
385	INPUT 5	PRESET 2
395	INPUT 5	PRESET 3
515	INPUT 5	PRESET 4
526	INPUT 5	PRESET 5
537	INPUT 5	PRESET 6
548	INPUT 5	PRESET 7
559	INPUT 5	PRESET 8
755	INPUT 5	TEC OPTION
647	INPUT 6	MULTIPLEXER 1
795	INPUT 6	MULTIPLEXER 2
353	INPUT 6	PRESET 1
386	INPUT 6	PRESET 2
396	INPUT 6	PRESET 3
516	INPUT 6	PRESET 4
527	INPUT 6	PRESET 5
538	INPUT 6	PRESET 6
549	INPUT 6	PRESET 7
560	INPUT 6	PRESET 8
648	INPUT 7	MULTIPLEXER 1
796	INPUT 7	MULTIPLEXER 2

TAG	MMI Name	Block
354	INPUT 7	PRESET 1
387	INPUT 7	PRESET 2
397	INPUT 7	PRESET 3
517	INPUT 7	PRESET 4
528	INPUT 7	PRESET 5
539	INPUT 7	PRESET 6
550	INPUT 7	PRESET 7
561	INPUT 7	PRESET 8
649	INPUT 8	MULTIPLEXER 1
797	INPUT 8	MULTIPLEXER 2
650	INPUT 9	MULTIPLEXER 1
798	INPUT 9	MULTIPLEXER 2
180	INPUT A	LOGIC FUNC 1
225	INPUT A	LOGIC FUNC 10
1346	INPUT A	LOGIC FUNC 11
1351	INPUT A	LOGIC FUNC 12
1356	INPUT A	LOGIC FUNC 13
1361	INPUT A	LOGIC FUNC 14
1366	INPUT A	LOGIC FUNC 15
1371	INPUT A	LOGIC FUNC 16
1376	INPUT A	LOGIC FUNC 17
1381	INPUT A	LOGIC FUNC 18
1386	INPUT A	LOGIC FUNC 19
185	INPUT A	LOGIC FUNC 2
1391	INPUT A	LOGIC FUNC 20
190	INPUT A	LOGIC FUNC 3
195	INPUT A	LOGIC FUNC 4
200	INPUT A	LOGIC FUNC 5
205	INPUT A	LOGIC FUNC 6
210	INPUT A	LOGIC FUNC 7
215	INPUT A	LOGIC FUNC 8
220	INPUT A	LOGIC FUNC 9
130	INPUT A	VALUE FUNC 1
175	INPUT A	VALUE FUNC 10
1296	INPUT A	VALUE FUNC 11
1301	INPUT A	VALUE FUNC 12
1306	INPUT A	VALUE FUNC 13
1311	INPUT A	VALUE FUNC 14
1316	INPUT A	VALUE FUNC 15
1321	INPUT A	VALUE FUNC 16
1326	INPUT A	VALUE FUNC 17
1331	INPUT A	VALUE FUNC 18
1336	INPUT A	VALUE FUNC 19
135	INPUT A	VALUE FUNC 2
1341	INPUT A	VALUE FUNC 20
140	INPUT A	VALUE FUNC 3
145	INPUT A	VALUE FUNC 4
150	INPUT A	VALUE FUNC 5
155	INPUT A	VALUE FUNC 6
160	INPUT A	VALUE FUNC 7
165	INPUT A	VALUE FUNC 8
170	INPUT A	VALUE FUNC 9
181	INPUT B	LOGIC FUNC 1
226	INPUT B	LOGIC FUNC 10
1347	INPUT B	LOGIC FUNC 11
1352	INPUT B	LOGIC FUNC 12
1357	INPUT B	LOGIC FUNC 13
1362	INPUT B	LOGIC FUNC 14
1367	INPUT B	LOGIC FUNC 15
1372	INPUT B	LOGIC FUNC 16
1377	INPUT B	LOGIC FUNC 17
1382	INPUT B	LOGIC FUNC 18
1387	INPUT B	LOGIC FUNC 19
186	INPUT B	LOGIC FUNC 2

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TAG	MMI Name	Block
1392	INPUT B	LOGIC FUNC 20
191	INPUT B	LOGIC FUNC 3
196	INPUT B	LOGIC FUNC 4
201	INPUT B	LOGIC FUNC 5
206	INPUT B	LOGIC FUNC 6
211	INPUT B	LOGIC FUNC 7
216	INPUT B	LOGIC FUNC 8
221	INPUT B	LOGIC FUNC 9
131	INPUT B	VALUE FUNC 1
176	INPUT B	VALUE FUNC 10
1297	INPUT B	VALUE FUNC 11
1302	INPUT B	VALUE FUNC 12
1307	INPUT B	VALUE FUNC 13
1312	INPUT B	VALUE FUNC 14
1317	INPUT B	VALUE FUNC 15
1322	INPUT B	VALUE FUNC 16
1327	INPUT B	VALUE FUNC 17
1332	INPUT B	VALUE FUNC 18
1337	INPUT B	VALUE FUNC 19
136	INPUT B	VALUE FUNC 2
1342	INPUT B	VALUE FUNC 20
141	INPUT B	VALUE FUNC 3
146	INPUT B	VALUE FUNC 4
151	INPUT B	VALUE FUNC 5
156	INPUT B	VALUE FUNC 6
161	INPUT B	VALUE FUNC 7
166	INPUT B	VALUE FUNC 8
171	INPUT B	VALUE FUNC 9
182	INPUT C	LOGIC FUNC 1
227	INPUT C	LOGIC FUNC 10
1348	INPUT C	LOGIC FUNC 11
1353	INPUT C	LOGIC FUNC 12
1358	INPUT C	LOGIC FUNC 13
1363	INPUT C	LOGIC FUNC 14
1368	INPUT C	LOGIC FUNC 15
1373	INPUT C	LOGIC FUNC 16
1378	INPUT C	LOGIC FUNC 17
1383	INPUT C	LOGIC FUNC 18
1388	INPUT C	LOGIC FUNC 19
187	INPUT C	LOGIC FUNC 2
1393	INPUT C	LOGIC FUNC 20
192	INPUT C	LOGIC FUNC 3
197	INPUT C	LOGIC FUNC 4
202	INPUT C	LOGIC FUNC 5
207	INPUT C	LOGIC FUNC 6
212	INPUT C	LOGIC FUNC 7
217	INPUT C	LOGIC FUNC 8
222	INPUT C	LOGIC FUNC 9
132	INPUT C	VALUE FUNC 1
177	INPUT C	VALUE FUNC 10
1298	INPUT C	VALUE FUNC 11
1303	INPUT C	VALUE FUNC 12
1308	INPUT C	VALUE FUNC 13
1313	INPUT C	VALUE FUNC 14
1318	INPUT C	VALUE FUNC 15
1323	INPUT C	VALUE FUNC 16
1328	INPUT C	VALUE FUNC 17
1333	INPUT C	VALUE FUNC 18
1338	INPUT C	VALUE FUNC 19
137	INPUT C	VALUE FUNC 2
1343	INPUT C	VALUE FUNC 20
142	INPUT C	VALUE FUNC 3
147	INPUT C	VALUE FUNC 4
152	INPUT C	VALUE FUNC 5

TAG	MMI Name	Block
157	INPUT C	VALUE FUNC 6
162	INPUT C	VALUE FUNC 7
167	INPUT C	VALUE FUNC 8
172	INPUT C	VALUE FUNC 9
362	INPUT Hz	SKIP FREQUENCIES
1189	INT DEFEAT	SPEED LOOP
312	INTEGRAL DEFEAT	PID
1153	INVERSE TIME OP	INVERSE TIME
30	INVERT	DIGITAL INPUT 1
1272	INVERT	DIGITAL INPUT 11
1274	INVERT	DIGITAL INPUT 12
1276	INVERT	DIGITAL INPUT 13
1278	INVERT	DIGITAL INPUT 14
1280	INVERT	DIGITAL INPUT 15
33	INVERT	DIGITAL INPUT 2
36	INVERT	DIGITAL INPUT 3
39	INVERT	DIGITAL INPUT 4
42	INVERT	DIGITAL INPUT 5
725	INVERT	DIGITAL INPUT 6
727	INVERT	DIGITAL INPUT 7
51	INVERT	DIGITAL OUTPUT 1
1282	INVERT	DIGITAL OUTPUT 11
1284	INVERT	DIGITAL OUTPUT 12
1286	INVERT	DIGITAL OUTPUT 13
1288	INVERT	DIGITAL OUTPUT 14
1290	INVERT	DIGITAL OUTPUT 15
54	INVERT	DIGITAL OUTPUT 2
736	INVERT	DIGITAL OUTPUT 3
1534	INVERT	ENCODER SPEED 1
1542	INVERT	ENCODER SPEED 2
1154	INVERT ENC TRIP	I/O TRIPS
1487	INVERT OUTPUT	PHASE CONTROL
1482	INVERT SPEED OP	PHASE CONTROL
760	INVERT THERMIST	I/O TRIPS
1152	IT LIMITING	INVERSE TIME
890	JERK 1	S-RAMP
891	JERK 2	S-RAMP
892	JERK 3	S-RAMP
893	JERK 4	S-RAMP
280	JOG	SEQUENCING LOGIC
302	JOGGING	SEQUENCING LOGIC
120	LEAKAGE INDUC	MOTOR DATA
1519	LIMIT	PHASE PID
1253	LIMIT	PID (TYPE 2)
1523	LIMITING	PHASE PID
1257	LIMITING	PID (TYPE 2)
811	LINE SPD DEMAND	COMPENSATION
830	LINE SPEED	DIAMETER CALC
778	LINE SPEED	SPEED CALC
820	LINE SPEED RATE	COMPENSATION
1533	LINES	ENCODER SPEED 1
1541	LINES	ENCODER SPEED 2
250	LOCAL REVERSE	REFERENCE
247	LOCAL SETPOINT	REFERENCE
53	LOW LIMIT	DISPLAY SCALE 1
675	LOW LIMIT	DISPLAY SCALE 2
858	LOW LIMIT	DISPLAY SCALE 3
866	LOW LIMIT	DISPLAY SCALE 4
328	LOWER INPUT	RAISE/LOWER
65	MAG CURRENT	MOTOR DATA
1210	MAIN TORQUE LIM	TORQUE LIMIT
1566	MARK OFFSET	PHASE REGISTER
1598	MASTER LENGTH	PHASE AUTO GEAR
1561	MASTER MARK TYPE	PHASE CONFIGURE

TAG	MMI Name	Block
1590	MASTER MARKS	PHASE AUTO GEAR
1491	MASTER POS (INT)	PHASE CONTROL
1529	MASTER POSITION	PHASE CONFIGURE
1492	MASTER POSITION	PHASE CONTROL
1527	MASTER SCALE A	PHASE CONFIGURE
1528	MASTER SCALE B	PHASE CONFIGURE
1535	MAX SPEED	ENCODER SPEED 1
1543	MAX SPEED	ENCODER SPEED 2
1560	MAX SPEED	PHASE CONFIGURE
1032	MAX SPEED	SETPOINT SCALE
252	MAX SPEED CLAMP	REFERENCE
330	MAX VALUE	RAISE/LOWER
575	MIN SEARCH SPEED	FLYCATCHING
253	MIN SPEED CLAMP	REFERENCE
329	MIN VALUE	RAISE/LOWER
337	MINIMUM	MINIMUM SPEED
806	MINIMUM DIAMETER	COMPENSATION
831	MINIMUM DIAMETER	DIAMETER CALC
781	MINIMUM DIAMETER	SPEED CALC
832	MINIMUM SPEED	DIAMETER CALC
1592	MISSED M MARKS	PHASE AUTO GEAR
1591	MISSED S MARKS	PHASE AUTO GEAR
836	MOD LINE SPEED	DIAMETER CALC
816	MOD WINDER SPEED	COMPENSATION
837	MOD WINDER SPEED	DIAMETER CALC
779	MOD WINDER SPEED	SPEED CALC
689	MODE	AUTOTUNE
338	MODE	MINIMUM SPEED
117	MODE	SYSTEM PORT (P3)
124	MOTOR CONNECTION	MOTOR DATA
64	MOTOR CURRENT	MOTOR DATA
66	MOTOR CURRENT %	FEEDBACKS
67	MOTOR CURRENT A	FEEDBACKS
84	MOTOR POLES	MOTOR DATA
1160	MOTOR VOLTAGE	MOTOR DATA
122	MOTOR VOLTS	VOLTAGE CONTROL
85	MOTORING LIMIT	SLIP COMP
121	MUTUAL INDUC	MOTOR DATA
324	NAME	OPERATOR MENU 1
1073	NAME	OPERATOR MENU 10
1077	NAME	OPERATOR MENU 11
1081	NAME	OPERATOR MENU 12
1085	NAME	OPERATOR MENU 13
1089	NAME	OPERATOR MENU 14
1093	NAME	OPERATOR MENU 15
1097	NAME	OPERATOR MENU 16
378	NAME	OPERATOR MENU 2
1045	NAME	OPERATOR MENU 3
1049	NAME	OPERATOR MENU 4
1053	NAME	OPERATOR MENU 5
1057	NAME	OPERATOR MENU 6
1061	NAME	OPERATOR MENU 7
1065	NAME	OPERATOR MENU 8
1069	NAME	OPERATOR MENU 9
83	NAMEPLATE RPM	MOTOR DATA
1209	NEG TORQUE LIM	TORQUE LIMIT
791	NEG TORQUE LIMIT	TORQUE CALC
1259	NEGATE	5703 INPUT
1038	NO SETPOINT PWRD	ACCESS CONTROL
1582	NOM MASTER LEN	PHASE AUTO GEAR
1583	NOM SLAVE LENGTH	PHASE AUTO GEAR
278	NOT COAST STOP	SEQUENCING LOGIC
277	NOT FAST STOP	SEQUENCING LOGIC
293	NOT STOP	SEQUENCING LOGIC

TAG	MMI Name	Block
586	OFF FREQUENCY	BRAKE CONTROL
588	OFF HOLD TIME	BRAKE CONTROL
15	OFFSET	ANALOG INPUT 1
24	OFFSET	ANALOG INPUT 2
714	OFFSET	ANALOG INPUT 3
721	OFFSET	ANALOG INPUT 4
47	OFFSET	ANALOG OUTPUT 1
733	OFFSET	ANALOG OUTPUT 2
802	OFFSET	ANALOG OUTPUT 3
1510	OFFSET	PHASE OFFSET
1511	OFFSET FINE	PHASE OFFSET
585	ON FREQUENCY	BRAKE CONTROL
587	ON HOLD TIME	BRAKE CONTROL
584	ON LOAD	BRAKE CONTROL
230	OP VERSION	OP STATION 1
1110	OP VERSION	OP STATION 2
1104	OUTPUT	FILTER 1
1108	OUTPUT	FILTER 2
1472	OUTPUT	HOME
887	OUTPUT	LINEAR RAMP
183	OUTPUT	LOGIC FUNC 1
228	OUTPUT	LOGIC FUNC 10
1349	OUTPUT	LOGIC FUNC 11
1354	OUTPUT	LOGIC FUNC 12
1359	OUTPUT	LOGIC FUNC 13
1364	OUTPUT	LOGIC FUNC 14
1369	OUTPUT	LOGIC FUNC 15
1374	OUTPUT	LOGIC FUNC 16
1379	OUTPUT	LOGIC FUNC 17
1384	OUTPUT	LOGIC FUNC 18
1389	OUTPUT	LOGIC FUNC 19
188	OUTPUT	LOGIC FUNC 2
1394	OUTPUT	LOGIC FUNC 20
193	OUTPUT	LOGIC FUNC 3
198	OUTPUT	LOGIC FUNC 4
203	OUTPUT	LOGIC FUNC 5
208	OUTPUT	LOGIC FUNC 6
213	OUTPUT	LOGIC FUNC 7
218	OUTPUT	LOGIC FUNC 8
223	OUTPUT	LOGIC FUNC 9
335	OUTPUT	MINIMUM SPEED
598	OUTPUT	MULTIPLEXER 1
873	OUTPUT	MULTIPLEXER 2
1488	OUTPUT	PHASE CONTROL
1522	OUTPUT	PHASE PID
1256	OUTPUT	PID (TYPE 2)
748	OUTPUT	POSITION
325	OUTPUT	RAISE/LOWER
59	OUTPUT	SETPOINT SCALE
346	OUTPUT	SKIP FREQUENCIES
767	OUTPUT	S-RAMP
133	OUTPUT	VALUE FUNC 1
178	OUTPUT	VALUE FUNC 10
1299	OUTPUT	VALUE FUNC 11
1304	OUTPUT	VALUE FUNC 12
1309	OUTPUT	VALUE FUNC 13
1314	OUTPUT	VALUE FUNC 14
1319	OUTPUT	VALUE FUNC 15
1324	OUTPUT	VALUE FUNC 16
1329	OUTPUT	VALUE FUNC 17
1334	OUTPUT	VALUE FUNC 18
1339	OUTPUT	VALUE FUNC 19
138	OUTPUT	VALUE FUNC 2
1344	OUTPUT	VALUE FUNC 20

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TAG	MMI Name	Block
143	OUTPUT	VALUE FUNC 3
148	OUTPUT	VALUE FUNC 4
153	OUTPUT	VALUE FUNC 5
158	OUTPUT	VALUE FUNC 6
163	OUTPUT	VALUE FUNC 7
168	OUTPUT	VALUE FUNC 8
173	OUTPUT	VALUE FUNC 9
657	OUTPUT 0	DEMULTIPLEXER 1
875	OUTPUT 0	DEMULTIPLEXER 2
658	OUTPUT 1	DEMULTIPLEXER 1
1000	OUTPUT 1	DEMULTIPLEXER 2
356	OUTPUT 1	PRESET 1
389	OUTPUT 1	PRESET 2
399	OUTPUT 1	PRESET 3
519	OUTPUT 1	PRESET 4
530	OUTPUT 1	PRESET 5
541	OUTPUT 1	PRESET 6
552	OUTPUT 1	PRESET 7
563	OUTPUT 1	PRESET 8
758	OUTPUT 1	TEC OPTION
667	OUTPUT 10	DEMULTIPLEXER 1
1009	OUTPUT 10	DEMULTIPLEXER 2
668	OUTPUT 11	DEMULTIPLEXER 1
1010	OUTPUT 11	DEMULTIPLEXER 2
669	OUTPUT 12	DEMULTIPLEXER 1
1011	OUTPUT 12	DEMULTIPLEXER 2
670	OUTPUT 13	DEMULTIPLEXER 1
1012	OUTPUT 13	DEMULTIPLEXER 2
671	OUTPUT 14	DEMULTIPLEXER 1
1013	OUTPUT 14	DEMULTIPLEXER 2
672	OUTPUT 15	DEMULTIPLEXER 1
1014	OUTPUT 15	DEMULTIPLEXER 2
659	OUTPUT 2	DEMULTIPLEXER 1
1001	OUTPUT 2	DEMULTIPLEXER 2
372	OUTPUT 2	PRESET 1
373	OUTPUT 2	PRESET 2
374	OUTPUT 2	PRESET 3
520	OUTPUT 2	PRESET 4
531	OUTPUT 2	PRESET 5
542	OUTPUT 2	PRESET 6
553	OUTPUT 2	PRESET 7
564	OUTPUT 2	PRESET 8
759	OUTPUT 2	TEC OPTION
660	OUTPUT 3	DEMULTIPLEXER 1
1002	OUTPUT 3	DEMULTIPLEXER 2
661	OUTPUT 4	DEMULTIPLEXER 1
1003	OUTPUT 4	DEMULTIPLEXER 2
662	OUTPUT 5	DEMULTIPLEXER 1
1004	OUTPUT 5	DEMULTIPLEXER 2
663	OUTPUT 6	DEMULTIPLEXER 1
1005	OUTPUT 6	DEMULTIPLEXER 2
664	OUTPUT 7	DEMULTIPLEXER 1
1006	OUTPUT 7	DEMULTIPLEXER 2
665	OUTPUT 8	DEMULTIPLEXER 1
1007	OUTPUT 8	DEMULTIPLEXER 2
666	OUTPUT 9	DEMULTIPLEXER 1
1008	OUTPUT 9	DEMULTIPLEXER 2
286	OUTPUT CONTACTOR	SEQUENCING LOGIC
363	OUTPUT Hz	SKIP FREQUENCIES
318	OUTPUT NEG LIMIT	PID
317	OUTPUT POS LIMIT	PID
1486	OUTPUT SCALE	PHASE CONTROL
319	OUTPUT SCALING	PID
776	OVER SPD ENABLE	SPEED CALC

TAG	MMI Name	Block
782	OVER SPEED	SPEED CALC
1164	OVERLOAD	MOTOR DATA
775	OVER-WIND	SPEED CALC
786	OVER-WIND	TORQUE CALC
1516	P GAIN	PHASE PID
1250	P GAIN	PID (TYPE 2)
74	PARAMETER	OPERATOR MENU 1
633	PARAMETER	OPERATOR MENU 10
634	PARAMETER	OPERATOR MENU 11
635	PARAMETER	OPERATOR MENU 12
636	PARAMETER	OPERATOR MENU 13
637	PARAMETER	OPERATOR MENU 14
638	PARAMETER	OPERATOR MENU 15
639	PARAMETER	OPERATOR MENU 16
371	PARAMETER	OPERATOR MENU 2
626	PARAMETER	OPERATOR MENU 3
627	PARAMETER	OPERATOR MENU 4
628	PARAMETER	OPERATOR MENU 5
629	PARAMETER	OPERATOR MENU 6
630	PARAMETER	OPERATOR MENU 7
631	PARAMETER	OPERATOR MENU 8
632	PARAMETER	OPERATOR MENU 9
8	PASSWORD	ACCESS CONTROL
608	PENDING	AUTO RESTART
1473	PERIOD	PHASE TUNING
1477	PHASE OFFSET	PHASE TUNING
766	PID ERROR	PID
1549	PID OUTPUT	PHASE PID
320	PID OUTPUT	PID
1548	PID OUTPUT	PID (TYPE 2)
1494	POS ERROR (INT)	PHASE CONTROL
1485	POS FDFWD SCALE	PHASE CONTROL
1490	POS FEED FWD	PHASE CONTROL
1208	POS TORQUE LIM	TORQUE LIMIT
790	POS TORQUE LIMIT	TORQUE CALC
1480	POSITION ENABLE	PHASE CONTROL
1495	POSITION ERROR	PHASE CONTROL
1158	POWER	MOTOR DATA
242	POWER FACTOR	MOTOR DATA
299	POWER UP MODE	LOCAL CONTROL
283	POWER UP START	SEQUENCING LOGIC
822	PRESET ENABLE	DIAMETER CALC
1271	PWR LOSS ACTIVE	POWER LOSS CNTRL
50	QUADRATIC TORQUE	FEEDBACKS
327	RAISE INPUT	RAISE/LOWER
326	RAMP TIME	RAISE/LOWER
244	RAMP TYPE	REFERENCE RAMP
888	RAMPING	LINEAR RAMP
698	RAMPING	REFERENCE RAMP
768	RAMPING	S-RAMP
98	RANDOM PATTERN	PATTERN GEN
1502	RATE	PHASE INCH
812	RATE CAL	COMPENSATION
1258	RATIO	5703 INPUT
1261	RAW VALUE	5703 INPUT
1040	READ ONLY	OPERATOR MENU 1
1075	READ ONLY	OPERATOR MENU 10
1079	READ ONLY	OPERATOR MENU 11
1083	READ ONLY	OPERATOR MENU 12
1087	READ ONLY	OPERATOR MENU 13
1091	READ ONLY	OPERATOR MENU 14
1095	READ ONLY	OPERATOR MENU 15
1099	READ ONLY	OPERATOR MENU 16
1043	READ ONLY	OPERATOR MENU 2

TAG	MMI Name	Block
1047	READ ONLY	OPERATOR MENU 3
1051	READ ONLY	OPERATOR MENU 4
1055	READ ONLY	OPERATOR MENU 5
1059	READ ONLY	OPERATOR MENU 6
1063	READ ONLY	OPERATOR MENU 7
1067	READ ONLY	OPERATOR MENU 8
1071	READ ONLY	OPERATOR MENU 9
1602	READY	PHASE AUTO GEAR
287	READY	SEQUENCING LOGIC
265	REF MODES	LOCAL CONTROL
709	REFLUX TIME	FLYCATCHING
686	REGEN LIM ENABLE	CURRENT LIMIT
86	REGEN LIMIT	SLIP COMP
589	RELEASE	BRAKE CONTROL
282	REM TRIP RESET	SEQUENCING LOGIC
300	REMOTE COMMS SEL	COMMS CONTROL
257	REMOTE REF	LOCAL CONTROL
308	REMOTE REF MODES	COMMS CONTROL
296	REMOTE REV OUT	SEQUENCING LOGIC
249	REMOTE REVERSE	REFERENCE
294	REMOTE REVERSE	SEQUENCING LOGIC
297	REMOTE SEQ	LOCAL CONTROL
307	REMOTE SEQ MODES	COMMS CONTROL
245	REMOTE SETPOINT	REFERENCE
1264	REPEATER	5703 OUTPUT
1570	REPEATS	PHASE REGISTER
1292	REQUIRED TYPE	SYSTEM OPTION
1102	RESET	FILTER 1
1106	RESET	FILTER 2
885	RESET	LINEAR RAMP
1579	RESET	PHASE AUTO GEAR
1563	RESET	PHASE REGISTER
747	RESET	POSITION
332	RESET	RAISE/LOWER
897	RESET	S-RAMP
1479	RESET (TOTAL)	PHASE CONTROL
1588	RESET COUNTERS	PHASE AUTO GEAR
886	RESET VALUE	LINEAR RAMP
331	RESET VALUE	RAISE/LOWER
898	RESET VALUE	S-RAMP
616	RESTARTING	AUTO RESTART
1501	RETARD	PHASE INCH
813	REVERSE	COMPENSATION
256	REVERSE	REFERENCE
810	REWIND	COMPENSATION
774	REWIND	SPEED CALC
1550	REWIND	TORQUE CALC
1163	ROTOR TIME CONST	MOTOR DATA
291	RUN FORWARD	SEQUENCING LOGIC
292	RUN REVERSE	SEQUENCING LOGIC
279	RUN STOP MODE	REFERENCE STOP
285	RUNNING	SEQUENCING LOGIC
14	SCALE	ANALOG INPUT 1
23	SCALE	ANALOG INPUT 2
713	SCALE	ANALOG INPUT 3
720	SCALE	ANALOG INPUT 4
46	SCALE	ANALOG OUTPUT 1
732	SCALE	ANALOG OUTPUT 2
801	SCALE	ANALOG OUTPUT 3
819	SCALED RATE	COMPENSATION
1260	SCALED VALUE	5703 INPUT
1039	SCALING	OPERATOR MENU 1
1074	SCALING	OPERATOR MENU 10
1078	SCALING	OPERATOR MENU 11
1082	SCALING	OPERATOR MENU 12
1086	SCALING	OPERATOR MENU 13
1090	SCALING	OPERATOR MENU 14
1094	SCALING	OPERATOR MENU 15
1098	SCALING	OPERATOR MENU 16
1042	SCALING	OPERATOR MENU 2
1046	SCALING	OPERATOR MENU 3
1050	SCALING	OPERATOR MENU 4
1054	SCALING	OPERATOR MENU 5
1058	SCALING	OPERATOR MENU 6
1062	SCALING	OPERATOR MENU 7
1066	SCALING	OPERATOR MENU 8
1070	SCALING	OPERATOR MENU 9
32	SEARCH BOOST	FLYCATCHING
572	SEARCH MODE	FLYCATCHING
574	SEARCH TIME	FLYCATCHING
573	SEARCH VOLTS	FLYCATCHING
824	SEL EXT DIAMETER	DIAMETER CALC
823	SELECT CORE 2	DIAMETER CALC
355	SELECT INPUT	PRESET 1
388	SELECT INPUT	PRESET 2
398	SELECT INPUT	PRESET 3
518	SELECT INPUT	PRESET 4
529	SELECT INPUT	PRESET 5
540	SELECT INPUT	PRESET 6
551	SELECT INPUT	PRESET 7
562	SELECT INPUT	PRESET 8
281	SEQ DIRECTION	LOCAL CONTROL
298	SEQ MODES	LOCAL CONTROL
301	SEQUENCER STATE	SEQUENCING LOGIC
28	SETPOINT	FLYCATCHING
310	SETPOINT	PID
246	SETPOINT	REFERENCE JOG
763	SETPOINT NEGATE	PID
1037	SETPOINT SCALE	ACCESS CONTROL
1524	SLAVE CNT SRC	PHASE CONFIGURE
1599	SLAVE LENGTH	PHASE AUTO GEAR
1562	SLAVE MARK TYPE	PHASE CONFIGURE
1589	SLAVE MARKS	PHASE AUTO GEAR
1567	SLAVE NOM LENGTH	PHASE REGISTER
1530	SLAVE POSITION	PHASE CONFIGURE
1493	SLAVE POSITION	PHASE CONTROL
1532	SOURCE	ENCODER SPEED 1
1540	SOURCE	ENCODER SPEED 2
400	SOURCE	LINK 1
418	SOURCE	LINK 10
420	SOURCE	LINK 11
422	SOURCE	LINK 12
424	SOURCE	LINK 13
426	SOURCE	LINK 14
428	SOURCE	LINK 15
430	SOURCE	LINK 16
432	SOURCE	LINK 17
434	SOURCE	LINK 18
436	SOURCE	LINK 19
402	SOURCE	LINK 2
438	SOURCE	LINK 20
440	SOURCE	LINK 21
442	SOURCE	LINK 22
444	SOURCE	LINK 23
446	SOURCE	LINK 24
448	SOURCE	LINK 25
450	SOURCE	LINK 26
452	SOURCE	LINK 27

TAG	MMI Name	Block
454	SOURCE	LINK 28
456	SOURCE	LINK 29
404	SOURCE	LINK 3
458	SOURCE	LINK 30
460	SOURCE	LINK 31
462	SOURCE	LINK 32
464	SOURCE	LINK 33
466	SOURCE	LINK 34
468	SOURCE	LINK 35
470	SOURCE	LINK 36
472	SOURCE	LINK 37
474	SOURCE	LINK 38
476	SOURCE	LINK 39
406	SOURCE	LINK 4
478	SOURCE	LINK 40
480	SOURCE	LINK 41
482	SOURCE	LINK 42
484	SOURCE	LINK 43
486	SOURCE	LINK 44
488	SOURCE	LINK 45
490	SOURCE	LINK 46
492	SOURCE	LINK 47
494	SOURCE	LINK 48
496	SOURCE	LINK 49
408	SOURCE	LINK 5
498	SOURCE	LINK 50
1400	SOURCE	LINK 51
1402	SOURCE	LINK 52
1404	SOURCE	LINK 53
1406	SOURCE	LINK 54
1408	SOURCE	LINK 55
1410	SOURCE	LINK 56
1412	SOURCE	LINK 57
1414	SOURCE	LINK 58
1416	SOURCE	LINK 59
410	SOURCE	LINK 6
1418	SOURCE	LINK 60
1420	SOURCE	LINK 61
1422	SOURCE	LINK 62
1424	SOURCE	LINK 63
1426	SOURCE	LINK 64
1428	SOURCE	LINK 65
1430	SOURCE	LINK 66
1432	SOURCE	LINK 67
1434	SOURCE	LINK 68
1436	SOURCE	LINK 69
412	SOURCE	LINK 7
1438	SOURCE	LINK 70
1440	SOURCE	LINK 71
1442	SOURCE	LINK 72
1444	SOURCE	LINK 73
1446	SOURCE	LINK 74
1448	SOURCE	LINK 75
1450	SOURCE	LINK 76
1452	SOURCE	LINK 77
1454	SOURCE	LINK 78
1456	SOURCE	LINK 79
414	SOURCE	LINK 8
1458	SOURCE	LINK 80
416	SOURCE	LINK 9
1525	SPD LOOP SPD FBK	PHASE CONFIGURE
1539	SPEED	ENCODER SPEED 1
1547	SPEED	ENCODER SPEED 2
255	SPEED DEMAND	REFERENCE

TAG	MMI Name	Block
784	SPEED DEMAND	SPEED CALC
1191	SPEED DMD FILTER	SPEED LOOP
1207	SPEED ERROR	SPEED LOOP
749	SPEED FBK %	FEEDBACKS
1192	SPEED FBK FILTER	SPEED LOOP
568	SPEED FBK REV/S	FEEDBACKS
569	SPEED FBK RPM	FEEDBACKS
1538	SPEED Hz	ENCODER SPEED 1
1546	SPEED Hz	ENCODER SPEED 2
1481	SPEED INPUT	PHASE CONTROL
1190	SPEED INT PRESET	SPEED LOOP
1188	SPEED INT TIME	SPEED LOOP
1201	SPEED NEG LIM	SPEED LOOP
1475	SPEED OFFSET	PHASE TUNING
1489	SPEED OUTPUT	PHASE CONTROL
1200	SPEED POS LIM	SPEED LOOP
1187	SPEED PROP GAIN	SPEED LOOP
254	SPEED SETPOINT	REFERENCE
248	SPEED TRIM	REFERENCE
783	SPEED TRIM	SPEED CALC
692	SRAMP ACCEL	REFERENCE RAMP
691	SRAMP CONTINUOUS	REFERENCE RAMP
693	SRAMP DECEL	REFERENCE RAMP
694	SRAMP JERK 1	REFERENCE RAMP
695	SRAMP JERK 2	REFERENCE RAMP
696	SRAMP JERK 3	REFERENCE RAMP
697	SRAMP JERK 4	REFERENCE RAMP
839	STALL ENABLE	TAPER CALC
240	STALL LIMIT	STALL TRIP
847	STALL TENSION	TAPER CALC
241	STALL TIME	STALL TRIP
571	START MODE	FLYCATCHING
93	STARTUP SCREEN	ACCESS CONTROL
815	STATIC COMP	COMPENSATION
119	STATOR RES	MOTOR DATA
1571	STATUS	PHASE REGISTER
284	STOP DELAY	REFERENCE STOP
263	STOP TIME	REFERENCE STOP
266	STOP ZERO SPEED	REFERENCE STOP
303	STOPPING	SEQUENCING LOGIC
288	SWITCH ON ENABLE	SEQUENCING LOGIC
306	SWITCHED ON	SEQUENCING LOGIC
1211	SYMMETRIC LIM	TORQUE LIMIT
882	SYMMETRIC MODE	LINEAR RAMP
268	SYMMETRIC MODE	REFERENCE RAMP
883	SYMMETRIC TIME	LINEAR RAMP
267	SYMMETRIC TIME	REFERENCE RAMP
305	SYSTEM RESET	SEQUENCING LOGIC
848	TAPER SPT	TAPER CALC
850	TAPERED DEMAND	TAPER CALC
851	TENSION DEMAND	TAPER CALC
825	TENSION ENABLE	DIAMETER CALC
787	TENSION ENABLE	TORQUE CALC
846	TENSION RAMP	TAPER CALC
849	TENSION SPT	TAPER CALC
1020	TERMINAL VOLTS	FEEDBACKS
1025	TEST DISABLE	AUTOTUNE
1155	THERMISTOR	I/O TRIPS
357	THRESHOLD	ZERO SPEED
1103	TIME CONSTANT	FILTER 1
1107	TIME CONSTANT	FILTER 2
615	TIME LEFT	AUTO RESTART
1270	TIME LIMIT	POWER LOSS CNTRL
582	TIMEOUT	INJ BRAKING

TAG	MMI Name	Block
1584	TOLERANCE	PHASE AUTO GEAR
1202	TORQ DMD ISOLATE	SPEED LOOP
1204	TORQUE DEMAND	SPEED LOOP
788	TORQUE DEMAND	TORQUE CALC
70	TORQUE FEEDBACK	FEEDBACKS
789	TORQUE LIMIT	TORQUE CALC
1206	TOTAL SPD DMD %	SPEED LOOP
1203	TOTL SPD DMD RPM	SPEED LOOP
609	TRIGGERS 1	AUTO RESTART
744	TRIGGERS 1+	AUTO RESTART
677	TRIGGERS 2	AUTO RESTART
745	TRIGGERS 2+	AUTO RESTART
243	TRIM IN LOCAL	REFERENCE
500	TRIP 1 (NEWEST)	TRIPS HISTORY
509	TRIP 10 (OLDEST)	TRIPS HISTORY
501	TRIP 2	TRIPS HISTORY
502	TRIP 3	TRIPS HISTORY
503	TRIP 4	TRIPS HISTORY
504	TRIP 5	TRIPS HISTORY
505	TRIP 6	TRIPS HISTORY
506	TRIP 7	TRIPS HISTORY
507	TRIP 8	TRIPS HISTORY
508	TRIP 9	TRIPS HISTORY
290	TRIP RST BY RUN	SEQUENCING LOGIC
1266	TRIP THRESHOLD	POWER LOSS CNTRL
289	TRIPPED	SEQUENCING LOGIC
13	TYPE	ANALOG INPUT 1
22	TYPE	ANALOG INPUT 2
712	TYPE	ANALOG INPUT 3
719	TYPE	ANALOG INPUT 4
49	TYPE	ANALOG OUTPUT 1
735	TYPE	ANALOG OUTPUT 2
804	TYPE	ANALOG OUTPUT 3
184	TYPE	LOGIC FUNC 1
229	TYPE	LOGIC FUNC 10
1350	TYPE	LOGIC FUNC 11
1355	TYPE	LOGIC FUNC 12
1360	TYPE	LOGIC FUNC 13
1365	TYPE	LOGIC FUNC 14
1370	TYPE	LOGIC FUNC 15
1375	TYPE	LOGIC FUNC 16
1380	TYPE	LOGIC FUNC 17
1385	TYPE	LOGIC FUNC 18
1390	TYPE	LOGIC FUNC 19
189	TYPE	LOGIC FUNC 2
1395	TYPE	LOGIC FUNC 20
194	TYPE	LOGIC FUNC 3
199	TYPE	LOGIC FUNC 4
204	TYPE	LOGIC FUNC 5
209	TYPE	LOGIC FUNC 6
214	TYPE	LOGIC FUNC 7
219	TYPE	LOGIC FUNC 8
224	TYPE	LOGIC FUNC 9
750	TYPE	TEC OPTION
134	TYPE	VALUE FUNC 1
179	TYPE	VALUE FUNC 10
1300	TYPE	VALUE FUNC 11
1305	TYPE	VALUE FUNC 12
1310	TYPE	VALUE FUNC 13
1315	TYPE	VALUE FUNC 14
1320	TYPE	VALUE FUNC 15
1325	TYPE	VALUE FUNC 16
1330	TYPE	VALUE FUNC 17
1335	TYPE	VALUE FUNC 18
1340	TYPE	VALUE FUNC 19
139	TYPE	VALUE FUNC 2
1345	TYPE	VALUE FUNC 20
144	TYPE	VALUE FUNC 3
149	TYPE	VALUE FUNC 4
154	TYPE	VALUE FUNC 5
159	TYPE	VALUE FUNC 6
164	TYPE	VALUE FUNC 7
169	TYPE	VALUE FUNC 8
174	TYPE	VALUE FUNC 9
103	UNIT ID (UID)	SYSTEM PORT (P3)
323	UNITS	DISPLAY SCALE 1
377	UNITS	DISPLAY SCALE 2
859	UNITS	DISPLAY SCALE 3
867	UNITS	DISPLAY SCALE 4
1151	UP TIME	INVERSE TIME
785	UP TO SPD (UTS)	SPEED CALC
777	UTS THRESHOLD	SPEED CALC
104	V/F SHAPE	FLUXING
1263	VALUE	5703 OUTPUT
16	VALUE	ANALOG INPUT 1
25	VALUE	ANALOG INPUT 2
715	VALUE	ANALOG INPUT 3
722	VALUE	ANALOG INPUT 4
45	VALUE	ANALOG OUTPUT 1
731	VALUE	ANALOG OUTPUT 2
800	VALUE	ANALOG OUTPUT 3
31	VALUE	DIGITAL INPUT 1
1273	VALUE	DIGITAL INPUT 11
1275	VALUE	DIGITAL INPUT 12
1277	VALUE	DIGITAL INPUT 13
1279	VALUE	DIGITAL INPUT 14
1281	VALUE	DIGITAL INPUT 15
34	VALUE	DIGITAL INPUT 2
37	VALUE	DIGITAL INPUT 3
40	VALUE	DIGITAL INPUT 4
43	VALUE	DIGITAL INPUT 5
726	VALUE	DIGITAL INPUT 6
728	VALUE	DIGITAL INPUT 7
52	VALUE	DIGITAL OUTPUT 1
1283	VALUE	DIGITAL OUTPUT 11
1285	VALUE	DIGITAL OUTPUT 12
1287	VALUE	DIGITAL OUTPUT 13
1289	VALUE	DIGITAL OUTPUT 14
1291	VALUE	DIGITAL OUTPUT 15
55	VALUE	DIGITAL OUTPUT 2
737	VALUE	DIGITAL OUTPUT 3
807	VARIABLE INERTIA	COMPENSATION
1553	VECTOR ENABLE	FLYCATCHING
1507	VELOCITY	PHASE MOVE
1568	VELOCITY	PHASE REGISTER
1295	VERSION	SYSTEM OPTION
757	VERSION	TEC OPTION
570	VHZ ENABLE	FLYCATCHING
876	VIEW LEVEL	ACCESS CONTROL
595	VOLTAGE MODE	VOLTAGE CONTROL
5	WARNINGS	TRIPS STATUS
741	WARNINGS+	TRIPS STATUS
809	WIDTH	COMPENSATION
833	WINDER SPEED	DIAMETER CALC

Specification Table: Tag Number Order

TAG	MMI Name	Block	Type	Range	ID	Notes
4	ACTIVE TRIPS	TRIPS STATUS	WORD	0000 to FFFF	04	Output
5	WARNINGS	TRIPS STATUS	WORD	0000 to FFFF	05	Output
6	FIRST TRIP	TRIPS STATUS	ENUM	0 to 45	06	Output
8	PASSWORD	ACCESS CONTROL	WORD	0000 to FFFF	08	
12	BREAK ENABLE	ANALOG INPUT 1	BOOL	FALSE / TRUE	0c	
13	TYPE	ANALOG INPUT 1	ENUM	0 to 9	0d	
14	SCALE	ANALOG INPUT 1	REAL	-300.00 to 300.00 %	0e	
15	OFFSET	ANALOG INPUT 1	REAL	-300.00 to 300.00 %	0f	
16	VALUE	ANALOG INPUT 1	REAL	_.xx	0g	Output
17	BREAK VALUE	ANALOG INPUT 1	REAL	-300.00 to 300.00 %	0h	
18	BREAK	ANALOG INPUT 1	BOOL	FALSE / TRUE	0i	Output
21	BREAK ENABLE	ANALOG INPUT 2	BOOL	FALSE / TRUE	0l	
22	TYPE	ANALOG INPUT 2	ENUM	0 to 9	0m	
23	SCALE	ANALOG INPUT 2	REAL	-300.00 to 300.00 %	0n	
24	OFFSET	ANALOG INPUT 2	REAL	-300.00 to 300.00 %	0o	
25	VALUE	ANALOG INPUT 2	REAL	_.xx	0p	Output
26	BREAK VALUE	ANALOG INPUT 2	REAL	-300.00 to 300.00 %	0q	
27	BREAK	ANALOG INPUT 2	BOOL	FALSE / TRUE	0r	Output
28	SETPOINT	FLYCATCHING	REAL	_.xx	0s	Output
30	INVERT	DIGITAL INPUT 1	BOOL	FALSE / TRUE	0u	
31	VALUE	DIGITAL INPUT 1	BOOL	FALSE / TRUE	0v	Output
32	SEARCH BOOST	FLYCATCHING	REAL	0.00 to 50.00 %	0w	3
33	INVERT	DIGITAL INPUT 2	BOOL	FALSE / TRUE	0x	
34	VALUE	DIGITAL INPUT 2	BOOL	FALSE / TRUE	0y	Output
36	INVERT	DIGITAL INPUT 3	BOOL	FALSE / TRUE	10	
37	VALUE	DIGITAL INPUT 3	BOOL	FALSE / TRUE	11	Output
39	INVERT	DIGITAL INPUT 4	BOOL	FALSE / TRUE	13	
40	VALUE	DIGITAL INPUT 4	BOOL	FALSE / TRUE	14	Output
42	INVERT	DIGITAL INPUT 5	BOOL	FALSE / TRUE	16	
43	VALUE	DIGITAL INPUT 5	BOOL	FALSE / TRUE	17	Output
44	COEFFICIENT B	DISPLAY SCALE 1	REAL	-32768.00 to 32767.00	18	
45	VALUE	ANALOG OUTPUT 1	REAL	-300.00 to 300.00 %	19	
46	SCALE	ANALOG OUTPUT 1	REAL	-300.00 to 300.00 %	1a	
47	OFFSET	ANALOG OUTPUT 1	REAL	-300.00 to 300.00 %	1b	
48	ABSOLUTE	ANALOG OUTPUT 1	BOOL	FALSE / TRUE	1c	
49	TYPE	ANALOG OUTPUT 1	ENUM	0 to 8	1d	
50	QUADRATIC TORQUE	FEEDBACKS	BOOL	FALSE / TRUE	1e	3
51	INVERT	DIGITAL OUTPUT 1	BOOL	FALSE / TRUE	1f	
52	VALUE	DIGITAL OUTPUT 1	BOOL	FALSE / TRUE	1g	
53	LOW LIMIT	DISPLAY SCALE 1	REAL	-32768.00 to 32767.00	1h	
54	INVERT	DIGITAL OUTPUT 2	BOOL	FALSE / TRUE	1i	
55	VALUE	DIGITAL OUTPUT 2	BOOL	FALSE / TRUE	1j	
58	INPUT	SETPOINT SCALE	REAL	-300.00 to 300.00 %	1m	
59	OUTPUT	SETPOINT SCALE	REAL	_.x	1n	Output
60	ENABLE	SLEW RATE LIMIT	BOOL	FALSE / TRUE	1o	
61	DECEL LIMIT	SLEW RATE LIMIT	REAL	1.0 to 1200.0 Hz/s	1p	
62	ACCEL LIMIT	SLEW RATE LIMIT	REAL	1.0 to 1200.0 Hz/s	1q	
64	MOTOR CURRENT	MOTOR DATA	REAL	0.00 to 595.00 A	1s	3,7,10
65	MAG CURRENT	MOTOR DATA	REAL	0.00 to 595.00 A	1t	3,10
66	MOTOR CURRENT %	FEEDBACKS	REAL	_.xx	1u	Output
67	MOTOR CURRENT A	FEEDBACKS	REAL	_.x	1v	Output
70	TORQUE FEEDBACK	FEEDBACKS	REAL	_.xx	1y	Output
73	FIELD FEEDBACK	FEEDBACKS	REAL	_.xx	21	Output
74	PARAMETER	OPERATOR MENU 1	PREF	-1999 to 1999	22	
75	DC LINK VOLTS	FEEDBACKS	REAL	_.	23	Output
77	BRAKE RESISTANCE	DYNAMIC BRAKING	REAL	1 to 1000 Ohm	25	7
78	BRAKE POWER	DYNAMIC BRAKING	REAL	0.1 to 510.0 kW	26	7
79	1SEC OVER RATING	DYNAMIC BRAKING	REAL	1 to 40	27	7

TAG	MMI Name	Block	Type	Range	ID	Notes
80	ENABLE	DYNAMIC BRAKING	BOOL	FALSE / TRUE	28	
81	BRAKING	DYNAMIC BRAKING	BOOL	FALSE / TRUE	29	Output
82	ENABLE	SLIP COMP	BOOL	FALSE / TRUE	2a	7
83	NAMEPLATE RPM	MOTOR DATA	REAL	0.0 to 30000.0 RPM	2b	3,10
84	MOTOR POLES	MOTOR DATA	ENUM	0 to 5	2c	3
85	MOTORING LIMIT	SLIP COMP	REAL	0.0 to 600.0 RPM	2d	3
86	REGEN LIMIT	SLIP COMP	REAL	0.0 to 600.0 RPM	2e	3
93	STARTUP SCREEN	ACCESS CONTROL	INT	0 to 16	2l	
98	RANDOM PATTERN	PATTERN GEN	BOOL	FALSE / TRUE	2q	
99	FREQ SELECT	PATTERN GEN	ENUM	0 : 3 kHz	2r	
100	DEFLUX DELAY	PATTERN GEN	REAL	0.1 to 10.0 s	2s	3
101	HIGH LIMIT	DISPLAY SCALE 1	REAL	-32768.00 to 32767.00	2t	
102	GROUP ID (GID)	SYSTEM PORT (P3)	INT	0 to 9	2u	
103	UNIT ID (UID)	SYSTEM PORT (P3)	INT	0 to 15	2v	
104	V/F SHAPE	FLUXING	ENUM	0 to 1	2w	
106	BASE FREQUENCY	FLUXING	REAL	7.5 to 500.0 Hz	2y	3
107	FIXED BOOST	FLUXING	REAL	0.00 to 25.00 %	2z	3
108	AUTO BOOST	FLUXING	REAL	0.00 to 25.00 %	30	3
112	BASE VOLTS	VOLTAGE CONTROL	REAL	0.00 to 115.47 %	34	
117	MODE	SYSTEM PORT (P3)	ENUM	0 to 1	39	
119	STATOR RES	MOTOR DATA	REAL	0.0000 to 250.0000 Ohm	3b	3,10
120	LEAKAGE INDUC	MOTOR DATA	REAL	0.00 to 300.00 mH	3c	3
121	MUTUAL INDUC	MOTOR DATA	REAL	0.00 to 3000.00 mH	3d	3,10
122	MOTOR VOLTS	VOLTAGE CONTROL	REAL	0.0 to 575.0 V	3e	3
124	MOTOR CONNECTION	MOTOR DATA	ENUM	0 to 1	3g	3
125	FORMULA	DISPLAY SCALE 1	ENUM	0 to 3	3h	
126	FINAL STOP RATE	REFERENCE STOP	REAL	12 to 4800 Hz/s	3i	
127	ENABLED KEYS	OP STATION 1	WORD	4 : DIRECTION 5 : JOG 6 : L/R 7 : START	3j	
128	ENABLE	STABILISATION	BOOL	FALSE / TRUE	3k	
130	INPUT A	VALUE FUNC 1	REAL	-32768.00 to 32767.00	3m	
131	INPUT B	VALUE FUNC 1	REAL	-32768.00 to 32767.00	3n	
132	INPUT C	VALUE FUNC 1	REAL	-32768.00 to 32767.00	3o	
133	OUTPUT	VALUE FUNC 1	REAL	_.xx	3p	Output
134	TYPE	VALUE FUNC 1	ENUM	0 to 22	3q	
135	INPUT A	VALUE FUNC 2	REAL	-32768.00 to 32767.00	3r	
136	INPUT B	VALUE FUNC 2	REAL	-32768.00 to 32767.00	3s	
137	INPUT C	VALUE FUNC 2	REAL	-32768.00 to 32767.00	3t	
138	OUTPUT	VALUE FUNC 2	REAL	_.xx	3u	Output
139	TYPE	VALUE FUNC 2	ENUM	0 to 22	3v	
140	INPUT A	VALUE FUNC 3	REAL	-32768.00 to 32767.00	3w	
141	INPUT B	VALUE FUNC 3	REAL	-32768.00 to 32767.00	3x	
142	INPUT C	VALUE FUNC 3	REAL	-32768.00 to 32767.00	3y	
143	OUTPUT	VALUE FUNC 3	REAL	_.xx	3z	Output
144	TYPE	VALUE FUNC 3	ENUM	0 to 22	40	
145	INPUT A	VALUE FUNC 4	REAL	-32768.00 to 32767.00	41	
146	INPUT B	VALUE FUNC 4	REAL	-32768.00 to 32767.00	42	
147	INPUT C	VALUE FUNC 4	REAL	-32768.00 to 32767.00	43	
148	OUTPUT	VALUE FUNC 4	REAL	_.xx	44	Output
149	TYPE	VALUE FUNC 4	ENUM	0 to 22	45	
150	INPUT A	VALUE FUNC 5	REAL	-32768.00 to 32767.00	46	
151	INPUT B	VALUE FUNC 5	REAL	-32768.00 to 32767.00	47	
152	INPUT C	VALUE FUNC 5	REAL	-32768.00 to 32767.00	48	
153	OUTPUT	VALUE FUNC 5	REAL	_.xx	49	Output
154	TYPE	VALUE FUNC 5	ENUM	0 to 22	4a	
155	INPUT A	VALUE FUNC 6	REAL	-32768.00 to 32767.00	4b	
156	INPUT B	VALUE FUNC 6	REAL	-32768.00 to 32767.00	4c	
157	INPUT C	VALUE FUNC 6	REAL	-32768.00 to 32767.00	4d	
158	OUTPUT	VALUE FUNC 6	REAL	_.xx	4e	Output
159	TYPE	VALUE FUNC 6	ENUM	0 to 22	4f	
160	INPUT A	VALUE FUNC 7	REAL	-32768.00 to 32767.00	4g	

TAG	MMI Name	Block	Type	Range	ID	Notes
161	INPUT B	VALUE FUNC 7	REAL	-32768.00 to 32767.00	4h	
162	INPUT C	VALUE FUNC 7	REAL	-32768.00 to 32767.00	4i	
163	OUTPUT	VALUE FUNC 7	REAL	_.xx	4j	Output
164	TYPE	VALUE FUNC 7	ENUM	0 to 22	4k	
165	INPUT A	VALUE FUNC 8	REAL	-32768.00 to 32767.00	4l	
166	INPUT B	VALUE FUNC 8	REAL	-32768.00 to 32767.00	4m	
167	INPUT C	VALUE FUNC 8	REAL	-32768.00 to 32767.00	4n	
168	OUTPUT	VALUE FUNC 8	REAL	_.xx	4o	Output
169	TYPE	VALUE FUNC 8	ENUM	0 to 22	4p	
170	INPUT A	VALUE FUNC 9	REAL	-32768.00 to 32767.00	4q	
171	INPUT B	VALUE FUNC 9	REAL	-32768.00 to 32767.00	4r	
172	INPUT C	VALUE FUNC 9	REAL	-32768.00 to 32767.00	4s	
173	OUTPUT	VALUE FUNC 9	REAL	_.xx	4t	Output
174	TYPE	VALUE FUNC 9	ENUM	0 to 22	4u	
175	INPUT A	VALUE FUNC 10	REAL	-32768.00 to 32767.00	4v	
176	INPUT B	VALUE FUNC 10	REAL	-32768.00 to 32767.00	4w	
177	INPUT C	VALUE FUNC 10	REAL	-32768.00 to 32767.00	4x	
178	OUTPUT	VALUE FUNC 10	REAL	_.xx	4y	Output
179	TYPE	VALUE FUNC 10	ENUM	0 to 22	4z	
180	INPUT A	LOGIC FUNC 1	BOOL	FALSE / TRUE	50	
181	INPUT B	LOGIC FUNC 1	BOOL	FALSE / TRUE	51	
182	INPUT C	LOGIC FUNC 1	BOOL	FALSE / TRUE	52	
183	OUTPUT	LOGIC FUNC 1	BOOL	FALSE / TRUE	53	Output
184	TYPE	LOGIC FUNC 1	ENUM	0 to 11	54	
185	INPUT A	LOGIC FUNC 2	BOOL	FALSE / TRUE	55	
186	INPUT B	LOGIC FUNC 2	BOOL	FALSE / TRUE	56	
187	INPUT C	LOGIC FUNC 2	BOOL	FALSE / TRUE	57	
188	OUTPUT	LOGIC FUNC 2	BOOL	FALSE / TRUE	58	Output
189	TYPE	LOGIC FUNC 2	ENUM	0 to 11	59	
190	INPUT A	LOGIC FUNC 3	BOOL	FALSE / TRUE	5a	
191	INPUT B	LOGIC FUNC 3	BOOL	FALSE / TRUE	5b	
192	INPUT C	LOGIC FUNC 3	BOOL	FALSE / TRUE	5c	
193	OUTPUT	LOGIC FUNC 3	BOOL	FALSE / TRUE	5d	Output
194	TYPE	LOGIC FUNC 3	ENUM	0 to 11	5e	
195	INPUT A	LOGIC FUNC 4	BOOL	FALSE / TRUE	5f	
196	INPUT B	LOGIC FUNC 4	BOOL	FALSE / TRUE	5g	
197	INPUT C	LOGIC FUNC 4	BOOL	FALSE / TRUE	5h	
198	OUTPUT	LOGIC FUNC 4	BOOL	FALSE / TRUE	5i	Output
199	TYPE	LOGIC FUNC 4	ENUM	0 to 11	5j	
200	INPUT A	LOGIC FUNC 5	BOOL	FALSE / TRUE	5k	
201	INPUT B	LOGIC FUNC 5	BOOL	FALSE / TRUE	5l	
202	INPUT C	LOGIC FUNC 5	BOOL	FALSE / TRUE	5m	
203	OUTPUT	LOGIC FUNC 5	BOOL	FALSE / TRUE	5n	Output
204	TYPE	LOGIC FUNC 5	ENUM	0 to 11	5o	
205	INPUT A	LOGIC FUNC 6	BOOL	FALSE / TRUE	5p	
206	INPUT B	LOGIC FUNC 6	BOOL	FALSE / TRUE	5q	
207	INPUT C	LOGIC FUNC 6	BOOL	FALSE / TRUE	5r	
208	OUTPUT	LOGIC FUNC 6	BOOL	FALSE / TRUE	5s	Output
209	TYPE	LOGIC FUNC 6	ENUM	0 to 11	5t	
210	INPUT A	LOGIC FUNC 7	BOOL	FALSE / TRUE	5u	
211	INPUT B	LOGIC FUNC 7	BOOL	FALSE / TRUE	5v	
212	INPUT C	LOGIC FUNC 7	BOOL	FALSE / TRUE	5w	
213	OUTPUT	LOGIC FUNC 7	BOOL	FALSE / TRUE	5x	Output
214	TYPE	LOGIC FUNC 7	ENUM	0 to 11	5y	
215	INPUT A	LOGIC FUNC 8	BOOL	FALSE / TRUE	5z	
216	INPUT B	LOGIC FUNC 8	BOOL	FALSE / TRUE	60	
217	INPUT C	LOGIC FUNC 8	BOOL	FALSE / TRUE	61	
218	OUTPUT	LOGIC FUNC 8	BOOL	FALSE / TRUE	62	Output
219	TYPE	LOGIC FUNC 8	ENUM	0 to 11	63	
220	INPUT A	LOGIC FUNC 9	BOOL	FALSE / TRUE	64	
221	INPUT B	LOGIC FUNC 9	BOOL	FALSE / TRUE	65	
222	INPUT C	LOGIC FUNC 9	BOOL	FALSE / TRUE	66	

TAG	MMI Name	Block	Type	Range	ID	Notes
223	OUTPUT	LOGIC FUNC 9	BOOL	FALSE / TRUE	67	Output
224	TYPE	LOGIC FUNC 9	ENUM	0 to 11	68	
225	INPUT A	LOGIC FUNC 10	BOOL	FALSE / TRUE	69	
226	INPUT B	LOGIC FUNC 10	BOOL	FALSE / TRUE	6a	
227	INPUT C	LOGIC FUNC 10	BOOL	FALSE / TRUE	6b	
228	OUTPUT	LOGIC FUNC 10	BOOL	FALSE / TRUE	6c	Output
229	TYPE	LOGIC FUNC 10	ENUM	0 to 11	6d	
230	OP VERSION	OP STATION 1	WORD	0000 to FFFF	6e	Output
231	DISABLE TRIPS	TRIPS STATUS	WORD	5 : INPUT 1 BREAK 6 : INPUT 2 BREAK 7 : MOTOR STALLED 9 : BRAKE RESISTOR 10 : BRAKE SWITCH 11 : OP STATION 12 : LOST COMMS 13 : CONTACTOR FBK 14 : SPEED FEEDBACK	6f	
233	EXT TRIP MODE	I/O TRIPS	ENUM	0 to 1	6h	
234	EXTERNAL TRIP	I/O TRIPS	BOOL	FALSE / TRUE	6i	Output
235	INPUT 1 BREAK	I/O TRIPS	BOOL	FALSE / TRUE	6j	
236	INPUT 2 BREAK	I/O TRIPS	BOOL	FALSE / TRUE	6k	
240	STALL LIMIT	STALL TRIP	REAL	50.00 to 150.00 %	6o	
241	STALL TIME	STALL TRIP	REAL	0.1 to 3000.0 s	6p	
242	POWER FACTOR	MOTOR DATA	REAL	0.50 to 0.99	6q	3
243	TRIM IN LOCAL	REFERENCE	BOOL	FALSE / TRUE	6r	
244	RAMP TYPE	REFERENCE RAMP	ENUM	0 to 1	6s	
245	REMOTE SETPOINT	REFERENCE	REAL	-300.00 to 300.00 %	6t	
246	SETPOINT	REFERENCE JOG	REAL	-100.00 to 100.00 %	6u	
247	LOCAL SETPOINT	REFERENCE	REAL	_.xx	6v	Output
248	SPEED TRIM	REFERENCE	REAL	-300.00 to 300.00 %	6w	
249	REMOTE REVERSE	REFERENCE	BOOL	FALSE / TRUE	6x	
250	LOCAL REVERSE	REFERENCE	BOOL	FALSE / TRUE	6y	Output
252	MAX SPEED CLAMP	REFERENCE	REAL	0.00 to 110.00 %	70	
253	MIN SPEED CLAMP	REFERENCE	REAL	-110.00 to 0.00 %	71	
254	SPEED SETPOINT	REFERENCE	REAL	_.xx	72	Output
255	SPEED DEMAND	REFERENCE	REAL	_.xx	73	Output
256	REVERSE	REFERENCE	BOOL	FALSE / TRUE	74	Output
257	REMOTE REF	LOCAL CONTROL	BOOL	FALSE / TRUE	75	Output
258	ACCEL TIME	REFERENCE RAMP	REAL	0.0 to 3000.0 s	76	3
259	DECEL TIME	REFERENCE RAMP	REAL	0.0 to 3000.0 s	77	3
260	HOLD	REFERENCE RAMP	BOOL	FALSE / TRUE	78	
261	ACCEL TIME	REFERENCE JOG	REAL	0.0 to 3000.0 s	79	
262	DECEL TIME	REFERENCE JOG	REAL	0.0 to 3000.0 s	7a	
263	STOP TIME	REFERENCE STOP	REAL	0.0 to 600.0 s	7b	
264	FAST STOP TIME	REFERENCE STOP	REAL	0.0 to 600.0 s	7c	
265	REF MODES	LOCAL CONTROL	ENUM	0 to 2	7d	
266	STOP ZERO SPEED	REFERENCE STOP	REAL	0.00 to 100.00 %	7e	
267	SYMMETRIC TIME	REFERENCE RAMP	REAL	0.0 to 3000.0 s	7f	3
268	SYMMETRIC MODE	REFERENCE RAMP	BOOL	FALSE / TRUE	7g	
270	COMMS REF	COMMS CONTROL	BOOL	FALSE / TRUE	7i	Output
272	COMMS STATUS	COMMS CONTROL	WORD	0000 to FFFF	7k	Output
273	COMMS COMMAND	COMMS CONTROL	WORD	0000 to FFFF	7l	Output
274	HEALTHY	SEQUENCING LOGIC	BOOL	FALSE / TRUE	7m	Output
275	FAST STOP LIMIT	REFERENCE STOP	REAL	0.0 to 3000.0 s	7n	
276	DRIVE ENABLE	SEQUENCING LOGIC	BOOL	FALSE / TRUE	7o	
277	NOT FAST STOP	SEQUENCING LOGIC	BOOL	FALSE / TRUE	7p	
278	NOT COAST STOP	SEQUENCING LOGIC	BOOL	FALSE / TRUE	7q	
279	RUN STOP MODE	REFERENCE STOP	ENUM	0 to 3	7r	
280	JOG	SEQUENCING LOGIC	BOOL	FALSE / TRUE	7s	
281	SEQ DIRECTION	LOCAL CONTROL	BOOL	FALSE / TRUE	7t	
282	REM TRIP RESET	SEQUENCING LOGIC	BOOL	FALSE / TRUE	7u	
283	POWER UP START	SEQUENCING LOGIC	BOOL	FALSE / TRUE	7v	
284	STOP DELAY	REFERENCE STOP	REAL	0.000 to 30.000 s	7w	
285	RUNNING	SEQUENCING LOGIC	BOOL	FALSE / TRUE	7x	Output

TAG	MMI Name	Block	Type	Range	ID	Notes
286	OUTPUT CONTACTOR	SEQUENCING LOGIC	BOOL	FALSE / TRUE	7y	Output
287	READY	SEQUENCING LOGIC	BOOL	FALSE / TRUE	7z	Output
288	SWITCH ON ENABLE	SEQUENCING LOGIC	BOOL	FALSE / TRUE	80	Output
289	TRIPPED	SEQUENCING LOGIC	BOOL	FALSE / TRUE	81	Output
290	TRIP RST BY RUN	SEQUENCING LOGIC	BOOL	FALSE / TRUE	82	
291	RUN FORWARD	SEQUENCING LOGIC	BOOL	FALSE / TRUE	83	
292	RUN REVERSE	SEQUENCING LOGIC	BOOL	FALSE / TRUE	84	
293	NOT STOP	SEQUENCING LOGIC	BOOL	FALSE / TRUE	85	
294	REMOTE REVERSE	SEQUENCING LOGIC	BOOL	FALSE / TRUE	86	
295	COMMS SEQ	COMMS CONTROL	BOOL	FALSE / TRUE	87	Output
296	REMOTE REV OUT	SEQUENCING LOGIC	BOOL	FALSE / TRUE	88	Output
297	REMOTE SEQ	LOCAL CONTROL	BOOL	FALSE / TRUE	89	Output
298	SEQ MODES	LOCAL CONTROL	ENUM	0 to 2	8a	
299	POWER UP MODE	LOCAL CONTROL	ENUM	0 to 2	8b	
300	REMOTE COMMS SEL	COMMS CONTROL	BOOL	FALSE / TRUE	8c	
301	SEQUENCER STATE	SEQUENCING LOGIC	ENUM	0 to 7	8d	Output
302	JOGGING	SEQUENCING LOGIC	BOOL	FALSE / TRUE	8e	Output
303	STOPPING	SEQUENCING LOGIC	BOOL	FALSE / TRUE	8f	Output
304	FAST STOP MODE	REFERENCE STOP	ENUM	0 to 1	8g	
305	SYSTEM RESET	SEQUENCING LOGIC	BOOL	FALSE / TRUE	8h	Output
306	SWITCHED ON	SEQUENCING LOGIC	BOOL	FALSE / TRUE	8i	Output
307	REMOTE SEQ MODES	COMMS CONTROL	ENUM	0 to 2	8j	
308	REMOTE REF MODES	COMMS CONTROL	ENUM	0 to 2	8k	
309	COMMS TIMEOUT	COMMS CONTROL	REAL	0.0 to 600.0 s	8l	
310	SETPOINT	PID	REAL	-300.00 to 300.00 %	8m	
311	ENABLE	PID	BOOL	FALSE / TRUE	8n	
312	INTEGRAL DEFEAT	PID	BOOL	FALSE / TRUE	8o	
313	GAIN	PID	REAL	0.0 to 100.0	8p	
314	I TIME CONSTANT	PID	REAL	0.01 to 100.00 s	8q	
315	D TIME CONSTANT	PID	REAL	0.000 to 10.000 s	8r	
316	FILTER TC	PID	REAL	0.000 to 10.000 s	8s	
317	OUTPUT POS LIMIT	PID	REAL	0.00 to 105.00 %	8t	
318	OUTPUT NEG LIMIT	PID	REAL	-105.00 to 0.00 %	8u	
319	OUTPUT SCALING	PID	REAL	-3.0000 to 3.0000	8v	
320	PID OUTPUT	PID	REAL	_.xx	8w	Output
321	COEFFICIENT A	DISPLAY SCALE 1	REAL	-32768.00 to 32767.00	8x	
322	COEFFICIENT C	DISPLAY SCALE 1	REAL	-32768.00 to 32767.00	8y	
323	UNITS	DISPLAY SCALE 1	STRING	max length is 6 chars	8z	
324	NAME	OPERATOR MENU 1	STRING	max length is 16 chars	90	
325	OUTPUT	RAISE/LOWER	REAL	_.xx	91	Output
326	RAMP TIME	RAISE/LOWER	REAL	0.0 to 600.0 s	92	
327	RAISE INPUT	RAISE/LOWER	BOOL	FALSE / TRUE	93	
328	LOWER INPUT	RAISE/LOWER	BOOL	FALSE / TRUE	94	
329	MIN VALUE	RAISE/LOWER	REAL	-300.00 to 300.00 %	95	
330	MAX VALUE	RAISE/LOWER	REAL	-300.00 to 300.00 %	96	
331	RESET VALUE	RAISE/LOWER	REAL	-300.00 to 300.00 %	97	
332	RESET	RAISE/LOWER	BOOL	FALSE / TRUE	98	
334	DECIMAL PLACE	DISPLAY SCALE 1	ENUM	0 to 5	9a	
335	OUTPUT	MINIMUM SPEED	REAL	_.xx	9b	Output
336	INPUT	MINIMUM SPEED	REAL	-300.00 to 300.00 %	9c	
337	MINIMUM	MINIMUM SPEED	REAL	-100.00 to 100.00 %	9d	
338	MODE	MINIMUM SPEED	ENUM	0 to 1	9e	
339	CONFIG NAME	ACCESS CONTROL	STRING	max length is 16 chars	9f	
340	INPUT	SKIP FREQUENCIES	REAL	-300.00 to 300.00 %	9g	
341	BAND 1	SKIP FREQUENCIES	REAL	0.0 to 500.0 Hz	9h	
342	FREQUENCY 1	SKIP FREQUENCIES	REAL	0.0 to 500.0 Hz	9i	
343	FREQUENCY 2	SKIP FREQUENCIES	REAL	0.0 to 500.0 Hz	9j	
344	FREQUENCY 3	SKIP FREQUENCIES	REAL	0.0 to 500.0 Hz	9k	
345	FREQUENCY 4	SKIP FREQUENCIES	REAL	0.0 to 500.0 Hz	9l	
346	OUTPUT	SKIP FREQUENCIES	REAL	_.xx	9m	Output
347	INPUT 0	PRESET 1	REAL	-32768.00 to 32767.00	9n	
348	INPUT 1	PRESET 1	REAL	-32768.00 to 32767.00	9o	

TAG	MMI Name	Block	Type	Range	ID	Notes
349	INPUT 2	PRESET 1	REAL	-32768.00 to 32767.00	9p	
350	INPUT 3	PRESET 1	REAL	-32768.00 to 32767.00	9q	
351	INPUT 4	PRESET 1	REAL	-32768.00 to 32767.00	9r	
352	INPUT 5	PRESET 1	REAL	-32768.00 to 32767.00	9s	
353	INPUT 6	PRESET 1	REAL	-32768.00 to 32767.00	9t	
354	INPUT 7	PRESET 1	REAL	-32768.00 to 32767.00	9u	
355	SELECT INPUT	PRESET 1	ENUM	0 to 7	9v	
356	OUTPUT 1	PRESET 1	REAL	_.xx	9w	Output
357	THRESHOLD	ZERO SPEED	REAL	0.00 to 300.00 %	9x	
359	HYSTERISIS	ZERO SPEED	REAL	0.00 to 300.00 %	9z	
360	AT ZERO SPD DMD	ZERO SPEED	BOOL	FALSE / TRUE	a0	Output
362	INPUT Hz	SKIP FREQUENCIES	REAL	_.x	a2	Output
363	OUTPUT Hz	SKIP FREQUENCIES	REAL	_.x	a3	Output
365	CURRENT LIMIT	CURRENT LIMIT	REAL	0.00 to 150.00 %	a5	
371	PARAMETER	OPERATOR MENU 2	PREF	-1999 to 1999	ab	
372	OUTPUT 2	PRESET 1	REAL	_.xx	ac	Output
373	OUTPUT 2	PRESET 2	REAL	_.xx	ad	Output
374	OUTPUT 2	PRESET 3	REAL	_.xx	ae	Output
375	COEFFICIENT A	DISPLAY SCALE 2	REAL	-32768.00 to 32767.00	af	
376	COEFFICIENT C	DISPLAY SCALE 2	REAL	-32768.00 to 32767.00	ag	
377	UNITS	DISPLAY SCALE 2	STRING	max length is 6 chars	ah	
378	NAME	OPERATOR MENU 2	STRING	max length is 16 chars	ai	
379	DECIMAL PLACE	DISPLAY SCALE 2	ENUM	0 to 5	aj	
380	INPUT 0	PRESET 2	REAL	-32768.00 to 32767.00	ak	
381	INPUT 1	PRESET 2	REAL	-32768.00 to 32767.00	al	
382	INPUT 2	PRESET 2	REAL	-32768.00 to 32767.00	am	
383	INPUT 3	PRESET 2	REAL	-32768.00 to 32767.00	an	
384	INPUT 4	PRESET 2	REAL	-32768.00 to 32767.00	ao	
385	INPUT 5	PRESET 2	REAL	-32768.00 to 32767.00	ap	
386	INPUT 6	PRESET 2	REAL	-32768.00 to 32767.00	aq	
387	INPUT 7	PRESET 2	REAL	-32768.00 to 32767.00	ar	
388	SELECT INPUT	PRESET 2	ENUM	0 to 7	as	
389	OUTPUT 1	PRESET 2	REAL	_.xx	at	Output
390	INPUT 0	PRESET 3	REAL	-32768.00 to 32767.00	au	
391	INPUT 1	PRESET 3	REAL	-32768.00 to 32767.00	av	
392	INPUT 2	PRESET 3	REAL	-32768.00 to 32767.00	aw	
393	INPUT 3	PRESET 3	REAL	-32768.00 to 32767.00	ax	
394	INPUT 4	PRESET 3	REAL	-32768.00 to 32767.00	ay	
395	INPUT 5	PRESET 3	REAL	-32768.00 to 32767.00	az	
396	INPUT 6	PRESET 3	REAL	-32768.00 to 32767.00	b0	
397	INPUT 7	PRESET 3	REAL	-32768.00 to 32767.00	b1	
398	SELECT INPUT	PRESET 3	ENUM	0 to 7	b2	
399	OUTPUT 1	PRESET 3	REAL	_.xx	b3	Output
400	SOURCE	LINK 1	PREF	-1999 to 1999	b4	8
401	DESTINATION	LINK 1	PREF	0 to 1999	b5	8
402	SOURCE	LINK 2	PREF	-1999 to 1999	b6	8
403	DESTINATION	LINK 2	PREF	0 to 1999	b7	8
404	SOURCE	LINK 3	PREF	-1999 to 1999	b8	8
405	DESTINATION	LINK 3	PREF	0 to 1999	b9	8
406	SOURCE	LINK 4	PREF	-1999 to 1999	ba	8
407	DESTINATION	LINK 4	PREF	0 to 1999	bb	8
408	SOURCE	LINK 5	PREF	-1999 to 1999	bc	8
409	DESTINATION	LINK 5	PREF	0 to 1999	bd	8
410	SOURCE	LINK 6	PREF	-1999 to 1999	be	8
411	DESTINATION	LINK 6	PREF	0 to 1999	bf	8
412	SOURCE	LINK 7	PREF	-1999 to 1999	bg	8
413	DESTINATION	LINK 7	PREF	0 to 1999	bh	8
414	SOURCE	LINK 8	PREF	-1999 to 1999	bi	8
415	DESTINATION	LINK 8	PREF	0 to 1999	bj	8
416	SOURCE	LINK 9	PREF	-1999 to 1999	bk	8
417	DESTINATION	LINK 9	PREF	0 to 1999	bl	8
418	SOURCE	LINK 10	PREF	-1999 to 1999	bm	8

TAG	MMI Name	Block	Type	Range	ID	Notes
419	DESTINATION	LINK 10	PREF	0 to 1999	bn	8
420	SOURCE	LINK 11	PREF	-1999 to 1999	bo	8
421	DESTINATION	LINK 11	PREF	0 to 1999	bp	8
422	SOURCE	LINK 12	PREF	-1999 to 1999	bq	8
423	DESTINATION	LINK 12	PREF	0 to 1999	br	8
424	SOURCE	LINK 13	PREF	-1999 to 1999	bs	8
425	DESTINATION	LINK 13	PREF	0 to 1999	bt	8
426	SOURCE	LINK 14	PREF	-1999 to 1999	bu	8
427	DESTINATION	LINK 14	PREF	0 to 1999	bv	8
428	SOURCE	LINK 15	PREF	-1999 to 1999	bw	8
429	DESTINATION	LINK 15	PREF	0 to 1999	bx	8
430	SOURCE	LINK 16	PREF	-1999 to 1999	by	8
431	DESTINATION	LINK 16	PREF	0 to 1999	bz	8
432	SOURCE	LINK 17	PREF	-1999 to 1999	c0	8
433	DESTINATION	LINK 17	PREF	0 to 1999	c1	8
434	SOURCE	LINK 18	PREF	-1999 to 1999	c2	8
435	DESTINATION	LINK 18	PREF	0 to 1999	c3	8
436	SOURCE	LINK 19	PREF	-1999 to 1999	c4	8
437	DESTINATION	LINK 19	PREF	0 to 1999	c5	8
438	SOURCE	LINK 20	PREF	-1999 to 1999	c6	8
439	DESTINATION	LINK 20	PREF	0 to 1999	c7	8
440	SOURCE	LINK 21	PREF	-1999 to 1999	c8	8
441	DESTINATION	LINK 21	PREF	0 to 1999	c9	8
442	SOURCE	LINK 22	PREF	-1999 to 1999	ca	8
443	DESTINATION	LINK 22	PREF	0 to 1999	cb	8
444	SOURCE	LINK 23	PREF	-1999 to 1999	cc	8
445	DESTINATION	LINK 23	PREF	0 to 1999	cd	8
446	SOURCE	LINK 24	PREF	-1999 to 1999	ce	8
447	DESTINATION	LINK 24	PREF	0 to 1999	cf	8
448	SOURCE	LINK 25	PREF	-1999 to 1999	cg	8
449	DESTINATION	LINK 25	PREF	0 to 1999	ch	8
450	SOURCE	LINK 26	PREF	-1999 to 1999	ci	8
451	DESTINATION	LINK 26	PREF	0 to 1999	cj	8
452	SOURCE	LINK 27	PREF	-1999 to 1999	ck	8
453	DESTINATION	LINK 27	PREF	0 to 1999	cl	8
454	SOURCE	LINK 28	PREF	-1999 to 1999	cm	8
455	DESTINATION	LINK 28	PREF	0 to 1999	cn	8
456	SOURCE	LINK 29	PREF	-1999 to 1999	co	8
457	DESTINATION	LINK 29	PREF	0 to 1999	cp	8
458	SOURCE	LINK 30	PREF	-1999 to 1999	cq	8
459	DESTINATION	LINK 30	PREF	0 to 1999	cr	8
460	SOURCE	LINK 31	PREF	-1999 to 1999	cs	8
461	DESTINATION	LINK 31	PREF	0 to 1999	ct	8
462	SOURCE	LINK 32	PREF	-1999 to 1999	cu	8
463	DESTINATION	LINK 32	PREF	0 to 1999	cv	8
464	SOURCE	LINK 33	PREF	-1999 to 1999	cw	8
465	DESTINATION	LINK 33	PREF	0 to 1999	cx	8
466	SOURCE	LINK 34	PREF	-1999 to 1999	cy	8
467	DESTINATION	LINK 34	PREF	0 to 1999	cz	8
468	SOURCE	LINK 35	PREF	-1999 to 1999	d0	8
469	DESTINATION	LINK 35	PREF	0 to 1999	d1	8
470	SOURCE	LINK 36	PREF	-1999 to 1999	d2	8
471	DESTINATION	LINK 36	PREF	0 to 1999	d3	8
472	SOURCE	LINK 37	PREF	-1999 to 1999	d4	8
473	DESTINATION	LINK 37	PREF	0 to 1999	d5	8
474	SOURCE	LINK 38	PREF	-1999 to 1999	d6	8
475	DESTINATION	LINK 38	PREF	0 to 1999	d7	8
476	SOURCE	LINK 39	PREF	-1999 to 1999	d8	8
477	DESTINATION	LINK 39	PREF	0 to 1999	d9	8
478	SOURCE	LINK 40	PREF	-1999 to 1999	da	8
479	DESTINATION	LINK 40	PREF	0 to 1999	db	8
480	SOURCE	LINK 41	PREF	-1999 to 1999	dc	8

TAG	MMI Name	Block	Type	Range	ID	Notes
481	DESTINATION	LINK 41	PREF	0 to 1999	dd	8
482	SOURCE	LINK 42	PREF	-1999 to 1999	de	8
483	DESTINATION	LINK 42	PREF	0 to 1999	df	8
484	SOURCE	LINK 43	PREF	-1999 to 1999	dg	8
485	DESTINATION	LINK 43	PREF	0 to 1999	dh	8
486	SOURCE	LINK 44	PREF	-1999 to 1999	di	8
487	DESTINATION	LINK 44	PREF	0 to 1999	dj	8
488	SOURCE	LINK 45	PREF	-1999 to 1999	dk	8
489	DESTINATION	LINK 45	PREF	0 to 1999	dl	8
490	SOURCE	LINK 46	PREF	-1999 to 1999	dm	8
491	DESTINATION	LINK 46	PREF	0 to 1999	dn	8
492	SOURCE	LINK 47	PREF	-1999 to 1999	do	8
493	DESTINATION	LINK 47	PREF	0 to 1999	dp	8
494	SOURCE	LINK 48	PREF	-1999 to 1999	dq	8
495	DESTINATION	LINK 48	PREF	0 to 1999	dr	8
496	SOURCE	LINK 49	PREF	-1999 to 1999	ds	8
497	DESTINATION	LINK 49	PREF	0 to 1999	dt	8
498	SOURCE	LINK 50	PREF	-1999 to 1999	du	8
499	DESTINATION	LINK 50	PREF	0 to 1999	dv	8
500	TRIP 1 (NEWEST)	TRIPS HISTORY	ENUM	0 to 45	dw	Output
501	TRIP 2	TRIPS HISTORY	ENUM	0 to 45	dx	Output
502	TRIP 3	TRIPS HISTORY	ENUM	0 to 45	dy	Output
503	TRIP 4	TRIPS HISTORY	ENUM	0 to 45	dz	Output
504	TRIP 5	TRIPS HISTORY	ENUM	0 to 45	e0	Output
505	TRIP 6	TRIPS HISTORY	ENUM	0 to 45	e1	Output
506	TRIP 7	TRIPS HISTORY	ENUM	0 to 45	e2	Output
507	TRIP 8	TRIPS HISTORY	ENUM	0 to 45	e3	Output
508	TRIP 9	TRIPS HISTORY	ENUM	0 to 45	e4	Output
509	TRIP 10 (OLDEST)	TRIPS HISTORY	ENUM	0 to 45	e5	Output
510	INPUT 0	PRESET 4	REAL	-32768.00 to 32767.00	e6	
511	INPUT 1	PRESET 4	REAL	-32768.00 to 32767.00	e7	
512	INPUT 2	PRESET 4	REAL	-32768.00 to 32767.00	e8	
513	INPUT 3	PRESET 4	REAL	-32768.00 to 32767.00	e9	
514	INPUT 4	PRESET 4	REAL	-32768.00 to 32767.00	ea	
515	INPUT 5	PRESET 4	REAL	-32768.00 to 32767.00	eb	
516	INPUT 6	PRESET 4	REAL	-32768.00 to 32767.00	ec	
517	INPUT 7	PRESET 4	REAL	-32768.00 to 32767.00	ed	
518	SELECT INPUT	PRESET 4	ENUM	0 to 7	ee	
519	OUTPUT 1	PRESET 4	REAL	_.xx	ef	Output
520	OUTPUT 2	PRESET 4	REAL	_.xx	eg	Output
521	INPUT 0	PRESET 5	REAL	-32768.00 to 32767.00	eh	
522	INPUT 1	PRESET 5	REAL	-32768.00 to 32767.00	ei	
523	INPUT 2	PRESET 5	REAL	-32768.00 to 32767.00	ej	
524	INPUT 3	PRESET 5	REAL	-32768.00 to 32767.00	ek	
525	INPUT 4	PRESET 5	REAL	-32768.00 to 32767.00	el	
526	INPUT 5	PRESET 5	REAL	-32768.00 to 32767.00	em	
527	INPUT 6	PRESET 5	REAL	-32768.00 to 32767.00	en	
528	INPUT 7	PRESET 5	REAL	-32768.00 to 32767.00	eo	
529	SELECT INPUT	PRESET 5	ENUM	0 to 7	ep	
530	OUTPUT 1	PRESET 5	REAL	_.xx	eq	Output
531	OUTPUT 2	PRESET 5	REAL	_.xx	er	Output
532	INPUT 0	PRESET 6	REAL	-32768.00 to 32767.00	es	
533	INPUT 1	PRESET 6	REAL	-32768.00 to 32767.00	et	
534	INPUT 2	PRESET 6	REAL	-32768.00 to 32767.00	eu	
535	INPUT 3	PRESET 6	REAL	-32768.00 to 32767.00	ev	
536	INPUT 4	PRESET 6	REAL	-32768.00 to 32767.00	ew	
537	INPUT 5	PRESET 6	REAL	-32768.00 to 32767.00	ex	
538	INPUT 6	PRESET 6	REAL	-32768.00 to 32767.00	ey	
539	INPUT 7	PRESET 6	REAL	-32768.00 to 32767.00	ez	
540	SELECT INPUT	PRESET 6	ENUM	0 to 7	f0	
541	OUTPUT 1	PRESET 6	REAL	_.xx	f1	Output
542	OUTPUT 2	PRESET 6	REAL	_.xx	f2	Output

TAG	MMI Name	Block	Type	Range	ID	Notes
543	INPUT 0	PRESET 7	REAL	-32768.00 to 32767.00	f3	
544	INPUT 1	PRESET 7	REAL	-32768.00 to 32767.00	f4	
545	INPUT 2	PRESET 7	REAL	-32768.00 to 32767.00	f5	
546	INPUT 3	PRESET 7	REAL	-32768.00 to 32767.00	f6	
547	INPUT 4	PRESET 7	REAL	-32768.00 to 32767.00	f7	
548	INPUT 5	PRESET 7	REAL	-32768.00 to 32767.00	f8	
549	INPUT 6	PRESET 7	REAL	-32768.00 to 32767.00	f9	
550	INPUT 7	PRESET 7	REAL	-32768.00 to 32767.00	fa	
551	SELECT INPUT	PRESET 7	ENUM	0 to 7	fb	
552	OUTPUT 1	PRESET 7	REAL	_.xx	fc	Output
553	OUTPUT 2	PRESET 7	REAL	_.xx	fd	Output
554	INPUT 0	PRESET 8	REAL	-32768.00 to 32767.00	fe	
555	INPUT 1	PRESET 8	REAL	-32768.00 to 32767.00	ff	
556	INPUT 2	PRESET 8	REAL	-32768.00 to 32767.00	fg	
557	INPUT 3	PRESET 8	REAL	-32768.00 to 32767.00	fh	
558	INPUT 4	PRESET 8	REAL	-32768.00 to 32767.00	fi	
559	INPUT 5	PRESET 8	REAL	-32768.00 to 32767.00	fj	
560	INPUT 6	PRESET 8	REAL	-32768.00 to 32767.00	fk	
561	INPUT 7	PRESET 8	REAL	-32768.00 to 32767.00	fl	
562	SELECT INPUT	PRESET 8	ENUM	0 to 7	fm	
563	OUTPUT 1	PRESET 8	REAL	_.xx	fn	Output
564	OUTPUT 2	PRESET 8	REAL	_.xx	fo	Output
566	ENCODER LINES	FEEDBACKS	INT	250 to 32767	fq	3
567	ENCODER INVERT	FEEDBACKS	BOOL	FALSE / TRUE	fr	3
568	SPEED FBK REV/S	FEEDBACKS	REAL	_.xx	fs	Output,10
569	SPEED FBK RPM	FEEDBACKS	REAL	_.xx	ft	Output,10
570	VHZ ENABLE	FLYCATCHING	BOOL	FALSE / TRUE	fu	
571	START MODE	FLYCATCHING	ENUM	0 to 2	fv	
572	SEARCH MODE	FLYCATCHING	ENUM	0 to 1	fw	
573	SEARCH VOLTS	FLYCATCHING	REAL	0.00 to 100.00 %	fx	3
574	SEARCH TIME	FLYCATCHING	REAL	0.1 to 60.0 s	fy	3
575	MIN SEARCH SPEED	FLYCATCHING	REAL	0.0 to 500.0 Hz	fz	
576	ACTIVE	FLYCATCHING	BOOL	FALSE / TRUE	g0	Output
577	FREQUENCY	INJ BRAKING	REAL	1.0 to 500.0 Hz	g1	3
578	I-LIM LEVEL	INJ BRAKING	REAL	50.00 to 150.00 %	g2	
579	DC PULSE	INJ BRAKING	REAL	0.0 to 100.0 s	g3	3
580	FINAL DC PULSE	INJ BRAKING	REAL	0.0 to 10.0 s	g4	3
581	DC LEVEL	INJ BRAKING	REAL	0.00 to 25.00 %	g5	3
582	TIMEOUT	INJ BRAKING	REAL	0.0 to 600.0 s	g6	
583	ACTIVE	INJ BRAKING	BOOL	FALSE / TRUE	g7	Output
584	ON LOAD	BRAKE CONTROL	REAL	0.00 to 150.00 %	g8	
585	ON FREQUENCY	BRAKE CONTROL	REAL	0.0 to 500.0 Hz	g9	
586	OFF FREQUENCY	BRAKE CONTROL	REAL	0.0 to 500.0 Hz	ga	
587	ON HOLD TIME	BRAKE CONTROL	REAL	0.00 to 60.00 s	gb	
588	OFF HOLD TIME	BRAKE CONTROL	REAL	0.00 to 60.00 s	gc	
589	RELEASE	BRAKE CONTROL	BOOL	FALSE / TRUE	gd	Output
590	HOLD	BRAKE CONTROL	BOOL	FALSE / TRUE	ge	Output
591	DRIVE FREQUENCY	PATTERN GEN	REAL	_.xx	gf	Output
595	VOLTAGE MODE	VOLTAGE CONTROL	ENUM	0 to 2	gj	
598	OUTPUT	MULTIPLEXER 1	WORD	0000 to FFFF	gm	Output
599	INPUT	DEMULTIPLEXER 1	WORD	0000 to FFFF	gn	
603	ENABLE	AUTOTUNE	BOOL	FALSE / TRUE	gr	
604	ACTIVE	AUTOTUNE	BOOL	FALSE / TRUE	gs	Output
608	PENDING	AUTO RESTART	BOOL	FALSE / TRUE	gw	Output

TAG	MMI Name	Block	Type	Range	ID	Notes
609	TRIGGERS 1	AUTO RESTART	WORD	0 : OVERVOLTAGE 1 : UNDERVOLTAGE 2 : OVERCURRENT 3 : HEATSINK 4 : EXTERNAL TRIP 5 : INPUT 1 BREAK 6 : INPUT 2 BREAK 7 : MOTOR STALLED 9 : BRAKE RESISTOR 10 : BRAKE SWITCH 11 : OP STATION 12 : LOST COMMS 13 : CONTACTOR FBK 14 : SPEED FEEDBACK 15 : AMBIENT TEMP	gx	
610	INITIAL DELAY 1	AUTO RESTART	REAL	0.0 to 600.0 s	gy	
611	ENABLE	AUTO RESTART	BOOL	FALSE / TRUE	gz	
612	ATTEMPTS	AUTO RESTART	INT	1 to 10	h0	
613	ATTEMPT DELAY 1	AUTO RESTART	REAL	0.0 to 600.0 s	h1	
614	ATTEMPTS LEFT	AUTO RESTART	INT	_	h2	Output
615	TIME LEFT	AUTO RESTART	REAL	_.x	h3	Output
616	RESTARTING	AUTO RESTART	BOOL	FALSE / TRUE	h4	Output
626	PARAMETER	OPERATOR MENU 3	PREF	-1999 to 1999	he	
627	PARAMETER	OPERATOR MENU 4	PREF	-1999 to 1999	hf	
628	PARAMETER	OPERATOR MENU 5	PREF	-1999 to 1999	hg	
629	PARAMETER	OPERATOR MENU 6	PREF	-1999 to 1999	hh	
630	PARAMETER	OPERATOR MENU 7	PREF	-1999 to 1999	hi	
631	PARAMETER	OPERATOR MENU 8	PREF	-1999 to 1999	hj	
632	PARAMETER	OPERATOR MENU 9	PREF	-1999 to 1999	hk	
633	PARAMETER	OPERATOR MENU 10	PREF	-1999 to 1999	hl	
634	PARAMETER	OPERATOR MENU 11	PREF	-1999 to 1999	hm	
635	PARAMETER	OPERATOR MENU 12	PREF	-1999 to 1999	hn	
636	PARAMETER	OPERATOR MENU 13	PREF	-1999 to 1999	ho	
637	PARAMETER	OPERATOR MENU 14	PREF	-1999 to 1999	hp	
638	PARAMETER	OPERATOR MENU 15	PREF	-1999 to 1999	hq	
639	PARAMETER	OPERATOR MENU 16	PREF	-1999 to 1999	hr	
641	INPUT 0	MULTIPLEXER 1	BOOL	FALSE / TRUE	ht	
642	INPUT 1	MULTIPLEXER 1	BOOL	FALSE / TRUE	hu	
643	INPUT 2	MULTIPLEXER 1	BOOL	FALSE / TRUE	hv	
644	INPUT 3	MULTIPLEXER 1	BOOL	FALSE / TRUE	hw	
645	INPUT 4	MULTIPLEXER 1	BOOL	FALSE / TRUE	hx	
646	INPUT 5	MULTIPLEXER 1	BOOL	FALSE / TRUE	hy	
647	INPUT 6	MULTIPLEXER 1	BOOL	FALSE / TRUE	hz	
648	INPUT 7	MULTIPLEXER 1	BOOL	FALSE / TRUE	i0	
649	INPUT 8	MULTIPLEXER 1	BOOL	FALSE / TRUE	i1	
650	INPUT 9	MULTIPLEXER 1	BOOL	FALSE / TRUE	i2	
651	INPUT 10	MULTIPLEXER 1	BOOL	FALSE / TRUE	i3	
652	INPUT 11	MULTIPLEXER 1	BOOL	FALSE / TRUE	i4	
653	INPUT 12	MULTIPLEXER 1	BOOL	FALSE / TRUE	i5	
654	INPUT 13	MULTIPLEXER 1	BOOL	FALSE / TRUE	i6	
655	INPUT 14	MULTIPLEXER 1	BOOL	FALSE / TRUE	i7	
656	INPUT 15	MULTIPLEXER 1	BOOL	FALSE / TRUE	i8	
657	OUTPUT 0	DEMULTIPLEXER 1	BOOL	FALSE / TRUE	i9	Output
658	OUTPUT 1	DEMULTIPLEXER 1	BOOL	FALSE / TRUE	ia	Output
659	OUTPUT 2	DEMULTIPLEXER 1	BOOL	FALSE / TRUE	ib	Output
660	OUTPUT 3	DEMULTIPLEXER 1	BOOL	FALSE / TRUE	ic	Output
661	OUTPUT 4	DEMULTIPLEXER 1	BOOL	FALSE / TRUE	id	Output
662	OUTPUT 5	DEMULTIPLEXER 1	BOOL	FALSE / TRUE	ie	Output
663	OUTPUT 6	DEMULTIPLEXER 1	BOOL	FALSE / TRUE	if	Output
664	OUTPUT 7	DEMULTIPLEXER 1	BOOL	FALSE / TRUE	ig	Output
665	OUTPUT 8	DEMULTIPLEXER 1	BOOL	FALSE / TRUE	ih	Output
666	OUTPUT 9	DEMULTIPLEXER 1	BOOL	FALSE / TRUE	ii	Output
667	OUTPUT 10	DEMULTIPLEXER 1	BOOL	FALSE / TRUE	ij	Output
668	OUTPUT 11	DEMULTIPLEXER 1	BOOL	FALSE / TRUE	ik	Output
669	OUTPUT 12	DEMULTIPLEXER 1	BOOL	FALSE / TRUE	il	Output
670	OUTPUT 13	DEMULTIPLEXER 1	BOOL	FALSE / TRUE	im	Output

TAG	MMI Name	Block	Type	Range	ID	Notes
671	OUTPUT 14	DEMULTIPLEXER 1	BOOL	FALSE / TRUE	in	Output
672	OUTPUT 15	DEMULTIPLEXER 1	BOOL	FALSE / TRUE	io	Output
673	COEFFICIENT B	DISPLAY SCALE 2	REAL	-32768.00 to 32767.00	ip	
674	HIGH LIMIT	DISPLAY SCALE 2	REAL	-32768.00 to 32767.00	iq	
675	LOW LIMIT	DISPLAY SCALE 2	REAL	-32768.00 to 32767.00	ir	
676	FORMULA	DISPLAY SCALE 2	ENUM	0 to 3	is	
677	TRIGGERS 2	AUTO RESTART	WORD	Same as Tag 609	it	
678	INITIAL DELAY 2	AUTO RESTART	REAL	0.0 to 600.0 s	iu	
679	ATTEMPT DELAY 2	AUTO RESTART	REAL	0.0 to 600.0 s	iv	
680	BAND 2	SKIP FREQUENCIES	REAL	0.0 to 500.0 Hz	iw	
681	BAND 3	SKIP FREQUENCIES	REAL	0.0 to 500.0 Hz	ix	
682	BAND 4	SKIP FREQUENCIES	REAL	0.0 to 500.0 Hz	iy	
686	REGEN LIM ENABLE	CURRENT LIMIT	BOOL	FALSE / TRUE	j2	
689	MODE	AUTOTUNE	ENUM	0 to 1	j5	
691	SRAMP CONTINUOUS	REFERENCE RAMP	BOOL	FALSE / TRUE	j7	
692	SRAMP ACCEL	REFERENCE RAMP	REAL	0.00 to 100.00 /s^2	j8	
693	SRAMP DECEL	REFERENCE RAMP	REAL	0.00 to 100.00 /s^2	j9	
694	SRAMP JERK 1	REFERENCE RAMP	REAL	0.00 to 100.00 /s^3	ja	
695	SRAMP JERK 2	REFERENCE RAMP	REAL	0.00 to 100.00 /s^3	jb	
696	SRAMP JERK 3	REFERENCE RAMP	REAL	0.00 to 100.00 /s^3	jc	
697	SRAMP JERK 4	REFERENCE RAMP	REAL	0.00 to 100.00 /s^3	jd	
698	RAMPING	REFERENCE RAMP	BOOL	FALSE / TRUE	je	Output
709	REFLUX TIME	FLYCATCHING	REAL	0.1 to 20.0 s	jp	3
710	DEFLUX TIME	INJ BRAKING	REAL	0.1 to 20.0 s	jq	3
711	BREAK ENABLE	ANALOG INPUT 3	BOOL	FALSE / TRUE	jr	
712	TYPE	ANALOG INPUT 3	ENUM	0 to 9	js	
713	SCALE	ANALOG INPUT 3	REAL	-300.00 to 300.00 %	jt	
714	OFFSET	ANALOG INPUT 3	REAL	-300.00 to 300.00 %	ju	
715	VALUE	ANALOG INPUT 3	REAL	_.xx	jv	Output
716	BREAK VALUE	ANALOG INPUT 3	REAL	-300.00 to 300.00 %	jw	
717	BREAK	ANALOG INPUT 3	BOOL	FALSE / TRUE	jx	Output
718	BREAK ENABLE	ANALOG INPUT 4	BOOL	FALSE / TRUE	jy	
719	TYPE	ANALOG INPUT 4	ENUM	0 to 9	jz	
720	SCALE	ANALOG INPUT 4	REAL	-300.00 to 300.00 %	k0	
721	OFFSET	ANALOG INPUT 4	REAL	-300.00 to 300.00 %	k1	
722	VALUE	ANALOG INPUT 4	REAL	_.xx	k2	Output
723	BREAK VALUE	ANALOG INPUT 4	REAL	-300.00 to 300.00 %	k3	
724	BREAK	ANALOG INPUT 4	BOOL	FALSE / TRUE	k4	Output
725	INVERT	DIGITAL INPUT 6	BOOL	FALSE / TRUE	k5	
726	VALUE	DIGITAL INPUT 6	BOOL	FALSE / TRUE	k6	Output
727	INVERT	DIGITAL INPUT 7	BOOL	FALSE / TRUE	k7	
728	VALUE	DIGITAL INPUT 7	BOOL	FALSE / TRUE	k8	Output
731	VALUE	ANALOG OUTPUT 2	REAL	-300.00 to 300.00 %	kb	
732	SCALE	ANALOG OUTPUT 2	REAL	-300.00 to 300.00 %	kc	
733	OFFSET	ANALOG OUTPUT 2	REAL	-300.00 to 300.00 %	kd	
734	ABSOLUTE	ANALOG OUTPUT 2	BOOL	FALSE / TRUE	ke	
735	TYPE	ANALOG OUTPUT 2	ENUM	0 to 8	kf	
736	INVERT	DIGITAL OUTPUT 3	BOOL	FALSE / TRUE	kg	
737	VALUE	DIGITAL OUTPUT 3	BOOL	FALSE / TRUE	kh	
739	BASE VOLTS	INJ BRAKING	REAL	0.00 to 115.47 %	kj	3
740	ACTIVE TRIPS+	TRIPS STATUS	WORD	0000 to FFFF	kk	Output
741	WARNINGS+	TRIPS STATUS	WORD	0000 to FFFF	kl	Output
742	DISABLE TRIPS+	TRIPS STATUS	WORD	0 : MOTOR OVERTEMP 3 : 24V FAILURE 6 : ENCODER 1 FAULT 10 : OVERSPEED	km	

TAG	MMI Name	Block	Type	Range	ID	Notes
744	TRIGGERS 1+	AUTO RESTART	WORD	0 : MOTOR OVERTEMP 1 : CURRENT LIMIT 3 : 24V FAILURE 4 : LOW SPEED OVER I 6 : ENCODER 1 FAULT 7 : DESAT (OVER I) 8 : VDC RIPPLE 9 : BRAKE SHORT CCT 10 : OVERSPEED 14 : UNKNOWN 15 : OTHER	ko	
745	TRIGGERS 2+	AUTO RESTART	WORD	Same as Tag 744	kp	
747	RESET	POSITION	BOOL	FALSE / TRUE	kr	
748	OUTPUT	POSITION	INT	_	ks	Output
749	SPEED FBK %	FEEDBACKS	REAL	_.xx	kt	Output
750	TYPE	TEC OPTION	ENUM	0 to 15	ku	
751	INPUT 1	TEC OPTION	INT	-32768 to 32767	kv	
752	INPUT 2	TEC OPTION	INT	-32768 to 32767	kw	
753	INPUT 3	TEC OPTION	INT	-32768 to 32767	kx	
754	INPUT 4	TEC OPTION	INT	-32768 to 32767	ky	
755	INPUT 5	TEC OPTION	INT	-32768 to 32767	kz	
756	FAULT	TEC OPTION	ENUM	0 to 5	l0	Output
757	VERSION	TEC OPTION	WORD	0000 to FFFF	l1	Output
758	OUTPUT 1	TEC OPTION	WORD	0000 to FFFF	l2	Output
759	OUTPUT 2	TEC OPTION	WORD	0000 to FFFF	l3	Output
760	INVERT THERMIST	I/O TRIPS	BOOL	FALSE / TRUE	l4	
761	ENCODER SUPPLY	FEEDBACKS	REAL	10.0 to 20.0 V	l5	3
763	SETPOINT NEGATE	PID	BOOL	FALSE / TRUE	l7	
764	FEEDBACK	PID	REAL	-300.00 to 300.00 %	l8	
765	FEEDBACK NEGATE	PID	BOOL	FALSE / TRUE	l9	
766	PID ERROR	PID	REAL	_.xx	la	Output
767	OUTPUT	S-RAMP	REAL	_.xx	lb	Output
768	RAMPING	S-RAMP	BOOL	FALSE / TRUE	lc	Output
770	COMMS SETPOINT	REFERENCE	REAL	_.xx	le	Output
771	INPUT 0	MULTIPLEXER 2	BOOL	FALSE / TRUE	lf	
772	INPUT 1	MULTIPLEXER 2	BOOL	FALSE / TRUE	lg	
773	INPUT 2	MULTIPLEXER 2	BOOL	FALSE / TRUE	lh	
774	REWIND	SPEED CALC	BOOL	FALSE / TRUE	li	
775	OVER-WIND	SPEED CALC	BOOL	FALSE / TRUE	lj	
776	OVER SPD ENABLE	SPEED CALC	BOOL	FALSE / TRUE	lk	
777	UTS THRESHOLD	SPEED CALC	REAL	0.00 to 110.00 %	ll	
778	LINE SPEED	SPEED CALC	REAL	-110.00 to 110.00 %	lm	
779	MOD WINDER SPEED	SPEED CALC	REAL	0.00 to 110.00 %	ln	
780	DIAMETER	SPEED CALC	REAL	0.00 to 110.00 %	lo	
781	MINIMUM DIAMETER	SPEED CALC	REAL	0.00 to 120.00 %	lp	
782	OVER SPEED	SPEED CALC	REAL	-120.00 to 120.00 %	lq	
783	SPEED TRIM	SPEED CALC	REAL	-110.00 to 110.00 %	lr	
784	SPEED DEMAND	SPEED CALC	REAL	_.xx	ls	Output
785	UP TO SPD (UTS)	SPEED CALC	BOOL	FALSE / TRUE	lt	Output
786	OVER-WIND	TORQUE CALC	BOOL	FALSE / TRUE	lu	
787	TENSION ENABLE	TORQUE CALC	BOOL	FALSE / TRUE	lv	
788	TORQUE DEMAND	TORQUE CALC	REAL	-200.00 to 200.00 %	lw	
789	TORQUE LIMIT	TORQUE CALC	REAL	0.00 to 200.00 %	lx	
790	POS TORQUE LIMIT	TORQUE CALC	REAL	_.xx	ly	Output
791	NEG TORQUE LIMIT	TORQUE CALC	REAL	_.xx	lz	Output
792	INPUT 3	MULTIPLEXER 2	BOOL	FALSE / TRUE	m0	
793	INPUT 4	MULTIPLEXER 2	BOOL	FALSE / TRUE	m1	
794	INPUT 5	MULTIPLEXER 2	BOOL	FALSE / TRUE	m2	
795	INPUT 6	MULTIPLEXER 2	BOOL	FALSE / TRUE	m3	
796	INPUT 7	MULTIPLEXER 2	BOOL	FALSE / TRUE	m4	
797	INPUT 8	MULTIPLEXER 2	BOOL	FALSE / TRUE	m5	
798	INPUT 9	MULTIPLEXER 2	BOOL	FALSE / TRUE	m6	
799	INPUT 10	MULTIPLEXER 2	BOOL	FALSE / TRUE	m7	
800	VALUE	ANALOG OUTPUT 3	REAL	-300.00 to 300.00 %	m8	
801	SCALE	ANALOG OUTPUT 3	REAL	-300.00 to 300.00 %	m9	

TAG	MMI Name	Block	Type	Range	ID	Notes
802	OFFSET	ANALOG OUTPUT 3	REAL	-300.00 to 300.00 %	ma	
803	ABSOLUTE	ANALOG OUTPUT 3	BOOL	FALSE / TRUE	mb	
804	TYPE	ANALOG OUTPUT 3	ENUM	0 to 8	mc	
805	DIAMETER	COMPENSATION	REAL	0.00 to 100.00 %	md	
806	MINIMUM DIAMETER	COMPENSATION	REAL	0.00 to 100.00 %	me	
807	VARIABLE INERTIA	COMPENSATION	REAL	0.00 to 100.00 %	mf	
808	FIXED INERTIA	COMPENSATION	REAL	0.00 to 100.00 %	mg	
809	WIDTH	COMPENSATION	REAL	0.00 to 100.00 %	mh	
810	REWIND	COMPENSATION	BOOL	FALSE / TRUE	mi	
811	LINE SPD DEMAND	COMPENSATION	REAL	-100.00 to 100.00 %	mj	
812	RATE CAL	COMPENSATION	REAL	-300.00 to 300.00	mk	
813	REVERSE	COMPENSATION	BOOL	FALSE / TRUE	ml	
814	DYNAMIC COMP	COMPENSATION	REAL	0.00 to 300.00 %	mm	
815	STATIC COMP	COMPENSATION	REAL	0.00 to 300.00 %	mn	
816	MOD WINDER SPEED	COMPENSATION	REAL	0.00 to 300.00 %	mo	
817	COMPENSATIONS	COMPENSATION	REAL	_.xx	mp	Output
818	INERTIA COMP	COMPENSATION	REAL	_.xx	mq	Output
819	SCALED RATE	COMPENSATION	REAL	_.xx	mr	Output
820	LINE SPEED RATE	COMPENSATION	REAL	_.xx	ms	Output
821	DIAMETER HOLD	DIAMETER CALC	BOOL	FALSE / TRUE	mt	
822	PRESET ENABLE	DIAMETER CALC	BOOL	FALSE / TRUE	mu	
823	SELECT CORE 2	DIAMETER CALC	BOOL	FALSE / TRUE	mv	
824	SEL EXT DIAMETER	DIAMETER CALC	BOOL	FALSE / TRUE	mw	
825	TENSION ENABLE	DIAMETER CALC	BOOL	FALSE / TRUE	mx	
826	CORE 1	DIAMETER CALC	REAL	0.00 to 120.00 %	my	
827	CORE 2	DIAMETER CALC	REAL	0.00 to 120.00 %	mz	
828	DIAMETER TC	DIAMETER CALC	REAL	0.00 to 300.00 s	n0	
829	EXT DIAMETER	DIAMETER CALC	REAL	0.00 to 120.00 %	n1	
830	LINE SPEED	DIAMETER CALC	REAL	-110.00 to 110.00 %	n2	
831	MINIMUM DIAMETER	DIAMETER CALC	REAL	0.00 to 120.00 %	n3	
832	MINIMUM SPEED	DIAMETER CALC	REAL	0.00 to 110.00 %	n4	
833	WINDER SPEED	DIAMETER CALC	REAL	-110.00 to 110.00 %	n5	
834	CURRENT CORE	DIAMETER CALC	REAL	_.xx	n6	Output
835	DIAMETER	DIAMETER CALC	REAL	_.xx	n7	Output
836	MOD LINE SPEED	DIAMETER CALC	REAL	_.xx	n8	Output
837	MOD WINDER SPEED	DIAMETER CALC	REAL	_.xx	n9	Output
838	HYPERBOLIC TAPER	TAPER CALC	BOOL	FALSE / TRUE	na	
839	STALL ENABLE	TAPER CALC	BOOL	FALSE / TRUE	nb	
840	BOOST ENABLE	TAPER CALC	BOOL	FALSE / TRUE	nc	
841	FIXED BOOST	TAPER CALC	BOOL	FALSE / TRUE	nd	
842	FIXED STALL TEN	TAPER CALC	BOOL	FALSE / TRUE	ne	
843	CURRENT CORE	TAPER CALC	REAL	0.00 to 120.00 %	nf	
844	DIAMETER	TAPER CALC	REAL	0.00 to 120.00 %	ng	
845	BOOST	TAPER CALC	REAL	-200.00 to 200.00 %	nh	
846	TENSION RAMP	TAPER CALC	REAL	0.000 to 300.000 s	ni	10
847	STALL TENSION	TAPER CALC	REAL	-100.00 to 100.00 %	nj	
848	TAPER SPT	TAPER CALC	REAL	-100.00 to 100.00 %	nk	
849	TENSION SPT	TAPER CALC	REAL	-200.00 to 200.00 %	nl	
850	TAPERED DEMAND	TAPER CALC	REAL	_.xx	nm	Output
851	TENSION DEMAND	TAPER CALC	REAL	_.xx	nn	Output
852	DECIMAL PLACE	DISPLAY SCALE 3	ENUM	0 to 5	no	
853	FORMULA	DISPLAY SCALE 3	ENUM	0 to 3	np	
854	COEFFICIENT A	DISPLAY SCALE 3	REAL	-32768.00 to 32767.00	nq	
855	COEFFICIENT B	DISPLAY SCALE 3	REAL	-32768.00 to 32767.00	nr	
856	COEFFICIENT C	DISPLAY SCALE 3	REAL	-32768.00 to 32767.00	ns	
857	HIGH LIMIT	DISPLAY SCALE 3	REAL	-32768.00 to 32767.00	nt	
858	LOW LIMIT	DISPLAY SCALE 3	REAL	-32768.00 to 32767.00	nu	
859	UNITS	DISPLAY SCALE 3	STRING	max length is 6 chars	nv	
860	DECIMAL PLACE	DISPLAY SCALE 4	ENUM	0 to 5	nw	
861	FORMULA	DISPLAY SCALE 4	ENUM	0 to 3	nx	
862	COEFFICIENT A	DISPLAY SCALE 4	REAL	-32768.00 to 32767.00	ny	
863	COEFFICIENT B	DISPLAY SCALE 4	REAL	-32768.00 to 32767.00	nz	

TAG	MMI Name	Block	Type	Range	ID	Notes
864	COEFFICIENT C	DISPLAY SCALE 4	REAL	-32768.00 to 32767.00	o0	
865	HIGH LIMIT	DISPLAY SCALE 4	REAL	-32768.00 to 32767.00	o1	
866	LOW LIMIT	DISPLAY SCALE 4	REAL	-32768.00 to 32767.00	o2	
867	UNITS	DISPLAY SCALE 4	STRING	max length is 6 chars	o3	
868	INPUT 11	MULTIPLEXER 2	BOOL	FALSE / TRUE	o4	
869	INPUT 12	MULTIPLEXER 2	BOOL	FALSE / TRUE	o5	
870	INPUT 13	MULTIPLEXER 2	BOOL	FALSE / TRUE	o6	
871	INPUT 14	MULTIPLEXER 2	BOOL	FALSE / TRUE	o7	
872	INPUT 15	MULTIPLEXER 2	BOOL	FALSE / TRUE	o8	
873	OUTPUT	MULTIPLEXER 2	WORD	0000 to FFFF	o9	Output
874	INPUT	DEMULTIPLEXER 2	WORD	0000 to FFFF	oa	
875	OUTPUT 0	DEMULTIPLEXER 2	BOOL	FALSE / TRUE	ob	Output
876	VIEW LEVEL	ACCESS CONTROL	ENUM	0 to 2	oc	
879	INPUT	LINEAR RAMP	REAL	-300.00 to 300.00 %	of	
880	ACCEL TIME	LINEAR RAMP	REAL	0.0 to 3000.0 s	og	
881	DECEL TIME	LINEAR RAMP	REAL	0.0 to 3000.0 s	oh	
882	SYMMETRIC MODE	LINEAR RAMP	BOOL	FALSE / TRUE	oi	
883	SYMMETRIC TIME	LINEAR RAMP	REAL	0.0 to 3000.0 s	oj	
884	HOLD	LINEAR RAMP	BOOL	FALSE / TRUE	ok	
885	RESET	LINEAR RAMP	BOOL	FALSE / TRUE	ol	
886	RESET VALUE	LINEAR RAMP	REAL	-300.00 to 300.00 %	om	
887	OUTPUT	LINEAR RAMP	REAL	_.xx	on	Output
888	RAMPING	LINEAR RAMP	BOOL	FALSE / TRUE	oo	Output
889	INPUT	S-RAMP	REAL	-100.00 to 100.00 %	op	
890	JERK 1	S-RAMP	REAL	0.00 to 100.00 /s^3	oq	
891	JERK 2	S-RAMP	REAL	0.00 to 100.00 /s^3	or	
892	JERK 3	S-RAMP	REAL	0.00 to 100.00 /s^3	os	
893	JERK 4	S-RAMP	REAL	0.00 to 100.00 /s^3	ot	
894	ACCELERATION	S-RAMP	REAL	0.00 to 100.00 /s^2	ou	
895	DECELERATION	S-RAMP	REAL	0.00 to 100.00 /s^2	ov	
896	HOLD	S-RAMP	BOOL	FALSE / TRUE	ow	
897	RESET	S-RAMP	BOOL	FALSE / TRUE	ox	
898	RESET VALUE	S-RAMP	REAL	-100.00 to 100.00 %	oy	
899	CONTINUOUS	S-RAMP	BOOL	FALSE / TRUE	oz	
1000	OUTPUT 1	DEMULTIPLEXER 2	BOOL	FALSE / TRUE	rs	Output
1001	OUTPUT 2	DEMULTIPLEXER 2	BOOL	FALSE / TRUE	rt	Output
1002	OUTPUT 3	DEMULTIPLEXER 2	BOOL	FALSE / TRUE	ru	Output
1003	OUTPUT 4	DEMULTIPLEXER 2	BOOL	FALSE / TRUE	rv	Output
1004	OUTPUT 5	DEMULTIPLEXER 2	BOOL	FALSE / TRUE	rw	Output
1005	OUTPUT 6	DEMULTIPLEXER 2	BOOL	FALSE / TRUE	rx	Output
1006	OUTPUT 7	DEMULTIPLEXER 2	BOOL	FALSE / TRUE	ry	Output
1007	OUTPUT 8	DEMULTIPLEXER 2	BOOL	FALSE / TRUE	rz	Output
1008	OUTPUT 9	DEMULTIPLEXER 2	BOOL	FALSE / TRUE	s0	Output
1009	OUTPUT 10	DEMULTIPLEXER 2	BOOL	FALSE / TRUE	s1	Output
1010	OUTPUT 11	DEMULTIPLEXER 2	BOOL	FALSE / TRUE	s2	Output
1011	OUTPUT 12	DEMULTIPLEXER 2	BOOL	FALSE / TRUE	s3	Output
1012	OUTPUT 13	DEMULTIPLEXER 2	BOOL	FALSE / TRUE	s4	Output
1013	OUTPUT 14	DEMULTIPLEXER 2	BOOL	FALSE / TRUE	s5	Output
1014	OUTPUT 15	DEMULTIPLEXER 2	BOOL	FALSE / TRUE	s6	Output
1016	ENCODER COUNT	FEEDBACKS	INT	_	s8	Output
1020	TERMINAL VOLTS	FEEDBACKS	REAL	_.	sc	Output
1025	TEST DISABLE	AUTOTUNE	WORD	0 to 3	sh	
1032	MAX SPEED	SETPOINT SCALE	REAL	0 to 32000 RPM	so	3,7
1037	SETPOINT SCALE	ACCESS CONTROL	ENUM	0 to 4	st	
1038	NO SETPOINT PWRD	ACCESS CONTROL	BOOL	FALSE / TRUE	su	
1039	SCALING	OPERATOR MENU 1	ENUM	0 to 4	sv	
1040	READ ONLY	OPERATOR MENU 1	BOOL	FALSE / TRUE	sw	
1041	IGNORE PASSWORD	OPERATOR MENU 1	BOOL	FALSE / TRUE	sx	
1042	SCALING	OPERATOR MENU 2	ENUM	0 to 4	sy	
1043	READ ONLY	OPERATOR MENU 2	BOOL	FALSE / TRUE	sz	
1044	IGNORE PASSWORD	OPERATOR MENU 2	BOOL	FALSE / TRUE	t0	
1045	NAME	OPERATOR MENU 3	STRING	max length is 16 chars	t1	

TAG	MMI Name	Block	Type	Range	ID	Notes
1046	SCALING	OPERATOR MENU 3	ENUM	0 to 4	t2	
1047	READ ONLY	OPERATOR MENU 3	BOOL	FALSE / TRUE	t3	
1048	IGNORE PASSWORD	OPERATOR MENU 3	BOOL	FALSE / TRUE	t4	
1049	NAME	OPERATOR MENU 4	STRING	max length is 16 chars	t5	
1050	SCALING	OPERATOR MENU 4	ENUM	0 to 4	t6	
1051	READ ONLY	OPERATOR MENU 4	BOOL	FALSE / TRUE	t7	
1052	IGNORE PASSWORD	OPERATOR MENU 4	BOOL	FALSE / TRUE	t8	
1053	NAME	OPERATOR MENU 5	STRING	max length is 16 chars	t9	
1054	SCALING	OPERATOR MENU 5	ENUM	0 to 4	ta	
1055	READ ONLY	OPERATOR MENU 5	BOOL	FALSE / TRUE	tb	
1056	IGNORE PASSWORD	OPERATOR MENU 5	BOOL	FALSE / TRUE	tc	
1057	NAME	OPERATOR MENU 6	STRING	max length is 16 chars	td	
1058	SCALING	OPERATOR MENU 6	ENUM	0 to 4	te	
1059	READ ONLY	OPERATOR MENU 6	BOOL	FALSE / TRUE	tf	
1060	IGNORE PASSWORD	OPERATOR MENU 6	BOOL	FALSE / TRUE	tg	
1061	NAME	OPERATOR MENU 7	STRING	max length is 16 chars	th	
1062	SCALING	OPERATOR MENU 7	ENUM	0 to 4	ti	
1063	READ ONLY	OPERATOR MENU 7	BOOL	FALSE / TRUE	tj	
1064	IGNORE PASSWORD	OPERATOR MENU 7	BOOL	FALSE / TRUE	tk	
1065	NAME	OPERATOR MENU 8	STRING	max length is 16 chars	tl	
1066	SCALING	OPERATOR MENU 8	ENUM	0 to 4	tm	
1067	READ ONLY	OPERATOR MENU 8	BOOL	FALSE / TRUE	tn	
1068	IGNORE PASSWORD	OPERATOR MENU 8	BOOL	FALSE / TRUE	to	
1069	NAME	OPERATOR MENU 9	STRING	max length is 16 chars	tp	
1070	SCALING	OPERATOR MENU 9	ENUM	0 to 4	tq	
1071	READ ONLY	OPERATOR MENU 9	BOOL	FALSE / TRUE	tr	
1072	IGNORE PASSWORD	OPERATOR MENU 9	BOOL	FALSE / TRUE	ts	
1073	NAME	OPERATOR MENU 10	STRING	max length is 16 chars	tt	
1074	SCALING	OPERATOR MENU 10	ENUM	0 to 4	tu	
1075	READ ONLY	OPERATOR MENU 10	BOOL	FALSE / TRUE	tv	
1076	IGNORE PASSWORD	OPERATOR MENU 10	BOOL	FALSE / TRUE	tw	
1077	NAME	OPERATOR MENU 11	STRING	max length is 16 chars	tx	
1078	SCALING	OPERATOR MENU 11	ENUM	0 to 4	ty	
1079	READ ONLY	OPERATOR MENU 11	BOOL	FALSE / TRUE	tz	
1080	IGNORE PASSWORD	OPERATOR MENU 11	BOOL	FALSE / TRUE	u0	
1081	NAME	OPERATOR MENU 12	STRING	max length is 16 chars	u1	
1082	SCALING	OPERATOR MENU 12	ENUM	0 to 4	u2	
1083	READ ONLY	OPERATOR MENU 12	BOOL	FALSE / TRUE	u3	
1084	IGNORE PASSWORD	OPERATOR MENU 12	BOOL	FALSE / TRUE	u4	
1085	NAME	OPERATOR MENU 13	STRING	max length is 16 chars	u5	
1086	SCALING	OPERATOR MENU 13	ENUM	0 to 4	u6	
1087	READ ONLY	OPERATOR MENU 13	BOOL	FALSE / TRUE	u7	
1088	IGNORE PASSWORD	OPERATOR MENU 13	BOOL	FALSE / TRUE	u8	
1089	NAME	OPERATOR MENU 14	STRING	max length is 16 chars	u9	
1090	SCALING	OPERATOR MENU 14	ENUM	0 to 4	ua	
1091	READ ONLY	OPERATOR MENU 14	BOOL	FALSE / TRUE	ub	
1092	IGNORE PASSWORD	OPERATOR MENU 14	BOOL	FALSE / TRUE	uc	
1093	NAME	OPERATOR MENU 15	STRING	max length is 16 chars	ud	
1094	SCALING	OPERATOR MENU 15	ENUM	0 to 4	ue	
1095	READ ONLY	OPERATOR MENU 15	BOOL	FALSE / TRUE	uf	
1096	IGNORE PASSWORD	OPERATOR MENU 15	BOOL	FALSE / TRUE	ug	
1097	NAME	OPERATOR MENU 16	STRING	max length is 16 chars	uh	
1098	SCALING	OPERATOR MENU 16	ENUM	0 to 4	ui	
1099	READ ONLY	OPERATOR MENU 16	BOOL	FALSE / TRUE	uj	
1100	IGNORE PASSWORD	OPERATOR MENU 16	BOOL	FALSE / TRUE	uk	
1101	INPUT	FILTER 1	REAL	-300.00 to 300.00 %	ul	
1102	RESET	FILTER 1	BOOL	FALSE / TRUE	um	
1103	TIME CONSTANT	FILTER 1	REAL	0.00 to 300.00 s	un	
1104	OUTPUT	FILTER 1	REAL	_.xx	uo	Output
1105	INPUT	FILTER 2	REAL	-300.00 to 300.00 %	up	
1106	RESET	FILTER 2	BOOL	FALSE / TRUE	uq	
1107	TIME CONSTANT	FILTER 2	REAL	0.00 to 300.00 s	ur	

TAG	MMI Name	Block	Type	Range	ID	Notes
1108	OUTPUT	FILTER 2	REAL	_.xx	us	Output
1109	ENABLED KEYS	OP STATION 2	WORD	4 : DIRECTION 5 : JOG 6 : L/R 7 : START	ut	
1110	OP VERSION	OP STATION 2	WORD	0000 to FFFF	uu	Output
1148	AIMING POINT	INVERSE TIME	REAL	50.00 to 150.00 %	vw	
1149	DELAY	INVERSE TIME	REAL	5.0 to 60.0 s	vx	
1150	DOWN TIME	INVERSE TIME	REAL	1.0 to 10.0 s	vy	
1151	UP TIME	INVERSE TIME	REAL	1.0 to 600.0 s	vz	
1152	IT LIMITING	INVERSE TIME	BOOL	FALSE / TRUE	w0	Output
1153	INVERSE TIME OP	INVERSE TIME	REAL	_.xx	w1	Output
1154	INVERT ENC TRIP	I/O TRIPS	BOOL	FALSE / TRUE	w2	
1155	THERMISTOR	I/O TRIPS	BOOL	FALSE / TRUE	w3	Output
1156	ENCODER	I/O TRIPS	BOOL	FALSE / TRUE	w4	Output
1157	CONTROL MODE	MOTOR DATA	ENUM	0 to 2	w5	3,7
1158	POWER	MOTOR DATA	REAL	0.00 to 355.00 kW	w6	3,10
1159	BASE FREQUENCY	MOTOR DATA	REAL	7.5 to 500.0 Hz	w7	3
1160	MOTOR VOLTAGE	MOTOR DATA	REAL	0.0 to 575.0 V	w8	3
1163	ROTOR TIME CONST	MOTOR DATA	REAL	10.00 to 3000.00 ms	wb	3,10
1164	OVERLOAD	MOTOR DATA	REAL	1.0 to 5.0	wc	3
1187	SPEED PROP GAIN	SPEED LOOP	REAL	0.00 to 300.00	wz	3
1188	SPEED INT TIME	SPEED LOOP	REAL	1 to 15000 ms	x0	3
1189	INT DEFEAT	SPEED LOOP	BOOL	FALSE / TRUE	x1	
1190	SPEED INT PRESET	SPEED LOOP	REAL	-500.00 to 500.00 %	x2	10
1191	SPEED DMD FILTER	SPEED LOOP	REAL	0.0 to 14.0 ms	x3	
1192	SPEED FBK FILTER	SPEED LOOP	REAL	0.0 to 15.0 ms	x4	
1193	AUX TORQUE DMD	SPEED LOOP	REAL	-300.00 to 300.00 %	x5	
1194	ADAPTIVE THRESH	SPEED LOOP	REAL	0.00 to 10.00 %	x6	
1195	ADAPTIVE P-GAIN	SPEED LOOP	REAL	0.00 to 300.00	x7	
1196	DIRECT IP SELECT	SPEED LOOP	ENUM	0 to 4	x8	
1197	DIRECT RATIO	SPEED LOOP	REAL	-10.0000 to 10.0000	x9	10
1198	DIRCT IP POS LIM	SPEED LOOP	REAL	-110.00 to 110.00 %	xa	
1199	DIRCT IP NEG LIM	SPEED LOOP	REAL	-110.00 to 110.00 %	xb	
1200	SPEED POS LIM	SPEED LOOP	REAL	-110.00 to 110.00 %	xc	
1201	SPEED NEG LIM	SPEED LOOP	REAL	-110.00 to 110.00 %	xd	
1202	TORQ DMD ISOLATE	SPEED LOOP	BOOL	FALSE / TRUE	xe	
1203	TOTL SPD DMD RPM	SPEED LOOP	REAL	_.xx	xf	Output,10
1204	TORQUE DEMAND	SPEED LOOP	REAL	_.xx	xg	Output
1205	DIRECT INPUT	SPEED LOOP	REAL	_.xx	xh	Output
1206	TOTAL SPD DMD %	SPEED LOOP	REAL	_.xx	xi	Output
1207	SPEED ERROR	SPEED LOOP	REAL	_.xx	xj	Output
1208	POS TORQUE LIM	TORQUE LIMIT	REAL	-300.00 to 300.00 %	xk	
1209	NEG TORQUE LIM	TORQUE LIMIT	REAL	-300.00 to 300.00 %	xl	
1210	MAIN TORQUE LIM	TORQUE LIMIT	REAL	0.00 to 300.00 %	xm	
1211	SYMMETRIC LIM	TORQUE LIMIT	BOOL	FALSE / TRUE	xn	
1212	ACTUAL POS LIM	TORQUE LIMIT	REAL	_.xx	xo	Output
1213	ACTUAL NEG LIM	TORQUE LIMIT	REAL	_.xx	xp	Output
1233	AT ZERO SPD FBK	ZERO SPEED	BOOL	FALSE / TRUE	y9	Output
1234	AT STANDSTILL	ZERO SPEED	BOOL	FALSE / TRUE	ya	Output
1235	CONTACTOR CLOSED	SEQUENCING LOGIC	BOOL	FALSE / TRUE	yb	
1238	ENCODER FBK %	FEEDBACKS	REAL	_.xx	ye	Output
1247	ERROR	PID (TYPE 2)	REAL	-300.00 to 300.00 %	yn	
1248	FEED FWD	PID (TYPE 2)	REAL	-300.00 to 300.00 %	yo	
1249	FEED FWD GAIN	PID (TYPE 2)	REAL	-300.00 to 300.00	yp	
1250	P GAIN	PID (TYPE 2)	REAL	0.00 to 100.00	yq	
1251	I GAIN	PID (TYPE 2)	REAL	0.00 to 100.00	yr	
1252	D GAIN	PID (TYPE 2)	REAL	0.00 to 100.00	ys	
1253	LIMIT	PID (TYPE 2)	REAL	0.00 to 300.00 %	yt	
1254	ENABLE	PID (TYPE 2)	BOOL	FALSE / TRUE	yu	
1255	D FILTER TC	PID (TYPE 2)	REAL	0.05 to 10.00 s	yv	
1256	OUTPUT	PID (TYPE 2)	REAL	_.xx	yw	Output
1257	LIMITING	PID (TYPE 2)	BOOL	FALSE / TRUE	yx	Output

TAG	MMI Name	Block	Type	Range	ID	Notes
1258	RATIO	5703 INPUT	REAL	-3.0000 to 3.0000 %	yy	
1259	NEGATE	5703 INPUT	BOOL	FALSE / TRUE	yz	
1260	SCALED VALUE	5703 INPUT	REAL	_.xx	z0	Output
1261	RAW VALUE	5703 INPUT	REAL	_.xx	z1	Output
1262	BREAK	5703 INPUT	BOOL	FALSE / TRUE	z2	Output
1263	VALUE	5703 OUTPUT	REAL	-300.00 to 300.00 %	z3	
1264	REPEATER	5703 OUTPUT	BOOL	FALSE / TRUE	z4	
1265	ENABLE	POWER LOSS CNTRL	BOOL	FALSE / TRUE	z5	
1266	TRIP THRESHOLD	POWER LOSS CNTRL	REAL	0 to 1000 V	z6	3
1267	CONTROL BAND	POWER LOSS CNTRL	REAL	0 to 1000 V	z7	
1268	ACCEL TIME	POWER LOSS CNTRL	REAL	0.01 to 300.00 s	z8	
1269	DECEL TIME	POWER LOSS CNTRL	REAL	0.01 to 300.00 s	z9	
1270	TIME LIMIT	POWER LOSS CNTRL	REAL	0.00 to 300.00 s	za	
1271	PWR LOSS ACTIVE	POWER LOSS CNTRL	BOOL	FALSE / TRUE	zb	Output
1272	INVERT	DIGITAL INPUT 11	BOOL	FALSE / TRUE	zc	
1273	VALUE	DIGITAL INPUT 11	BOOL	FALSE / TRUE	zd	Output
1274	INVERT	DIGITAL INPUT 12	BOOL	FALSE / TRUE	ze	
1275	VALUE	DIGITAL INPUT 12	BOOL	FALSE / TRUE	zf	Output
1276	INVERT	DIGITAL INPUT 13	BOOL	FALSE / TRUE	zg	
1277	VALUE	DIGITAL INPUT 13	BOOL	FALSE / TRUE	zh	Output
1278	INVERT	DIGITAL INPUT 14	BOOL	FALSE / TRUE	zi	
1279	VALUE	DIGITAL INPUT 14	BOOL	FALSE / TRUE	zj	Output
1280	INVERT	DIGITAL INPUT 15	BOOL	FALSE / TRUE	zk	
1281	VALUE	DIGITAL INPUT 15	BOOL	FALSE / TRUE	zl	Output
1282	INVERT	DIGITAL OUTPUT 11	BOOL	FALSE / TRUE	zm	
1283	VALUE	DIGITAL OUTPUT 11	BOOL	FALSE / TRUE	zn	
1284	INVERT	DIGITAL OUTPUT 12	BOOL	FALSE / TRUE	zo	
1285	VALUE	DIGITAL OUTPUT 12	BOOL	FALSE / TRUE	zp	
1286	INVERT	DIGITAL OUTPUT 13	BOOL	FALSE / TRUE	zq	
1287	VALUE	DIGITAL OUTPUT 13	BOOL	FALSE / TRUE	zr	
1288	INVERT	DIGITAL OUTPUT 14	BOOL	FALSE / TRUE	zs	
1289	VALUE	DIGITAL OUTPUT 14	BOOL	FALSE / TRUE	zt	
1290	INVERT	DIGITAL OUTPUT 15	BOOL	FALSE / TRUE	zu	
1291	VALUE	DIGITAL OUTPUT 15	BOOL	FALSE / TRUE	zv	
1292	REQUIRED TYPE	SYSTEM OPTION	ENUM	0 to 8	zw	
1293	FAULT	SYSTEM OPTION	ENUM	0 to 5	zx	Output
1294	ACTUAL TYPE	SYSTEM OPTION	ENUM	0 to 8	zy	Output
1295	VERSION	SYSTEM OPTION	WORD	0000 to FFFF	zz	Output
1296	INPUT A	VALUE FUNC 11	REAL	-32768.00 to 32767.00	aA	
1297	INPUT B	VALUE FUNC 11	REAL	-32768.00 to 32767.00	aB	
1298	INPUT C	VALUE FUNC 11	REAL	-32768.00 to 32767.00	aC	
1299	OUTPUT	VALUE FUNC 11	REAL	_.xx	aD	Output
1300	TYPE	VALUE FUNC 11	ENUM	0 to 22	aE	
1301	INPUT A	VALUE FUNC 12	REAL	-32768.00 to 32767.00	aF	
1302	INPUT B	VALUE FUNC 12	REAL	-32768.00 to 32767.00	aG	
1303	INPUT C	VALUE FUNC 12	REAL	-32768.00 to 32767.00	aH	
1304	OUTPUT	VALUE FUNC 12	REAL	_.xx	aI	Output
1305	TYPE	VALUE FUNC 12	ENUM	0 to 22	aJ	
1306	INPUT A	VALUE FUNC 13	REAL	-32768.00 to 32767.00	aK	
1307	INPUT B	VALUE FUNC 13	REAL	-32768.00 to 32767.00	aL	
1308	INPUT C	VALUE FUNC 13	REAL	-32768.00 to 32767.00	aM	
1309	OUTPUT	VALUE FUNC 13	REAL	_.xx	aN	Output
1310	TYPE	VALUE FUNC 13	ENUM	0 to 22	aO	
1311	INPUT A	VALUE FUNC 14	REAL	-32768.00 to 32767.00	aP	
1312	INPUT B	VALUE FUNC 14	REAL	-32768.00 to 32767.00	aQ	
1313	INPUT C	VALUE FUNC 14	REAL	-32768.00 to 32767.00	aR	
1314	OUTPUT	VALUE FUNC 14	REAL	_.xx	aS	Output
1315	TYPE	VALUE FUNC 14	ENUM	0 to 22	aT	
1316	INPUT A	VALUE FUNC 15	REAL	-32768.00 to 32767.00	aU	
1317	INPUT B	VALUE FUNC 15	REAL	-32768.00 to 32767.00	aV	
1318	INPUT C	VALUE FUNC 15	REAL	-32768.00 to 32767.00	aW	
1319	OUTPUT	VALUE FUNC 15	REAL	_.xx	aX	Output

TAG	MMI Name	Block	Type	Range	ID	Notes
1320	TYPE	VALUE FUNC 15	ENUM	0 to 22	aY	
1321	INPUT A	VALUE FUNC 16	REAL	-32768.00 to 32767.00	aZ	
1322	INPUT B	VALUE FUNC 16	REAL	-32768.00 to 32767.00	bA	
1323	INPUT C	VALUE FUNC 16	REAL	-32768.00 to 32767.00	bB	
1324	OUTPUT	VALUE FUNC 16	REAL	_.xx	bC	Output
1325	TYPE	VALUE FUNC 16	ENUM	0 to 22	bD	
1326	INPUT A	VALUE FUNC 17	REAL	-32768.00 to 32767.00	bE	
1327	INPUT B	VALUE FUNC 17	REAL	-32768.00 to 32767.00	bF	
1328	INPUT C	VALUE FUNC 17	REAL	-32768.00 to 32767.00	bG	
1329	OUTPUT	VALUE FUNC 17	REAL	_.xx	bH	Output
1330	TYPE	VALUE FUNC 17	ENUM	0 to 22	bI	
1331	INPUT A	VALUE FUNC 18	REAL	-32768.00 to 32767.00	bJ	
1332	INPUT B	VALUE FUNC 18	REAL	-32768.00 to 32767.00	bK	
1333	INPUT C	VALUE FUNC 18	REAL	-32768.00 to 32767.00	bL	
1334	OUTPUT	VALUE FUNC 18	REAL	_.xx	bM	Output
1335	TYPE	VALUE FUNC 18	ENUM	0 to 22	bN	
1336	INPUT A	VALUE FUNC 19	REAL	-32768.00 to 32767.00	bO	
1337	INPUT B	VALUE FUNC 19	REAL	-32768.00 to 32767.00	bP	
1338	INPUT C	VALUE FUNC 19	REAL	-32768.00 to 32767.00	bQ	
1339	OUTPUT	VALUE FUNC 19	REAL	_.xx	bR	Output
1340	TYPE	VALUE FUNC 19	ENUM	0 to 22	bS	
1341	INPUT A	VALUE FUNC 20	REAL	-32768.00 to 32767.00	bT	
1342	INPUT B	VALUE FUNC 20	REAL	-32768.00 to 32767.00	bU	
1343	INPUT C	VALUE FUNC 20	REAL	-32768.00 to 32767.00	bV	
1344	OUTPUT	VALUE FUNC 20	REAL	_.xx	bW	Output
1345	TYPE	VALUE FUNC 20	ENUM	0 to 22	bX	
1346	INPUT A	LOGIC FUNC 11	BOOL	FALSE / TRUE	bY	
1347	INPUT B	LOGIC FUNC 11	BOOL	FALSE / TRUE	bZ	
1348	INPUT C	LOGIC FUNC 11	BOOL	FALSE / TRUE	cA	
1349	OUTPUT	LOGIC FUNC 11	BOOL	FALSE / TRUE	cB	Output
1350	TYPE	LOGIC FUNC 11	ENUM	0 to 11	cC	
1351	INPUT A	LOGIC FUNC 12	BOOL	FALSE / TRUE	cD	
1352	INPUT B	LOGIC FUNC 12	BOOL	FALSE / TRUE	cE	
1353	INPUT C	LOGIC FUNC 12	BOOL	FALSE / TRUE	cF	
1354	OUTPUT	LOGIC FUNC 12	BOOL	FALSE / TRUE	cG	Output
1355	TYPE	LOGIC FUNC 12	ENUM	0 to 11	cH	
1356	INPUT A	LOGIC FUNC 13	BOOL	FALSE / TRUE	cI	
1357	INPUT B	LOGIC FUNC 13	BOOL	FALSE / TRUE	cJ	
1358	INPUT C	LOGIC FUNC 13	BOOL	FALSE / TRUE	cK	
1359	OUTPUT	LOGIC FUNC 13	BOOL	FALSE / TRUE	cL	Output
1360	TYPE	LOGIC FUNC 13	ENUM	0 to 11	cM	
1361	INPUT A	LOGIC FUNC 14	BOOL	FALSE / TRUE	cN	
1362	INPUT B	LOGIC FUNC 14	BOOL	FALSE / TRUE	cO	
1363	INPUT C	LOGIC FUNC 14	BOOL	FALSE / TRUE	cP	
1364	OUTPUT	LOGIC FUNC 14	BOOL	FALSE / TRUE	cQ	Output
1365	TYPE	LOGIC FUNC 14	ENUM	0 to 11	cR	
1366	INPUT A	LOGIC FUNC 15	BOOL	FALSE / TRUE	cS	
1367	INPUT B	LOGIC FUNC 15	BOOL	FALSE / TRUE	cT	
1368	INPUT C	LOGIC FUNC 15	BOOL	FALSE / TRUE	cU	
1369	OUTPUT	LOGIC FUNC 15	BOOL	FALSE / TRUE	cV	Output
1370	TYPE	LOGIC FUNC 15	ENUM	0 to 11	cW	
1371	INPUT A	LOGIC FUNC 16	BOOL	FALSE / TRUE	cX	
1372	INPUT B	LOGIC FUNC 16	BOOL	FALSE / TRUE	cY	
1373	INPUT C	LOGIC FUNC 16	BOOL	FALSE / TRUE	cZ	
1374	OUTPUT	LOGIC FUNC 16	BOOL	FALSE / TRUE	dA	Output
1375	TYPE	LOGIC FUNC 16	ENUM	0 to 11	dB	
1376	INPUT A	LOGIC FUNC 17	BOOL	FALSE / TRUE	dC	
1377	INPUT B	LOGIC FUNC 17	BOOL	FALSE / TRUE	dD	
1378	INPUT C	LOGIC FUNC 17	BOOL	FALSE / TRUE	dE	
1379	OUTPUT	LOGIC FUNC 17	BOOL	FALSE / TRUE	dF	Output
1380	TYPE	LOGIC FUNC 17	ENUM	0 to 11	dG	
1381	INPUT A	LOGIC FUNC 18	BOOL	FALSE / TRUE	dH	

TAG	MMI Name	Block	Type	Range	ID	Notes
1382	INPUT B	LOGIC FUNC 18	BOOL	FALSE / TRUE	dI	
1383	INPUT C	LOGIC FUNC 18	BOOL	FALSE / TRUE	dJ	
1384	OUTPUT	LOGIC FUNC 18	BOOL	FALSE / TRUE	dK	Output
1385	TYPE	LOGIC FUNC 18	ENUM	0 to 11	dL	
1386	INPUT A	LOGIC FUNC 19	BOOL	FALSE / TRUE	dM	
1387	INPUT B	LOGIC FUNC 19	BOOL	FALSE / TRUE	dN	
1388	INPUT C	LOGIC FUNC 19	BOOL	FALSE / TRUE	dO	
1389	OUTPUT	LOGIC FUNC 19	BOOL	FALSE / TRUE	dP	Output
1390	TYPE	LOGIC FUNC 19	ENUM	0 to 11	dQ	
1391	INPUT A	LOGIC FUNC 20	BOOL	FALSE / TRUE	dR	
1392	INPUT B	LOGIC FUNC 20	BOOL	FALSE / TRUE	dS	
1393	INPUT C	LOGIC FUNC 20	BOOL	FALSE / TRUE	dT	
1394	OUTPUT	LOGIC FUNC 20	BOOL	FALSE / TRUE	dU	Output
1395	TYPE	LOGIC FUNC 20	ENUM	0 to 11	dV	
1400	SOURCE	LINK 51	PREF	-1999 to 1999	eA	8
1401	DESTINATION	LINK 51	PREF	0 to 1999	eB	8
1402	SOURCE	LINK 52	PREF	-1999 to 1999	eC	8
1403	DESTINATION	LINK 52	PREF	0 to 1999	eD	8
1404	SOURCE	LINK 53	PREF	-1999 to 1999	eE	8
1405	DESTINATION	LINK 53	PREF	0 to 1999	eF	8
1406	SOURCE	LINK 54	PREF	-1999 to 1999	eG	8
1407	DESTINATION	LINK 54	PREF	0 to 1999	eH	8
1408	SOURCE	LINK 55	PREF	-1999 to 1999	eI	8
1409	DESTINATION	LINK 55	PREF	0 to 1999	eJ	8
1410	SOURCE	LINK 56	PREF	-1999 to 1999	eK	8
1411	DESTINATION	LINK 56	PREF	0 to 1999	eL	8
1412	SOURCE	LINK 57	PREF	-1999 to 1999	eM	8
1413	DESTINATION	LINK 57	PREF	0 to 1999	eN	8
1414	SOURCE	LINK 58	PREF	-1999 to 1999	eO	8
1415	DESTINATION	LINK 58	PREF	0 to 1999	eP	8
1416	SOURCE	LINK 59	PREF	-1999 to 1999	eQ	8
1417	DESTINATION	LINK 59	PREF	0 to 1999	eR	8
1418	SOURCE	LINK 60	PREF	-1999 to 1999	eS	8
1419	DESTINATION	LINK 60	PREF	0 to 1999	eT	8
1420	SOURCE	LINK 61	PREF	-1999 to 1999	eU	8
1421	DESTINATION	LINK 61	PREF	0 to 1999	eV	8
1422	SOURCE	LINK 62	PREF	-1999 to 1999	eW	8
1423	DESTINATION	LINK 62	PREF	0 to 1999	eX	8
1424	SOURCE	LINK 63	PREF	-1999 to 1999	eY	8
1425	DESTINATION	LINK 63	PREF	0 to 1999	eZ	8
1426	SOURCE	LINK 64	PREF	-1999 to 1999	fA	8
1427	DESTINATION	LINK 64	PREF	0 to 1999	fB	8
1428	SOURCE	LINK 65	PREF	-1999 to 1999	fC	8
1429	DESTINATION	LINK 65	PREF	0 to 1999	fD	8
1430	SOURCE	LINK 66	PREF	-1999 to 1999	fE	8
1431	DESTINATION	LINK 66	PREF	0 to 1999	fF	8
1432	SOURCE	LINK 67	PREF	-1999 to 1999	fG	8
1433	DESTINATION	LINK 67	PREF	0 to 1999	fH	8
1434	SOURCE	LINK 68	PREF	-1999 to 1999	fI	8
1435	DESTINATION	LINK 68	PREF	0 to 1999	fJ	8
1436	SOURCE	LINK 69	PREF	-1999 to 1999	fK	8
1437	DESTINATION	LINK 69	PREF	0 to 1999	fL	8
1438	SOURCE	LINK 70	PREF	-1999 to 1999	fM	8
1439	DESTINATION	LINK 70	PREF	0 to 1999	fN	8
1440	SOURCE	LINK 71	PREF	-1999 to 1999	fO	8
1441	DESTINATION	LINK 71	PREF	0 to 1999	fP	8
1442	SOURCE	LINK 72	PREF	-1999 to 1999	fQ	8
1443	DESTINATION	LINK 72	PREF	0 to 1999	fR	8
1444	SOURCE	LINK 73	PREF	-1999 to 1999	fS	8
1445	DESTINATION	LINK 73	PREF	0 to 1999	fT	8
1446	SOURCE	LINK 74	PREF	-1999 to 1999	fU	8
1447	DESTINATION	LINK 74	PREF	0 to 1999	fV	8

TAG	MMI Name	Block	Type	Range	ID	Notes
1448	SOURCE	LINK 75	PREF	-1999 to 1999	fW	8
1449	DESTINATION	LINK 75	PREF	0 to 1999	fX	8
1450	SOURCE	LINK 76	PREF	-1999 to 1999	fY	8
1451	DESTINATION	LINK 76	PREF	0 to 1999	fZ	8
1452	SOURCE	LINK 77	PREF	-1999 to 1999	gA	8
1453	DESTINATION	LINK 77	PREF	0 to 1999	gB	8
1454	SOURCE	LINK 78	PREF	-1999 to 1999	gC	8
1455	DESTINATION	LINK 78	PREF	0 to 1999	gD	8
1456	SOURCE	LINK 79	PREF	-1999 to 1999	gE	8
1457	DESTINATION	LINK 79	PREF	0 to 1999	gF	8
1458	SOURCE	LINK 80	PREF	-1999 to 1999	gG	8
1459	DESTINATION	LINK 80	PREF	0 to 1999	gH	8
1460	ENABLE	HOME	BOOL	FALSE / TRUE	gI	
1461	INPUT	HOME	REAL	-300.00 to 300.00 %	gJ	
1462	DISTANCE	HOME	REAL	0.00 to 300.00	gK	
1463	DISTANCE FINE	HOME	REAL	0.0000 to 1.0000	gL	
1464	GAIN	HOME	REAL	0.0 to 1000.0	gM	
1465	CORRECTION LIMIT	HOME	REAL	0.00 to 100.00 %	gN	
1466	DECEL LIMIT	HOME	REAL	0.0 to 3000.0 %	gO	
1467	ERROR COUNT	HOME	INT	_	gP	Output
1468	DECELERATION	HOME	REAL	_.xx	gQ	Output
1469	ACTIVE	HOME	BOOL	FALSE / TRUE	gR	Output
1470	DONE	HOME	BOOL	FALSE / TRUE	gS	Output
1471	ERROR	HOME	BOOL	FALSE / TRUE	gT	Output
1472	OUTPUT	HOME	REAL	_.xx	gU	Output
1473	PERIOD	PHASE TUNING	REAL	0.10 to 300.00 s	gV	
1474	ENABLE SPEED	PHASE TUNING	BOOL	FALSE / TRUE	gW	
1475	SPEED OFFSET	PHASE TUNING	REAL	-300.00 to 300.00 %	gX	
1476	ENABLE PHASE	PHASE TUNING	BOOL	FALSE / TRUE	gY	
1477	PHASE OFFSET	PHASE TUNING	REAL	-300.00 to 300.00	gZ	
1478	ACTIVE	PHASE TUNING	BOOL	FALSE / TRUE	hA	Output
1479	RESET (TOTAL)	PHASE CONTROL	BOOL	FALSE / TRUE	hB	
1480	POSITION ENABLE	PHASE CONTROL	BOOL	FALSE / TRUE	hC	
1481	SPEED INPUT	PHASE CONTROL	REAL	-300.00 to 300.00	hD	
1482	INVERT SPEED OP	PHASE CONTROL	BOOL	FALSE / TRUE	hE	
1483	GEARING A	PHASE CONTROL	REAL	-30000.00 to 30000.00	hF	10
1484	GEARING B	PHASE CONTROL	REAL	-30000.00 to 30000.00	hG	10
1485	POS FDFWD SCALE	PHASE CONTROL	REAL	-300.00 to 300.00	hH	
1486	OUTPUT SCALE	PHASE CONTROL	REAL	0.00 to 300.00	hI	
1487	INVERT OUTPUT	PHASE CONTROL	BOOL	FALSE / TRUE	hJ	
1488	OUTPUT	PHASE CONTROL	REAL	_.xx	hK	Output
1489	SPEED OUTPUT	PHASE CONTROL	REAL	_.xx	hL	Output
1490	POS FEED FWD	PHASE CONTROL	REAL	_.xx	hM	Output
1491	MASTER POS (INT)	PHASE CONTROL	INT	_	hN	Output
1492	MASTER POSITION	PHASE CONTROL	REAL	_.xx	hO	Output
1493	SLAVE POSITION	PHASE CONTROL	REAL	_.xx	hP	Output
1494	POS ERROR (INT)	PHASE CONTROL	INT	_	hQ	Output
1495	POSITION ERROR	PHASE CONTROL	REAL	_.xx	hR	Output
1498	FEATURES	SYSTEM OPTION	WORD	0000 to FFFF	hU	Output
1499	ACCELERATION	PHASE MOVE	REAL	0.01 to 3000.00 %	hV	
1500	ADVANCE	PHASE INCH	BOOL	FALSE / TRUE	hW	
1501	RETARD	PHASE INCH	BOOL	FALSE / TRUE	hX	
1502	RATE	PHASE INCH	REAL	0.001 to 30.000	hY	
1503	ACTIVE	PHASE INCH	BOOL	FALSE / TRUE	hZ	Output
1504	ENABLE	PHASE MOVE	BOOL	FALSE / TRUE	iA	
1505	DISTANCE	PHASE MOVE	REAL	-3000.0 to 3000.0	iB	
1506	DISTANCE FINE	PHASE MOVE	REAL	-1.0000 to 1.0000	iC	
1507	VELOCITY	PHASE MOVE	REAL	0.10 to 300.00 %	iD	
1508	DISTANCE LEFT	PHASE MOVE	REAL	_.xx	iE	Output
1509	ACTIVE	PHASE MOVE	BOOL	FALSE / TRUE	iF	Output
1510	OFFSET	PHASE OFFSET	REAL	-3000.0 to 3000.0	iG	
1511	OFFSET FINE	PHASE OFFSET	REAL	-1.0000 to 1.0000	iH	

TAG	MMI Name	Block	Type	Range	ID	Notes
1512	ACTIVE	PHASE OFFSET	BOOL	FALSE / TRUE	iI	Output
1513	ERROR	PHASE PID	REAL	-300.00 to 300.00 %	iJ	
1514	FEED FWD	PHASE PID	REAL	-300.00 to 300.00 %	iK	
1515	FEED FWD GAIN	PHASE PID	REAL	-300.00 to 300.00	iL	
1516	P GAIN	PHASE PID	REAL	0.00 to 300.00	iM	
1517	I GAIN	PHASE PID	REAL	0.00 to 300.00	iN	
1518	D GAIN	PHASE PID	REAL	0.00 to 100.00	iO	
1519	LIMIT	PHASE PID	REAL	0.000 to 300.000 %	iP	10
1520	ENABLE	PHASE PID	BOOL	FALSE / TRUE	iQ	
1521	D FILTER TC	PHASE PID	REAL	0.00 to 10.00 s	iR	
1522	OUTPUT	PHASE PID	REAL	_.xx	iS	Output
1523	LIMITING	PHASE PID	BOOL	FALSE / TRUE	iT	Output
1524	SLAVE CNT SRC	PHASE CONFIGURE	ENUM	0 to 2	iU	
1525	SPD LOOP SPD FBK	PHASE CONFIGURE	ENUM	0 to 1	iV	
1526	COUNTS PER UNIT	PHASE CONFIGURE	INT	0 to 32767	iW	
1527	MASTER SCALE A	PHASE CONFIGURE	INT	-30000 to 30000	iX	
1528	MASTER SCALE B	PHASE CONFIGURE	INT	-30000 to 30000	iY	
1529	MASTER POSITION	PHASE CONFIGURE	INT	_	iZ	Output
1530	SLAVE POSITION	PHASE CONFIGURE	INT	_	jA	Output
1531	FAULT	PHASE CONFIGURE	ENUM	0 to 1	jB	Output
1532	SOURCE	ENCODER SPEED 1	ENUM	0 to 1	jC	
1533	LINES	ENCODER SPEED 1	INT	250 to 32767	jD	
1534	INVERT	ENCODER SPEED 1	BOOL	FALSE / TRUE	jE	
1535	MAX SPEED	ENCODER SPEED 1	REAL	0 to 32000 RPM	jF	
1537	FILTER TIME	ENCODER SPEED 1	REAL	0.00 to 300.00 s	jH	
1538	SPEED Hz	ENCODER SPEED 1	REAL	_.xx	jI	Output
1539	SPEED	ENCODER SPEED 1	REAL	_.xx	jJ	Output
1540	SOURCE	ENCODER SPEED 2	ENUM	0 to 1	jK	
1541	LINES	ENCODER SPEED 2	INT	250 to 32767	jL	
1542	INVERT	ENCODER SPEED 2	BOOL	FALSE / TRUE	jM	
1543	MAX SPEED	ENCODER SPEED 2	REAL	0 to 32000 RPM	jN	
1545	FILTER TIME	ENCODER SPEED 2	REAL	0.00 to 300.00 s	jP	
1546	SPEED Hz	ENCODER SPEED 2	REAL	_.xx	jQ	Output
1547	SPEED	ENCODER SPEED 2	REAL	_.xx	jR	Output
1548	PID OUTPUT	PID (TYPE 2)	REAL	_.xx	jS	Output
1549	PID OUTPUT	PHASE PID	REAL	_.xx	jT	Output
1550	REWIND	TORQUE CALC	BOOL	FALSE / TRUE	jU	
1553	VECTOR ENABLE	FLYCATCHING	BOOL	FALSE / TRUE	jX	
1554	FAST STOP T-LIM	TORQUE LIMIT	REAL	0.00 to 300.00 %	jY	
1560	MAX SPEED	PHASE CONFIGURE	REAL	0 to 32000 upm	kE	
1561	MASTER MARK TYPE	PHASE CONFIGURE	ENUM	0 to 2	kF	
1562	SLAVE MARK TYPE	PHASE CONFIGURE	ENUM	0 to 2	kG	
1563	RESET	PHASE REGISTER	BOOL	FALSE / TRUE	kH	
1564	ENABLE	PHASE REGISTER	BOOL	FALSE / TRUE	kI	
1565	INCH OFFSET	PHASE REGISTER	REAL	_.xxxx	kJ	Output
1566	MARK OFFSET	PHASE REGISTER	REAL	-100.0000 to 100.0000	kK	
1567	SLAVE NOM LENGTH	PHASE REGISTER	REAL	0.0000 to 100.0000	kL	
1568	VELOCITY	PHASE REGISTER	REAL	0.10 to 300.00 %	kM	
1569	ACCELERATION	PHASE REGISTER	REAL	0.01 to 3000.00 %	kN	
1570	REPEATS	PHASE REGISTER	INT	_	kO	Output
1571	STATUS	PHASE REGISTER	ENUM	0 to 1	kP	Output
1572	ERROR (COUNTS)	PHASE REGISTER	INT	_	kQ	Output
1573	ERROR	PHASE REGISTER	REAL	_.xxxx	kR	Output
1579	RESET	PHASE AUTO GEAR	BOOL	FALSE / TRUE	kX	
1580	ENABLE	PHASE AUTO GEAR	BOOL	FALSE / TRUE	kY	
1581	HOLD	PHASE AUTO GEAR	BOOL	FALSE / TRUE	kZ	
1582	NOM MASTER LEN	PHASE AUTO GEAR	REAL	0.0000 to 100.0000	lA	
1583	NOM SLAVE LENGTH	PHASE AUTO GEAR	REAL	0.0000 to 100.0000	lB	
1584	TOLERANCE	PHASE AUTO GEAR	REAL	0.0000 to 10.0000	lC	
1585	INITIAL REPEATS	PHASE AUTO GEAR	INT	0 to 1000	lD	
1586	INITIAL FILTER	PHASE AUTO GEAR	REAL	0.000 to 300.000	lE	
1587	FILTER	PHASE AUTO GEAR	REAL	0.000 to 300.000	lF	

TAG	MMI Name	Block	Type	Range	ID	Notes
1588	RESET COUNTERS	PHASE AUTO GEAR	BOOL	FALSE / TRUE	IG	
1589	SLAVE MARKS	PHASE AUTO GEAR	INT	_	IH	Output
1590	MASTER MARKS	PHASE AUTO GEAR	INT	_	II	Output
1591	MISSED S MARKS	PHASE AUTO GEAR	INT	_	IJ	Output
1592	MISSED M MARKS	PHASE AUTO GEAR	INT	_	IK	Output
1593	FALSE S MARKS	PHASE AUTO GEAR	INT	_	IL	Output
1594	FALSE M MARKS	PHASE AUTO GEAR	INT	_	IM	Output
1595	EXT MARK MASTER	PHASE AUTO GEAR	BOOL	FALSE / TRUE	IN	Output
1596	EXT MARK SLAVE	PHASE AUTO GEAR	BOOL	FALSE / TRUE	IO	Output
1597	GEAR CORRECTION	PHASE AUTO GEAR	REAL	_.xxxx	IP	Output
1598	MASTER LENGTH	PHASE AUTO GEAR	REAL	_.xxxx	IQ	Output
1599	SLAVE LENGTH	PHASE AUTO GEAR	REAL	_.xxxx	IR	Output
1602	READY	PHASE AUTO GEAR	BOOL	FALSE / TRUE	IU	Output

6053 Technology Box Dependent Parameters

The parameters shown below have special scaling rules applied when using 6053 Technology Box comms options.

TAG	MMI Name	Block	Decimal Point position used by Comms Interface
64	MOTOR CURRENT	MOTOR DATA	_.x
65	MAG CURRENT	MOTOR DATA	_.x
83	NAMEPLATE RPM	MOTOR DATA	_.
119	STATOR RES	MOTOR DATA	_.xx
121	MUTUAL INDUC	MOTOR DATA	_.x
568	SPEED FBK REV/S	FEEDBACKS	_.
569	SPEED FBK RPM	FEEDBACKS	_.
846	TENSION RAMP	TAPER CALC	_.xx
1158	POWER	MOTOR DATA	_.x
1163	ROTOR TIME CONST	MOTOR DATA	_.x
1190	SPEED INT PRESET	SPEED LOOP	_.x
1197	DIRECT RATIO	SPEED LOOP	_.xxx
1203	TOTL SPD DMD RPM	SPEED LOOP	_.
1483	GEARING A	PHASE CONTROL	_.
1484	GEARING B	PHASE CONTROL	_.
1519	LIMIT	PHASE PID	_.xx

Product-Related Default Values

All examples given in this book are based on a UK, 400V, 50Hz, 7.5kW drive.

* Frequency Dependent Defaults

These parameter values (marked with "*" in function block descriptions and macro diagrams) are dependent upon the drive's default motor base frequency. The following table lists the changes to the "** Power Dependent Defaults" tables below for those parameters whose settings are adjusted for operation at 60Hz.

Parameter	Function Block	Tag	60Hz Operation
BASE FREQUENCY	MOTOR DATA	1159	60Hz
MOTOR CONNECTION	MOTOR DATA	124	STAR
MOTOR VOLTAGE	MOTOR DATA	1160	*
NAMEPLATE RPM	MOTOR DATA	83	1750 RPM
MAX SPEED	SETPOINT SCALE	1032	1800 RPM
BASE FREQUENCY	FLUXING	106	60.0Hz
* 230V unit : 230V, 400V unit : 460V, 500V unit : 500V			

** Power Dependent Defaults

These parameters (marked with "**" in function block descriptions and macro diagrams) are set to a value depending on the overall "power-build" of the drive indicated by the Product Code.

FRAME B - 230V Build Power Dependent Defaults

			Single Phase			Three Phase			
Parameter	Function Block	Tag	0.75kW	1.5kW	2.2kW	0.75kW	1.5kW	2.2kW	4kW
AUTO BOOST	FLUXING	108	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BASE FREQUENCY	MOTOR DATA	1159	50.0	50.0	50.0	50.0	50.0	50.0	50.0
CONTROL MODE	MOTOR DATA	1157	VOLTS / HZ	VOLTS / HZ	VOLTS / HZ	VOLTS / HZ	VOLTS / HZ	VOLTS / HZ	VOLTS / HZ
DEFLUX DELAY	PATTERN GEN	100	2.0	2.0	2.0	2.0	2.0	2.0	2.0
ENCODER INVERT	FEEDBACKS	567	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
ENCODER LINES	FEEDBACKS	566	2048	2048	2048	2048	2048	2048	2048
ENCODER SUPPLY	FEEDBACKS	761	10.0	10.0	10.0	10.0	10.0	10.0	10.0
FIXED BOOST	FLUXING	107	0.00	0.00	0.00	0.00	0.00	0.00	0.00
INJ BASE VOLTS	INJ BRAKING	739	100.0	100.0	100.0	100.0	100.0	100.0	100.0
INJ DC LEVEL	INJ BRAKING	581	3.0	3.0	3.0	3.0	3.0	3.0	3.0
INJ DC PULSE	INJ BRAKING	579	2.0	2.0	2.0	2.0	2.0	2.0	2.0
INJ DEFLUX TIME	INJ BRAKING	710	0.5	0.5	0.5	0.5	0.5	0.5	0.5
INJ FINAL DC	INJ BRAKING	580	1.0	1.0	1.0	1.0	1.0	1.0	1.0
INJ FREQUENCY	INJ BRAKING	577	9.0	9.0	9.0	9.0	9.0	9.0	9.0
LEAKAGE INDUC	MOTOR DATA	120	62.32	33.76	24.80	62.32	33.76	24.80	24.80
MAG CURRENT	MOTOR DATA	65	1.36	2.50	3.41	1.36	2.50	3.41	5.84
MAX SPEED	SETPOINT SCALE	1032	1500	1500	1500	1500	1500	1500	1500
MOTOR CONNECTION	MOTOR DATA	124	STAR	STAR	STAR	STAR	STAR	STAR	STAR
MOTOR CURRENT	MOTOR DATA	64	3.39	6.26	8.52	3.39	6.26	8.52	14.61
MOTOR POLES	MOTOR DATA	84	4	4	4	4	4	4	4
MOTOR VOLTAGE	MOTOR DATA	1160	230.0	230.0	230.0	230.0	230.0	230.0	230.0
MOTOR VOLTS	VOLTAGE CONTROL	122	230.0	230.0	230.0	230.0	230.0	230.0	230.0

FRAME B - 230V Build Power Dependent Defaults									
			Single Phase			Three Phase			
Parameter	Function Block	Tag	0.75kW	1.5kW	2.2kW	0.75kW	1.5kW	2.2kW	4kW
MOTORING LIMIT	SLIP COMP	85	150.0	150.0	150.0	150.0	150.0	150.0	150.0
MUTUAL INDUC	MOTOR DATA	121	249.28	135.02	99.20	249.28	135.02	99.20	57.87
NAMEPLATE RPM	MOTOR DATA	83	1400	1420	1420	1400	1420	1420	1420
OVERLOAD	MOTOR DATA	1164	2.0	2.0	2.0	2.0	2.0	2.0	2.0
POWER	MOTOR DATA	1158	0.75	1.50	2.20	0.75	1.50	2.20	4.00
POWER FACTOR	MOTOR DATA	242	0.70	0.71	0.78	0.70	0.71	0.78	0.80
QUADRATIC TORQUE	FEEDBACKS	50	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
REFLUX TIME	FLYCATCHING	709	3.0	3.0	3.0	3.0	3.0	3.0	3.0
REGEN LIMIT	SLIP COMP	86	150.0	150.0	150.0	150.0	150.0	150.0	150.0
ROTOR TIME CONST	MOTOR DATA	1163	109.40	136.75	136.75	109.40	136.75	136.75	136.75
SEARCH BOOST	FLYCATCHING	32	40.0	40.0	40.0	40.0	40.0	40.0	40.0
SEARCH TIME	FLYCATCHING	574	5.0	5.0	5.0	5.0	5.0	5.0	5.0
SEARCH VOLTS	FLYCATCHING	573	9.0	9.0	9.0	9.0	9.0	9.0	9.0
SPEED INT TIME	SPEED LOOP	1188	100	100	100	100	100	100	100
SPEED PROP GAIN	SPEED LOOP	1187	20.00	20.00	20.00	20.00	20.00	20.00	20.00
STATOR RES	MOTOR DATA	119	2.9367	1.5907	1.1687	2.9367	1.5907	1.1687	0.6817
TRIP THRESHOLD	PWR LOSS CNTRL	1266	243	243	243	243	243	243	243
VHZ BASE FREQ	FLUXING	106	50.0	50.0	50.0	50.0	50.0	50.0	50.0

FRAME B – 400V Build Power Dependent Defaults						
			Three Phase			
Parameter	Function Block	Tag	0.75kW	1.5kW	2.2kW	4kW
AUTO BOOST	FLUXING	108	0.00	0.00	0.00	0.00
BASE FREQUENCY	MOTOR DATA	1159	50.0	50.0	50.0	50.0
CONTROL MODE	MOTOR DATA	1157	VOLTS / HZ	VOLTS / HZ	VOLTS / HZ	VOLTS / HZ
DEFLUX DELAY	PATTERN GEN	100	2.0	2.0	2.0	2.0
ENCODER INVERT	FEEDBACKS	567	FALSE	FALSE	FALSE	FALSE
ENCODER LINES	FEEDBACKS	566	2048	2048	2048	2048
ENCODER SUPPLY	FEEDBACKS	761	10.0	10.0	10.0	10.0
FIXED BOOST	FLUXING	107	0.00	0.00	0.00	0.00
INJ BASE VOLTS	INJ BRAKING	739	100.0	100.0	100.0	100.0
INJ DC LEVEL	INJ BRAKING	581	2.5	2.5	2.5	2.5
INJ DC PULSE	INJ BRAKING	579	2.0	2.0	2.0	2.0
INJ DEFLUX TIME	INJ BRAKING	710	0.5	0.5	0.5	0.5
INJ FINAL DC	INJ BRAKING	580	1.0	1.0	1.0	1.0
INJ FREQUENCY	INJ BRAKING	577	9.0	9.0	9.0	9.0
LEAKAGE INDUC	MOTOR DATA	120	188.49	102.10	75.01	43.76
MAG CURRENT	MOTOR DATA	65	0.78	1.44	1.96	3.36
MAX SPEED	SETPOINT SCALE	1032	1500	1500	1500	1500
MOTOR CONNECTION	MOTOR DATA	124	STAR	STAR	STAR	STAR
MOTOR CURRENT	MOTOR DATA	64	1.95	3.60	4.90	8.40
MOTOR POLES	MOTOR DATA	84	4	4	4	4
MOTOR VOLTAGE	MOTOR DATA	1160	400.0	400.0	400.0	400.0
MOTOR VOLTS	VOLTAGE CONTROL	122	400.0	400.0	400.0	400.0
MOTORING LIMIT	SLIP COMP	85	150.0	150.0	150.0	150.0
MUTUAL INDUC	MOTOR DATA	121	753.95	408.39	300.04	175.03
NAMEPLATE RPM	MOTOR DATA	83	1400	1420	1420	1420
OVERLOAD	MOTOR DATA	1164	2.0	2.0	2.0	2.0
POWER	MOTOR DATA	1158	0.75	1.50	2.20	4.00
POWER FACTOR	MOTOR DATA	242	0.70	0.71	0.78	0.80
QUADRATIC TORQUE	FEEDBACKS	50	FALSE	FALSE	FALSE	FALSE
REFLUX TIME	FLYCATCHING	709	3.0	3.0	3.0	3.0
REGEN LIMIT	SLIP COMP	86	150.0	150.0	150.0	150.0
ROTOR TIME CONST	MOTOR DATA	1163	109.40	136.75	136.75	136.75
SEARCH BOOST	FLYCATCHING	32	40.0	40.0	40.0	40.0
SEARCH TIME	FLYCATCHING	574	10.0	10.0	10.0	10.0
SEARCH VOLTS	FLYCATCHING	573	9.0	9.0	9.0	9.0
SPEED INT TIME	SPEED LOOP	1188	100	100	100	100
SPEED PROP GAIN	SPEED LOOP	1187	20.00	20.00	20.00	20.00
STATOR RES	MOTOR DATA	119	8.8823	4.8113	3.5348	2.0620
TRIP THRESHOLD	PWR LOSS CNTRL	1266	447	447	447	447
VHZ BASE FREQ	FLUXING	106	50.0	50.0	50.0	50.0

FRAME C – 400V Build Power Dependent Defaults								
			Constant Torque			Quadratic Torque		
Parameter	Function Block	Tag	5.5kW	7.5kW	11kW	7.5kW	11kW	15kW
AUTO BOOST	FLUXING	108	0.00	0.00	0.00	0.00	0.00	0.00
BASE FREQUENCY	MOTOR DATA	1159	50.0	50.0	50.0	50.0	50.0	50.0
CONTROL MODE	MOTOR DATA	1157	VOLTS / HZ	VOLTS / HZ	VOLTS / HZ	VOLTS / HZ	VOLTS / HZ	VOLTS / HZ
DEFLUX DELAY	PATTERN GEN	100	2.0	2.0	2.0	2.0	2.0	2.0
ENCODER INVERT	FEEDBACKS	567	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
ENCODER LINES	FEEDBACKS	566	2048	2048	2048	2048	2048	2048
ENCODER SUPPLY	FEEDBACKS	761	10.0	10.0	10.0	10.0	10.0	10.0
FIXED BOOST	FLUXING	107	0.00	0.00	0.00	0.00	0.00	0.00
INJ BASE VOLTS	INJ BRAKING	739	100.0	100.0	100.0	100.0	100.0	100.0
INJ DC LEVEL	INJ BRAKING	581	2.5	2.5	2.5	2.5	2.5	2.5
INJ DC PULSE	INJ BRAKING	579	2.0	2.0	2.0	2.0	2.0	2.0
INJ DEFLUX TIME	INJ BRAKING	710	0.5	0.5	0.5	0.5	0.5	0.5
INJ FINAL DC	INJ BRAKING	580	1.0	1.0	1.0	1.0	1.0	1.0
INJ FREQUENCY	INJ BRAKING	577	9.0	9.0	9.0	9.0	9.0	9.0
LEAKAGE INDUC	MOTOR DATA	120	43.37	33.57	24.50	43.37	33.57	24.50
MAG CURRENT	MOTOR DATA	65	3.39	4.38	6.00	3.39	4.38	6.00
MAX SPEED	SETPOINT SCALE	1032	1500	1500	1500	1500	1500	1500
MOTOR CONNECTION	MOTOR DATA	124	STAR	STAR	STAR	STAR	STAR	STAR
MOTOR CURRENT	MOTOR DATA	64	11.30	14.60	20.00	11.30	14.60	20.00
MOTOR POLES	MOTOR DATA	84	4	4	4	4	4	4
MOTOR VOLTAGE	MOTOR DATA	1160	400.0	400.0	400.0	400.0	400.0	400.0
MOTOR VOLTS	VOLTAGE CONTROL	122	400.0	400.0	400.0	400.0	400.0	400.0
MOTORING LIMIT	SLIP COMP	85	150.0	150.0	150.0	150.0	150.0	150.0
MUTUAL INDUC	MOTOR DATA	121	173.48	134.27	98.01	173.48	134.27	98.01
NAMEPLATE RPM	MOTOR DATA	83	1445	1450	1460	1445	1450	1460
OVERLOAD	MOTOR DATA	1164	2.0	2.0	2.0	2.0	2.0	2.0
POWER	MOTOR DATA	1158	5.50	7.50	11.00	5.50	7.50	11.00
POWER FACTOR	MOTOR DATA	242	0.80	0.83	0.86	0.80	0.83	0.86
QUADRATIC TORQUE	FEEDBACKS	50	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
REFLUX TIME	FLYCATCHING	709	3.0	3.0	3.0	3.0	3.0	3.0
REGEN LIMIT	SLIP COMP	86	150.0	150.0	150.0	150.0	150.0	150.0
ROTOR TIME CONST	MOTOR DATA	1163	276.04	303.65	379.56	276.04	303.65	379.56
SEARCH BOOST	FLYCATCHING	32	40.0	40.0	40.0	40.0	40.0	40.0
SEARCH TIME	FLYCATCHING	574	10.0	10.0	10.0	10.0	10.0	10.0
SEARCH VOLTS	FLYCATCHING	573	9.0	9.0	9.0	9.0	9.0	9.0
SPEED INT TIME	SPEED LOOP	1188	100	100	100	100	100	100
SPEED PROP GAIN	SPEED LOOP	1187	20.00	20.00	20.00	20.00	20.00	20.00
STATOR RES	MOTOR DATA	119	1.3625	1.0545	0.7698	1.3625	1.0545	0.7698
TRIP THRESHOLD	PWR LOSS CNTRL	1266	447	447	447	447	447	447
VHZ BASE FREQ	FLUXING	106	50.0	50.0	50.0	50.0	50.0	50.0

FRAME C – 500V Build Power Dependent Defaults								
			Constant Torque			Quadratic Torque		
Parameter	Function Block	Tag	5.5kW	7.5kW	11kW	7.5kW	11kW	15kW
AUTO BOOST	FLUXING	108	0.00	0.00	0.00	0.00	0.00	0.00
BASE FREQUENCY	MOTOR DATA	1159	50.0	50.0	50.0	50.0	50.0	50.0
CONTROL MODE	MOTOR DATA	1157	VOLTS / HZ	VOLTS / HZ	VOLTS / HZ	VOLTS / HZ	VOLTS / HZ	VOLTS / HZ
DEFLUX DELAY	PATTERN GEN	100	2.0	2.0	2.0	2.0	2.0	2.0
ENCODER INVERT	FEEDBACKS	567	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
ENCODER LINES	FEEDBACKS	566	2048	2048	2048	2048	2048	2048
ENCODER SUPPLY	FEEDBACKS	761	10.0	10.0	10.0	10.0	10.0	10.0
FIXED BOOST	FLUXING	107	0.00	0.00	0.00	0.00	0.00	0.00
INJ BASE VOLTS	INJ BRAKING	739	100.0	100.0	100.0	100.0	100.0	100.0
INJ DC LEVEL	INJ BRAKING	581	2.5	2.5	2.5	2.5	2.5	2.5
INJ DC PULSE	INJ BRAKING	579	2.0	2.0	2.0	2.0	2.0	2.0
INJ DEFLUX TIME	INJ BRAKING	710	0.5	0.5	0.5	0.5	0.5	0.5
INJ FINAL DC	INJ BRAKING	580	1.0	1.0	1.0	1.0	1.0	1.0
INJ FREQUENCY	INJ BRAKING	577	9.0	9.0	9.0	9.0	9.0	9.0
LEAKAGE INDUC	MOTOR DATA	120	67.76	52.45	38.29	67.76	52.45	38.29
MAG CURRENT	MOTOR DATA	65	2.71	3.50	4.80	2.71	3.50	4.80
MAX SPEED	SETPOINT SCALE	1032	1500	1500	1500	1500	1500	1500
MOTOR CONNECTION	MOTOR DATA	124	STAR	STAR	STAR	STAR	STAR	STAR
MOTOR CURRENT	MOTOR DATA	64	9.04	11.68	16.00	9.04	11.68	16.00
MOTOR POLES	MOTOR DATA	84	4	4	4	4	4	4
MOTOR VOLTAGE	MOTOR DATA	1160	500.0	500.0	500.0	500.0	500.0	500.0
MOTOR VOLTS	VOLTAGE CONTROL	122	500.0	500.0	500.0	500.0	500.0	500.0
MOTORING LIMIT	SLIP COMP	85	150.0	150.0	150.0	150.0	150.0	150.0
MUTUAL INDUC	MOTOR DATA	121	271.06	209.76	153.15	271.06	209.76	153.15
NAMEPLATE RPM	MOTOR DATA	83	1445	1450	1460	1445	1450	1460
OVERLOAD	MOTOR DATA	1164	2.0	2.0	2.0	2.0	2.0	2.0
POWER	MOTOR DATA	1158	5.50	7.50	11.00	5.50	7.50	11.00
POWER FACTOR	MOTOR DATA	242	0.80	0.83	0.86	0.80	0.83	0.86
QUADRATIC TORQUE	FEEDBACKS	50	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
REFLUX TIME	FLYCATCHING	709	3.0	3.0	3.0	3.0	3.0	3.0
REGEN LIMIT	SLIP COMP	86	150.0	150.0	150.0	150.0	150.0	150.0
ROTOR TIME CONST	MOTOR DATA	1163	276.04	303.65	379.56	276.04	303.65	379.56
SEARCH BOOST	FLYCATCHING	32	40.0	40.0	40.0	40.0	40.0	40.0
SEARCH TIME	FLYCATCHING	574	10.0	10.0	10.0	10.0	10.0	10.0
SEARCH VOLTS	FLYCATCHING	573	9.0	9.0	9.0	9.0	9.0	9.0
SPEED INT TIME	SPEED LOOP	1188	100	100	100	100	100	100
SPEED PROP GAIN	SPEED LOOP	1187	20.00	20.00	20.00	20.00	20.00	20.00
STATOR RES	MOTOR DATA	119	2.1289	1.6477	1.2028	2.1289	1.6477	1.2028
TRIP THRESHOLD	PWR LOSS CNTRL	1266	447	447	447	447	447	447
VHZ BASE FREQ	FLUXING	106	50.0	50.0	50.0	50.0	50.0	50.0

FRAME D - 400V Build Power Dependent Defaults								
			Constant Torque			Quadratic Torque		
Parameter	Function Block	Tag	15kW	18.5kW	22kW	18.5kW	22kW	30kW
AUTO BOOST	FLUXING	108	0.00	0.00	0.00	0.00	0.00	0.00
BASE FREQUENCY	MOTOR DATA	1159	50.0	50.0	50.0	50.0	50.0	50.0
CONTROL MODE	MOTOR DATA	1157	VOLTS / HZ	VOLTS / HZ	VOLTS / HZ	VOLTS / HZ	VOLTS / HZ	VOLTS / HZ
DEFLUX DELAY	PATTERN GEN	100	3.0	3.0	3.0	3.0	3.0	3.0
ENCODER INVERT	FEEDBACKS	567	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
ENCODER LINES	FEEDBACKS	566	2048	2048	2048	2048	2048	2048
ENCODER SUPPLY	FEEDBACKS	761	10.0	10.0	10.0	10.0	10.0	10.0
FIXED BOOST	FLUXING	107	0.00	0.00	0.00	0.00	0.00	0.00
INJ BASE VOLTS	INJ BRAKING	739	100.0	100.0	100.0	100.0	100.0	100.0
INJ DC LEVEL	INJ BRAKING	581	1.75	1.75	1.75	1.75	1.75	1.75
INJ DC PULSE	INJ BRAKING	579	2.0	2.0	2.0	2.0	2.0	2.0
INJ DEFLUX TIME	INJ BRAKING	710	1.0	1.0	1.0	1.0	1.0	1.0
INJ FINAL DC	INJ BRAKING	580	3.0	3.0	3.0	3.0	3.0	3.0
INJ FREQUENCY	INJ BRAKING	577	9.0	9.0	9.0	9.0	9.0	9.0
LEAKAGE INDUC	MOTOR DATA	120	18.15	14.85	12.90	18.15	14.85	12.90
MAG CURRENT	MOTOR DATA	65	8.10	9.90	11.40	8.10	9.90	11.40
MAX SPEED	SETPOINT SCALE	1032	1500	1500	1500	1500	1500	1500
MOTOR CONNECTION	MOTOR DATA	124	STAR	STAR	STAR	STAR	STAR	STAR
MOTOR CURRENT	MOTOR DATA	64	27.00	33.00	38.00	27.00	33.00	38.00
MOTOR POLES	MOTOR DATA	84	4	4	4	4	4	4
MOTOR VOLTAGE	MOTOR DATA	1160	400.0	400.0	400.0	400.0	400.0	400.0
MOTOR VOLTS	VOLTAGE CONTROL	122	400.0	400.0	400.0	400.0	400.0	400.0
MOTORING LIMIT	SLIP COMP	85	150.0	150.0	150.0	150.0	150.0	150.0
MUTUAL INDUC	MOTOR DATA	121	72.60	59.40	51.59	72.60	59.40	51.59
NAMEPLATE RPM	MOTOR DATA	83	1470	1460	1460	1470	1460	1460
OVERLOAD	MOTOR DATA	1164	2.0	2.0	2.0	2.0	2.0	2.0
POWER	MOTOR DATA	1158	15.00	18.50	22.00	15.00	18.50	22.00
POWER FACTOR	MOTOR DATA	242	0.87	0.88	0.88	0.87	0.88	0.88
QUADRATIC TORQUE	FEEDBACKS	50	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
REFLUX TIME	FLYCATCHING	709	4.0	4.0	4.0	4.0	4.0	4.0
REGEN LIMIT	SLIP COMP	86	150.0	150.0	150.0	150.0	150.0	150.0
ROTOR TIME CONST	MOTOR DATA	1163	506.08	379.56	379.56	506.08	379.56	379.56
SEARCH BOOST	FLYCATCHING	32	15.0	15.0	15.0	15.0	15.0	15.0
SEARCH TIME	FLYCATCHING	574	15.0	15.0	15.0	15.0	15.0	15.0
SEARCH VOLTS	FLYCATCHING	573	9.0	9.0	9.0	9.0	9.0	9.0
SPEED INT TIME	SPEED LOOP	1188	100	100	100	100	100	100
SPEED PROP GAIN	SPEED LOOP	1187	20.00	20.00	20.00	20.00	20.00	20.00
STATOR RES	MOTOR DATA	119	0.5702	0.4665	0.4052	0.5702	0.4665	0.4052
TRIP THRESHOLD	PWR LOSS CNTRL	1266	447	447	447	447	447	447
VHZ BASE FREQ	FLUXING	106	50.0	50.0	50.0	50.0	50.0	50.0

FRAME D - 500V Build Power Dependent Defaults								
			Constant Torque			Quadratic Torque		
Parameter	Function Block	Tag	15kW	18.5kW	22kW	18.5kW	22kW	30kW
AUTO BOOST	FLUXING	108	0.00	0.00	0.00	0.00	0.00	0.00
BASE FREQUENCY	MOTOR DATA	1159	50.0	50.0	50.0	50.0	50.0	50.0
CONTROL MODE	MOTOR DATA	1157	VOLTS / HZ	VOLTS / HZ	VOLTS / HZ	VOLTS / HZ	VOLTS / HZ	VOLTS / HZ
DEFLUX DELAY	PATTERN GEN	100	3.0	3.0	3.0	3.0	3.0	3.0
ENCODER INVERT	FEEDBACKS	567	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
ENCODER LINES	FEEDBACKS	566	2048	2048	2048	2048	2048	2048
ENCODER SUPPLY	FEEDBACKS	761	10.0	10.0	10.0	10.0	10.0	10.0
FIXED BOOST	FLUXING	107	0.00	0.00	0.00	0.00	0.00	0.00
INJ BASE VOLTS	INJ BRAKING	739	100.0	100.0	100.0	100.0	100.0	100.0
INJ DC LEVEL	INJ BRAKING	581	1.75	1.75	1.75	1.75	1.75	1.75
INJ DC PULSE	INJ BRAKING	579	2.0	2.0	2.0	2.0	2.0	2.0
INJ DEFLUX TIME	INJ BRAKING	710	1.0	1.0	1.0	1.0	1.0	1.0
INJ FINAL DC	INJ BRAKING	580	3.0	3.0	3.0	3.0	3.0	3.0
INJ FREQUENCY	INJ BRAKING	577	9.0	9.0	9.0	9.0	9.0	9.0
LEAKAGE INDUC	MOTOR DATA	120	28.36	23.20	20.15	28.36	23.20	20.15
MAG CURRENT	MOTOR DATA	65	6.48	7.92	9.12	6.48	7.92	9.12
MAX SPEED	SETPOINT SCALE	1032	1500	1500	1500	1500	1500	1500
MOTOR CONNECTION	MOTOR DATA	124	STAR	STAR	STAR	STAR	STAR	STAR
MOTOR CURRENT	MOTOR DATA	64	21.60	26.40	30.40	21.60	26.40	30.40
MOTOR POLES	MOTOR DATA	84	4	4	4	4	4	4
MOTOR VOLTAGE	MOTOR DATA	1160	500.0	500.0	500.0	500.0	500.0	500.0
MOTOR VOLTS	VOLTAGE CONTROL	122	500.0	500.0	500.0	500.0	500.0	500.0
MOTORING LIMIT	SLIP COMP	85	150.0	150.0	150.0	150.0	150.0	150.0
MUTUAL INDUC	MOTOR DATA	121	113.44	92.82	80.60	113.44	92.82	80.60
NAMEPLATE RPM	MOTOR DATA	83	1470	1460	1460	1470	1460	1460
OVERLOAD	MOTOR DATA	1164	2.0	2.0	2.0	2.0	2.0	2.0
POWER	MOTOR DATA	1158	15.00	18.50	22.00	15.00	18.50	22.00
POWER FACTOR	MOTOR DATA	242	0.87	0.88	0.88	0.87	0.88	0.88
QUADRATIC TORQUE	FEEDBACKS	50	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
REFLUX TIME	FLYCATCHING	709	4.0	4.0	4.0	4.0	4.0	4.0
REGEN LIMIT	SLIP COMP	86	150.0	150.0	150.0	150.0	150.0	150.0
ROTOR TIME CONST	MOTOR DATA	1163	506.08	379.56	379.56	506.08	379.56	379.56
SEARCH BOOST	FLYCATCHING	32	15.0	15.0	15.0	15.0	15.0	15.0
SEARCH TIME	FLYCATCHING	574	15.0	15.0	15.0	15.0	15.0	15.0
SEARCH VOLTS	FLYCATCHING	573	9.0	9.0	9.0	9.0	9.0	9.0
SPEED INT TIME	SPEED LOOP	1188	100	100	100	100	100	100
SPEED PROP GAIN	SPEED LOOP	1187	20.00	20.00	20.00	20.00	20.00	20.00
STATOR RES	MOTOR DATA	119	0.8910	0.7290	0.6331	0.8910	0.7290	0.6331
TRIP THRESHOLD	PWR LOSS CNTRL	1266	447	447	447	447	447	447
VHZ BASE FREQ	FLUXING	106	50.0	50.0	50.0	50.0	50.0	50.0

FRAME E - 400V Build Power Dependent Defaults								
			Constant Torque			Quadratic Torque		
Parameter	Function Block	Tag	30kW	37kW	45kW	37kW	45kW	55kW
AUTO BOOST	FLUXING	108	0.00	0.00	0.00	0.00	0.00	0.00
BASE FREQUENCY	MOTOR DATA	1159	50.0	50.0	50.0	50.0	50.0	50.0
CONTROL MODE	MOTOR DATA	1157	VOLTS / HZ	VOLTS / HZ	VOLTS / HZ	VOLTS / HZ	VOLTS / HZ	VOLTS / HZ
DEFLUX DELAY	PATTERN GEN	100	4.0	4.0	4.0	4.0	4.0	4.0
ENCODER INVERT	FEEDBACKS	567	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
ENCODER LINES	FEEDBACKS	566	2048	2048	2048	2048	2048	2048
ENCODER SUPPLY	FEEDBACKS	761	10.0	10.0	10.0	10.0	10.0	10.0
FIXED BOOST	FLUXING	107	0.00	0.00	0.00	0.00	0.00	0.00
INJ BASE VOLTS	INJ BRAKING	739	75.0	75.0	75.0	75.0	75.0	75.0
INJ DC LEVEL	INJ BRAKING	581	1.25	1.25	1.25	1.25	1.25	1.25
INJ DC PULSE	INJ BRAKING	579	2.0	2.0	2.0	2.0	2.0	2.0
INJ DEFLUX TIME	INJ BRAKING	710	1.0	1.0	1.0	1.0	1.0	1.0
INJ FINAL DC	INJ BRAKING	580	3.0	3.0	3.0	3.0	3.0	3.0
INJ FREQUENCY	INJ BRAKING	577	6.0	6.0	6.0	6.0	6.0	6.0
LEAKAGE INDUC	MOTOR DATA	120	9.08	7.43	6.20	9.08	7.43	6.20
MAG CURRENT	MOTOR DATA	65	16.20	19.80	23.70	16.20	19.80	23.70
MAX SPEED	SETPOINT SCALE	1032	1500	1500	1500	1500	1500	1500
MOTOR CONNECTION	MOTOR DATA	124	STAR	STAR	STAR	STAR	STAR	STAR
MOTOR CURRENT	MOTOR DATA	64	54.00	66.00	79.00	54.00	66.00	79.00
MOTOR POLES	MOTOR DATA	84	4	4	4	4	4	4
MOTOR VOLTAGE	MOTOR DATA	1160	400.0	400.0	400.0	400.0	400.0	400.0
MOTOR VOLTS	VOLTAGE CONTROL	122	400.0	400.0	400.0	400.0	400.0	400.0
MOTORING LIMIT	SLIP COMP	85	150.0	150.0	150.0	150.0	150.0	150.0
MUTUAL INDUC	MOTOR DATA	121	36.30	29.70	24.81	36.30	29.70	24.81
NAMEPLATE RPM	MOTOR DATA	83	1470	1470	1470	1470	1470	1470
OVERLOAD	MOTOR DATA	1164	2.0	2.0	2.0	2.0	2.0	2.0
POWER	MOTOR DATA	1158	30.00	37.00	45.00	30.00	37.00	45.00
POWER FACTOR	MOTOR DATA	242	0.86	0.85	0.87	0.86	0.85	0.87
QUADRATIC TORQUE	FEEDBACKS	50	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
REFLUX TIME	FLYCATCHING	709	5.0	5.0	5.0	5.0	5.0	5.0
REGEN LIMIT	SLIP COMP	86	150.0	150.0	150.0	150.0	150.0	150.0
ROTOR TIME CONST	MOTOR DATA	1163	506.08	506.08	506.08	506.08	506.08	506.08
SEARCH BOOST	FLYCATCHING	32	15.0	15.0	15.0	15.0	15.0	15.0
SEARCH TIME	FLYCATCHING	574	15.0	15.0	15.0	15.0	15.0	15.0
SEARCH VOLTS	FLYCATCHING	573	8.0	8.0	8.0	8.0	8.0	8.0
SPEED INT TIME	SPEED LOOP	1188	100	100	100	100	100	100
SPEED PROP GAIN	SPEED LOOP	1187	20.00	20.00	20.00	20.00	20.00	20.00
STATOR RES	MOTOR DATA	119	0.2851	0.2333	0.1949	0.2851	0.2333	0.1949
TRIP THRESHOLD	PWR LOSS CNTRL	1266	447	447	447	447	447	447
VHZ BASE FREQ	FLUXING	106	50.0	50.0	50.0	50.0	50.0	50.0

FRAME E – 500V Build Power Dependent Defaults								
			Constant Torque			Quadratic Torque		
Parameter	Function Block	Tag	30kW	37kW	45kW	37kW	45kW	55kW
AUTO BOOST	FLUXING	108	0.00	0.00	0.00	0.00	0.00	0.00
BASE FREQUENCY	MOTOR DATA	1159	50.0	50.0	50.0	50.0	50.0	50.0
CONTROL MODE	MOTOR DATA	1157	VOLTS / HZ	VOLTS / HZ	VOLTS / HZ	VOLTS / HZ	VOLTS / HZ	VOLTS / HZ
DEFLUX DELAY	PATTERN GEN	100	4.0	4.0	4.0	4.0	4.0	4.0
ENCODER INVERT	FEEDBACKS	567	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
ENCODER LINES	FEEDBACKS	566	2048	2048	2048	2048	2048	2048
ENCODER SUPPLY	FEEDBACKS	761	10.0	10.0	10.0	10.0	10.0	10.0
FIXED BOOST	FLUXING	107	0.00	0.00	0.00	0.00	0.00	0.00
INJ BASE VOLTS	INJ BRAKING	739	75.0	75.0	75.0	75.0	75.0	75.0
INJ DC LEVEL	INJ BRAKING	581	1.25	1.25	1.25	1.25	1.25	1.25
INJ DC PULSE	INJ BRAKING	579	2.0	2.0	2.0	2.0	2.0	2.0
INJ DEFLUX TIME	INJ BRAKING	710	1.0	1.0	1.0	1.0	1.0	1.0
INJ FINAL DC	INJ BRAKING	580	3.0	3.0	3.0	3.0	3.0	3.0
INJ FREQUENCY	INJ BRAKING	577	6.0	6.0	6.0	6.0	6.0	6.0
LEAKAGE INDUC	MOTOR DATA	120	14.18	11.60	9.69	14.18	11.60	9.69
MAG CURRENT	MOTOR DATA	65	12.96	15.84	18.96	12.96	15.84	18.96
MAX SPEED	SETPOINT SCALE	1032	1500	1500	1500	1500	1500	1500
MOTOR CONNECTION	MOTOR DATA	124	STAR	STAR	STAR	STAR	STAR	STAR
MOTOR CURRENT	MOTOR DATA	64	43.20	52.80	63.20	43.20	52.80	63.20
MOTOR POLES	MOTOR DATA	84	4	4	4	4	4	4
MOTOR VOLTAGE	MOTOR DATA	1160	500.0	500.0	500.0	500.0	500.0	500.0
MOTOR VOLTS	VOLTAGE CONTROL	122	500.0	500.0	500.0	500.0	500.0	500.0
MOTORING LIMIT	SLIP COMP	85	150.0	150.0	150.0	150.0	150.0	150.0
MUTUAL INDUC	MOTOR DATA	121	56.72	46.41	38.77	56.72	46.41	38.77
NAMEPLATE RPM	MOTOR DATA	83	1470	1470	1470	1470	1470	1470
OVERLOAD	MOTOR DATA	1164	2.0	2.0	2.0	2.0	2.0	2.0
POWER	MOTOR DATA	1158	30.00	37.00	45.00	30.00	37.00	45.00
POWER FACTOR	MOTOR DATA	242	0.86	0.85	0.87	0.86	0.85	0.87
QUADRATIC TORQUE	FEEDBACKS	50	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
REFLUX TIME	FLYCATCHING	709	5.0	5.0	5.0	5.0	5.0	5.0
REGEN LIMIT	SLIP COMP	86	150.0	150.0	150.0	150.0	150.0	150.0
ROTOR TIME CONST	MOTOR DATA	1163	506.08	506.08	506.08	506.08	506.08	506.08
SEARCH BOOST	FLYCATCHING	32	15.0	15.0	15.0	15.0	15.0	15.0
SEARCH TIME	FLYCATCHING	574	15.0	15.0	15.0	15.0	15.0	15.0
SEARCH VOLTS	FLYCATCHING	573	8.0	8.0	8.0	8.0	8.0	8.0
SPEED INT TIME	SPEED LOOP	1188	100	100	100	100	100	100
SPEED PROP GAIN	SPEED LOOP	1187	20.00	20.00	20.00	20.00	20.00	20.00
STATOR RES	MOTOR DATA	119	0.4455	0.3645	0.3045	0.4455	0.3645	0.3045
TRIP THRESHOLD	PWR LOSS CNTRL	1266	447	447	447	447	447	447
VHZ BASE FREQ	FLUXING	106	50.0	50.0	50.0	50.0	50.0	50.0

FRAME F - 400V Build Power Dependent Defaults								
			Constant Torque			Quadratic Torque		
Parameter	Function Block	Tag	55kW	75kw	90kw	75kW	90kW	110kW
AUTO BOOST	FLUXING	108	0.00	0.00	0.00	0.00	0.00	0.00
BASE FREQUENCY	MOTOR DATA	1159	50.0	50.0	50.0	50.0	50.0	50.0
CONTROL MODE	MOTOR DATA	1157	VOLTS / HZ	VOLTS / HZ	VOLTS / HZ	VOLTS / HZ	VOLTS / HZ	VOLTS / HZ
DEFLUX DELAY	PATTERN GEN	100	4.0	4.0	4.0	4.0	4.0	4.0
ENCODER INVERT	FEEDBACKS	567	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
ENCODER LINES	FEEDBACKS	566	2048	2048	2048	2048	2048	2048
ENCODER SUPPLY	FEEDBACKS	761	10.0	10.0	10.0	10.0	10.0	10.0
FIXED BOOST	FLUXING	107	0.00	0.00	0.00	0.00	0.00	0.00
INJ BASE VOLTS	INJ BRAKING	739	75.00	75.00	75.00	75.00	75.00	75.00
INJ DC LEVEL	INJ BRAKING	581	1.25	1.25	1.25	1.25	1.25	1.25
INJ DC PULSE	INJ BRAKING	579	2.0	2.0	2.0	2.0	2.0	2.0
INJ DEFLUX TIME	INJ BRAKING	710	2.0	2.0	2.0	2.0	2.0	2.0
INJ FINAL DC	INJ BRAKING	580	3.0	3.0	3.0	3.0	3.0	3.0
INJ FREQUENCY	INJ BRAKING	577	6.0	6.0	6.0	6.0	6.0	6.0
LEAKAGE INDUC	MOTOR DATA	120	5.05	3.71	3.25	5.05	3.71	3.25
MAG CURRENT	MOTOR DATA	65	29.10	39.60	45.30	29.10	39.60	45.30
MAX SPEED	SETPOINT SCALE	1032	1500	1500	1500	1500	1500	1500
MOTOR CONNECTION	MOTOR DATA	124	STAR	STAR	STAR	STAR	STAR	STAR
MOTOR CURRENT	MOTOR DATA	64	97.00	132.00	151.00	97.00	132.00	151.00
MOTOR POLES	MOTOR DATA	84	4	4	4	4	4	4
MOTOR VOLTAGE	MOTOR DATA	1160	400.0	400.0	400.0	400.0	400.0	400.0
MOTOR VOLTS	VOLTAGE CONTROL	122	400.0	400.0	400.0	400.0	400.0	400.0
MOTORING LIMIT	SLIP COMP	85	150.0	150.0	150.0	150.0	150.0	150.0
MUTUAL INDUC	MOTOR DATA	121	20.21	14.85	12.98	20.12	14.85	12.98
NAMEPLATE RPM	MOTOR DATA	83	1475.0	1475.0	1480.0	1475.0	1475.0	1480.0
OVERLOAD	MOTOR DATA	1164	2.2	2.2	2.2	2.2	2.2	2.2
POWER	MOTOR DATA	1158	55.00	75.00	90.00	55.00	75.00	90.00
POWER FACTOR	MOTOR DATA	242	0.86	0.87	0.90	0.86	0.87	0.90
QUADRATIC TORQUE	FEEDBACKS	50	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
REFLUX TIME	FLYCATCHING	709	6.0	6.0	6.0	6.0	6.0	6.0
REGEN LIMIT	SLIP COMP	86	150.0	150.0	150.0	150.0	150.0	150.0
ROTOR TIME CONST	MOTOR DATA	1163	607.30	607.30	759.12	607.30	607.30	759.12
SEARCH BOOST	FLYCATCHING	32	15.00	15.00	15.00	15.00	15.00	15.00
SEARCH TIME	FLYCATCHING	574	15.0	15.0	15.0	15.0	15.0	15.0
SEARCH VOLTS	FLYCATCHING	573	8.00	8.00	8.00	8.00	8.00	8.00
SPEED INT TIME	SPEED LOOP	1188	100	100	100	100	100	100
SPEED PROP GAIN	SPEED LOOP	1187	20.00	20.00	20.00	20.00	20.00	20.00
STATOR RES	MOTOR DATA	119	0.1587	0.1166	0.1020	0.1587	0.1166	0.1020
TRIP THRESHOLD	PWR LOSS CNTRL	1266	447.0	447.0	447.0	447.0	447.0	447.0
VHZ BASE FREQ	FLUXING	106	50.0	50.0	50.0	50.0	50.0	50.0

FRAME F – 500V Build Power Dependent Defaults								
			Constant Torque			Quadratic Torque		
Parameter	Function Block	Tag	55kW	75kW	90kW	75kW	90kW	110kW
AUTO BOOST	FLUXING	108	0.00	0.00	0.00	0.00	0.00	0.00
BASE FREQUENCY	MOTOR DATA	1159	50.0	50.0	50.0	50.0	50.0	50.0
CONTROL MODE	MOTOR DATA	1157	VOLTS / HZ	VOLTS / HZ	VOLTS / HZ	VOLTS / HZ	VOLTS / HZ	VOLTS / HZ
DEFLUX DELAY	PATTERN GEN	100	4.0	4.0	4.0	4.0	4.0	4.0
ENCODER INVERT	FEEDBACKS	567	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
ENCODER LINES	FEEDBACKS	566	2048	2048	2048	2048	2048	2048
ENCODER SUPPLY	FEEDBACKS	761	10.0	10.0	10.0	10.0	10.0	10.0
FIXED BOOST	FLUXING	107	0.00	0.00	0.00	0.00	0.00	0.00
INJ BASE VOLTS	INJ BRAKING	739	75.00	75.00	75.00	75.00	75.00	75.00
INJ DC LEVEL	INJ BRAKING	581	1.25	1.25	1.25	1.25	1.25	1.25
INJ DC PULSE	INJ BRAKING	579	2.0	2.0	2.0	2.0	2.0	2.0
INJ DEFLUX TIME	INJ BRAKING	710	2.0	2.0	2.0	2.0	2.0	2.0
INJ FINAL DC	INJ BRAKING	580	3.0	3.0	3.0	3.0	3.0	3.0
INJ FREQUENCY	INJ BRAKING	577	6.0	6.0	6.0	6.0	6.0	6.0
LEAKAGE INDUC	MOTOR DATA	120	7.89	5.80	5.07	7.89	5.80	5.07
MAG CURRENT	MOTOR DATA	65	23.28	31.68	36.24	23.28	31.68	36.24
MAX SPEED	SETPOINT SCALE	1032	1500	1500	1500	1500	1500	1500
MOTOR CONNECTION	MOTOR DATA	124	STAR	STAR	STAR	STAR	STAR	STAR
MOTOR CURRENT	MOTOR DATA	64	77.60	105.60	120.80	77.60	105.60	120.80
MOTOR POLES	MOTOR DATA	84	4	4	4	4	4	4
MOTOR VOLTAGE	MOTOR DATA	1160	500.0	500.0	500.0	500.0	500.0	500.0
MOTOR VOLTS	VOLTAGE CONTROL	122	500.0	500.0	500.0	500.0	500.0	500.0
MOTORING LIMIT	SLIP COMP	85	150.0	150.0	150.0	150.0	150.0	150.0
MUTUAL INDUC	MOTOR DATA	121	31.58	23.20	20.28	31.58	23.20	20.28
NAMEPLATE RPM	MOTOR DATA	83	1475.0	1475.0	1480.0	1475.0	1475.0	1480.0
OVERLOAD	MOTOR DATA	1164	2.2	2.2	2.2	2.2	2.2	2.2
POWER	MOTOR DATA	1158	55.00	75.00	90.00	55.00	75.00	90.00
POWER FACTOR	MOTOR DATA	242	0.86	0.87	0.90	0.86	0.87	0.90
QUADRATIC TORQUE	FEEDBACKS	50	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
REFLUX TIME	FLYCATCHING	709	6.0	6.0	6.0	6.0	6.0	6.0
REGEN LIMIT	SLIP COMP	86	150.0	150.0	150.0	150.0	150.0	150.0
ROTOR TIME CONST	MOTOR DATA	1163	607.30	607.30	759.12	607.30	607.30	759.12
SEARCH BOOST	FLYCATCHING	32	15.00	15.00	15.00	15.00	15.00	15.00
SEARCH TIME	FLYCATCHING	574	15.0	15.0	15.0	15.0	15.0	15.0
SEARCH VOLTS	FLYCATCHING	573	8.00	8.00	8.00	8.00	8.00	8.00
SPEED INT TIME	SPEED LOOP	1188	100	100	100	100	100	100
SPEED PROP GAIN	SPEED LOOP	1187	20.00	20.00	20.00	20.00	20.00	20.00
STATOR RES	MOTOR DATA	119	0.2480	0.1822	0.1593	0.2480	0.1822	0.1593
TRIP THRESHOLD	PWR LOSS CNTRL	1266	447.0	447.0	447.0	447.0	447.0	447.0
VHZ BASE FREQ	FLUXING	106	50.0	50.0	50.0	50.0	50.0	50.0

SERIAL COMMUNICATIONS

Communications Technology Option

The plug-in COMMS Technology Option provides a serial data port, allowing drives to be linked to form a network. Using a PLC/SCADA or other intelligent device, this network can be continuously controlled to provide supervision and monitoring for each drive in the system.

Refer to the Communications Interface Technical Manual for further details.

ConfigEd Lite

This is Eurotherm Drives' Windows-based block programming software. It has a graphical user-interface and drawing tools to allow you to create block programming diagrams quickly and easily. Contact your local Eurotherm Drives sales office.

Connection to the P3 Port

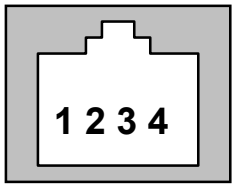
The port is an un-isolated RS232, 19200 Baud, supporting the standard EI bisynch ASCII communications protocol. Contact Eurotherm Drives for further information.

- **Frame B** : The P3 port is on the front of the unit and is used by the keypad.
- **Frame C, D & E** : There are two ports - one is used by the keypad, and the second is under the terminal cover to the right of the Control Terminals.

Using any P3 port on the drive, parameters can be monitored and updated by a suitable PC programming tool, i.e. ConfigEd Lite.

P3 Port

A standard P3 lead is used to connect to the drive.



P3 Port Pin	Lead	Signal
1	Black	0V
2	Red	5V
3	Green	TX
4	Yellow	RX

6-Way Lead to DB9/DB25 Connector

Note: *There is 5V present on pin 2 of the P3 port - do not connect this to your PC.*

P3 Port Pin	Lead	Female DB9 Pin	Female DB25 Pin
1	Black	5	7
2	Red	not connected	not connected
3	Green	2	3
4	Yellow	3	2

3-2 Serial Communications

SEQUENCING LOGIC STATES

Principle State Machine

The drive's reaction to commands is defined by a state machine. This determines which commands provide the demanded action, and in which sequence.

Main Sequencing States

The main sequencing state of the unit is indicated by an enumerated value given by the parameter SEQUENCER STATE under SEQUENCING LOGIC menu at level 3.

Enumerated Value	Main Seq State	Standard Name	Description
0	START DISABLED	Switch On Disabled	The drive will not accept a switch on command
1	START ENABLED	Ready To Switch On	The drive will accept a switch on command
2	SWITCHED ON	Switched On	The drive's stack is enabled
3	READY	Ready	Waiting for Contactor to be closed
4	ENABLED	Enabled	The drive is enabled and operational
5	F-STOP ACTIVE	Fast-Stop Active	Fast stop is active
6	TRIP ACTIVE	Trip Active	The drive is processing a trip event
7	TRIPPED	Tripped	The drive is tripped awaiting trip reset

Table 4-1 Enumerated Values for the SEQUENCING LOGIC Function Block

State Outputs of the SEQUENCING LOGIC Function Block

The following table shows the states of individual parameters for the SEQUENCING LOGIC function block required to produce the condition of the MAIN SEQ STATE parameter.

	START DISABLED	START ENABLED	SWITCHED ON	READY	ENABLED	F-STOP ACTIVE	TRIP ACTIVE	TRIPPED
Tripped	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	TRUE
Running	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE
Jogging	FALSE	FALSE	FALSE	FALSE	Note 1	FALSE	FALSE	FALSE
Stopping	FALSE	FALSE	FALSE	FALSE	Note 2	TRUE	FALSE	FALSE
Output Contactor	Depends on previous state	Depends on previous state	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE
Switch On Enable	FALSE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE
Switched On	FALSE	FALSE	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE
Ready	FALSE	FALSE	FALSE	TRUE	TRUE	TRUE	TRUE	FALSE
Healthy	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE	FALSE Note 3

Table 4-2 Parameter States for the MAIN SEQ STATE Parameter

Note: *1. JOGGING is set TRUE once the jog cycle has started, and remains TRUE until the jog cycle has finished which is when either the stop delay has finished or another mode is demanded.*

2. STOPPING is set TRUE during the stopping cycles commanded by either RUNNING going low, JOGGING going low or if Fast Stop is active, i.e. SEQUENCING LOGIC is F-STOP ACTIVE.

3. Once Run and Jog are both FALSE, HEALTHY O/P will be set TRUE.

Transition of States

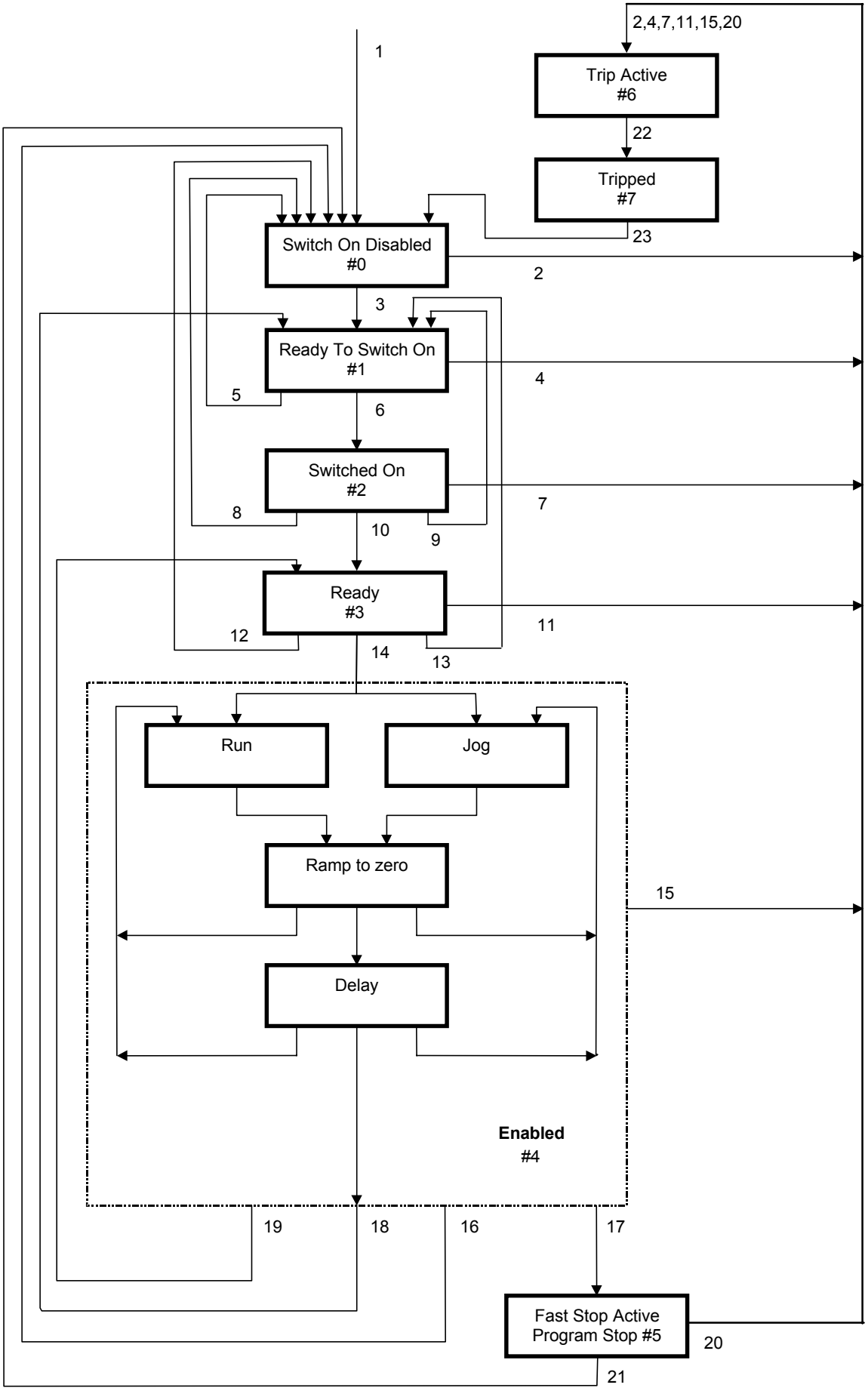
The transition matrix describes what causes the transition from one state to another, for example see no. 4 below: the transition from "Ready To Switch On" to "Trip Active" is triggered by "TRIP" going TRUE. Note – where a state has more than one exit transition, the transition with the lowest number has priority.

Refer to the following table and state diagram.

	Current State	Next State	Cause (FALSE to TRUE)
1	Power Up	Switch On Disabled	Power-Up, Restore Configuration or exit from Configuration mode.
2	Switch On Disabled	Trip Active	Trip
3	Switch On Disabled	Ready To Switch On	RUN = FALSE, JOG = FALSE, NOT FAST STOP = TRUE and NOT COAST STOP = TRUE
4	Ready To Switch On	Trip Active	Trip
5	Ready To Switch On	Switch On Disabled	NOT COAST STOP = FALSE or NOT FAST STOP = FALSE
6	Ready To Switch On	Switched On	RUN = TRUE or JOG = TRUE
7	Switched On	Trip Active	Trip (includes CONTACTOR CLOSED = FALSE after 10 seconds)
8	Switched On	Switch On Disabled	NOT COAST STOP = FALSE or NOT FAST STOP = FALSE
9	Switched On	Ready To Switch On	RUN = FALSE and JOG = FALSE
10	Switched On	Ready	CONTACTOR CLOSED = TRUE and defluxed
11	Ready	Trip Active	Trip (includes CONTACTOR CLOSED = FALSE)
12	Ready	Switch On Disabled	NOT COAST STOP = FALSE or NOT FAST STOP = FALSE
13	Ready	Ready To Switch On	RUN = FALSE and JOG = FALSE
14	Ready	Enabled	ENABLE = TRUE
15	Enabled	Trip Active	Trip (includes CONTACTOR CLOSED = FALSE)
16	Enabled	Switch On Disabled	NOT COAST STOP = FALSE
17	Enabled	Fast Stop Active	NOT FAST STOP = FALSE
18	Enabled	Ready To Switch On	RUN = FALSE, JOG = FALSE and stopping complete
19	Enabled	Ready	ENABLE = FALSE
20	Fast Stop Active	Trip Active	Trip (includes CONTACTOR CLOSED = FALSE)
21	Fast Stop Active	Switch On Disabled	Fast Stop timer expired or FAST STOP MODE = Coast Stop OR drive at zero setpoint
22	Trip Active	Tripped	Stack quenched
23	Tripped	Switch On Disabled	Trip = FALSE and TRIP RESET 0->1 transition

Table 4-3 Transition Matrix

State Diagram



External Control of the Drive

Communications Command

When sequencing is in the Remote Comms mode, the sequencing of the drive is controlled by writing to the hidden parameter COMMS COMMAND (Tag 271). This parameter can only be written to using a communications interface. The output parameter (Tag 273) COMMS COMMAND of the COMMS CONTROL function block is provided as a diagnostic.

The COMMS COMMAND parameter is a 16-bit word based on standard fieldbus drive profiles. Some bits are not implemented in this release (see "Supported" column of the table below).

Bit	Name	Description	Supported	Required Value
0	Switch On	OFF1 Operational	√	
1	(Not) Disable Voltage	OFF2 Coast Stop	√	
2	(Not) Quick Stop	OFF3 Fast Stop	√	
3	Enable Operation		√	
4	Enable Ramp Output	=0 to set ramp output to zero		1
5	Enable Ramp	=0 to hold ramp		1
6	Enable Ramp Input	=0 to set ramp input to zero		1
7	Reset Fault	Reset on 0 to 1 transition	√	
8				0
9				0
10	Remote	=1 to control remotely		1
11				0
12				0
13				0
14				0
15				0

Switch On

Replaces the RUN FWD, RUN REV and NOT STOP parameters of the SEQUENCING LOGIC function block. When Set (=1) is the same as :

RUN FWD = TRUE
RUN REV = FALSE
NOT STOP = FALSE

When Cleared (= 0) is the same as :

RUN FWD = FALSE
RUN REV = FALSE
NOT STOP = FALSE

(Not) Disable Voltage

ANDed with the NOT COAST STOP parameter of the SEQUENCING LOGIC function block. When both Set (=1) is the same as:

NOT COAST STOP = TRUE

When either or both Cleared (= 0) is the same as :

NOT COAST STOP = FALSE

(Not) Quick Stop

ANDed with the NOT FAST STOP parameter on the SEQUENCING LOGIC function block. When both Set (=1) is the same as:

NOT FAST STOP = TRUE

When either or both Cleared (= 0) is the same as :

NOT FAST STOP = FALSE

Enable Operation

ANDed with the DRIVE ENABLE parameter on the SEQUENCING LOGIC function block. When both Set (=1) is the same as:

DRIVE ENABLE = TRUE

When either or both Cleared (= 0) is the same as :

DRIVE ENABLE = FALSE

Enable Ramp Output, Enable Ramp, Enable Ramp Input

Not implemented. The state of these bits must be set (=1) to allow this feature to be added in the future.

Reset Fault

Replaces the REM TRIP RESET parameter on the SEQUENCING LOCIC function block. When Set (=1) is the same as:

REM TRIP RESET = TRUE

When Cleared (= 0) is the same as :

REM TRIP RESET = FALSE

Remote

Not implemented. It is intended to allow the PLC to toggle between local and remote. The state of this must be set (=1) to allow this feature to be added in the future.

Example Commands

047F hexadecimal to RUN

047E hexadecimal to STOP

Communications Status

The COMMS STATUS parameter (Tag 272) in the COMMS CONTROL function block monitors the sequencing of the drive. It is a 16-bit word based on standard fieldbus drive profiles. Some bits are not implemented in the initial release and are set to 0 (see "Supported" column of the table below).

Bit	Name	Description	Supported
0	Ready To Switch On		√
1	Switched On	Ready for operation (refer control bit 0)	√
2	Operation Enabled	(refer control bit 3)	√
3	Fault	Tripped	√
4	(Not) Voltage Disabled	OFF 2 Command pending	√
5	(Not) Quick Stop	OFF 3 Command pending	√
6	Switch On Disable	Switch On Inhibited	√
7	Warning		
8	SP / PV in Range		
9	Remote	= 1 if drive will accept Command Word	√
10	Setpoint Reached		
11	Internal Limit Active		
12			
13			
14			
15			

Ready To Switch On

Same as the SWITCH ON ENABLE output parameter of the SEQUENCING LOGIC function block.

Switched On

Same as the SWITCHED ON output parameter of the SEQUENCING LOGIC function block.

Operation Enabled

Same as the RUNNING output parameter of the SEQUENCING LOGIC function block.

Fault

Same as the TRIPPED output parameter of the SEQUENCING LOGIC function block.

(Not) Voltage Disabled

If in Remote Comms mode, this is the same as Bit 1 of the COMMS COMMAND parameter. Otherwise it is the same as the NOT COAST STOP input parameter of the SEQUENCING LOGIC function block.

(Not) Quick Stop

If in Remote Comms mode, this is the same as Bit 2 of the COMMS COMMAND parameter. Otherwise it is the same as the NOT FAST STOP input parameter of the SEQUENCING LOGIC function block.

Switch On Disable

Set (=1) only when in START DISABLED state, refer to Table 4-1.

Remote

This bit is set (= 1) if the drive is in Remote mode **AND** the parameter REMOTE COMMS SEL of the COMMS CONTROL function block is Set (= 1).

APPLICATION MACROS

The Default Application

The drive is supplied with 8 macros, Macro 0 to Macro 7. Each macro recalls a pre-programmed set of parameters when it is loaded.

- Macro 0 will not control a motor. Loading Macro 0 removes all links, and sets all parameters to the values defined for each function block in Chapter 1 "Programming Your Application".
- Macro 1 is the factory default macro, providing for basic speed control
- Macro 2 is a set-up providing speed control with Raise/Lower Trim
- Macro 3 is for PID process control
- Macro 4 is a Speed Programmed Winder (SPW) macro.
- Macro 5 supplies speed control using preset speeds.
- Macro 6 provides for basic speed control with similar functionality to the 620 and 590+ Series Drives.
- Macro 7 is for Phase/Register applications.

How to Load a Macro

RESTORE CONFIG

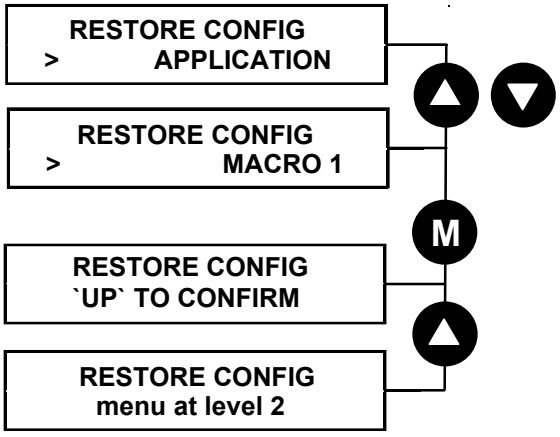
This menu restores the displayed application to the drive. The information is saved on power-down.

Also listed with your application names are the factory macros.

To restore an application see below.

MMI Menu Map

1 SYSTEM
2 RESTORE CONFIG
RESTORE CONFIG

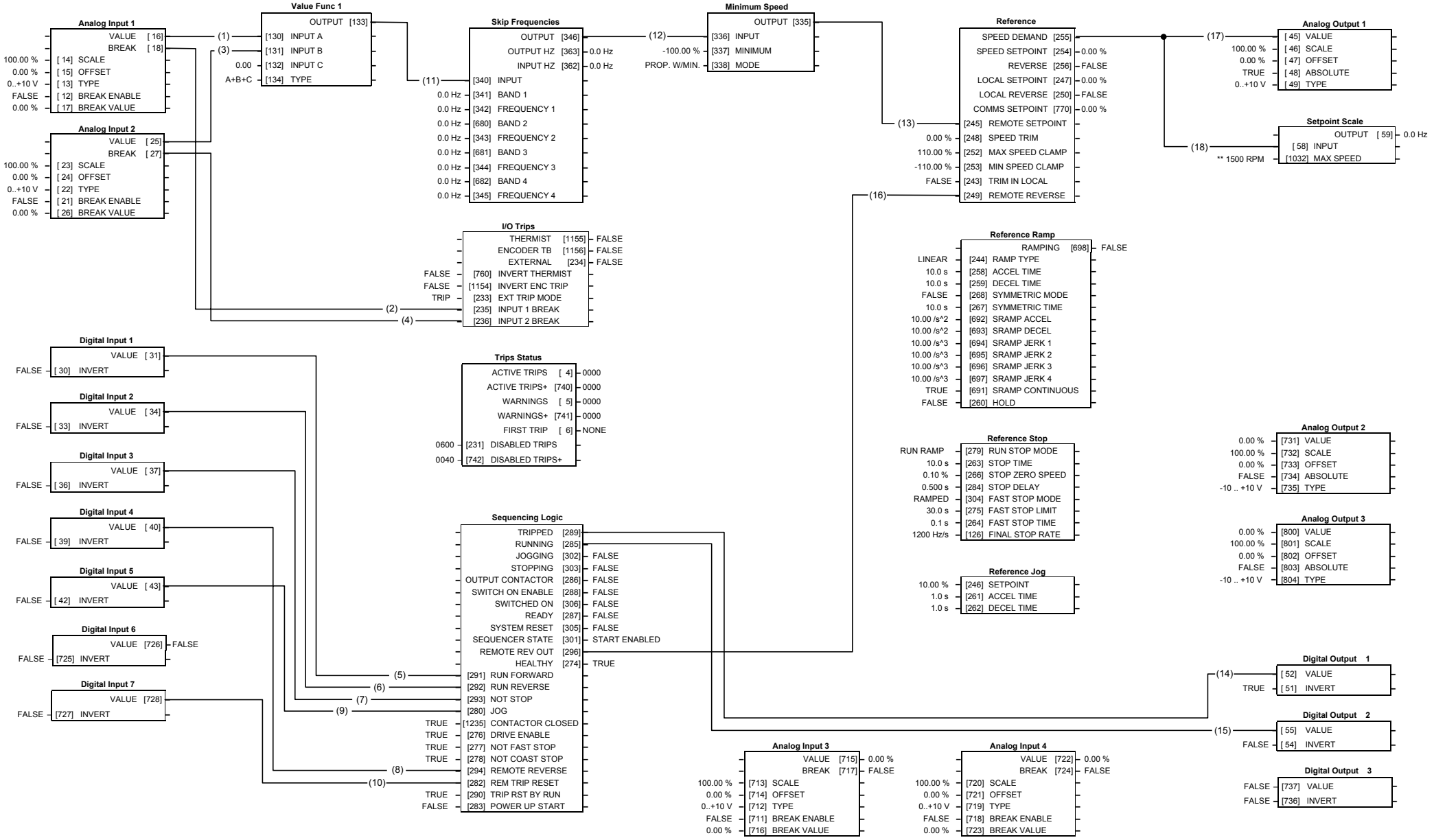


Now update the non-volatile memory within the drive by performing a SAVE CONFIG. Refer to the Installation Product Manual, Chapter 5: "The Operator Station" - Saving/Restoring/Deleting Your Application

Macro Descriptions

Note: *Parameters whose default values are product-related are indicated in the block diagrams with * or **. Refer to Chapter 2: "Parameter Specification" - Product-Related Default Values.*

5-2 Application Macros



Macro 1: Basic Speed Control (default)

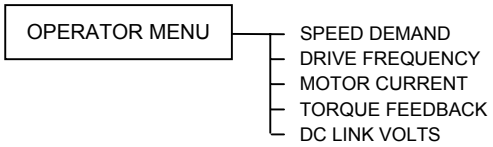
Macro 1: Basic Speed Control (default)

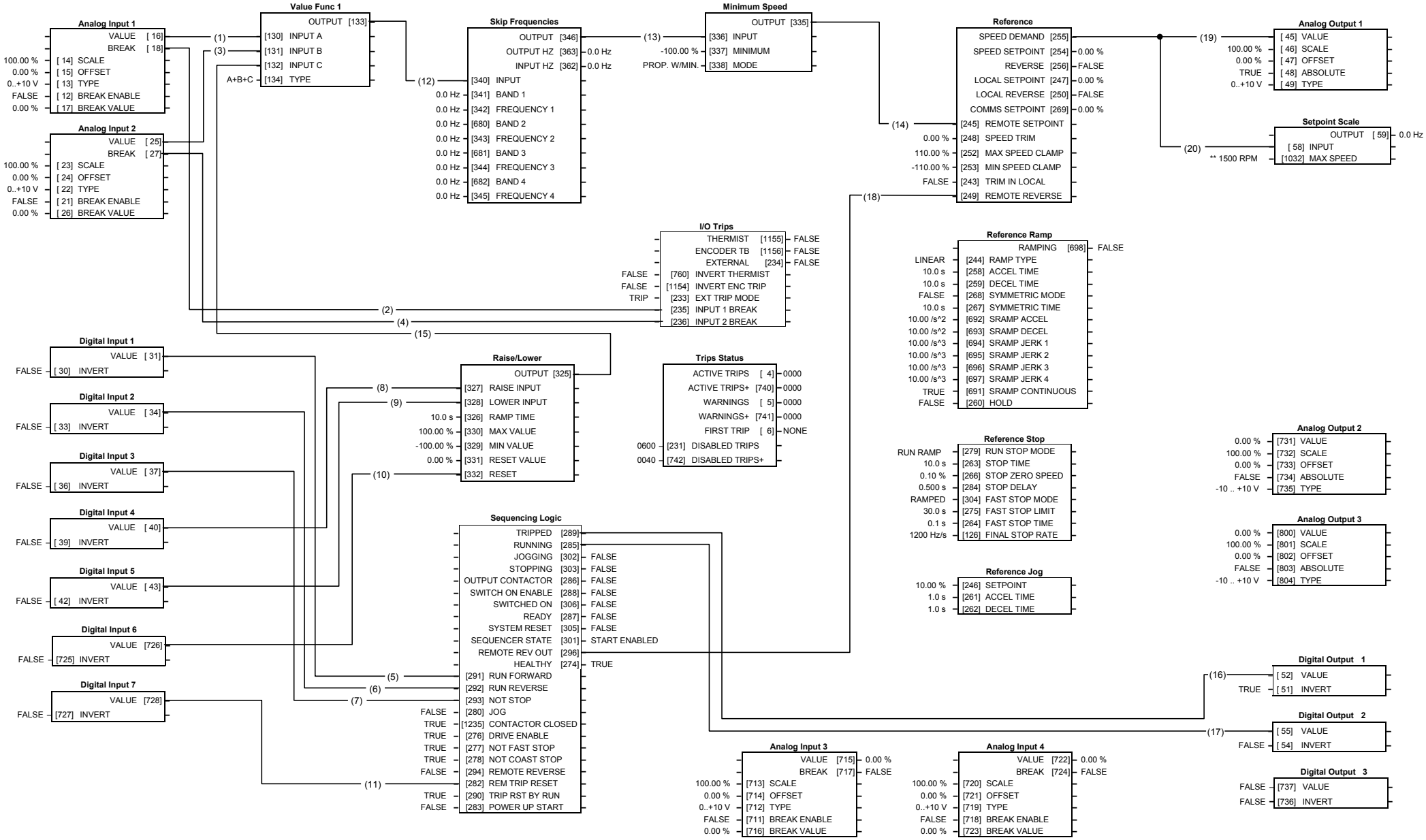
This macro provides standard control of the drive.

Control Wiring I/O			
Terminal	**Name**	**Purpose**	**Comment**
2	ANALOG INPUT 1	Speed Setpoint	0V = 0%, 10V = 100%
3	ANALOG INPUT 2	Speed Trim	0V = 0%, 10V = 100%
6	ANALOG OUTPUT 1	Ramp Output	absolute speed demand 0V = 0%, 10V = 100%
12	DIGITAL INPUT 1	Run Forward	24V = run forward
13	DIGITAL INPUT 2	Run Reverse	24V = run reverse
14	DIGITAL INPUT 3	Not Stop	24V = RUN FWD and RUN REV signals latched 0V = RUN FWD and RUN REV signals not latched
15	DIGITAL INPUT 4	Remote Reverse	0V = remote forward 24V = remote reverse
16	DIGITAL INPUT 5	Jog	24V = jog
18	DIGITAL INPUT 7	Remote Trip Reset	24V = reset trips
19	DIGITAL INPUT 8	External Trip	*Non-configurable* 0V = Trip (connect to terminal 20)
21, 22	DIGITAL OUTPUT 1	Health	0V = tripped, i.e. not healthy
23, 24	DIGITAL OUTPUT 2	Running	0V = stopped, 24V = running

The Operator Menu for Macro 1

The default Operator Menu is shown below.





Macro 2: Raise/Lower

Macro 2: Raise/Lower Trim

This macro provides a raise/lower (push button) interface for an additional Setpoint Trim. The Setpoint is derived from the sum of the ANALOG INPUT 1, ANALOG INPUT 2 and the output of the raise/lower ramp. This ramp is controlled by the 3 digital inputs RAISE INPUT, RAISE LOWER and RESET of the RAISE/LOWER function block.

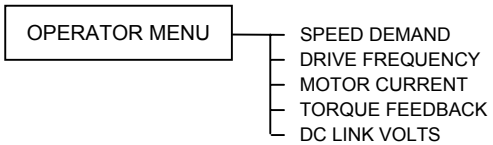
The raise/lower trim is restricted to be +/- 10.00%. This limit is set by the MIN VALUE and MAX VALUE parameters in the RAISE/LOWER function block.

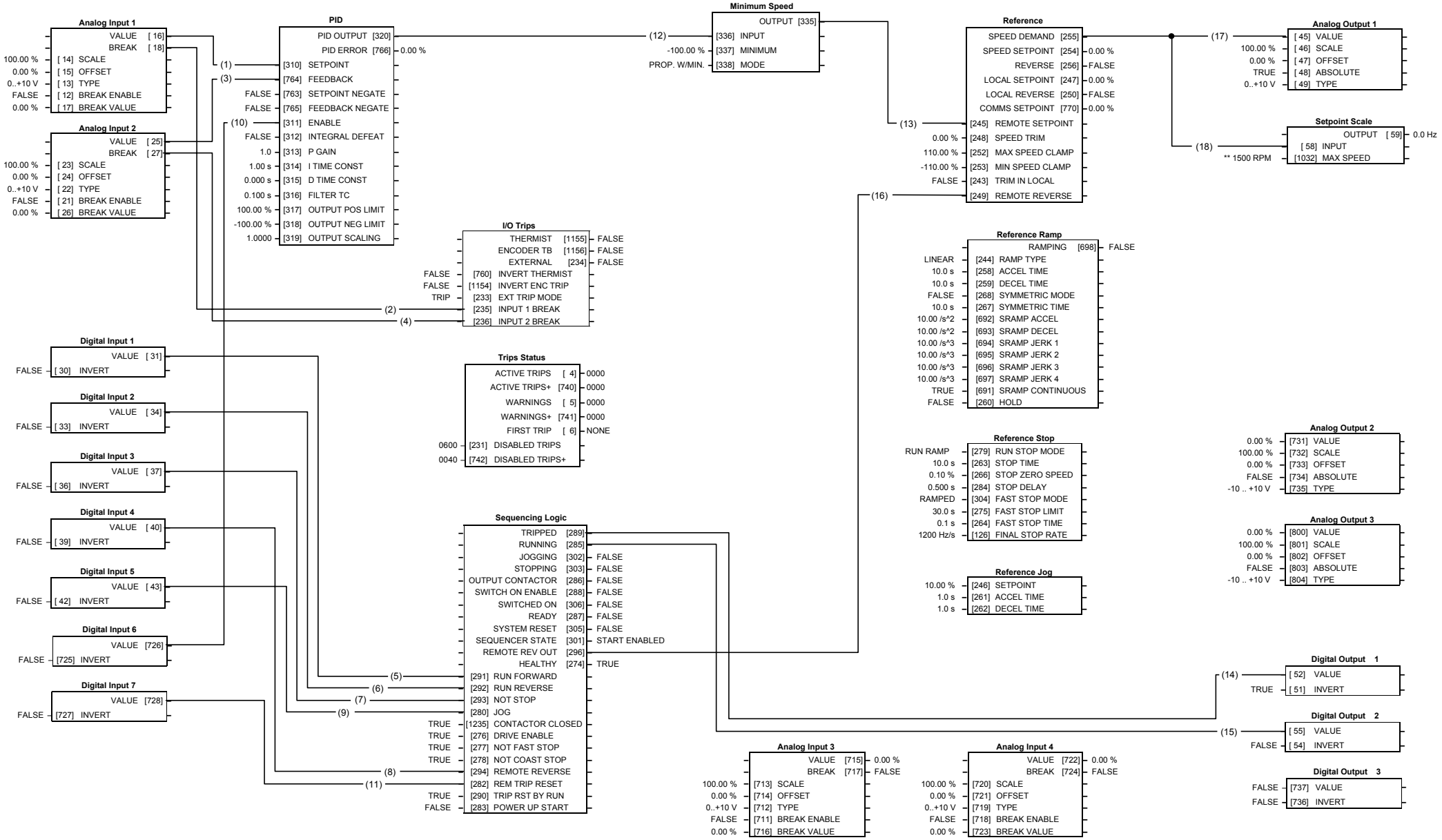
Note that the raise/lower ramp output is automatically preserved in non-volatile memory during a power-down.

Control Wiring I/O			
Terminal	**Name**	**Purpose**	**Comment**
2	ANALOG INPUT 1	Speed Setpoint	0V = 0%, 10V = 100%
3	ANALOG INPUT 2	Speed Trim	0V = 0%, 10V = 100%
6	ANALOG OUTPUT 1	Ramp Output	absolute speed demand 0V = 0%, 10V = 100%
12	DIGITAL INPUT 1	Run Forward	24V = run forward
13	DIGITAL INPUT 2	Run Reverse	24V = run reverse
14	DIGITAL INPUT 3	Not Stop	24V = RUN FWD and RUN REV signals latched 0V = RUN FWD and RUN REV signals not latched
15	DIGITAL INPUT 4	Raise	24V = raise input
16	DIGITAL INPUT 5	Lower	24V = lower input
17	DIGITAL INPUT 6	Reset	24V = reset raise/lower
18	DIGITAL INPUT 7	Remote Trip Reset	24V = reset trips
19	DIGITAL INPUT 8	External Trip	*Non-configurable* 0V = Trip (connect to terminal 20)
21, 22	DIGITAL OUTPUT 1	Health	0V = tripped, i.e. not healthy
23, 24	DIGITAL OUTPUT 2	Running	0V = stopped, 24V = running

The Operator Menu for Macro 2

The default Operator Menu is shown below.




Analog Input 1
VALUE [16]
BREAK [18]
100.00 % [14] SCALE
0.00 % [15] OFFSET
0..+10 V [13] TYPE
FALSE [12] BREAK ENABLE
0.00 % [17] BREAK VALUE
Analog Input 2
VALUE [25]
BREAK [27]
100.00 % [23] SCALE
0.00 % [24] OFFSET
0..+10 V [22] TYPE
FALSE [21] BREAK ENABLE
0.00 % [26] BREAK VALUE
PID
PID OUTPUT [320]
PID ERROR [766] 0.00 %
(1) [310] SETPOINT
(3) [764] FEEDBACK
FALSE [763] SETPOINT NEGATE
FALSE [765] FEEDBACK NEGATE
(10) [311] ENABLE
FALSE [312] INTEGRAL DEFEAT
1.0 [313] P GAIN
1.00 s [314] I TIME CONST
0.000 s [315] D TIME CONST
0.100 s [316] FILTER TC
100.00 % [317] OUTPUT POS LIMIT
-100.00 % [318] OUTPUT NEG LIMIT
1.0000 [319] OUTPUT SCALING
Minimum Speed
OUTPUT [335]
(12) [336] INPUT
-100.00 % [337] MINIMUM
PROP. W/MIN. [338] MODE
Reference
SPEED DEMAND [255]
SPEED SETPOINT [254] 0.00 %
REVERSE [256] FALSE
LOCAL SETPOINT [247] 0.00 %
LOCAL REVERSE [250] FALSE
COMMS SETPOINT [770] 0.00 %
(13) [245] REMOTE SETPOINT
0.00 % [248] SPEED TRIM
110.00 % [252] MAX SPEED CLAMP
-110.00 % [253] MIN SPEED CLAMP
FALSE [243] TRIM IN LOCAL
(16) [249] REMOTE REVERSE
Analog Output 1
(17) [45] VALUE
100.00 % [46] SCALE
0.00 % [47] OFFSET
TRUE [48] ABSOLUTE
0..+10 V [49] TYPE
Setpoint Scale
OUTPUT [59] 0.0 Hz
(18) [58] INPUT
** 1500 RPM [1032] MAX SPEED
I/O Trips
THERMIST [1155] FALSE
ENCODER TB [1156] FALSE
EXTERNAL [234] FALSE
FALSE [760] INVERT THERMIST
FALSE [1154] INVERT ENC TRIP
TRIP [233] EXT TRIP MODE
(2) [235] INPUT 1 BREAK
(4) [236] INPUT 2 BREAK
Reference Ramp
RAMPING [698] FALSE
LINEAR [244] RAMP TYPE
10.0 s [258] ACCEL TIME
10.0 s [259] DECEL TIME
FALSE [268] SYMMETRIC MODE
10.0 s [267] SYMMETRIC TIME
10.00 /s^2 [692] SRAMP ACCEL
10.00 /s^2 [693] SRAMP DECEL
10.00 /s^3 [694] SRAMP JERK 1
10.00 /s^3 [695] SRAMP JERK 2
10.00 /s^3 [696] SRAMP JERK 3
10.00 /s^3 [697] SRAMP JERK 4
TRUE [691] SRAMP CONTINUOUS
FALSE [260] HOLD
Digital Input 1
VALUE [31]
FALSE [30] INVERT
Digital Input 2
VALUE [34]
FALSE [33] INVERT
Digital Input 3
VALUE [37]
FALSE [36] INVERT
Digital Input 4
VALUE [40]
FALSE [39] INVERT
Digital Input 5
VALUE [43]
FALSE [42] INVERT
Digital Input 6
VALUE [726]
FALSE [725] INVERT
Digital Input 7
VALUE [728]
FALSE [727] INVERT
Trips Status
ACTIVE TRIPS [4] 0000
ACTIVE TRIPS+ [740] 0000
WARNINGS [5] 0000
WARNINGS+ [741] 0000
FIRST TRIP [6] NONE
0600 [231] DISABLED TRIPS
0040 [742] DISABLED TRIPS+
Reference Stop
RUN RAMP [279] RUN STOP MODE
10.0 s [263] STOP TIME
0.10 % [266] STOP ZERO SPEED
0.500 s [284] STOP DELAY
RAMPED [304] FAST STOP MODE
30.0 s [275] FAST STOP LIMIT
0.1 s [264] FAST STOP TIME
1200 Hz/s [126] FINAL STOP RATE
Reference Jog
10.00 % [246] SETPOINT
1.0 s [261] ACCEL TIME
1.0 s [262] DECEL TIME
Analog Output 2
0.00 % [731] VALUE
100.00 % [732] SCALE
0.00 % [733] OFFSET
FALSE [734] ABSOLUTE
-10 .. +10 V [735] TYPE
Analog Output 3
0.00 % [800] VALUE
100.00 % [801] SCALE
0.00 % [802] OFFSET
FALSE [803] ABSOLUTE
-10 .. +10 V [804] TYPE
Sequencing Logic
TRIPPED [289]
RUNNING [285]
JOGGING [302] FALSE
STOPPING [303] FALSE
OUTPUT CONTACTOR [286] FALSE
SWITCH ON ENABLE [288] FALSE
SWITCHED ON [306] FALSE
READY [287] FALSE
SYSTEM RESET [305] FALSE
SEQUENCER STATE [301] START ENABLED
REMOTE REV OUT [296]
HEALTHY [274] TRUE
(5) [291] RUN FORWARD
(6) [292] RUN REVERSE
(7) [293] NOT STOP
(9) [280] JOG
TRUE [1235] CONTACTOR CLOSED
TRUE [276] DRIVE ENABLE
TRUE [277] NOT FAST STOP
TRUE [278] NOT COAST STOP
(8) [294] REMOTE REVERSE
(11) [282] REM TRIP RESET
TRUE [290] TRIP RST BY RUN
FALSE [283] POWER UP START
Digital Output 1
(14) [52] VALUE
TRUE [51] INVERT
Digital Output 2
(15) [55] VALUE
FALSE [54] INVERT
Digital Output 3
FALSE [737] VALUE
FALSE [736] INVERT
Analog Input 3
VALUE [715] 0.00 %
BREAK [717] FALSE
100.00 % [713] SCALE
0.00 % [714] OFFSET
0..+10 V [712] TYPE
FALSE [711] BREAK ENABLE
0.00 % [716] BREAK VALUE
Analog Input 4
VALUE [722] 0.00 %
BREAK [724] FALSE
100.00 % [720] SCALE
0.00 % [721] OFFSET
0..+10 V [719] TYPE
FALSE [718] BREAK ENABLE
0.00 % [723] BREAK VALUE

Macro 3: PID

Macro 3: PID

PID error derived from the difference of 2 analog inputs.

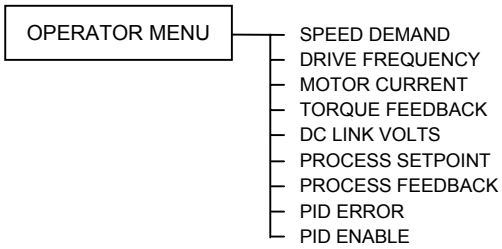
Digital input to disable PID.

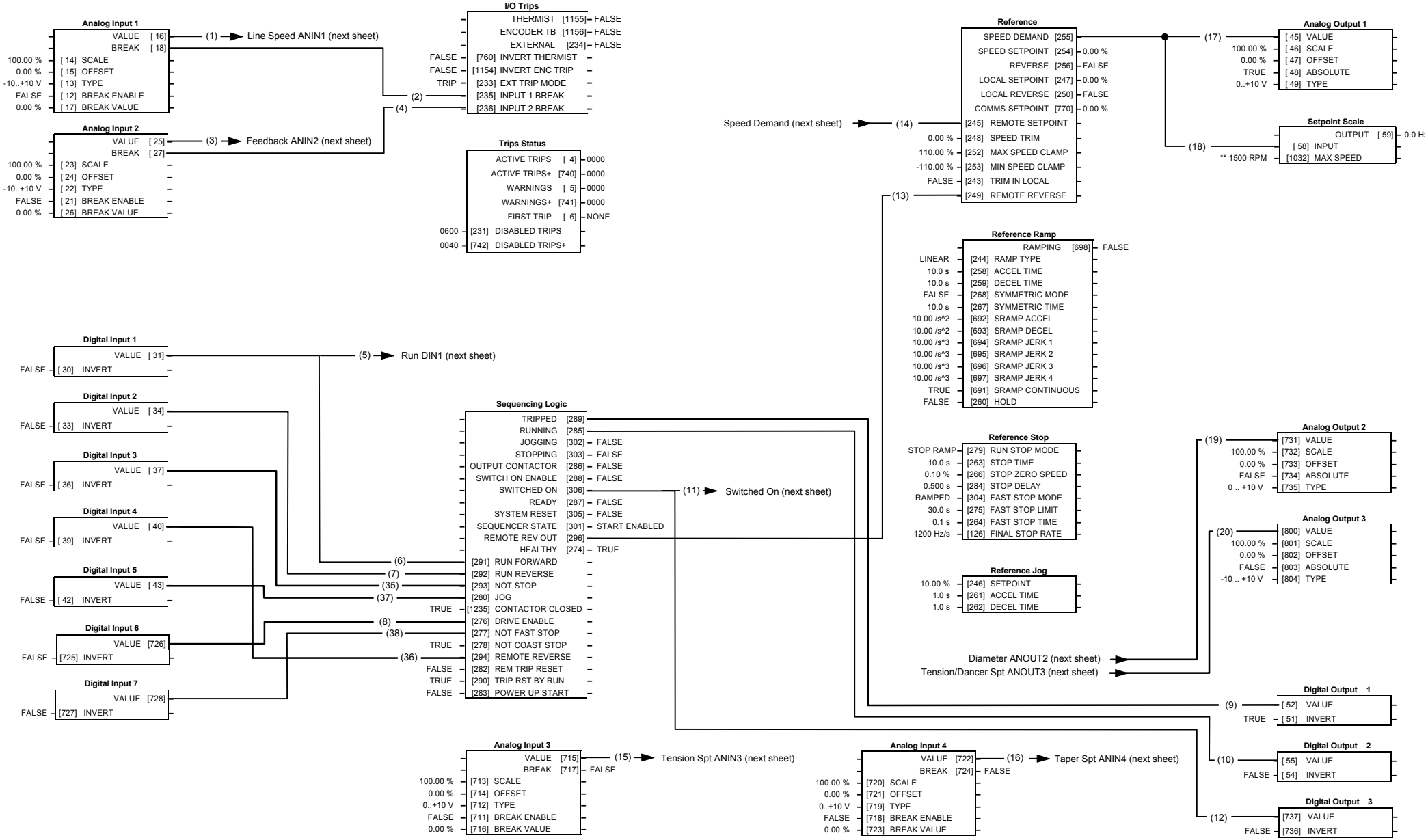
Additional Operator Menu display parameters.

Control Wiring I/O			
Terminal	**Name**	**Purpose**	**Comment**
2	ANALOG INPUT 1	Process Setpoint	0V = 0%, 10V = 100%
3	ANALOG INPUT 2	Process Setpoint Trim	0V = 0%, 10V = 100%
6	ANALOG OUTPUT 1	Ramp Output	absolute speed demand 0V = 0%, 10V = 100%
12	DIGITAL INPUT 1	Run Forward	24V = run forward
13	DIGITAL INPUT 2	Run Reverse	24V = run reverse
14	DIGITAL INPUT 3	Not Stop	24V = RUN FWD and RUN REV signals latched 0V = RUN FWD and RUN REV signals not latched
15	DIGITAL INPUT 4	Remote Reverse	0V = remote forward 24V = remote reverse
16	DIGITAL INPUT 5	Jog	24V = jog
17	DIGITAL INPUT 6	PID Enable	24V = PID enable
18	DIGITAL INPUT 7	Remote Trip Reset	24V = reset trips
19	DIGITAL INPUT 8	External Trip	*Non-configurable* 0V = Trip (connect to terminal 20)
21, 22	DIGITAL OUTPUT 1	Health	0V = tripped, i.e. not healthy
23, 24	DIGITAL OUTPUT 2	Running	0V = stopped, 24V = running

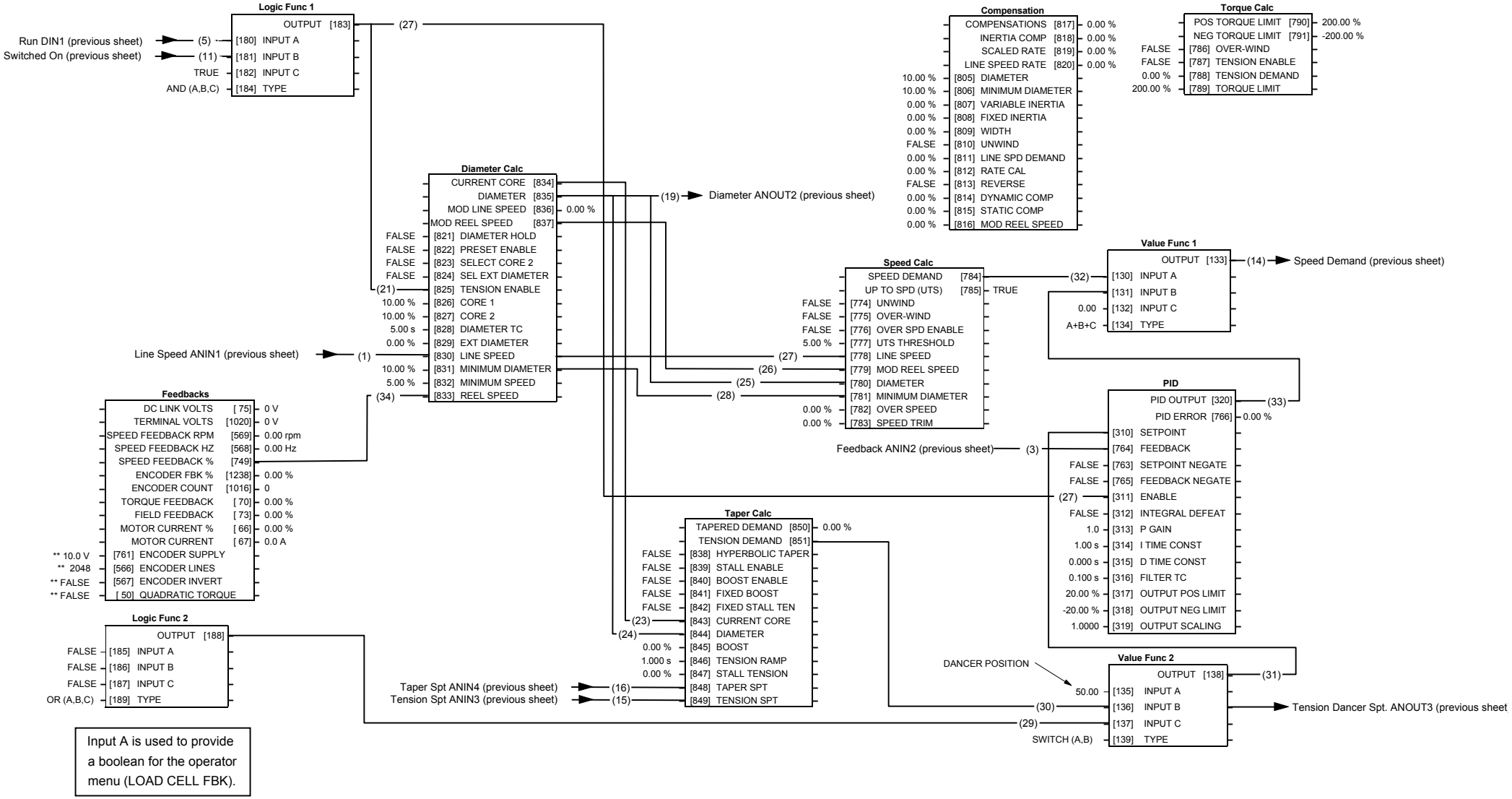
The Operator Menu for Macro 3

The default Operator Menu is shown below.





Macro 4: Speed Programmed Winder (SPW)



Macro 4: Speed Programmed Winder (SPW)

Macro 4: Speed Programmed Winder (SPW)

The winder macro is for tension control of closed loop winders. The function blocks control the motor speed with a closed loop trim to provide constant tension throughout the roll.

The basic tension control controls the motor speed, compensated for diameter, trimmed by a dancer position loop or a loadcell tension loop, to produce constant web tension.

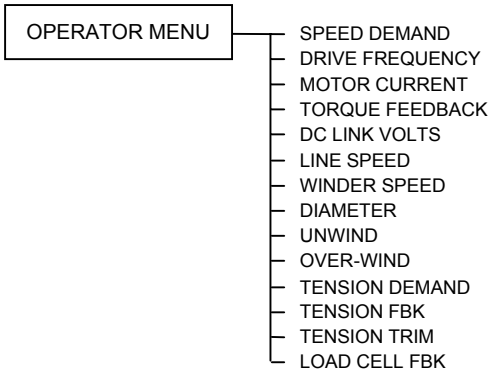
Other features provide Taper Tension, Stall Tension, Tension Boost, and Inertia Compensation.

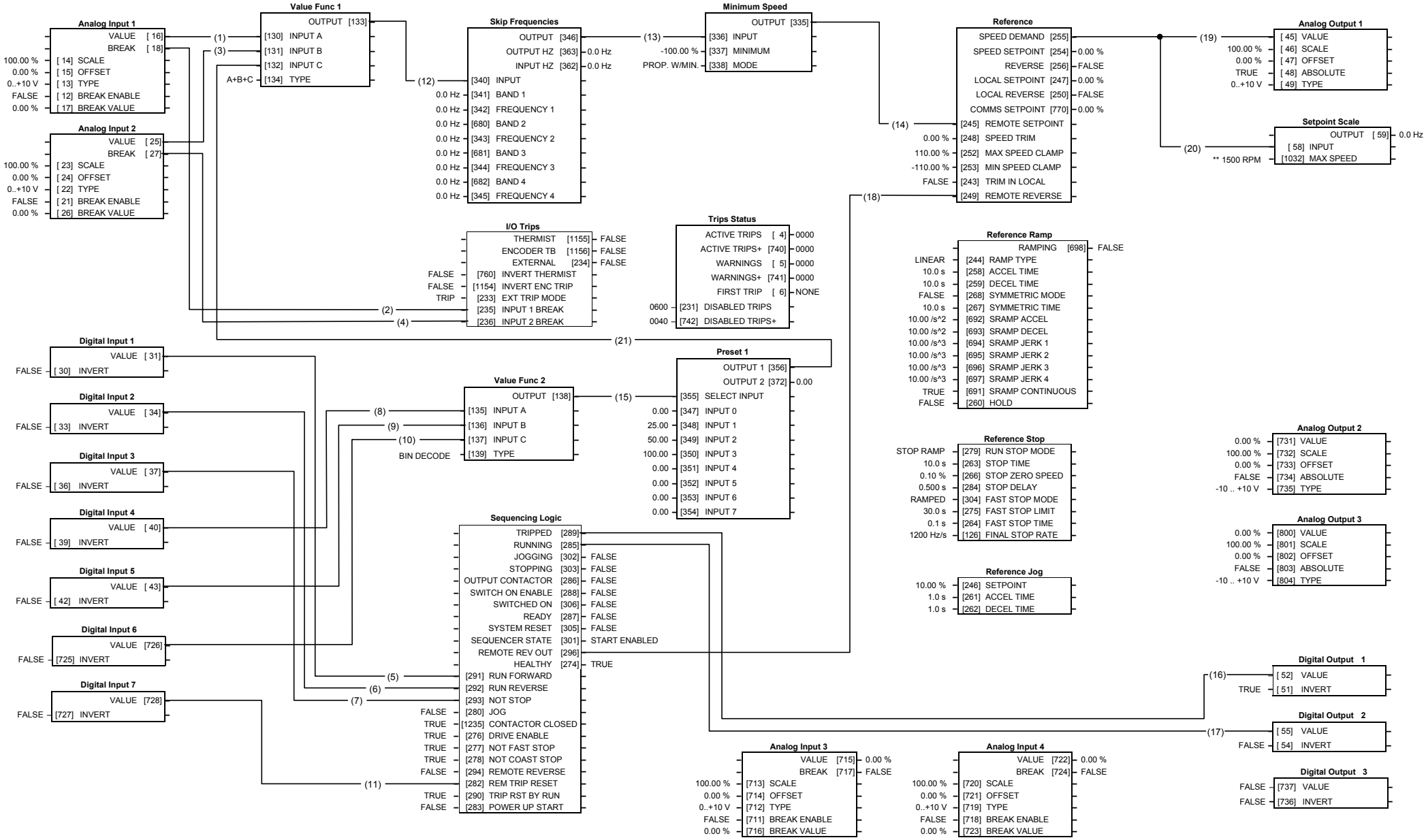
Additional Operator Menu display parameters.

Control Wiring I/O			
Terminal	**Name**	**Purpose**	**Comment**
2	ANALOG INPUT 1	Line Speed	-10V = -100%, 10V = 100%
3	ANALOG INPUT 2	Feedback	-10V = -100%, 10V = 100%
4	ANALOG INPUT 3	Tension Setpoint	0V = 0%, 10V = 100%
5	ANALOG INPUT 4	Taper Setpoint	0V = 0%, 10V = 100%
6	ANALOG OUTPUT 1	Speed Demand	absolute speed demand 0V = 0%, 10V = 100%
7	ANALOG OUTPUT 2	Diameter	diameter 0V = 0%, 10V = 100%
8	ANALOG OUTPUT 3	Tension/Dancer Setpoint	tension diagnostic in load cell mode, or load setpoint for dancer –10V = -100%, 10V = 100%
12	DIGITAL INPUT 1	Run Forward	24V = run forward
13	DIGITAL INPUT 2	Run Reverse	24V = run reverse
14	DIGITAL INPUT 3	Not Stop	24V = RUN FWD and RUN REV signals latched 0V = RUN FWD and RUN REV signals not latched
15	DIGITAL INPUT 4	Remote Reverse	0V = remote forward 24V = remote reverse
16	DIGITAL INPUT 5	Jog	24V = jog
17	DIGITAL INPUT 6	Drive Enable	24V = drive enable
18	DIGITAL INPUT 7	Fast Stop	0V = fast stop
19	DIGITAL INPUT 8	External Trip	*Non-configurable* 0V = Trip (connect to terminal 20)
21, 22	DIGITAL OUTPUT 1	Health	0V = tripped, i.e. not healthy
23, 24	DIGITAL OUTPUT 2	Running	0V = stopped, 24V = running
25, 26	DIGITAL OUTPUT 3	Switched On	0V = not ready, 24V = switched on

The Operator Menu for Macro 4

The default Operator Menu is shown below.





Macro 5: Preset Speeds

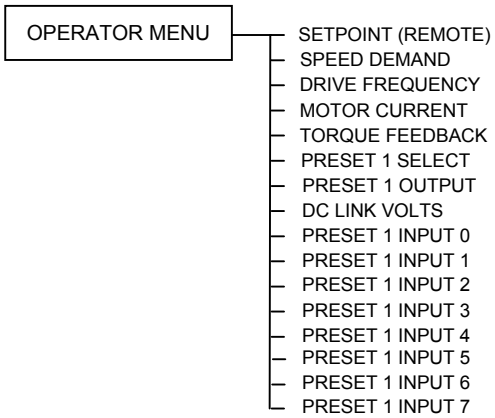
Macro 5: Preset Speeds

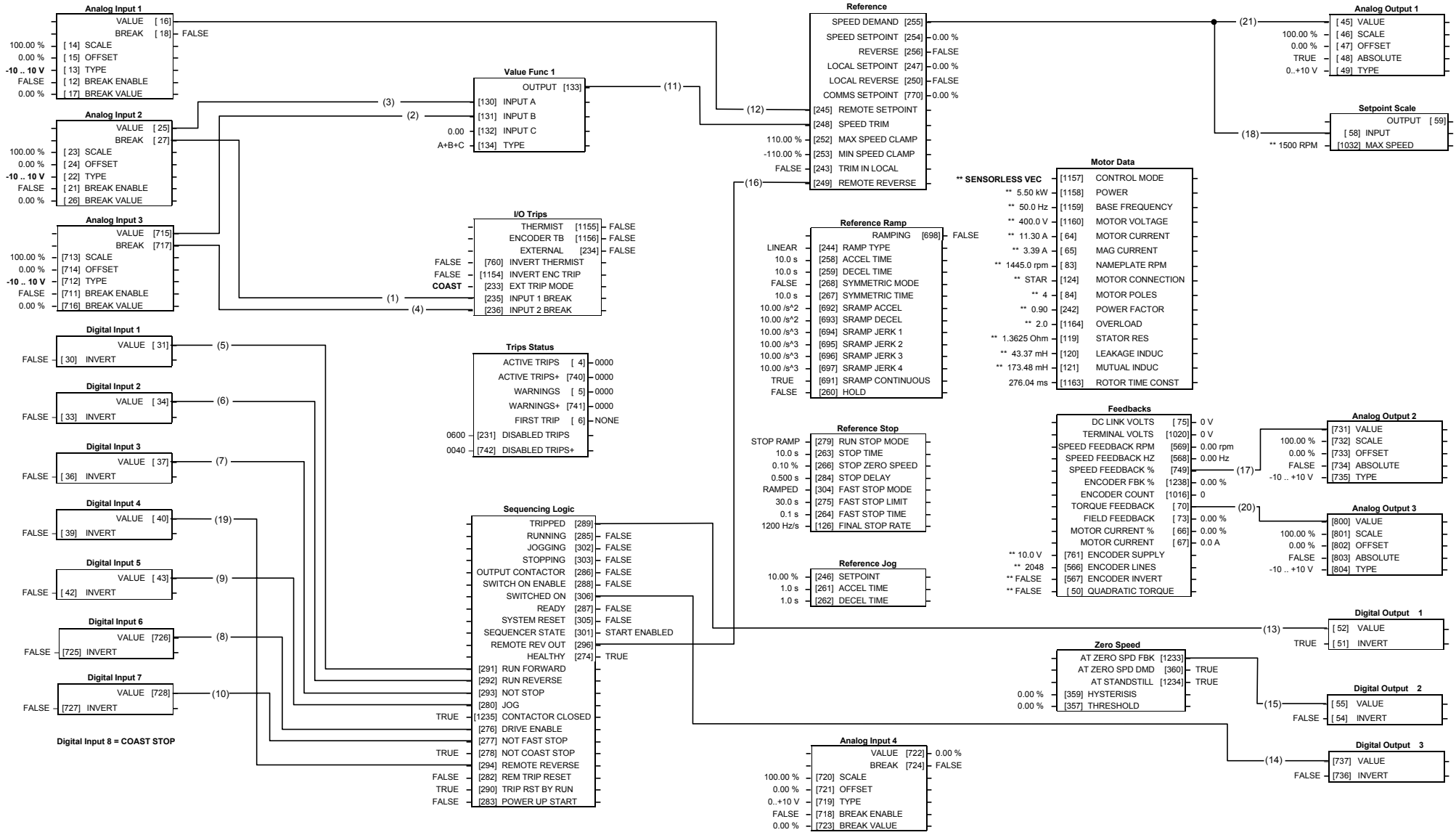
Digital inputs select up to 8 preset speeds.
Additional Operator Menu display parameters.

Control Wiring I/O			
Terminal	**Name**	**Purpose**	**Comment**
2	ANALOG INPUT 1	Speed Setpoint	0V = 0%, 10V = 100%
3	ANALOG INPUT 2	Speed Trim	0V = 0%, 10V = 100%
6	ANALOG OUTPUT 1	Ramp Output	absolute speed demand 0V = 0%, 10V = 100%
12	DIGITAL INPUT 1	Run Forward	24V = run forward
13	DIGITAL INPUT 2	Run Reverse	24V = run reverse
14	DIGITAL INPUT 3	Not Stop	24V = RUN FWD and RUN REV signals latched 0V = RUN FWD and RUN REV signals not latched
15	DIGITAL INPUT 4	Preset 1	Preset Speed Select
16	DIGITAL INPUT 5	Preset 2	Preset Speed Select
17	DIGITAL INPUT 6	Preset 3	Preset Speed Select
18	DIGITAL INPUT 7	Remote Trip Reset	24V = reset trips
19	DIGITAL INPUT 8	External Trip	*Non-configurable* 0V = Trip (connect to terminal 20)
21, 22	DIGITAL OUTPUT 1	Health	0V = tripped, i.e. not healthy
23, 24	DIGITAL OUTPUT 2	Running	0V = stopped, 24V = running

The Operator Menu for Macro 5

The default Operator Menu is shown below.





Macro 6: "System" Drive

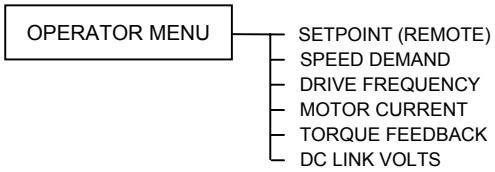
Macro 6: "System" Drive

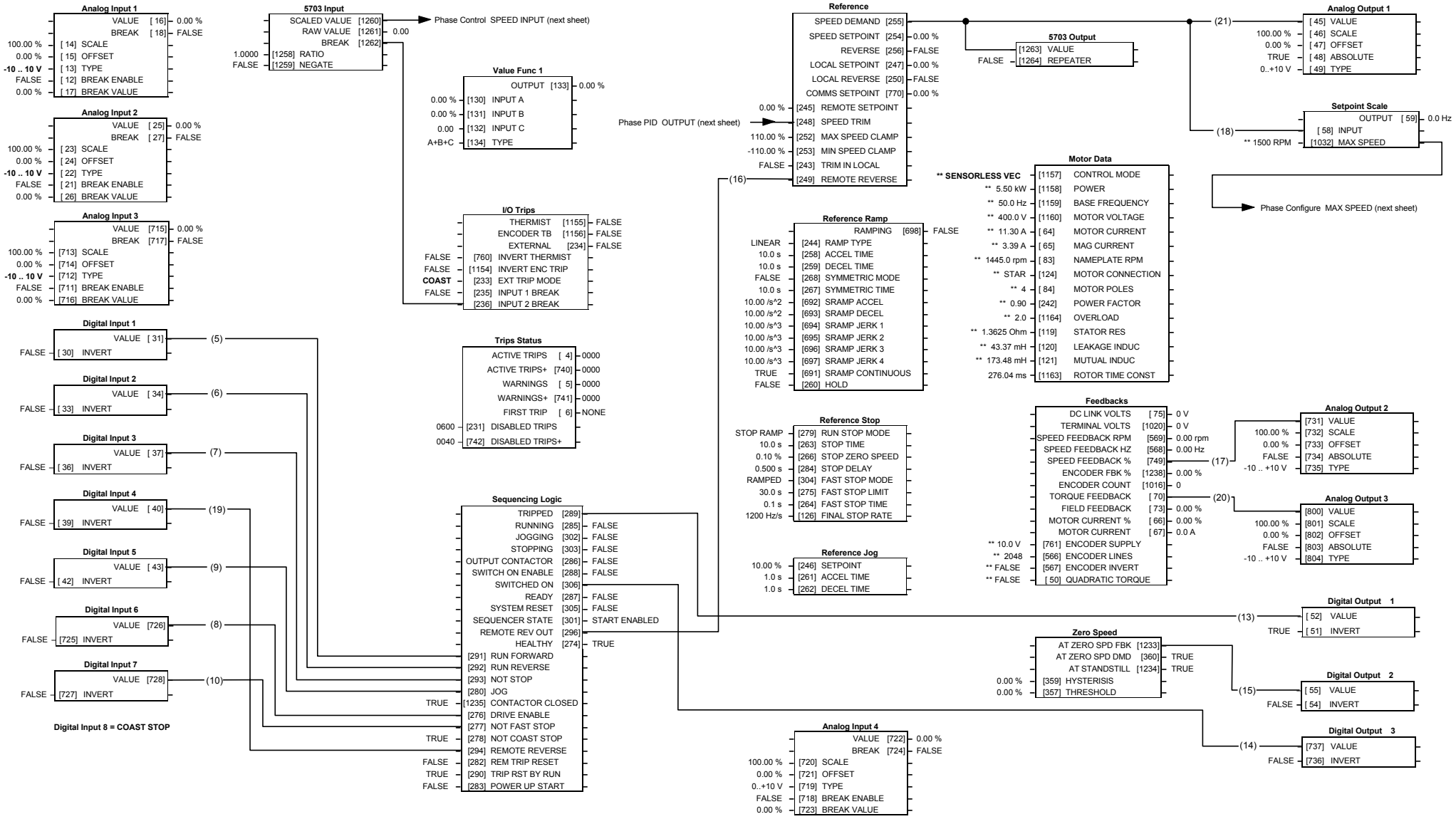
Provides for basic speed control with similar functionality to the 620 and 590+ Series Drives.

Control Wiring I/O			
Terminal	**Name**	**Purpose**	**Comment**
2	ANALOG INPUT 1	Speed Setpoint	-10V = -100%, 10V = 100%
3	ANALOG INPUT 2	Speed Trim 1	-10V = -100%, 10V = 100%
4	ANALOG INPUT 3	Speed Trim 2	-10V = -100%, 10V = 100%
6	ANALOG OUTPUT 1	Ramp Output	absolute speed demand 0V = 0%, 10V = 100%
7	ANALOG OUTPUT 2	Speed Feedback	-10V = -100%, 10V = 100%
8	ANALOG OUTPUT 3	Torque Feedback	-10V = -100%, 10V = 100%
12	DIGITAL INPUT 1	Run Forward	24V = Run forward
13	DIGITAL INPUT 2	Run Reverse	24V = Run reverse
14	DIGITAL INPUT 3	Not Stop	24V = RUN FWD and RUN REV signals latched 0V = RUN FWD and RUN REV signals not latched
15	DIGITAL INPUT 4	Reverse	24V = Reverse
16	DIGITAL INPUT 5	Jog	24V = Jog
17	DIGITAL INPUT 6	Drive Enable	24V = Drive Enable
18	DIGITAL INPUT 7	Fast Stop	0V = Fast Stop
19	DIGITAL INPUT 8	Coast Stop	0V = Coast Stop
21, 22	DIGITAL OUTPUT 1	Health	0V = Tripped, i.e. not healthy
23, 24	DIGITAL OUTPUT 2	At Zero Speed	0V = At Zero Speed Feedback
25, 26	DIGITAL OUTPUT 3	Switched On	0V = Open, 24V = Swtiched On

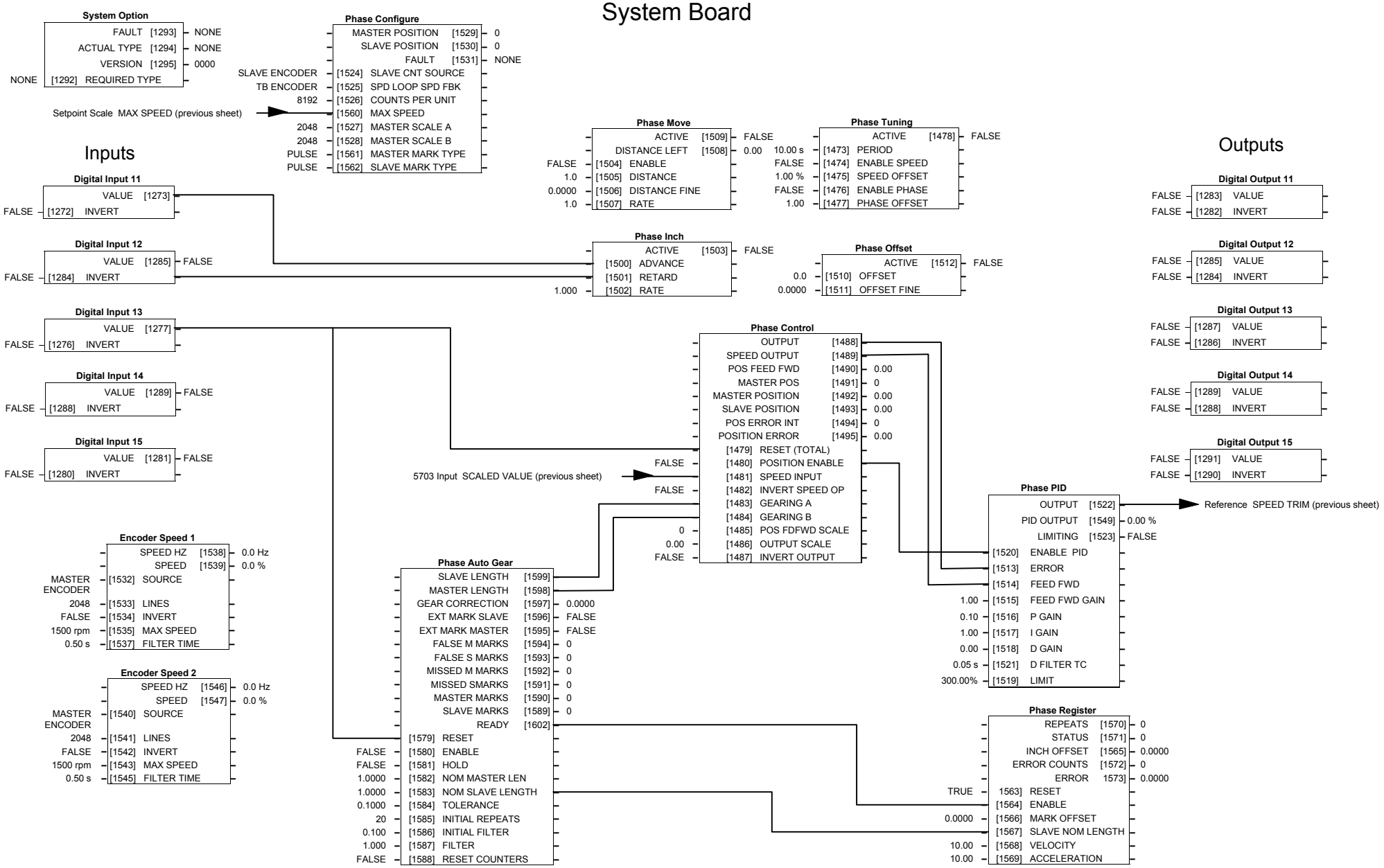
The Operator Menu for Macro 6

The default Operator Menu is shown below.





Macro 7: Phase/Register



Macro 7: Phase/Register

Macro 7: Phase/Register

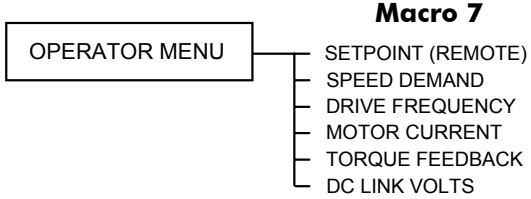
This macro is to be used in a slave drive set up for phase/register control. The slave will get the line speed setpoint from the master drive via the system port (serial port using the 5703 setpoint repeater). This provides the highest accuracy and least lag. If this is not possible, the speed demand should be derived from the master encoder using the Encoder Speed function block, or over the network.

Note: *Register control is enabled by setting REGISTER::RESET = FALSE*
If Auto-gearing is enabled, then it is important that
PHASE CONFIGURE::SCALE A = PHASE CONFIGURE::SCALE B

Control Wiring I/O			
Terminal	**Name**	**Purpose**	**Comment**
6	ANALOG OUTPUT 1	Ramp Output	absolute speed demand 0V = 0%, 10V = 100%
7	ANALOG OUTPUT 2	Speed Feedback	-10V = -100%, 10V = 100%
8	ANALOG OUTPUT 3	Torque Feedback	-10V = -100%, 10V = 100%
12	DIGITAL INPUT 1	Run Forward	24V = Run forward
13	DIGITAL INPUT 2	Run Reverse	24V = Run reverse
14	DIGITAL INPUT 3	Not Stop	24V = RUN FWD and RUN REV signals latched 0V = RUN FWD and RUN REV signals not latched
15	DIGITAL INPUT 4	Reverse	24V = Reverse
16	DIGITAL INPUT 5	Jog	24V = Jog
17	DIGITAL INPUT 6	Drive Enable	24V = Drive Enable
18	DIGITAL INPUT 7	Fast Stop	0V = Fast Stop
21, 22	DIGITAL OUTPUT 1	Health	0V = Tripped, i.e. not healthy
23, 24	DIGITAL OUTPUT 2	At Zero Speed	0V = At Zero Speed Feedback
25, 26	DIGITAL OUTPUT 3	Switched On	0V = Open, 24V = Swtiched On
System Board			
A2	DIGITAL INPUT 11	Inch Advance	
A3	DIGITAL INPUT 12	Inch Retard	
A4	DIGITAL INPUT 13	Reset	
5703	P3	Master Line Speed Demand	

The Operator Menu for Macro 7

The default Operator Menu is shown below.



System Board Terminals (option)

Terminal No.	Name	Range	Description
Terminal A 1 2 3 4 5 6			
1	External 0V		User-supplied 0V reference
2	DIGIO1		Configurable digital input/output
3	DIGIO2		Configurable digital input/output
4	DIGIO3		Configurable digital input/output
5	DIGIO4		Configurable digital input/output
6	DIGIO5		Configurable digital input/output
Terminal B 1 2 3 4 5 6 7 8 9			
1	External 24V In	24V dc (±10%) 1A	User-supplied power supply
2	Reference Encoder A		Input
3	Reference Encoder /A		Input
4	Reference Encoder B		Input
5	Reference Encoder /B		Input
6	Reference Encoder Z		Input
7	Reference Encoder /Z		Input
8	Encoder Supply Out	5V, 12V, 18V, 24V	User selectable (max load 500mA)
9	External 0V		User-supplied 0V reference
Terminal C 1 2 3 4 5 6			
1	Slave Encoder A		Input
2	Slave Encoder /A		Input
3	Slave Encoder B		Input
4	Slave Encoder /B		Input
5	Slave Encoder Z		Input
6	Slave Encoder /Z		Input
Terminal D 1 2 3 4 5 6			
1	Repeat Encoder Output A		Output
2	Repeat Encoder Output /A		Output
3	Repeat Encoder Output B		Output
4	Repeat Encoder Output /B		Output
5	Repeat Encoder Output Z		Output
6	Repeat Encoder Output /Z		Output

Motor Control

Autotune

	ACTIVE [604]	FALSE
FALSE	[603] ENABLE	

Current Limit

150.00 %	[365] CURRENT LIMIT	
TRUE	[686] REGEN LIM ENABLE	

Dynamic Braking

	BRAKING [81]	FALSE
TRUE	[80] ENABLE	
100 Ohm	[77] BRAKE RESISTANCE	
0.1 kW	[78] BRAKE POWER	
25	[79] 1SEC OVER RATING	

Feedbacks

	DC LINK VOLTS [75]	0 V
	TERMINAL VOLTS [1020]	0 V
	SPEED FEEDBACK RPM [569]	0.00 rpm
	SPEED FEEDBACK HZ [568]	0.00 Hz
	SPEED FEEDBACK % [749]	0.00 %
	ENCODER FBK % [1238]	0.00 %
	ENCODER COUNT [1016]	0
	TORQUE FEEDBACK [70]	0.00 %
	FIELD FEEDBACK [73]	0.00 %
	MOTOR CURRENT % [66]	0.00 %
	MOTOR CURRENT [67]	0.0 A
** 10.0 V	[761] ENCODER SUPPLY	
** 2048	[566] ENCODER LINES	
** FALSE	[567] ENCODER INVERT	
** FALSE	[50] QUADRATIC TORQUE	

Fluxing

LINEAR LAW	[104] V/F SHAPE
* 50.0 Hz	[106] BASE FREQUENCY
** 0.00 %	[107] FIXED BOOST
** 0.00 %	[108] AUTO BOOST

Flycatching

	ACTIVE [576]	FALSE
	SETPOINT [28]	0.00 %
FALSE	[570] ENABLE	
ALWAYS	[571] START MODE	
BIDIRECTIONAL	[572] SEARCH MODE	
** 9.00 %	[573] SEARCH VOLTS	
** 40.00 %	[32] SEARCH BOOST	
** 10.0 s	[574] SEARCH TIME	
5.0 Hz	[575] MIN SEARCH SPEED	
** 3.0 s	[709] REFLUX TIME	

Inverse Time

	IT LIMITING [1152]	FALSE
	INVERSE TIME OP [1153]	0.00 %
105.00 %	[1148] AIMING POINT	
60.0 s	[1149] DELAY	
10.0 s	[1150] DOWN TIME	
120.0 s	[1151] UP TIME	

Inj Braking

	ACTIVE [583]	FALSE
** 0.5 s	[710] DEFLUX TIME	
** 9.0 Hz	[577] FREQUENCY	
100.00 %	[578] I-LIM LEVEL	
** 2.0 s	[579] DC PULSE	
** 1.0 s	[580] FINAL DC PULSE	
** 4.00 %	[581] DC LEVEL	
600.0 s	[582] TIMEOUT	
** 100.00 %	[739] BASE VOLTS	

Motor Data

** VOLTS / HZ	[1157] CONTROL MODE	
** 5.50 kW	[1158] POWER	
** 50.0 Hz	[1159] BASE FREQUENCY	
** 400.0 V	[1160] MOTOR VOLTAGE	
** 11.30 A	[64] MOTOR CURRENT	
** 3.39 A	[65] MAG CURRENT	
** 1445.0 rpm	[83] NAMEPLATE RPM	
** STAR	[124] MOTOR CONNECTION	
** 4	[84] MOTOR POLES	
** 0.90	[242] POWER FACTOR	
** 2.0	[1164] OVERLOAD	
** 1.3625 Ohm	[119] STATOR RES	
** 43.37 mH	[120] LEAKAGE INDUC	
** 173.48 mH	[121] MUTUAL INDUC	
276.04 ms	[1163] ROTOR TIME CONST	

Pattern Gen

	DRIVE FREQUENCY [591]	0.00 Hz
TRUE	[98] RANDOM PATTERN	
3 kHz	[99] FREQ SELECT	
** 2.0 s	[100] DEFLUX DELAY	

Power Loss Cntrl

	PWR LOSS ACTIVE [1271]	FALSE
FALSE	[1265] ENABLE	
** 447V	[1266] TRIP THRESHOLD	
20V	[1267] CONTROL BAND	
10.00s	[1268] ACCEL TIME	
5.00s	[1269] DECEL TIME	
30.00s	[1270] TIME LIMIT	

Setpoint Scale

	OUTPUT [59]	0.0 Hz
0.00 %	[58] INPUT	
** 1500 RPM	[1032] MAX SPEED	

Slew Rate Limit

TRUE	[60] ENABLE	
500.0 Hz/s	[62] ACCEL LIMIT	
500.0 Hz/s	[61] DECEL LIMIT	

System Port (P3)

EI ASCII	[101] MODE	
0	[102] GROUP ID (GID)	
0	[103] UNIT ID (UID)	

Slip Comp

FALSE	[82] ENABLE	
** 150.0 rpm	[85] MOTORING LIMIT	
** 150.0 rpm	[86] REGEN LIMIT	

Speed Loop

	TOTAL SPD DMD RPM [1203]	0.00 RPM
	TOTAL SPD DMD % [1206]	0.00 %
	SPEED ERROR [1207]	0.00 %
	TORQUE DEMAND [1204]	0.00 %
	DIRECT INPUT [1205]	0.00 %
** 20.00	[1187] SPEED PROP GAIN	
** 100 ms	[1188] SPEED INT TIME	
FALSE	[1189] INT DEFEAT	
0.00 %	[1190] SPEED INT PRESET	
3.0 ms	[1191] SPEED DMD FILTER	
1.5 ms	[1192] SPEED FBK FILTER	
0.00 %	[1193] AUX TORQUE DMD	
0.00 %	[1194] ADAPTIVE THRESH	
0.00	[1195] ADAPTIVE P-GAIN	
NONE	[1196] DIRECT IP SELECT	
1.0000	[1197] DIRECT RATIO	
110.00 %	[1198] DIRCT IP POS LIM	
-110.00 %	[1199] DIRCT IP NEG LIM	
110.00 %	[1200] SPEED POS LIM	
-110.00 %	[1201] SPEED NEG LIM	
FALSE	[1202] TORQ DMD ISOLATE	

Stabilisation

TRUE	[128] ENABLE

Torque Limit

	ACTUAL POS LIM [1212]	0.00 %
	ACTUAL NEG LIM [1213]	0.00 %
150.00 %	[1208] POS TORQUE LIM	
-150.00 %	[1209] NEG TORQUE LIM	
150.00 %	[1210] MAIN TORQUE LIM	
150.00 %	[1554] FAST STOP T-LIM	
FALSE	[1211] SYMMETRIC LIM	

Voltage Control

NONE	[595] VOLTAGE MODE
** 400.0 V	[122] MOTOR VOLTS
100.00 %	[112] BASE VOLTS

Communications

Tec Option

	FAULT [756]	NONE
	VERSION [757]	0000
	OUTPUT 1 [758]	0000
	OUTPUT 2 [759]	0000
NONE	[750] TYPE	
0	[751] INPUT 1	
0	[752] INPUT 2	
0	[753] INPUT 3	
0	[754] INPUT 4	
0	[755] INPUT 5	

Sequencing and Reference

Auto Restart

	PENDING [608]	FALSE
	RESTARTING [616]	FALSE
	ATTEMPTS LEFT [614]	5
	TIME LEFT [615]	0.0 s
FALSE	[611] ENABLE	
5	[612] ATTEMPTS	
10.0 s	[610] INITIAL DELAY 1	
10.0 s	[613] ATTEMPT DELAY 1	
0000	[609] TRIGGERS 1	
0000	[744] TRIGGERS 1+	
0.1 s	[678] INITIAL DELAY 2	
0.1 s	[679] ATTEMPT DELAY 2	
0000	[677] TRIGGERS 2	
0000	[745] TRIGGERS 2+	

Comms Control

	COMMS SEQ [295]	FALSE
	COMMS REF [270]	FALSE
	COMMS STATUS [272]	0
	COMMS COMMAND [273]	0
FALSE	[300] REMOTE COMMS SEL	
TERMINALS/COMMS	[307] REMOTE SEQ MODES	
TERMINALS/COMMS	[308] REMOTE REF MODES	
0.0 s	[309] COMMS TIMEOUT	

Reference Jog

10.00 %	[246] SETPOINT	
1.0 s	[261] ACCEL TIME	
1.0 s	[262] DECEL TIME	

Reference

	SPEED DEMAND [255]	0.00 %
	SPEED SETPOINT [254]	0.00 %
	REVERSE [256]	FALSE
	LOCAL SETPOINT [247]	0.00 %
	LOCAL REVERSE [250]	FALSE
	COMMS SETPOINT [770]	0.00 %
0.00 %	[245] REMOTE SETPOINT	
0.00 %	[248] SPEED TRIM	
110.00 %	[252] MAX SPEED CLAMP	
-110.00 %	[253] MIN SPEED CLAMP	
FALSE	[243] TRIM IN LOCAL	
FALSE	[249] REMOTE REVERSE	

5703 Input

	SCALED VALUE [1260]	0.00
	RAW VALUE [1261]	0.00
	BREAK [1262]	FALSE
1.0000	[1258] RATIO	
FALSE	[1259] NEGATE	

5703 Output

0.00	[1263] VALUE	
FALSE	[1264] REPEATER	

Local Control

	REMOTE SEQ [297]	TRUE
	REMOTE REF [257]	TRUE
LOCAL/REMOTE	[298] SEQ MODES	
LOCAL/REMOTE	[265] REF MODES	
REMOTE	[299] POWER UP MODE	
FALSE	[281] SEQ DIRECTION	

Reference Ramp

	RAMPING [698]	FALSE
LINEAR	[244] RAMP TYPE	
10.0 s	[258] ACCEL TIME	
10.0 s	[259] DECEL TIME	
FALSE	[268] SYMMETRIC MODE	
10.0 s	[267] SYMMETRIC TIME	
10.00 /s^2	[692] SRAMP ACCEL	
10.00 /s^2	[693] SRAMP DECEL	
10.00 /s^3	[694] SRAMP JERK 1	
10.00 /s^3	[695] SRAMP JERK 2	
10.00 /s^3	[696] SRAMP JERK 3	
10.00 /s^3	[697] SRAMP JERK 4	
TRUE	[691] SRAMP CONTINUOUS	
FALSE	[260] HOLD	

Reference Stop

STOP RAMP	[279] RUN STOP MODE	
10.0 s	[263] STOP TIME	
0.10 %	[266] STOP ZERO SPEED	
0.500 s	[284] STOP DELAY	
RAMPED	[304] FAST STOP MODE	
30.0 s	[275] FAST STOP LIMIT	
0.1 s	[264] FAST STOP TIME	
1200 Hz/s	[126] FINAL STOP RATE	

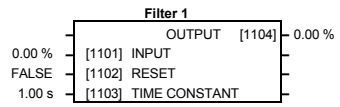
Sequencing Logic

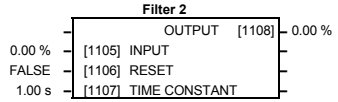
	TRIPPED [289]	FALSE
	RUNNING [285]	FALSE
	JOGGING [302]	FALSE
	STOPPING [303]	FALSE
	OUTPUT CONTACTOR [286]	FALSE
	SWITCH ON ENABLE [288]	FALSE
	SWITCHED ON [306]	FALSE
	READY [287]	FALSE
	SYSTEM RESET [305]	FALSE
	SEQUENCER STATE [301]	START DISABLED
	REMOTE REV OUT [296]	FALSE
	HEALTHY [274]	TRUE
FALSE	[291] RUN FORWARD	
FALSE	[292] RUN REVERSE	
FALSE	[293] NOT STOP	
FALSE	[280] JOG	
TRUE	[1235] CONTACTOR CLOSED	
TRUE	[276] DRIVE ENABLE	
TRUE	[277] NOT FAST STOP	
TRUE	[278] NOT COAST STOP	
FALSE	[294] REMOTE REVERSE	
FALSE	[282] REM TRIP RESET	
TRUE	[290] TRIP RST BY RUN	
FALSE	[283] POWER UP START	

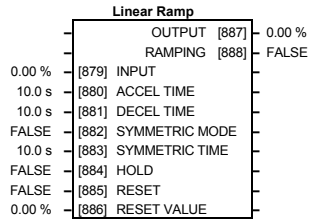
Macro Control Blocks

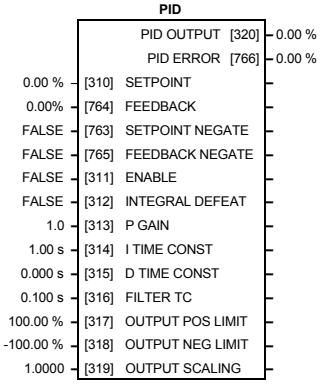
Some of these blocks may already be in use by the macros

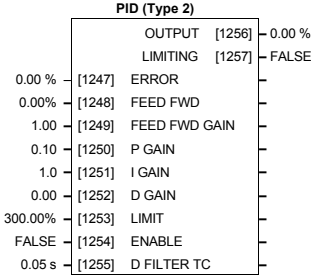
Setpoint Functions

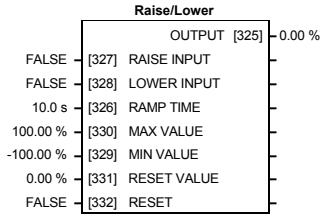


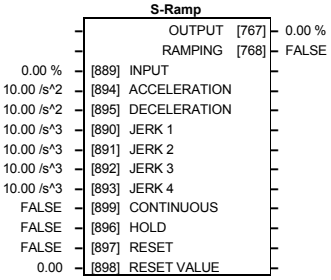


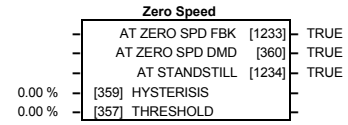


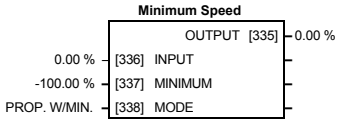


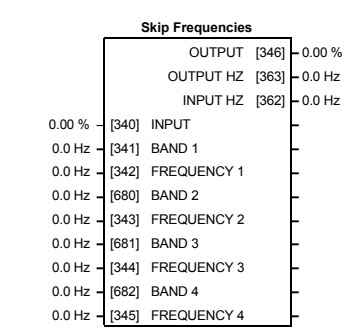


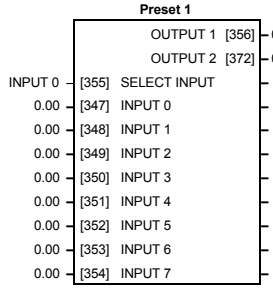


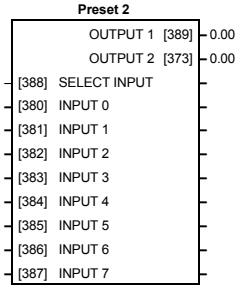


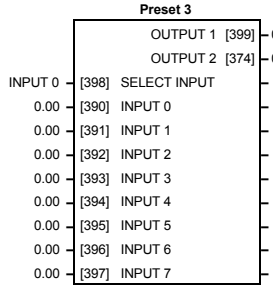


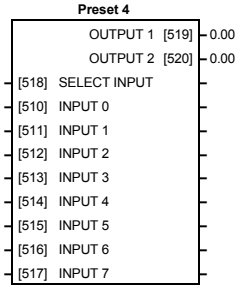


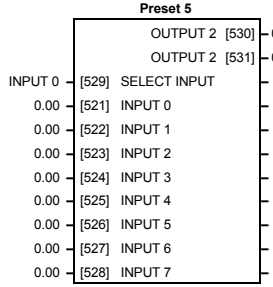


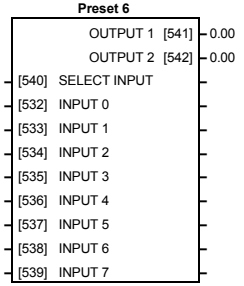


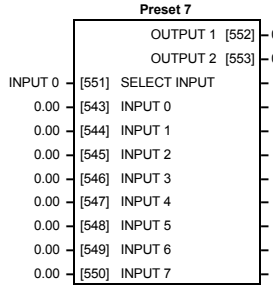


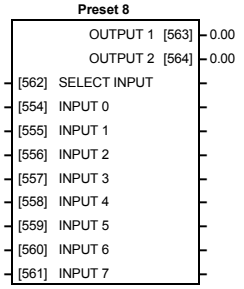




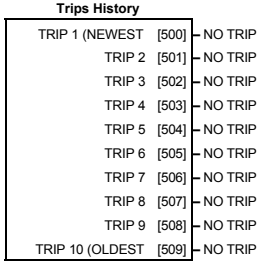


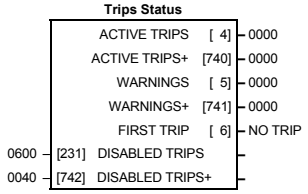


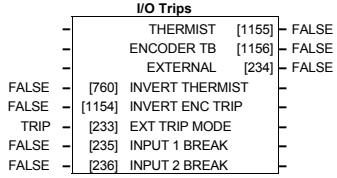


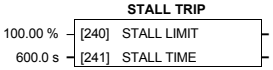


Trips

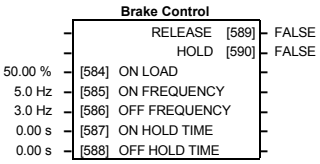








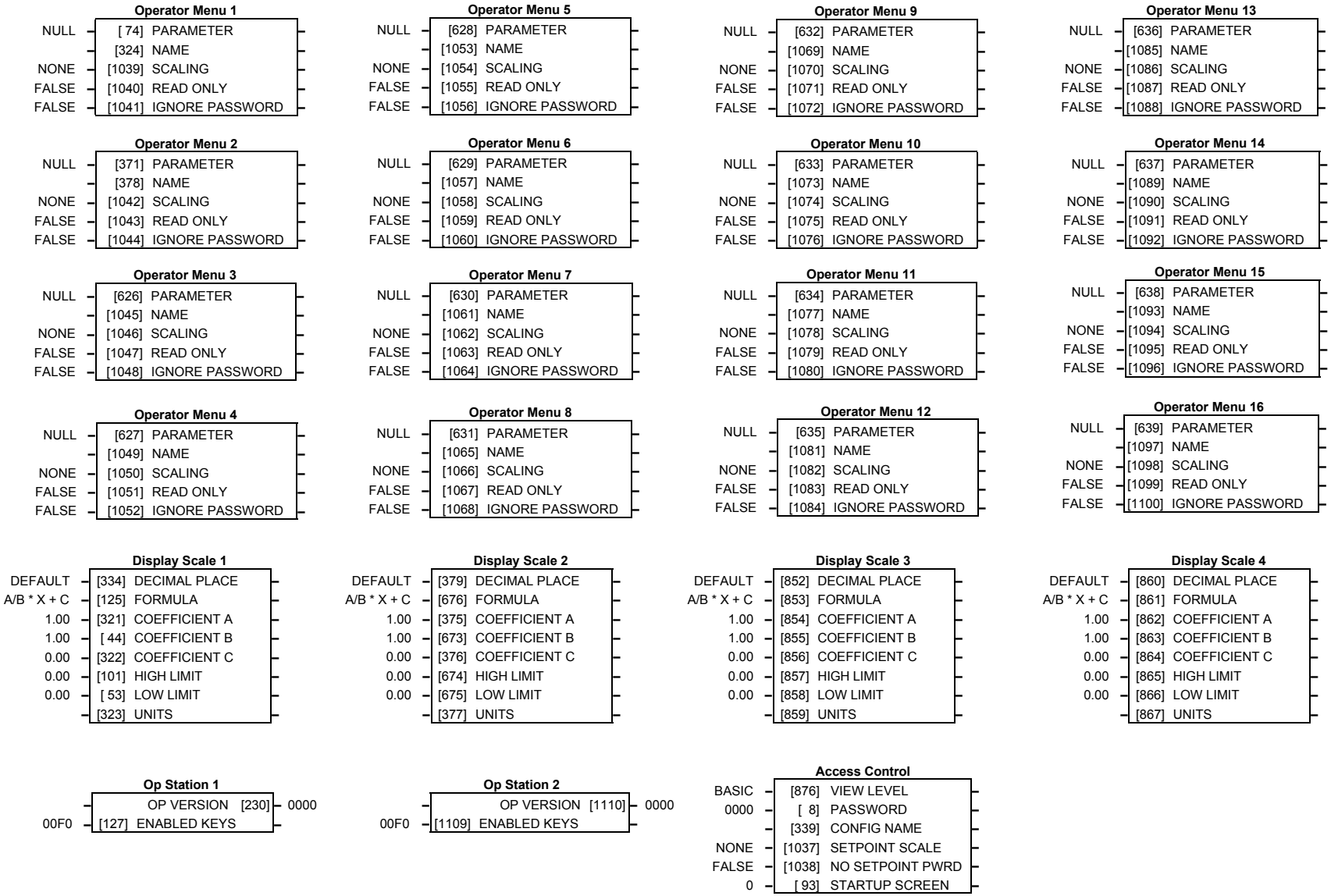
Hoist/Lift



Macro Control Blocks

Some of these blocks may already be in use by the macros

Menus



Macro Control Blocks

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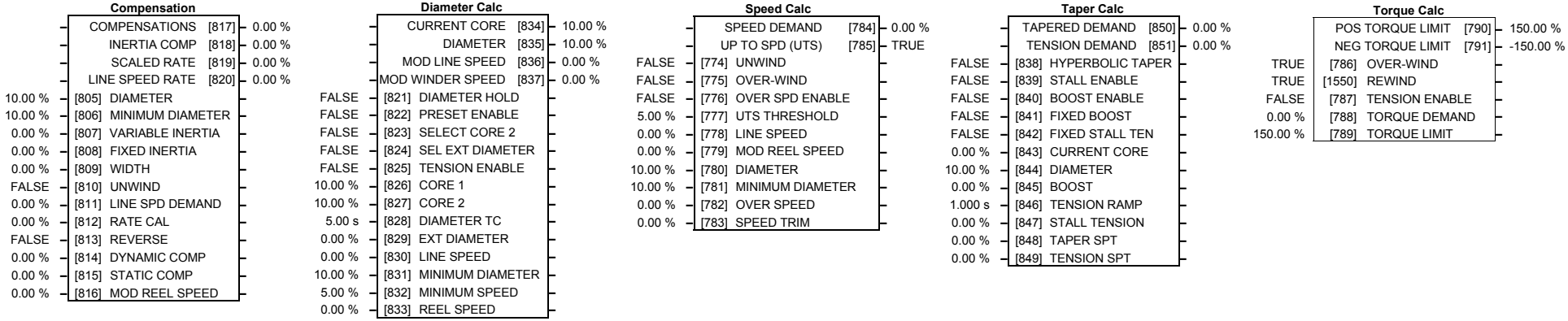
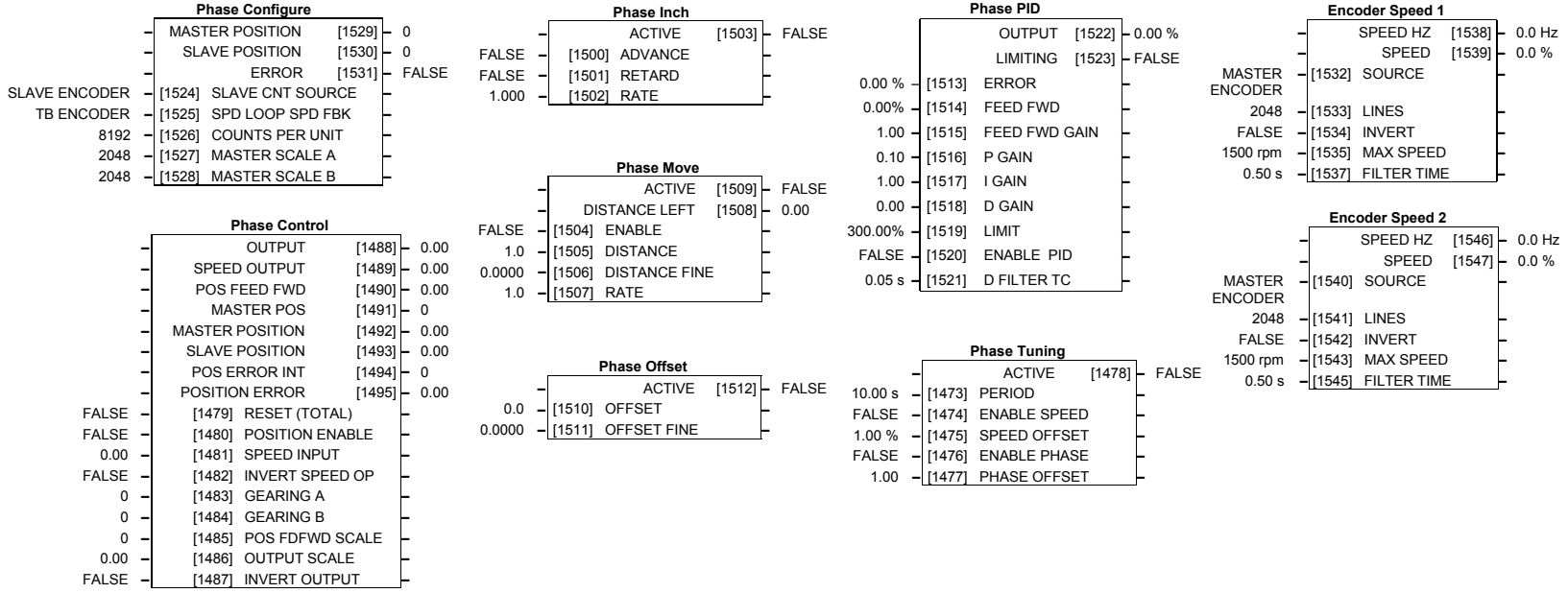
Winder



Encoder Functions



Macro Control Blocks

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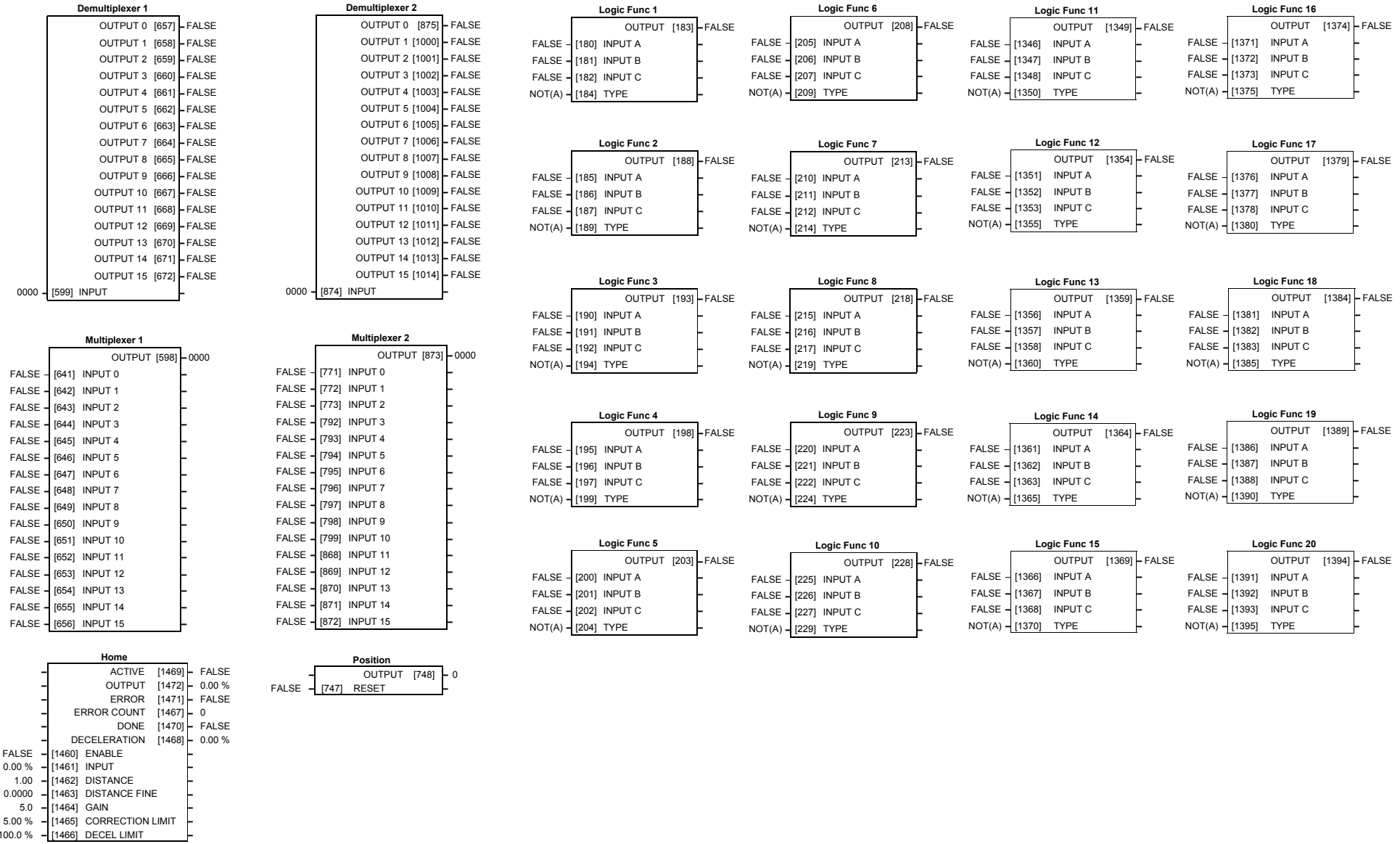
Miscellaneous



Macro Control Blocks

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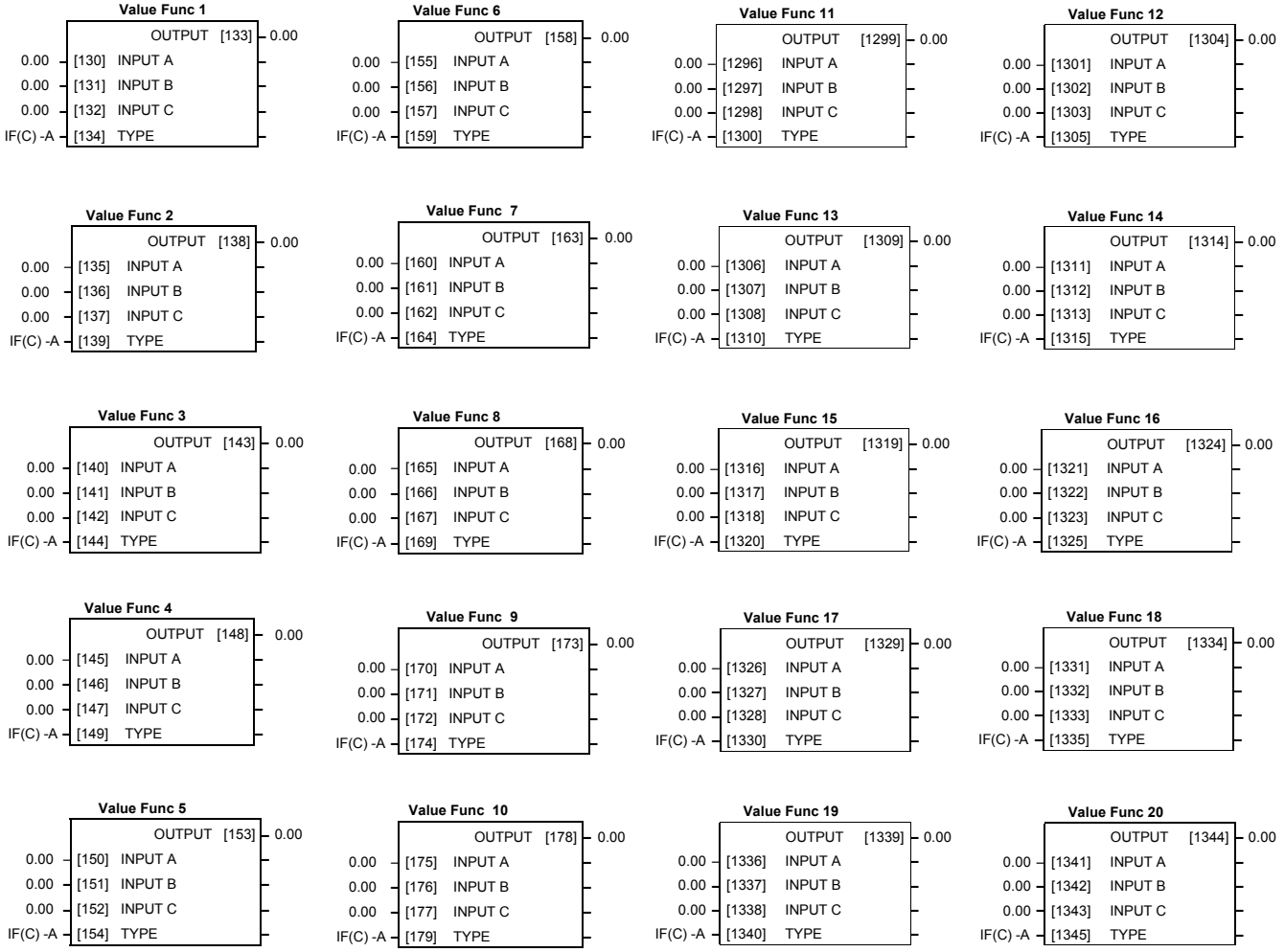
Miscellaneous



Macro Control Blocks

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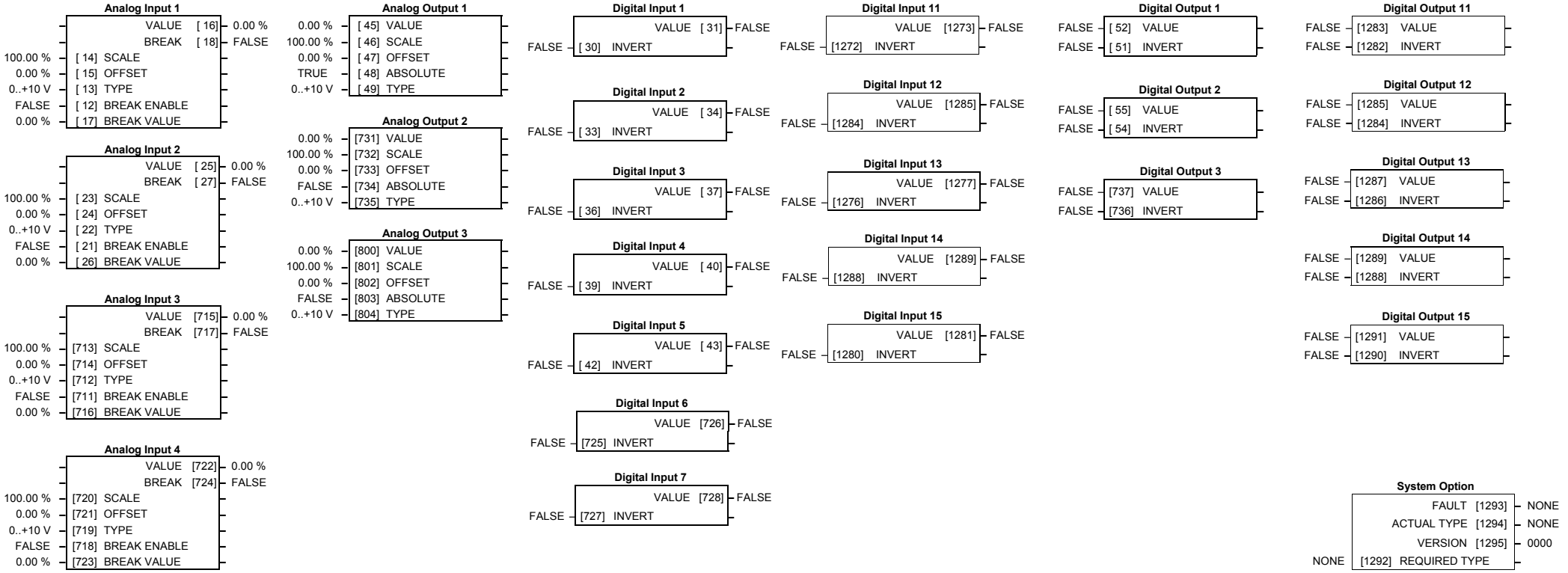
Inputs and Outputs



Macro Control Blocks

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ISS.	MODIFICATION	ECN No.	DATE	DRAWN	CHK'D
A	First release of HA470844	HVAC10	6/2/02	CM	FW

FIRST USED ON	MODIFICATION RECORD HVAC10 Series AC Drive	
EUROTHERM DRIVES	DRAWING NUMBER ZZ470844	SHT. 1 OF 1