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11.4 Onboard PLC parameters

The following parameters are associated with the Onboard PLC user program.

11.047	Onboard User Program: Enable					
RW	Txt				US	
⇳	Stop (0) or Run (1)			⇨	Run (1)	

This parameter stops and starts the user program.

0 - Stop the User Program

The onboard user program is stopped. If it is restarted by setting *Onboard User Program: Enable* (11.047) to a non-zero value the background task starts from the beginning.

1 - Run the User Program

The user program will execute.

11.048	Onboard User Program: Status					
RO	Txt		NC	PT		
⇳	-2147483648 to 2147483647			⇨		

This parameter is read-only and indicates the status of the user program in the drive. The user program writes the value to this parameter.

0: Stopped

1: Running

2: Exception

3: No user program present

11.049	Onboard User Program: Programming Events					
RO	Uni		NC	PT	PS	
⇳	0 to 65535			⇨		

This parameter holds the number of times an Onboard PLC user program download has taken place and is 0 on dispatch from the factory. The drive is rated for one hundred program downloads. This parameter is not altered when defaults are loaded.

11.050	Onboard User Program: Freewheeling Tasks Per Second					
RO	Uni		NC	PT		
⇳	0 to 65535			⇨		

This parameter shows the number of times the freewheeling task has started per second.

11.051	Onboard User Program: Clock Task Time Used					
RO			NC	PT		
⇳	0.0 to 100.0 %			⇨		

This parameter shows the percentage of the available time used by the user program clock task.

11.055	Onboard User Program: Clock Task Scheduled Interval					
RO			NC	PT		
⇳	0 to 262128 ms			⇨		

This parameter shows the interval at which the clock task is scheduled to run at in ms.

11.5 Onboard PLC trips

If the drive detects an error in the user program it will initiate a User Program trip. The sub-trip number for the User Program trip details the reason for the error. See Chapter 13 *Diagnostics* on page 245 for more information on the User Program trip.

12 Advanced parameters

This is a quick reference to all parameters in the drive showing units, ranges limits etc, with block diagrams to illustrate their function. Full descriptions of the parameters can be found in the *Parameter Reference Guide*.

WARNING

These advanced parameters are listed for reference purposes only. The lists in this chapter do not include sufficient information for adjusting these parameters. Incorrect adjustment can affect the safety of the system, and damage the drive and or external equipment. Before attempting to adjust any of these parameters, refer to the *Parameter Reference Guide*.

Table 12-1 Menu descriptions

Menu	Description
0	Commonly used basic set up parameters for quick / easy programming
1	Frequency / Speed reference
2	Ramps
3	Frequency slaving, speed feedback and speed control
4	Torque and current control
5	Motor control
6	Sequencer and clock
7	Analog I/O / Temperature monitoring
8	Digital I/O
9	Programmable logic, motorized pot, binary sum, timers and scope
10	Status and trips
11	Drive set-up and identification, serial communications
12	Threshold detectors and variable selectors
13	Standard motion control
14	User PID controller
15	Option module slot 1 set-up menu
16	Option module slot 2 set-up menu
17	Option module slot 3 set-up menu
18	General option module application menu 1
19	General option module application menu 2
20	General option module application menu 3
21	Second motor parameters
22	Menu 0 set-up
23	Not allocated
24	Ethernet module (slot 4) set-up menu*
25	Option module slot 1 application parameters
26	Option module slot 2 application parameters
27	Option module slot 3 application parameters
28	Option module slot 4 application parameters
29	Reserved menu
30	Onboard user programming application menu
31-41	Advanced motion controller setup parameters
Slot 1	Slot 1 option menus**
Slot 2	Slot 2 option menus**
Slot 3	Slot 3 option menus**
Slot 4	Slot 4 option menus**

* Only displayed on *Unidrive M700 / M702*.

** Only displayed when the option modules are installed.

Operation mode abbreviations:

Open-loop: Sensorless control for induction motors

RFC-A: Asynchronous Rotor Flux Control for induction motors

RFC-S: Synchronous Rotor Flux Control for synchronous motors including permanent magnet motors.

Default abbreviations:

Standard default value (50 Hz AC supply frequency)

USA default value (60 Hz AC supply frequency)

NOTE

Parameter numbers shown in brackets {...} are the equivalent Menu 0 parameters. Some Menu 0 parameters appear twice since their function depends on the operating mode.

The Range - RFC-A / S column applies to both RFC-A and RFC-S. For some parameters, this column applies to only one of these modes, this is indicated accordingly in the Default columns.

In some cases, the function or range of a parameter is affected by the setting of another parameter. The information in the lists relates to the default condition of any parameters affected in this way.

Table 12-2 Key to parameter table coding

Coding	Attribute
RW	Read/Write: can be written by the user
RO	Read only: can only be read by the user
Bit	1 bit parameter. 'On' or 'Off' on the display
Num	Number: can be uni-polar or bi-polar
Txt	Text: the parameter uses text strings instead of numbers.
Bin	Binary parameter
IP	IP Address parameter
Mac	Mac Address parameter
Date	Date parameter
Time	Time parameter
Chr	Character parameter
FI	Filtered: some parameters which can have rapidly changing values are filtered when displayed on the drive keypad for easy viewing.
DE	Destination: This parameter selects the destination of an input or logic function.
RA	Rating dependent: this parameter is likely to have different values and ranges with drives of different voltage and current ratings. Parameters with this attribute will be transferred to the destination drive by non-volatile storage media when the rating of the destination drive is different from the source drive and the file is a parameter file. However, the values will be transferred if only the current rating is different and the file is a difference from default type file.
ND	No default: The parameter is not modified when defaults are loaded
NC	Not copied: not transferred to or from non-volatile media during copying.
PT	Protected: cannot be used as a destination.
US	User save: parameter saved in drive EEPROM when the user initiates a parameter save.
PS	Power-down save: parameter automatically saved in drive EEPROM when the under volts (UV) state occurs.

Table 12-3 Feature look-up table

Feature	Related parameters (Pr)												
Acceleration rates	02.010	02.011 to 02.019		02.032	02.033	02.034	02.002						
Analog speed reference 1	01.036	07.010	07.001	07.007	07.008	07.009	07.025	07.026	07.030				
Analog speed reference 2	01.037	07.014	01.041	07.002	07.011	07.012	07.013	07.029	07.031				
Analog I/O	Menu 7												
Analog input 1	07.001	07.007	07.008	07.009	07.010	07.025	07.026	07.030					
Analog input 2	07.002	07.011	07.012	07.013	07.014	07.029	07.031						
Analog input 3	07.003	07.015	07.016	07.017	07.018	07.032							
Analog output 1	07.019	07.020											
Analog output 2	07.022	07.023											
Application menu	Menu 18		Menu 19		Menu 20								
At speed indicator bit	03.006	03.007	03.009	10.006	10.005	10.007							
Auto reset	10.034	10.035	10.036	10.001									
Autotune	05.010	05.012	05.017	05.024	05.025	05.029	05.030	05.059	05.060	05.062			
Binary sum	09.029	09.030	09.031	09.032	09.033	09.034							
Bipolar speed	01.010												
Brake control	12.040 to 12.055												
Braking	10.011	10.010	10.030	10.031	06.001	02.004	02.002	10.012	10.039	10.040	10.061		
Catch a spinning motor	06.009	05.040											
Coast to stop	06.001												
Comms	11.023 to 11.027												
Copying	11.042	11.036 to 11.040											
Cost - per kWh electricity	06.016	06.017	06.024	06.025	06.026	06.027	06.028						
Current controller	04.013	04.014											
Current feedback	04.001	04.002	04.017	04.004	04.012	04.020	04.023	04.024	04.026	10.008	10.009	10.017	
Current limits	04.005	04.006	04.007	04.018	04.015	04.019	04.016	05.007	05.010	10.008	10.009	10.017	
DC bus voltage	05.005	02.008											
DC injection braking	06.006	06.007	06.001										
Deceleration rates	02.020	02.021 to 02.029		02.004	02.035 to 02.037		02.002	02.008	06.001	10.030	10.031	10.039	02.009
Defaults	11.043	11.046											
Digital I/O	Menu 8												
Digital I/O read word	08.020												
Digital I/O 1 T24	08.001	08.011	08.021	08.031									
Digital I/O 2 T25	08.002	08.012	08.022	08.032									
Digital I/O 3 T26	08.003	08.013	08.023	08.033									
Digital input 4 T27	08.004	08.014	08.024										
Digital input 5 T28	08.005	08.015	08.025										
Digital input 6 T29	08.006	08.016	08.026										
Digital lock	13.010	13.001 to 13.009			13.011	13.012	13.016	03.022	03.023	13.019 to 13.023			
Digital output T22	08.008	08.018	08.028										
Direction	10.013	06.030	06.031	01.003	10.014	02.001	03.002	08.003	08.004	10.040			
Drive active	10.002	10.040											
Drive derivative	11.028												
Drive OK	10.001	08.027	08.007	08.017	10.036	10.040							
Dynamic performance	05.026												
Dynamic V/F	05.013												
Enable	06.015	08.009	08.040										
Encoder reference	03.043	03.044	03.045	03.046									
Encoder set-up	03.033	03.034 to 03.042			03.047	03.048							
External trip	10.032	08.010	08.007										
Fan speed	06.045												
Fast disable	06.029												
Field weakening - induction motor	05.029	05.030	01.006	05.028	05.062	05.063							
Field weakening - servo	05.022	01.006	05.009										
Filter change	06.019	06.018	06.021	06.022	06.023								
Frequency reference selection	01.014	01.015											
Frequency slaving	03.001	03.013	03.014	03.015	03.016	03.017							
Hard speed reference	03.022	03.023											
Heavy duty rating	05.007	11.032											
High stability space vector modulation	05.019												
I/O sequencer	06.030	06.031	06.032	06.033	06.034	06.042	06.043	06.041					
Inertia compensation	02.038	05.012	04.022	03.018									

Feature	Related parameters (Pr)												
Jog reference	01.005	02.019	02.029										
Keypad reference	01.017	01.014	01.043	01.051	06.012	06.013							
Kt	05.032												
Limit switches	06.035	06.036											
Line power supply loss	06.003	10.015	10.016	05.005	06.048								
Local position reference	13.020 to 13.023												
Logic function 1	09.001	09.004	09.005	09.006	09.007	09.008	09.009	09.010					
Logic function 2	09.002	09.014	09.015	09.016	09.017	09.018	09.019	09.020					
Low voltage supply	06.044												
Marker pulse	03.032	03.031											
Maximum speed	01.006												
Menu 0 set-up	11.018 to 11.022			Menu 22									
Minimum speed	01.007	10.004											
Modules - number of	11.035												
Motor map	05.006	05.007	05.008	05.009	05.010	05.011							
Motor map 2	Menu 21		11.45										
Motorized potentiometer	09.021	09.022	09.023	09.024	09.025	09.026	09.027	09.028					
Offset speed reference	01.004	01.038	01.009										
Onboard PLC	11.047 to 11.051												
Open loop vector mode	05.014	05.017											
Operating mode	00.048	11.031	03.024	05.014									
Orientation	13.010	13.013 to 13.015											
Output	05.001	05.002	05.003	05.004									
Overspeed threshold	03.008												
Phase angle	03.025	05.012											
PID controller	Menu 14												
Position feedback - drive	03.028	03.029	03.030	03.050									
Positive logic	08.029												
Power up parameter	11.022	11.021											
Precision reference	01.018	01.019	01.020	01.044									
Preset speeds	01.015	01.021 to 01.028			01.016	01.014	01.042	01.045 to 01.048			01.050		
Programmable logic	Menu 9												
Quasi square operation	05.020												
Ramp (accel / decel) mode	02.004	02.008	06.001	02.002	02.003	10.030	10.031	10.039					
Rated speed autotune	05.016	05.008											
Regenerating	10.010	10.011	10.030	10.031	06.001	02.004	02.002	10.012	10.039	10.040			
Relative jog	13.017 to 13.019												
Relay output	08.007	08.017	08.027										
Reset	10.033	08.002	08.022	10.034	10.035	10.036	10.001	10.038					
RFC mode (encoder less CLV mode)	03.024	03.042	04.012										
S ramp	02.006	02.007											
Sample rates	05.018												
Safe Torque Off input	08.009	08.040											
Security code	11.030	11.044											
Serial comms	11.023 to 11.027			11.020									
Skip speeds	01.029	01.030	01.031	01.032	01.033	01.034	01.035						
Slip compensation	05.027	05.008											
NV media card	11.036 to 11.040			11.042									
Firmware version	11.029	11.034	11.062										
Speed controller	03.010 to 03.017			03.019	03.020	03.021							
Speed feedback	03.002	03.003	03.004										
Speed feedback - drive	03.026	03.027	03.028	03.029	03.030	03.031	03.042						
Speed feed forward	01.039	01.040											
Speed reference selection	01.014	01.015	01.049	01.050	01.001								
Status word	10.040												
Supply	06.044	05.005											
Switching frequency	05.018	05.035	07.034	07.035									
Thermal protection - drive	05.018	05.035	07.004	07.005	07.006	07.034	07.035	07.036	10.018				
Thermal protection - motor	04.015	05.007	04.019	04.016	04.025	07.015							
Thermistor input	07.003	07.015	07.046	07.047	07.048	07.049	07.050						
Threshold detector 1	12.001	12.003 to 12.007											
Threshold detector 2	12.002	12.023 to 12.027											
Time - filter change	06.019	06.018	06.021	06.022	06.023								
Time - powered up log	06.019	06.020											

Feature	Related parameters (Pr)												
Time - run log	06.019												
Torque	04.003	04.026	05.032										
Torque mode	04.008	04.011	04.009	04.010									
Trip detection	10.037	10.038	10.020 to 10.029										
Trip log	10.020 to 10.029			10.041 to 10.060				10.070 to 10.079					
Under voltage	05.005	10.016	10.015										
V/F mode	05.015	05.014											
Variable selector 1	12.008 to 12.016												
Variable selector 2	12.028 to 12.036												
Voltage controller	05.031												
Voltage mode	05.014	05.017		05.015									
Voltage rating	11.033	05.009	05.005										
Voltage supply	06.044		05.005										
Warning	10.019	10.012	10.017	10.018	10.040								
Zero speed indicator bit	03.005	10.003											

12.1 Parameter ranges and Variable minimum/maximums

Some parameters in the drive have a variable range with a variable minimum and a variable maximum value which is dependent on one of the following:

- The settings of other parameters
- The drive rating
- The drive mode
- Combination of any of the above

The tables below give the definition of variable minimum/maximum and the maximum range of these.

VM_AC_VOLTAGE	Range applied to parameters showing AC voltage
Units	V
Range of [MIN]	0
Range of [MAX]	0 to 930
Definition	VM_AC_VOLTAGE[MAX] is drive voltage rating dependent. See Table 12-4 VM_AC_VOLTAGE[MIN] = 0

VM_AC_VOLTAGE_SET	Range applied to the AC voltage set-up parameters
Units	V
Range of [MIN]	0
Range of [MAX]	0 to 690
Definition	VM_AC_VOLTAGE[MAX] is drive voltage rating dependent. See Table 12-4 VM_AC_VOLTAGE[MIN] = 0

VM_ACCEL_RATE	Maximum applied to the ramp rate parameters
Units	s / 100 Hz, s / 1000 rpm, s / 1000 mm/s
Range of [MIN]	Open-loop: 0.0 RFC-A, RFC-S: 0.000
Range of [MAX]	Open-loop: 0.0 to 3200.0 RFC-A, RFC-S: 0.000 to 3200.000
Definition	Open-loop mode If *Ramp Rate Units* (02.039) = 0: VM_ACCEL_RATE[MAX] = 3200.0 If *Ramp Rate Units* (02.039) = 1: VM_ACCEL_RATE[MAX] = 3200.0 x Pr **01.006** / 100.0 VM_ACCEL_RATE[MIN] = 0.0 RFC-A, RFC-S modes If *Ramp Rate Units* (02.039) = 0: VM_ACCEL_RATE[MAX] = 3200.000 If *Ramp Rate Units* (02.039) = 1: VM_ACCEL_RATE[MAX] = 3200.000 x Pr **01.006** / 1000.0 VM_ACCEL_RATE[MIN] = 0.000 If the second motor map is selected (Pr **11.045** = 1) Pr **21.001** is used instead of Pr **01.006**.

VM_AMC_JERK_UNIPOLAR	Range applied to the parameters showing the AMC jerk
Units	User units / ms / ms / ms
Range of [MIN]	0
Range of [MAX]	107374.1823
Definition	VM_AMC_JERK_UNIPOLAR[MAX] = 107374.1823 / *AMC Auto Resolution Scaling* (31.016) VM_AMC_JERK_UNIPOLAR[MIN] = 0

VM_AMC_POSITION	Range applied to the parameters showing the AMC position
Unit	User units
Range of [MIN]	-2147483648
Range of [MAX]	2147483647
Definition	VM_AMC_POSITION is modified by *AMC Auto Resolution Scaling* (31.016) and *AMC Roll Over Limit* (31.010). See the table below.

AMC Roll Over Limit (31.010)	**= 0**	**> 0**
VM_AMC_POSITION[MAX]	2147483647 / *AMC Auto Resolution Scaling* (31.016)	*AMC Roll Over Limit* (31.010) - 1
VM_AMC_POSITION[MIN]	-2147483648 / *AMC Auto Resolution Scaling* (31.016)	0

VM_AMC_POSITION_CAM	Range applied to the parameters showing the AMC cam position
Unit	User units
Range of [MIN]	-1073741824
Range of [MAX]	1073741823
Definition	VM_AMC_POSITION_CAM is modified by *AMC Auto Resolution Scaling* (31.016) and *AMC Roll Over Limit* (31.010). See the table below.

AMC Roll Over Limit (31.010)	**= 0**	**> 0**
VM_AMC_POSITION_CAM[MAX]	1073741823 / *AMC Auto Resolution Scaling* (31.016)	*AMC Roll Over Limit* (31.010) - 1
VM_AMC_POSITION_CAM[MIN]	-1073741824 / *AMC Auto Resolution Scaling* (31.016)	-*AMC Roll Over Limit* (31.010) + 1

VM_AMC_POSITION_CAM_UNIPOLAR	Unipolar version of VM_AMC_POSITION_CAM
Unit	User units
Range of [MIN]	0
Range of [MAX]	1073741823
Definition	VM_AMC_POSITION_CAM_UNIPOLAR is modified by *AMC Auto Resolution Scaling* (31.016) and *AMC Roll Over Limit* (31.010). See the table below. .

AMC Roll Over Limit (31.010)	**= 0**	**> 0**
VM_AMC_POSITION_CAM_UNIPOLAR[MAX]	1073741823 / *AMC Auto Resolution Scaling* (31.016)	*AMC Roll Over Limit* (31.010) - 1
VM_AMC_POSITION_CAM_UNIPOLAR[MIN]	0	0

VM_AMC_POSITION_REF	Range applied to the AMC position reference
Unit	User units
Range of [MIN]	-2147483648
Range of [MAX]	2147483647
Definition	VM_AMC_POSITION_REF is modified by *AMC Auto Resolution Scaling* (31.016), *AMC Roll Over Limit* (31.010) and *AMC Rotary Mode* (34.005). See the table below.

AMC Roll Over Limit (31.010)	**= 0**	**> 0**	**> 0**
AMC Rotary Mode (34.005)	**Not active**	**< 4**	**= 4**
VM_AMC_POSITION_REF[MAX]	2147483647 / *AMC Auto Resolution Scaling* (31.016)	*AMC Roll Over Limit* (31.010) - 1	1073741823 / *AMC Auto Resolution Scaling* (31.016)
VM_AMC_POSITION_REF[MIN]	-2147483648 / *AMC Auto Resolution Scaling* (31.016)	0	-1073741824 / *AMC Auto Resolution Scaling* (31.016)

VM_AMC_POSITION_UNIPOLAR	Unipolar version of VM_AMC_POSITION
Unit	User units
Range of [MIN]	0
Range of [MAX]	2147483647
Definition	VM_AMC_POSITION_UNIPOLAR is modified by *AMC Auto Resolution Scaling* (31.016) and *AMC Roll Over Limit* (31.010). See the table below.

AMC Roll Over Limit (31.010)	= 0	> 0
VM_AMC_POSITION_UNIPOLAR[MAX]	2147483647 / *AMC Auto Resolution Scaling* (31.016)	*AMC Roll Over Limit* (31.010) - 1
VM_AMC_POSITION_UNIPOLAR[MIN]	0	0

VM_AMC_RATE	Range applied to the parameters showing the AMC acceleration
Unit	User units / ms / ms
Range of [MIN]	1073742.824
Range of [MAX]	1073741.823
Definition	VM_AMC_RATE_UNIPOLAR[MAX] = 1073741.823 / *AMC Auto Resolution Scaling* (31.016) VM_AMC_RATE_UNIPOLAR[MIN] = 1073741.824 / AMC Auto Resolution Scaling (31.016)

VM_AMC_RATE_UNIPOLAR	Unipolar version of VM_AMC_RATE
Unit	User units / ms / ms
Range of [MIN]	0
Range of [MAX]	1073741.823
Definition	VM_AMC_RATE_UNIPOLAR[MAX] = 1073741.823 / *AMC Auto Resolution Scaling* (31.016) VM_AMC_RATE_UNIPOLAR[MIN] = 0

VM_AMC_ROLLOVER	Maximum applied to the AMC Rollover parameter
Unit	User units / ms / ms
Range of [MIN]	0
Range of [MAX]	1073741823
Definition	VM_AMC_ROLLOVER[MAX] = 1073741823 / *AMC Auto Resolution Scaling* (31.016) VM_AMC_ROLLOVER[MIN] = 0

VM_AMC_SPEED	Range applied to the parameters showing the AMC speed
Unit	User units / ms / ms
Range of [MIN]	-21474836.48
Range of [MAX]	21474836.47
Definition	VM_AMC_SPEED[MAX] = 21474836.47 / *AMC Auto Resolution Scaling* (31.016) VM_AMC_SPEED[MIN] = -21474836.48 / *AMC Auto Resolution Scaling* (31.016)

VM_AMC_SPEED_UNIPOLAR	Unipolar version of VM_AMC_SPEED
Unit	User units / ms
Range of [MIN]	0
Range of [MAX]	21474836.47
Definition	VM_SPEED_UNIPOLAR[MAX] = 21474836.47 / *AMC Auto Resolution Scaling* (31.016) VM_SPEED_UNIPOLAR[MIN] = 0

VM_DC_VOLTAGE	Range applied to parameters showing DC voltage
Units	V
Range of [MIN]	0
Range of [MAX]	0 to 1190
Definition	VM_DC_VOLTAGE[MAX] is the full scale d.c. link voltage feedback (over voltage trip level) for the drive. This level is drive voltage rating dependent. See Table 12-4. VM_DC_VOLTAGE[MIN] = 0

VM_DC_VOLTAGE_SET	Range applied to DC voltage reference parameters
Units	V
Range of [MIN]	0
Range of [MAX]	0 to 1150
Definition	VM_DC_VOLTAGE_SET[MAX] is drive voltage rating dependent. See Table 12-4. VM_DC_VOLTAGE_SET[MIN] = 0

VM_DRIVE_CURRENT	Range applied to parameters showing current in A
Units	A
Range of [MIN]	-99999.999 to 0.000
Range of [MAX]	0.000 to 99999.999
Definition	VM_DRIVE_CURRENT[MAX] is equivalent to the full scale (over current trip level) for the drive and is given by *Full Scale Current Kc* (11.061). VM_DRIVE_CURRENT[MIN] = - VM_DRIVE_CURRENT[MAX]

VM_DRIVE_CURRENT_UNIPOLAR	Unipolar version of VM_DRIVE_CURRENT
Units	A
Range of [MIN]	0.000
Range of [MAX]	0.000 to 99999.999
Definition	VM_DRIVE_CURRENT_UNIPOLAR[MAX] = VM_DRIVE_CURRENT[MAX] VM_DRIVE_CURRENT_UNIPOLAR[MIN] = 0.000

VM_HIGH_DC_VOLTAGE	Range applied to parameters showing high DC voltage
Units	V
Range of [MIN]	0
Range of [MAX]	0 to 1500
Definition	VM_HIGH_DC_VOLTAGE[MAX] is the full scale d.c. link voltage feedback for the high d.c. link voltage measurement which can measure the voltage if it goes above the normal full scale value. See Table 12-4 VM_HIGH_DC_VOLTAGE[MIN] = 0

VM_LOW_UNDER_VOLTS	Range applied to the low under-voltage threshold
Units	V
Range of [MIN]	24
Range of [MAX]	24 to 1150
Definition	If *Back-up Mode Enable* (06.068) = 0: VM_LOW_UNDER_VOLTS[MAX] = VM_STD_UNDER_VOLTS[MIN] If *Back-up Mode Enable* (06.068) = 1: VM_LOW_UNDER_VOLTS[MAX] = VM_STD_UNDER_VOLTS[MIN] / 1.1. VM_LOW_UNDER_VOLTS[MIN] = 24.

VM_MIN_SWITCHING_FREQUENCY	Range applied to the minimum switching frequency parameter
Units	User units
Range of [MIN]	0
Range of [MAX]	0 to 6
Definition	VM_MIN_SWITCHING_FREQUENCY[MAX] = *Maximum Switching Frequency* (05.018) VM_MIN_SWITCHING_FREQUENCY[MIN] = 0 for motor control modes, or 1 for Regen mode (subject to the maximum)

VM_MOTOR1_CURRENT_LIMIT **VM_MOTOR2_CURRENT_LIMIT**	Range applied to current limit parameters
Units	%
Range of [MIN]	0.0
Range of [MAX]	0.0 to 1000.0
Definition	VM_MOTOR1_CURRENT_LIMIT[MIN] = 0.0 **Open-loop** VM_MOTOR1_CURRENT_LIMIT[MAX] = (I_{Tlimit} / I_{Trated}) x 100 % Where: I_{Tlimit} = I_{MaxRef} x cos($\sin^{-1}$(I_{Mrated} / I_{MaxRef})) I_{Mrated} = Pr **05.007** sin ϕ I_{Trated} = Pr **05.007** x cos ϕ cos ϕ = Pr **05.010** I_{MaxRef} is 0.7 x Pr **11.061** when the motor rated current set in Pr **05.007** is less than or equal to Pr **11.032** (i.e. Heavy duty), otherwise it is the lower of 0.7 x Pr **11.061** or 1.1 x Pr **11.060** (i.e. Normal duty). **RFC-A** VM_MOTOR1_CURRENT_LIMIT[MAX] = (I_{Tlimit} / I_{Trated}) x 100 % Where: I_{Tlimit} = I_{MaxRef} x cos($\sin^{-1}$(I_{Mrated} / I_{MaxRef})) I_{Mrated} = Pr **05.007** x sin ϕ_1 ITrated = Pr **05.007** x cos ϕ_1 ϕ_1 = cos-1 (Pr **05.010**) + ϕ_2. ϕ_1 is calculated during an autotune. See the variable minimum / maximum calculations in the *Parameter Reference Guide* for more information regarding ϕ_2. I_{MaxRef} is 0.9 x Pr **11.061** when the motor rated current set in Pr **05.007** is less than or equal to Pr **11.032** (i.e. Heavy duty), otherwise it is the lower of 0.9 x Pr **11.061** or 1.1 x Pr **11.060** (i.e. Normal duty). **RFC-S and Regen** VM_MOTOR1_CURRENT_LIMIT[MAX] = (I_{MaxRef} / Pr **05.007**) x 100 % Where: I_{MaxRef} is 0.9 x Pr **11.061** when the motor rated current set in Pr **05.007** is less than or equal to Pr **11.032** (i.e. Heavy duty), otherwise it is the lower of 0.9 x Pr **11.061** or 1.1 x Pr **11.060** (i.e. Normal duty). For VM_MOTOR2_CURRENT_LIMIT[MAX] use Pr **21.007** instead of Pr **05.007** and Pr **21.010** instead of Pr **05.010**.

VM_NEGATIVE_REF_CLAMP1 **VM_NEGATIVE_REF_CLAMP2**	Limits applied to the negative frequency or speed clamp
Units	Open-loop: Hz RFC-A, RFC-S: rpm or mm/s
Range of [MIN]	Open-loop: -599.0 to 0.0 RFC-A, RFC-S: -50000.0 to 0.0
Range of [MAX]	Open-loop: 0.0 to 599.0 RFC-A, RFC-S: 0.0 to 50000.0
Definition	See table below VM_NEGATIVE_REF_CLAMP2 is defined in the same way except that Pr **21.001** is used instead of Pr **01.006**.

***Negative Reference Clamp Enable* (01.008)**	***Bipolar Reference Enable* (01.010)**	**VM_NEGATIVE_REF_ CLAMP1[MIN]**	**VM_NEGATIVE_REF_ CLAMP1[MAX]**
0	0	0.0	Pr **01.006**
0	1	0.0	0.0
1	X	-VM_POSITIVE_REF_CLAMP1[MAX]	0.0

VM_POSITIVE_REF_CLAMP1 **VM_POSITIVE_REF_CLAMP2**	Limits applied to the positive frequency or speed reference clamp
Units	Open-loop: Hz RFC-A, RFC-S: rpm or mm/s
Range of [MIN]	Open-loop: 0.0 RFC-A, RFC-S: 0.0
Range of [MAX]	Open-loop: 599.0 RFC-A, RFC-S: 0.0 to 550 x 60 / Motor pole pairs
Definition	VM_POSITIVE_REF_CLAMP1[MAX] defines the range of the positive reference clamp, *Maximum Reference Clamp* (01.006), which in turn limit the references. In RFC-A and RFC-S modes a limit is applied so that the position feedback does not exceed the speed where the drive can no longer interpret the feedback signal correctly as given in the table below. The limit is based on the position feedback device selected with *Motor Control Feedback Select* (03.026). It is possible to disable this limit if the *RFC Feedback Mode* (03.024) ≥ 1 (i.e. VM_POSITIVE_REF_CLAMP1 = 50000.0), so that the motor can be operated at a speed above the level where the drive can interpret the feedback in sensorless mode. It should be noted that the position feedback device itself may have a maximum speed limit that is lower than those given in the table. Care should be taken not to exceed a speed that would cause damage to the position feedback device.

Feedback device	VM_POSITIVE_REF_CLAMP1[MAX]
AB, AB Servo	(500 kHz x 60 / rotary lines per revolution) rpm (500 kHz x linear line pitch in mm) mm/s
FD, FR, FD Servo, FR Servo	(500 kHz x 60 / rotary lines per revolution)/2 rpm (500 kHz x linear line pitch in mm)/2 mm/s
SC, SC Hiper, SC EnDat, SC SSI, SC Servo	(500 kHz x 60 / sine waves per revolution) rpm (500 kHz x linear line pitch in mm) mm/s
Resolver	30000 rpm (250 Hz x pole pitch in mm) mm/s
Any other device	50000.0 rpm or mm/s

In open-loop mode VM_POSITIVE_REF_CLAMP1[MAX] is fixed at 599.0 Hz

In RFC mode a limit is applied to the speed reference of 550 x 60 / Motor pole pairs. Therefore, with a 4 pole motor the limit for VM_POSITIVE_REF_CLAMP1[MAX] will be 16,500 rpm.

VM_POSITIVE_REF_CLAMP1[MIN] = 0.0

VM_POSITIVE_REF_CLAMP2 is defined in the same way as VM_POSITIVE_REF_CLAMP1 except VM_POSITIVE_REF_CLAMP2[MAX] defines the range of the positive reference clamp, *M2 Maximum Reference Clamp* (21.001), which in turn limits the references.

VM_POWER	Range applied to parameters that either set or display power
Units	kW
Range of [MIN]	-99999.999 to 0.000
Range of [MAX]	0.000 to 99999.999
Definition	VM_POWER[MAX] is rating dependent and is chosen to allow for the maximum power that can be output by the drive with maximum a.c. output voltage, at maximum controlled current and unity power factor. VM_POWER[MAX] = √3 x VM_AC_VOLTAGE[MAX] x VM_DRIVE_CURRENT[MAX] / 1000 VM_POWER[MIN] = -VM_POWER[MAX]

VM_RATED_CURRENT	Range applied to rated current parameters
Units	A
Range of [MIN]	0.000
Range of [MAX]	0.000 to 99999.999
Definition	VM_RATED_CURRENT [MAX] = *Maximum Rated Current* (11.060) and is dependent on the drive rating. This is the Normal Duty rating of the drive. VM_RATED_CURRENT [MIN] = 0.000

VM_REGEN_REACTIVE	Range applied to the reactive current reference in Regen mode
Units	%
Range of [MIN]	-1000.0 to 0.0
Range of [MAX]	0.0 to 1000.0
Definition	VM_REGEN_REACTIVE[MAX] Applies a limit to the reactive current reference in Regen mode so that the total current reference does not exceed its maximum allowed level. VM_REGEN_REACTIVE[MIN] = - VM_REGEN_REACTIVE[MAX]

VM_SPEED	Range applied to parameters showing speed
Units	Open-loop, RFC-A, RFC-S: rpm or mm/s
Range of [MIN]	Open-loop, RFC-A, RFC-S: -50000.0 to 0.0
Range of [MAX]	Open-loop, RFC-A, RFC-S: 0.0 to 50000.0
Definition	This variable minimum/maximum defines the range of speed monitoring parameters. To allow headroom for overshoot the range is set to twice the range of the speed references. VM_SPEED[MAX] = 2 x VM_SPEED_FREQ_REF[MAX] VM_SPEED[MIN] = 2 x VM_SPEED_FREQ_REF[MIN]

VM_SPEED_FREQ_KEYPAD_REF	Range applied to the keypad reference
Units	Open-loop: Hz RFC-A, RFC-S: rpm or mm/s
Range of [MIN]	Open-loop: -599.0 to 599.0 RFC-A, RFC-S: -(550 x 60 / Motor pole pairs) to (550 x 60 / Motor pole pairs)
Range of [MAX]	Open-loop: 0.0 to 599.0 RFC-A, RFC-S: 0.0 to 550 x 60 / Motor pole pairs
Definition	This variable maximum is applied to *Keypad Control Mode Reference* (01.017). The maximum applied to these parameters is the same as other frequency reference parameters. VM_SPEED_FREQ_USER_REFS [MAX] = VM_SPEED_FREQ_REF[MAX] However the minimum is dependent on *Negative Reference Clamp Enable* (01.008) and *Bipolar Reference Enable* (01.010).

Negative Reference Clamp Enable (01.008)	Bipolar Reference Enable (01.010)	VM_SPEED_FREQ_USER_REFS[MIN]
0	0	If *Select Motor 2 Parameters* (11.045) = 0 *Minimum Reference Clamp* (01.007), otherwise *M2 Minimum Reference Clamp* (21.002)
0	1	-VM_SPEED_FREQ_REF[MAX]
1	0	0.0
1	1	-VM_SPEED_FREQ_REF[MAX]

VM_SPEED_FREQ_REF	Range applied to the frequency or speed reference parameters
Units	Open-loop: Hz RFC-A, RFC-S: rpm or mm/s
Range of [MIN]	Open-loop: -599.0 to 0.0 RFC-A, RFC-S: -(550 x 60 / Motor pole pairs to 0.0)
Range of [MAX]	Open-loop: 0.0 to 599.0 RFC-A, RFC-S: 0.0 to 550 x 60 / Motor pole pairs
Definition	If Pr **01.008** = 0: VM_SPEED_FREQ_REF[MAX] = Pr **01.006** If Pr **01.008** = 1: VM_SPEED_FREQ_REF[MAX] = Pr **01.006** or |Pr **01.007**|, whichever is larger. If the second motor map is selected (Pr **11.045** = 1) Pr **21.001** is used instead of Pr **01.006** and Pr **21.002** instead of Pr **01.007**. VM_SPEED_FREQ_REF[MIN] = -VM_SPEED_FREQ_REF[MAX].

VM_SPEED_FREQ_REF_UNIPOLAR	Unipolar version of VM_SPEED_FREQ_REF
Units	Open-loop: Hz RFC-A, RFC-S: rpm or mm/s
Range of [MIN]	Open-loop: 0.0 RFC-A, RFC-S: 0.0
Range of [MAX]	Open-loop: 0.0 to 599.0 RFC-A, RFC-S: 0.0 to 550 x 60 / Motor pole pairs
Definition	VM_SPEED_FREQ_REF_UNIPOLAR[MAX] = VM_SPEED_FREQ_REF[MAX] VM_SPEED_FREQ_REF_UNIPOLAR[MIN] = 0.0

VM_SPEED_FREQ_USER_REFS	Range applied to Analog reference parameters
Units	Open-loop: Hz RFC-A, RFC-S: rpm or mm/s
Range of [MIN]	Open-loop: -599.00 to 599.00 RFC-A, RFC-S: -(550 x 60 / Motor pole pairs) to 550 x 60 / Motor pole pairs
Range of [MAX]	Open-loop: 0.00 to 599.00 RFC-A, RFC-S: 0.0 to 550 x 60 / Motor pole pairs
Definition	VM_SPEED_FREQ_USER_REFS= VM_SPEED_FREQ_REF[MAX]

***Negative Reference Clamp Enable* (01.008)**	***Bipolar Reference Enable* (01.010)**	**VM_SPEED_FREQ_USER_REFS [MIN]**
0	0	Pr **01.007**
0	1	-VM_SPEED_FREQ_REF[MAX]
1	0	0.0
1	1	-VM_SPEED_FREQ_REF[MAX]

If the second motor map is selected (Pr **11.045** = 1) Pr **21.002** is used instead of Pr **01.007**.

VM_STD_UNDER_VOLTS	Range applied to the standard under-voltage threshold
Units	V
Range of [MIN]	0 to 1150
Range of [MAX]	0 to 1150
Definition	VM_STD_UNDER_VOLTS[MAX] = VM_DC_VOLTAGE_SET / 1.1 VM_STD_UNDER_VOLTS[MIN] is voltage rating dependent. See Table 12-4

VM_SUPPLY_LOSS_LEVEL	Range applied to the supply loss threshold
Units	V
Range of [MIN]	0 to 1150
Range of [MAX]	0 to 1150
Definition	VM_SUPPLY_LOSS_LEVEL[MAX] = VM_DC_VOLTAGE_SET[MAX] VM_SUPPLY_LOSS_LEVEL[MIN] is drive voltage rating dependent. See Table 12-4

VM_SWITCHING_FREQUENCY	Range applied to the maximum switching frequency parameters
Units	User units
Range of [MIN]	0
Range of [MAX]	0 to 6
Definition	VM_SWITCHING_FREQUENCY[MAX] = Power stage dependent VM_SWITCHING_FREQUENCY[MIN] = 0 for motor control modes, or 1 for Regen mode (subject to the maximum)

VM_TORQUE_CURRENT	Range applied to torque and torque producing current parameters (where this is used in Regen mode it refers to the active current)
Units	%
Range of [MIN]	-1000.0 to 0.0
Range of [MAX]	0.0 to 1000.0
Definition	*Select Motor 2 Parameters* (11.045) / VM_TORQUE_CURRENT [MAX] 0 / VM_MOTOR1_CURRENT_LIMIT[MAX] 1 / VM_MOTOR2_CURRENT_LIMIT[MAX] VM_TORQUE_CURRENT[MIN] = -VM_TORQUE_CURRENT[MAX]

VM_TORQUE_CURRENT_UNIPOLAR	Unipolar version of VM_TORQUE_CURRENT
Units	%
Range of [MIN]	0.0
Range of [MAX]	0.0 to 1000.0
Definition	VM_TORQUE_CURRENT_UNIPOLAR[MAX] = VM_TORQUE_CURRENT[MAX] VM_TORQUE_CURRENT_UNIPOLAR[MIN] =0.0

VM_USER_CURRENT	Range applied to torque reference and percentage load parameters with one decimal place
Units	%
Range of [MIN]	-1000.0 to 0.0
Range of [MAX]	0.0 to 1000.0
Definition	VM_USER_CURRENT[MAX] = *User Current Maximum Scaling* (04.024) VM_USER_CURRENT[MIN] = -VM_USER_CURRENT[MAX] *User Current Maximum Scaling* (04.024) defines the variable maximum/minimums VM_USER_CURRENT and VM_USER_CURRENT_HIGH_RES which are applied to *Percentage Load* (04.020), *Torque Reference* (04.008) and *Torque Offset* (04.009). This is useful when routing these parameters to an analog output as it allows the full scale output value to be defined by the user. The maximum value (VM_TORQUE_CURRENT_UNIPOLAR [MAX]) varies between drive sizes with default parameters loaded. For some drive sizes the default value may be reduced below the value given by the parameter range limiting.

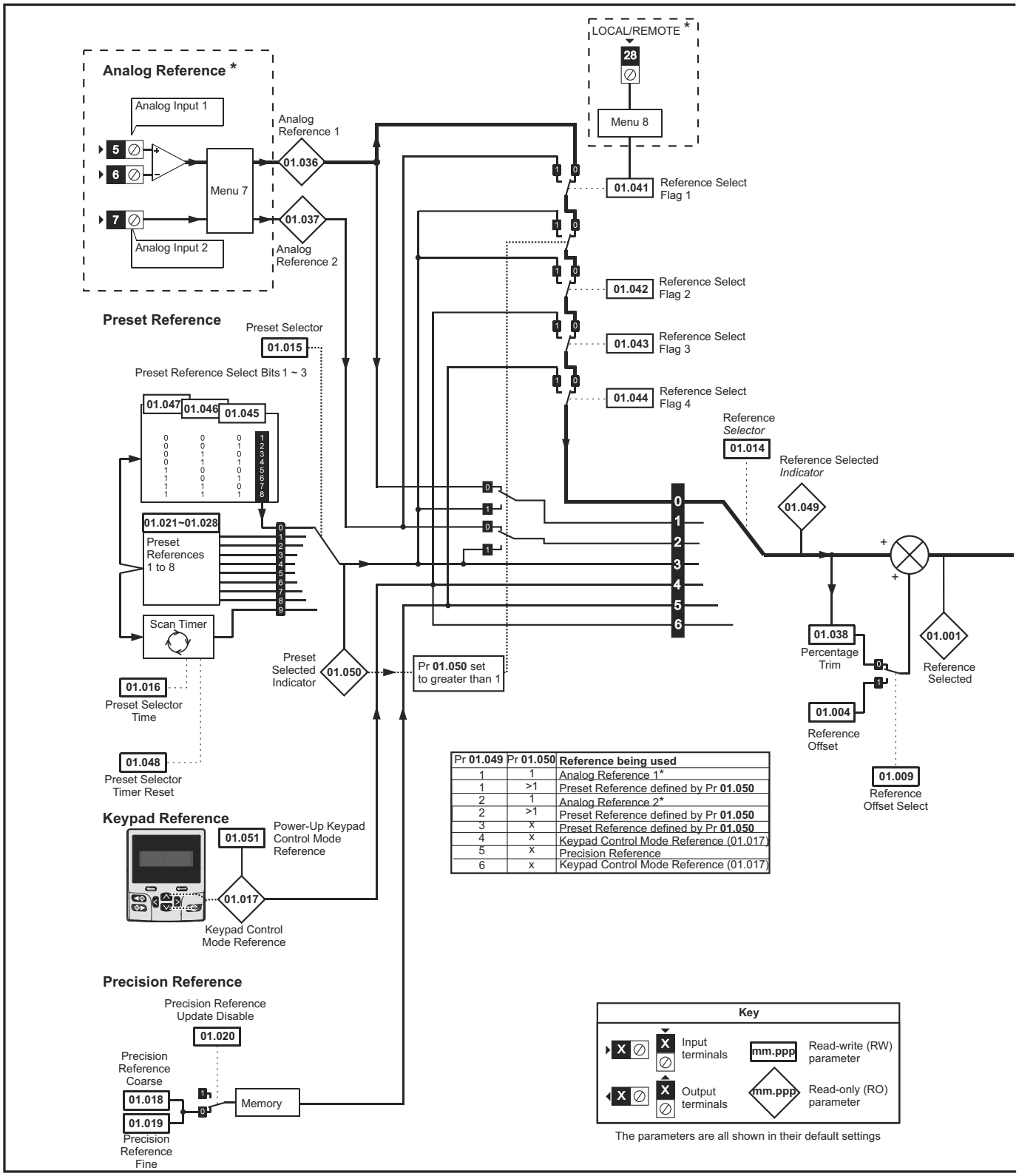
VM_USER_CURRENT_HIGH_RES	Range applied to torque reference and percentage load parameters with two decimal places
Units	%
Range of [MIN]	-1000.00 to 0.00
Range of [MAX]	0.00 to 1000.00
Definition	VM_USER_CURRENT_HIGH_RES[MAX] = *User Current Maximum Scaling* (04.024) with an additional decimal place VM_USER_CURRENT_HIGH_RES[MIN] = -VM_USER_CURRENT_HIGH_RES[MAX] *User Current Maximum Scaling* (04.024) defines the variable maximum/minimums VM_USER_CURRENT and VM_USER_CURRENT_HIGH_RES which are applied to *Percentage Load* (04.020), *Torque Reference* (04.008) and *Torque Offset* (04.009). This is useful when routing these parameters to an analog output as it allows the full scale output value to be defined by the user. The maximum value (VM_TORQUE_CURRENT_UNIPOLAR [MAX]) varies between drive sizes with default parameters loaded. For some drive sizes the default value may be reduced below the value given by the parameter range limiting.

Table 12-4 Voltage ratings dependant values

Variable min/max	**Voltage level (V)**			
	200 V	**400 V**	**575 V**	**690 V**
VM_DC_VOLTAGE_SET[MAX]	400	800	955	1150
VM_DC_VOLTAGE[MAX]	415	830	990	1190
VM_AC_VOLTAGE_SET[MAX]	265	530	635	765
VM_AC_VOLTAGE[MAX]	325	650	780	930
VM_STD_UNDER_VOLTS[MIN]	175	330	435	435
VM_SUPPLY_LOSS_LEVEL[MIN]	205	410	540	540
VM_HIGH_DC_VOLTAGE[MAX]	1500	1500	1500	1500

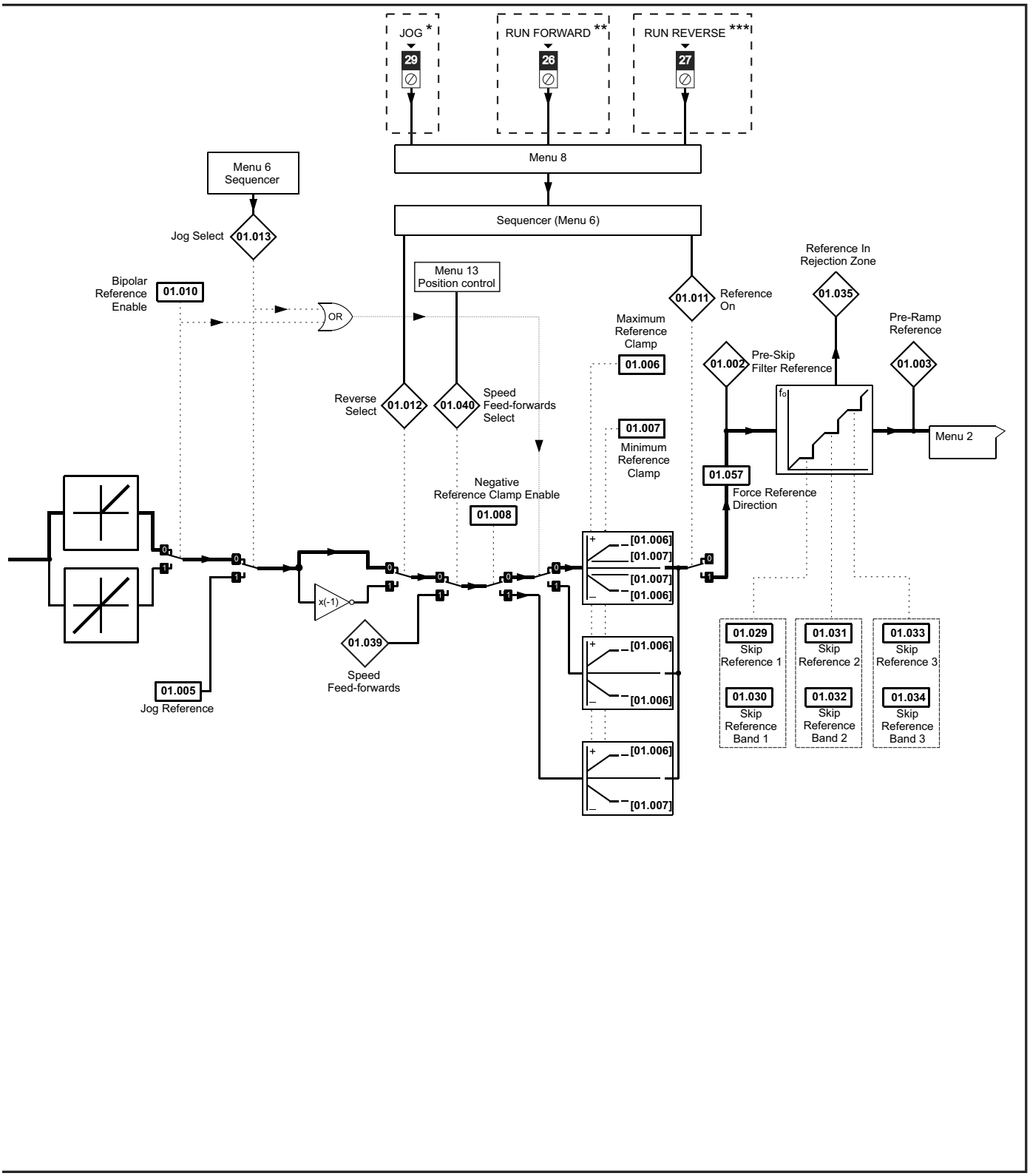
12.2 Menu 1: Frequency / speed reference

Figure 12-1 Menu 1 logic diagram



Pr 01.049	Pr 01.050	Reference being used
1	1	Analog Reference 1*
1	>1	Preset Reference defined by Pr **01.050**
2	1	Analog Reference 2*
2	>1	Preset Reference defined by Pr **01.050**
3	x	Preset Reference defined by Pr **01.050**
4	x	Keypad Control Mode Reference (01.017)
5	x	Precision Reference
6	x	Keypad Control Mode Reference (01.017)

* Not available on *Unidrive M702*.



* Not available on *Unidrive M702*.

** Terminal 7 on *Unidrive M702*.

*** Terminal 8 on *Unidrive M702*.

Parameter		Range(⇳)		Default(⇨)			Type					
		OL	RFC-A / S	OL	RFC-A	RFC-S						
01.001	Reference Selected	VM_SPEED_FREQ_REF Hz	VM_SPEED_FREQ_REF rpm				RO	Num	ND	NC	PT	
01.002	Pre-Skip Filter Reference	VM_SPEED_FREQ_REF Hz	VM_SPEED_FREQ_REF rpm				RO	Num	ND	NC	PT	
01.003	Pre-Ramp Reference	VM_SPEED_FREQ_REF Hz	VM_SPEED_FREQ_REF rpm				RO	Num	ND	NC	PT	
01.004	Reference Offset	VM_SPEED_FREQ_REF Hz	VM_SPEED_FREQ_REF rpm	0.0			RW	Num				US
01.005	Jog Reference	0.0 to 400.0 Hz	0.0 to 4000.0 rpm	0.0			RW	Num				US
01.006	Maximum Reference Clamp	VM_POSITIVE_REF_ CLAMP1 Hz	VM_POSITIVE_REF_ CLAMP1 rpm	50 Hz: 50.0 60 Hz: 60.0	50Hz: 1500.0 60Hz: 1800.0	3000.0	RW	Num				US
01.007	Minimum Reference Clamp	VM_NEGATIVE_REF_ CLAMP1 Hz	VM_NEGATIVE_REF_ CLAMP1 rpm	0.0			RW	Num				US
01.008	Negative Reference Clamp Enable	Off (0) or On (1)		Off (0)			RW	Bit				US
01.009	Reference Offset Select	Off (0) or On (1)		Off (0)			RW	Bit				US
01.010	Bipolar Reference Enable	Off (0) or On (1)		Off (0)			RW	Bit				US
01.011	Reference On	Off (0) or On (1)					RO	Bit	ND	NC	PT	
01.012	Reverse Select	Off (0) or On (1)					RO	Bit	ND	NC	PT	
01.013	Jog Select	Off (0) or On (1)					RO	Bit	ND	NC	PT	
01.014	Reference Selector	A1 A2 (0)*, A1 Preset (1)*, A2 Preset (2)* Preset (3), Keypad (4), Precision (5) Keypad Ref (6)		A1 A2 (0)**			RW	Txt				US
01.015	Preset Selector	0 to 9		0			RW	Num				US
01.016	Preset Selector Time	0.0 to 400.0 s		10.0 s			RW	Num				US
01.017	Keypad Control Mode Reference	VM_SPEED_FREQ_KEYPAD_REF		0.0			RO	Num		NC	PT	PS
01.018	Precision Reference Coarse	VM_SPEED_FREQ_REF		0.0			RW	Num				US
01.019	Precision Reference Fine	0.000 to 0.099 Hz	0.000 to 0.099 rpm	0.000			RW	Num				US
01.020	Precision Reference Update Disable	Off (0) or On (1)		Off (0)			RW	Bit		NC		
01.021	Preset Reference 1	VM_SPEED_FREQ_REF		0.0			RW	Num				US
01.022	Preset Reference 2	VM_SPEED_FREQ_REF		0.0			RW	Num				US
01.023	Preset Reference 3	VM_SPEED_FREQ_REF		0.0			RW	Num				US
01.024	Preset Reference 4	VM_SPEED_FREQ_REF		0.0			RW	Num				US
01.025	Preset Reference 5	VM_SPEED_FREQ_REF		0.0			RW	Num				US
01.026	Preset Reference 6	VM_SPEED_FREQ_REF		0.0			RW	Num				US
01.027	Preset Reference 7	VM_SPEED_FREQ_REF		0.0			RW	Num				US
01.028	Preset Reference 8	VM_SPEED_FREQ_REF		0.0			RW	Num				US
01.029	Skip Reference 1	0.0 to 599.0 Hz	0 to 33, 000 rpm	0.0	0		RW	Num				US
01.030	Skip Reference Band 1	0.0 to 25.0 Hz	0 to 250 rpm	0.0	0		RW	Num				US
01.031	Skip Reference 2	0.0 to 599.0 Hz	0 to 33, 000 rpm	0.0	0		RW	Num				US
01.032	Skip Reference Band 2	0.0 to 25.0 Hz	0 to 250 rpm	0.0	0		RW	Num				US
01.033	Skip Reference 3	0.0 to 599.0 Hz	0 to 33, 000 rpm	0.0	0		RW	Num				US
01.034	Skip Reference Band 3	0.0 to 25.0 Hz	0 to 250 rpm	0.0	0		RW	Num				US
01.035	Reference In Rejection Zone	Off (0) or On (1)					RO	Bit	ND	NC	PT	
01.036	Analog Reference 1	VM_SPEED_FREQ_USER_ REFS Hz	VM_SPEED_FREQ_USER_ REFS rpm	0.0			RO	Num		NC		
01.037	Analog Reference 2			0.0			RO	Num		NC		
01.038	Percentage Trim	±100.00 %		0.00 %			RW	Num		NC		
01.039	Speed Feed-forwards	VM_SPEED_FREQ_REF					RO	Num	ND	NC	PT	
01.040	Speed Feed-forwards Select	Off (0) or On (1)					RO	Bit	ND	NC	PT	
01.041	Reference Select Flag 1	Off (0) or On (1)		Off (0)			RW	Bit		NC		
01.042	Reference Select Flag 2	Off (0) or On (1)		Off (0)			RW	Bit		NC		
01.043	Reference Select Flag 3	Off (0) or On (1)		Off (0)			RW	Bit		NC		
01.044	Reference Select Flag 4	Off (0) or On (1)		Off (0)			RW	Bit		NC		
01.045	Preset Select Flag 1	Off (0) or On (1)		Off (0)			RW	Bit		NC		
01.046	Preset Select Flag 2	Off (0) or On (1)		Off (0)			RW	Bit		NC		
01.047	Preset Select Flag 3	Off (0) or On (1)		Off (0)			RW	Bit		NC		
01.048	Preset Selector Timer Reset	Off (0) or On (1)		Off (0)			RW	Bit		NC		
01.049	Reference Selected Indicator	1 to 6					RO	Num	ND	NC	PT	
01.050	Preset Selected Indicator	1 to 8					RO	Num	ND	NC	PT	
01.051	Power-up Keypad Control Mode Reference	Reset (0), Last (1), Preset (2)		Reset (0)			RW	Txt				US
01.052	Hand/Off/Auto Operating Mode	0 to 3		0			RW	Num				US
01.055	Linear Speed Select		Off (0) or On (1)		Off (0)		RW	Bit				US
01.056	Linear Speed Selected		Off (0) or On (1)				RO	Bit	ND	NC	PT	
01.057	Force Reference Direction	None (0), Forward (1), Reverse (2)		None (0)			RW	Txt				

* Not available on *Unidrive M702*.

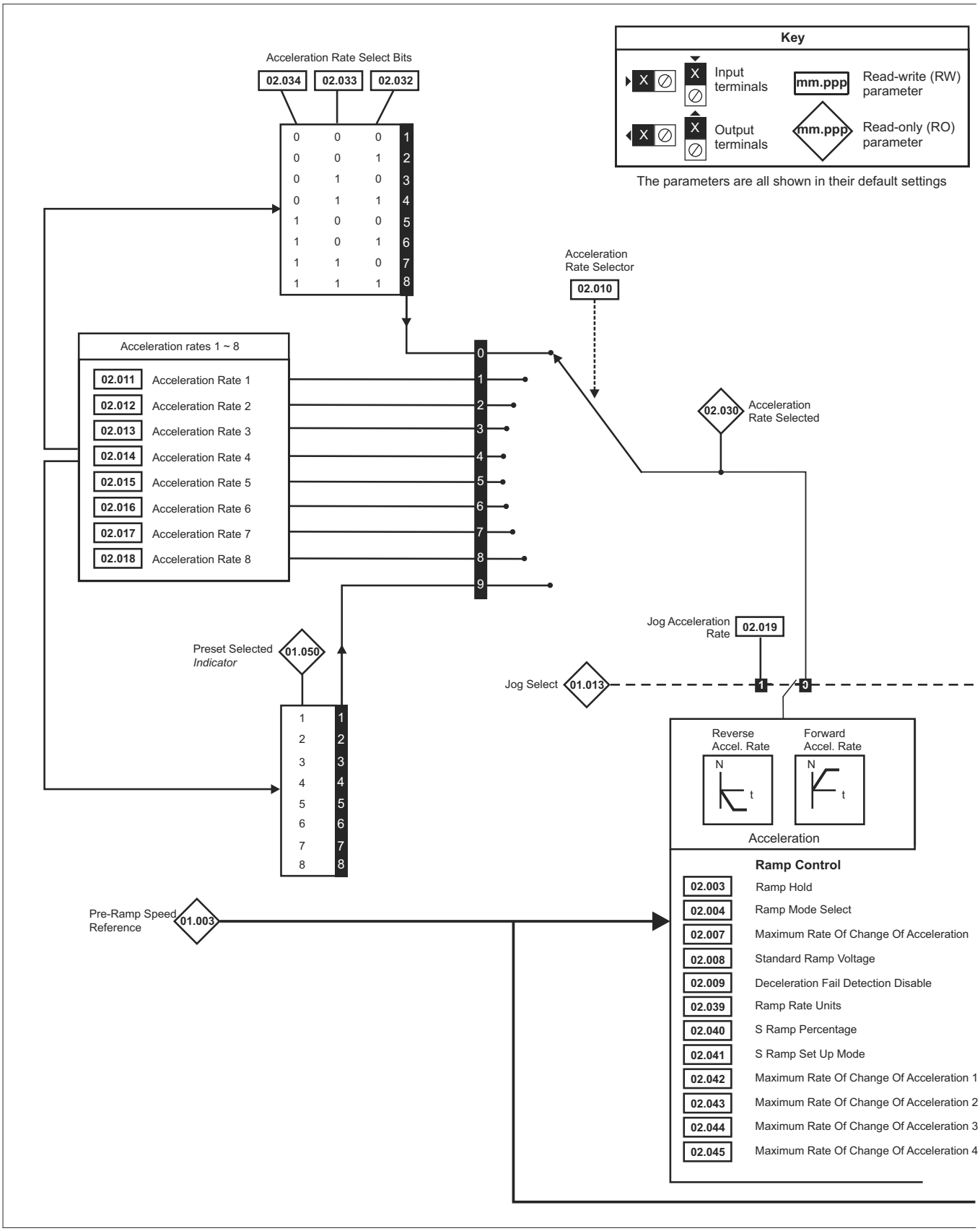
** Preset (3) on *Unidrive M702*.

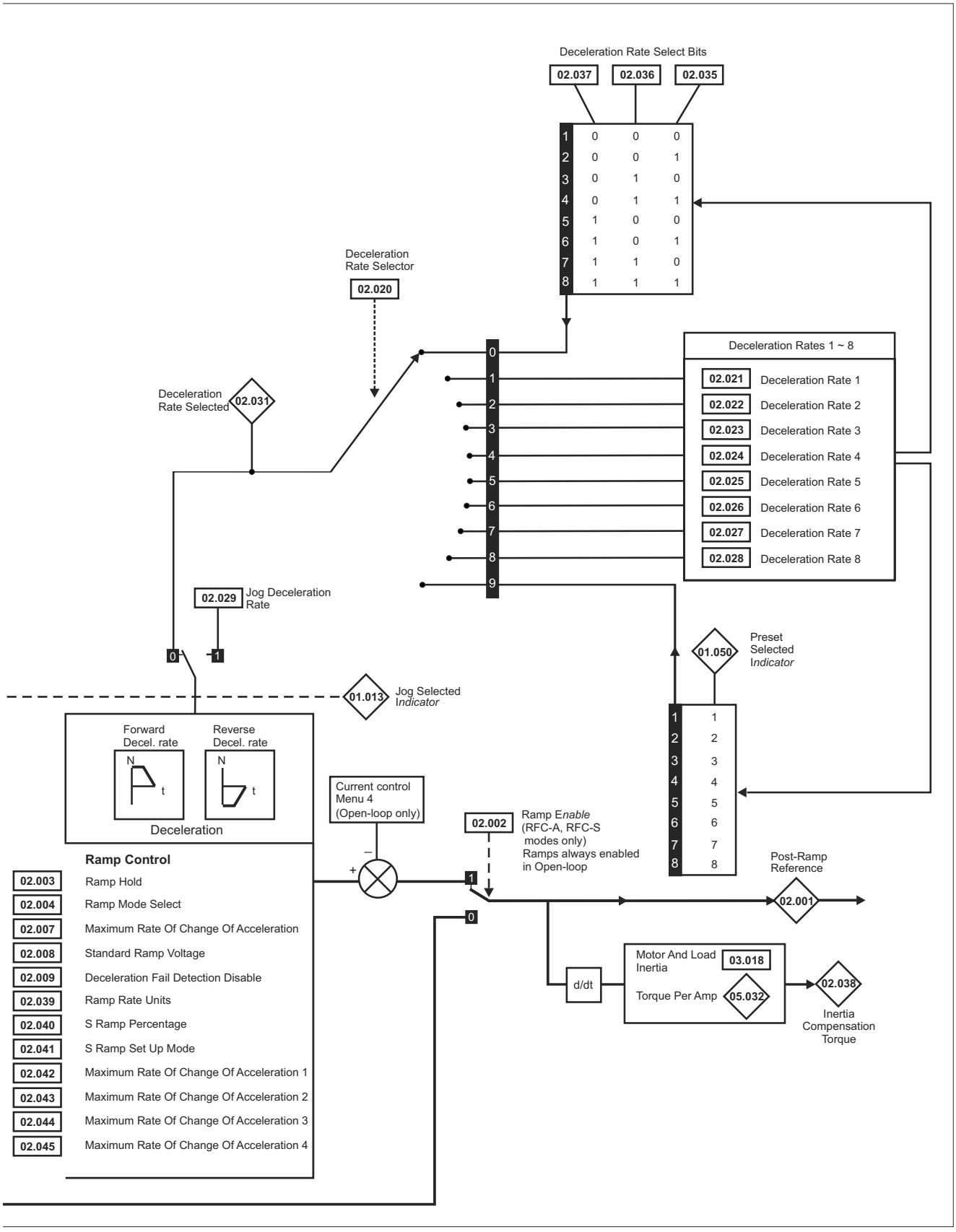
RW	Read / Write	RO	Read only	Num	Number parameter	Bit	Bit parameter	Txt	Text string	Bin	Binary parameter	FI	Filtered
ND	No default value	NC	Not copied	PT	Protected parameter	RA	Rating dependent	US	User save	PS	Power-down save	DE	Destination

.

12.3 Menu 2: Ramps

Figure 12-2 Menu 2 logic diagram




Deceleration Rate Select Bits
02.037
02.036
02.035
1 0 0 0
2 0 0 1
3 0 1 0
4 0 1 1
5 1 0 0
6 1 0 1
7 1 1 0
8 1 1 1
Deceleration Rate Selector
02.020
Deceleration Rate Selected
02.031
Deceleration Rates 1 ~ 8
02.021 Deceleration Rate 1
02.022 Deceleration Rate 2
02.023 Deceleration Rate 3
02.024 Deceleration Rate 4
02.025 Deceleration Rate 5
02.026 Deceleration Rate 6
02.027 Deceleration Rate 7
02.028 Deceleration Rate 8
02.029 Jog Deceleration Rate
01.050 Preset Selected Indicator
01.013 Jog Selected Indicator
Forward Decel. rate
Reverse Decel. rate
Deceleration
Current control Menu 4 (Open-loop only)
02.002 Ramp Enable (RFC-A, RFC-S modes only) Ramps always enabled in Open-loop
Post-Ramp Reference
02.001
Motor And Load Inertia 03.018
Torque Per Amp 05.032
d/dt
02.038 Inertia Compensation Torque
Ramp Control
02.003 Ramp Hold
02.004 Ramp Mode Select
02.007 Maximum Rate Of Change Of Acceleration
02.008 Standard Ramp Voltage
02.009 Deceleration Fail Detection Disable
02.039 Ramp Rate Units
02.040 S Ramp Percentage
02.041 S Ramp Set Up Mode
02.042 Maximum Rate Of Change Of Acceleration 1
02.043 Maximum Rate Of Change Of Acceleration 2
02.044 Maximum Rate Of Change Of Acceleration 3
02.045 Maximum Rate Of Change Of Acceleration 4

Parameter		Range(⇳)		Default(⇨)			Type					
		OL	RFC-A / S	OL	RFC-A	RFC-S						
02.001	Post Ramp Reference	VM_SPEED_FREQ_ REF Hz	VM_SPEED_FREQ_ REF rpm				RO	Num	ND	NC	PT	
02.002	Ramp Enable		Off (0) or On (1)		On (1)		RW	Bit				US
02.003	Ramp Hold	Off (0) or On (1)		Off (0)			RW	Bit				US
02.004	Ramp Mode	Fast (0), Standard (1), Std boost (2)	Fast (0), Standard (1)	Standard (1)			RW	Txt				US
02.005	Disable Ramp Output		Off (0) or On (1)		Off (0)		RW	Bit				US
02.006	S Ramp Enable	Off (0) or On (1)		Off (0)			RW	Bit				US
02.007	Maximum Rate Of Change Of Acceleration	0.0 to 300.0 s^2/100 Hz	0.000 to 100.000 s^2/1000 rpm	3.1	1.500	0.030	RW	Num				US
02.008	Standard Ramp Voltage	0 to VM_DC_VOLTAGE_SET V		200 V drive: 375 V 50 Hz - 400 V drive: 750 V 60 Hz - 400 V drive: 775 V 575 V drive: 895 V 690 V drive: 1075 V			RW	Num		RA		US
02.009	Deceleration Fail Detection Disable	Off (0) or On (1)		Off (0)			RW	Bit				US
02.010	Acceleration Rate Selector	0 to 9		0			RW	Num				US
02.011	Acceleration Rate 1	0.0 to VM_ACCEL_RATE s/100 Hz	0.000 to VM_ACCEL_RATE s/1000 rpm	5.0 s	2.000 s	0.200 s	RW	Num				US
02.012	Acceleration Rate 2	0.0 to VM_ACCEL_RATE s/100 Hz	0.000 to VM_ACCEL_RATE s/1000 rpm	5.0 s	2.000 s	0.200 s	RW	Num				US
02.013	Acceleration Rate 3	0.0 to VM_ACCEL_RATE s/100 Hz	0.000 to VM_ACCEL_RATE s/1000 rpm	5.0 s	2.000 s	0.200 s	RW	Num				US
02.014	Acceleration Rate 4	0.0 to VM_ACCEL_RATE s/100 Hz	0.000 to VM_ACCEL_RATE s/1000 rpm	5.0 s	2.000 s	0.200 s	RW	Num				US
02.015	Acceleration Rate 5	0.0 to VM_ACCEL_RATE s/100 Hz	0.000 to VM_ACCEL_RATE s/1000 rpm	5.0 s	2.000 s	0.200 s	RW	Num				US
02.016	Acceleration Rate 6	0.0 to VM_ACCEL_RATE s/100 Hz	0.000 to VM_ACCEL_RATE s/1000 rpm	5.0 s	2.000 s	0.200 s	RW	Num				US
02.017	Acceleration Rate 7	0.0 to VM_ACCEL_RATE s/100 Hz	0.000 to VM_ACCEL_RATE s/1000 rpm	5.0 s	2.000 s	0.200 s	RW	Num				US
02.018	Acceleration Rate 8	0.0 to VM_ACCEL_RATE s/100 Hz	0.000 to VM_ACCEL_RATE s/1000 rpm	5.0 s	2.000 s	0.200 s	RW	Num				US
02.019	Jog Acceleration Rate	0.0 to VM_ACCEL_RATE s/100 Hz	0.000 to VM_ACCEL_RATE s/1000 rpm	0.2 s	0.000 s		RW	Num				US
02.020	Deceleration Rate Selector	0 to 9		0			RW	Num				US
02.021	Deceleration Rate 1	0.0 to VM_ACCEL_RATE s/100 Hz	0.000 to VM_ACCEL_RATE s/1000 rpm	10.0 s	2.000 s	0.200 s	RW	Num				US
02.022	Deceleration Rate 2	0.0 to VM_ACCEL_RATE s/100 Hz	0.000 to VM_ACCEL_RATE s/1000 rpm	10.0 s	2.000 s	0.200 s	RW	Num				US
02.023	Deceleration Rate 3	0.0 to VM_ACCEL_RATE s/100 Hz	0.000 to VM_ACCEL_RATE s/1000 rpm	10.0 s	2.000 s	0.200 s	RW	Num				US
02.024	Deceleration Rate 4	0.0 to VM_ACCEL_RATE s/100 Hz	0.000 to VM_ACCEL_RATE s/1000 rpm	10.0 s	2.000 s	0.200 s	RW	Num				US
02.025	Deceleration Rate 5	0.0 to VM_ACCEL_RATE s/100 Hz	0.000 to VM_ACCEL_RATE s/1000 rpm	10.0 s	2.000 s	0.200 s	RW	Num				US
02.026	Deceleration Rate 6	0.0 to VM_ACCEL_RATE s/100 Hz	0.000 to VM_ACCEL_RATE s/1000 rpm	10.0 s	2.000 s	0.200 s	RW	Num				US
02.027	Deceleration Rate 7	0.0 to VM_ACCEL_RATE s/100 Hz	0.000 to VM_ACCEL_RATE s/1000 rpm	10.0 s	2.000 s	0.200 s	RW	Num				US
02.028	Deceleration Rate 8	0.0 to VM_ACCEL_RATE s/100 Hz	0.000 to VM_ACCEL_RATE s/1000 rpm	10.0 s	2.000 s	0.200 s	RW	Num				US
02.029	Jog Deceleration Rate	0.0 to VM_ACCEL_RATE s/100 Hz	0.000 to VM_ACCEL_RATE s/1000 rpm	0.2 s	0.000 s		RW	Num				US
02.030	Acceleration Rate Selected	0 to 8					RO	Num	ND	NC	PT	
02.031	Deceleration Rate Selected	0 to 8					RO	Num	ND	NC	PT	
02.032	Acceleration Rate Select Bit 0	Off (0) or On (1)		Off (0)			RW	Bit		NC		
02.033	Acceleration Rate Select Bit 1	Off (0) or On (1)		Off (0)			RW	Bit		NC		
02.034	Acceleration Rate Select Bit 2	Off (0) or On (1)		Off (0)			RW	Bit		NC		
02.035	Deceleration Rate Select Bit 0	Off (0) or On (1)		Off (0)			RW	Bit		NC		
02.036	Deceleration Rate Select Bit 1	Off (0) or On (1)		Off (0)			RW	Bit		NC		
02.037	Deceleration Rate Select Bit 2	Off (0) or On (1)		Off (0)			RW	Bit		NC		
02.038	Inertia Compensation Torque		±1000.0 %				RO	Num	ND	NC	PT	
02.039	Ramp Rate Units	Off (0) or On (1)		Off (0)			RW	Bit				US
02.040	S Ramp Percentage	0.0 to 50.0 %		0.0 %			RW					US
02.041	S Ramp Set-up Mode	Single (0), Percentage (1), Independent (2)		Single (0)			RW	Txt				US
02.042	Maximum Rate Of Change Of Acceleration 1	0.0 to 300.0	0.000 to 100.000	0.0	0.000		RW	Num				US
02.043	Maximum Rate Of Change Of Acceleration 2	0.0 to 300.0	0.000 to 100.000	0.0	0.000		RW	Num				US
02.044	Maximum Rate Of Change Of Acceleration 3	0.0 to 300.0	0.000 to 100.000	0.0	0.000		RW	Num				US
02.045	Maximum Rate Of Change Of Acceleration 4	0.0 to 300.0	0.000 to 100.000	0.0	0.000		RW	Num				US

RW	Read / Write	RO	Read only	Num	Number parameter	Bit	Bit parameter	Txt	Text string	Bin	Binary parameter	FI	Filtered
ND	No default value	NC	Not copied	PT	Protected parameter	RA	Rating dependent	US	User save	PS	Power-down save	DE	Destination

12.4 Menu 3: Frequency slaving, speed feedback and speed control

Figure 12-3 Menu 3 Open-loop logic diagram

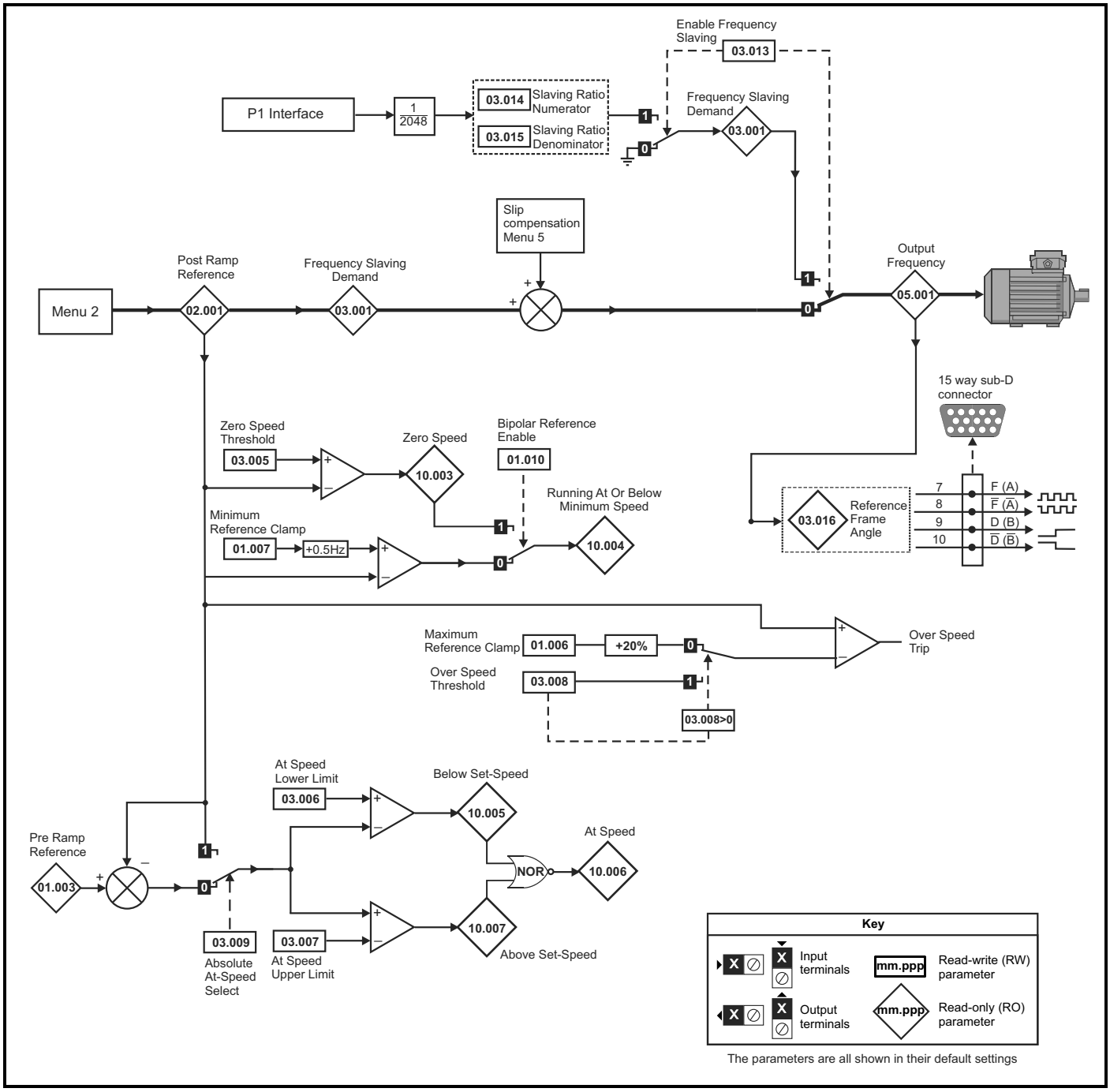
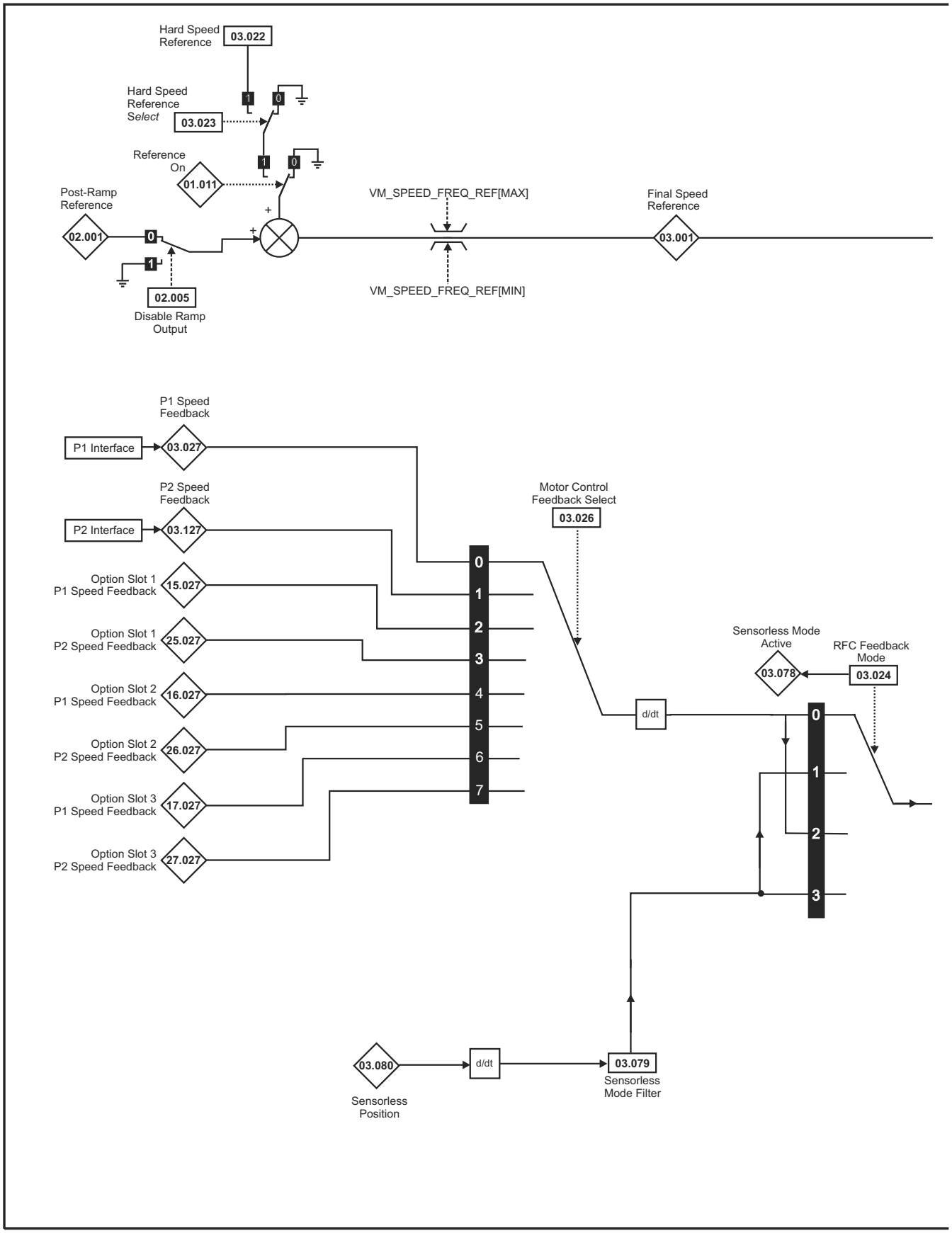
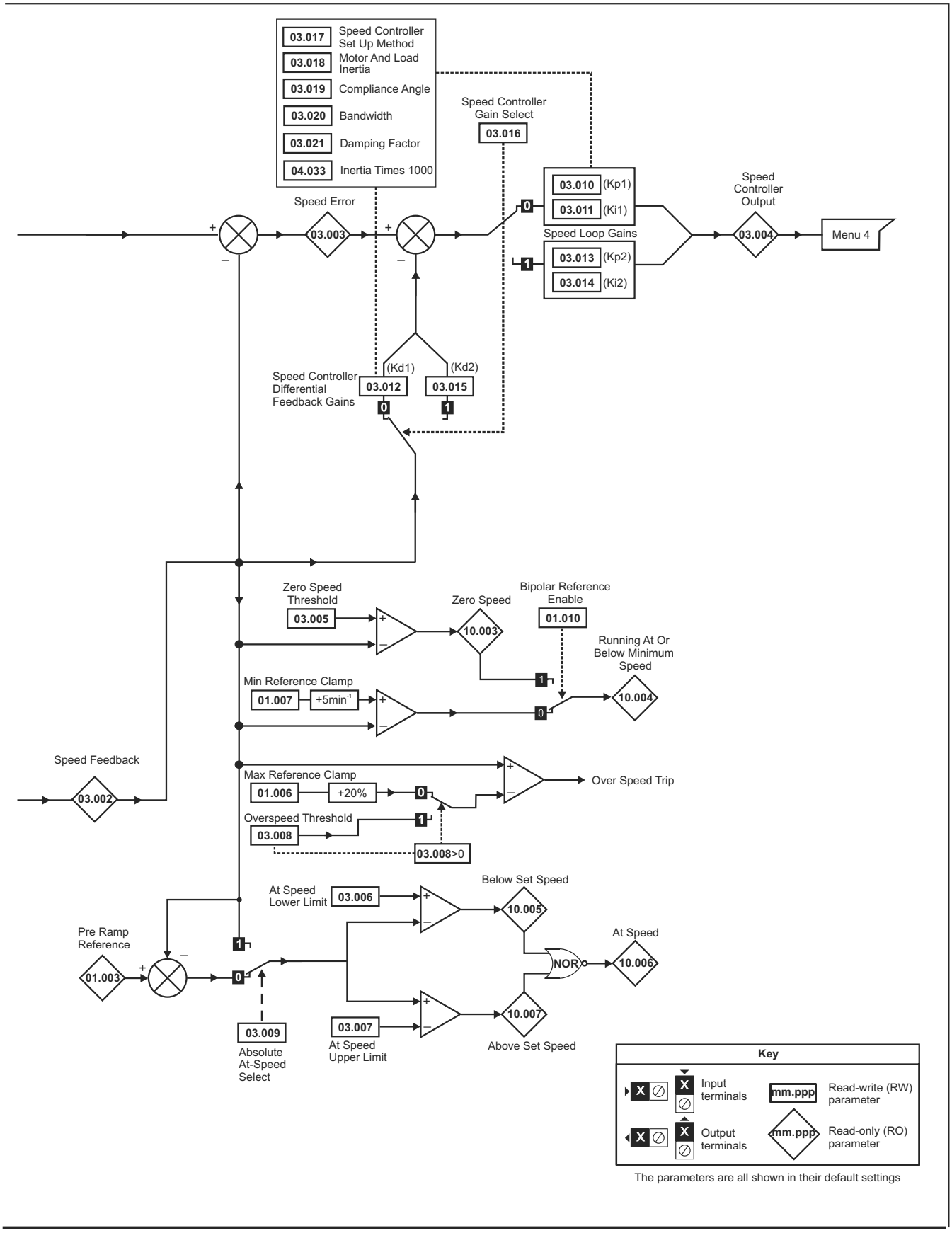


Figure 12-4 Menu 3 RFC-A, RFC-S logic diagram



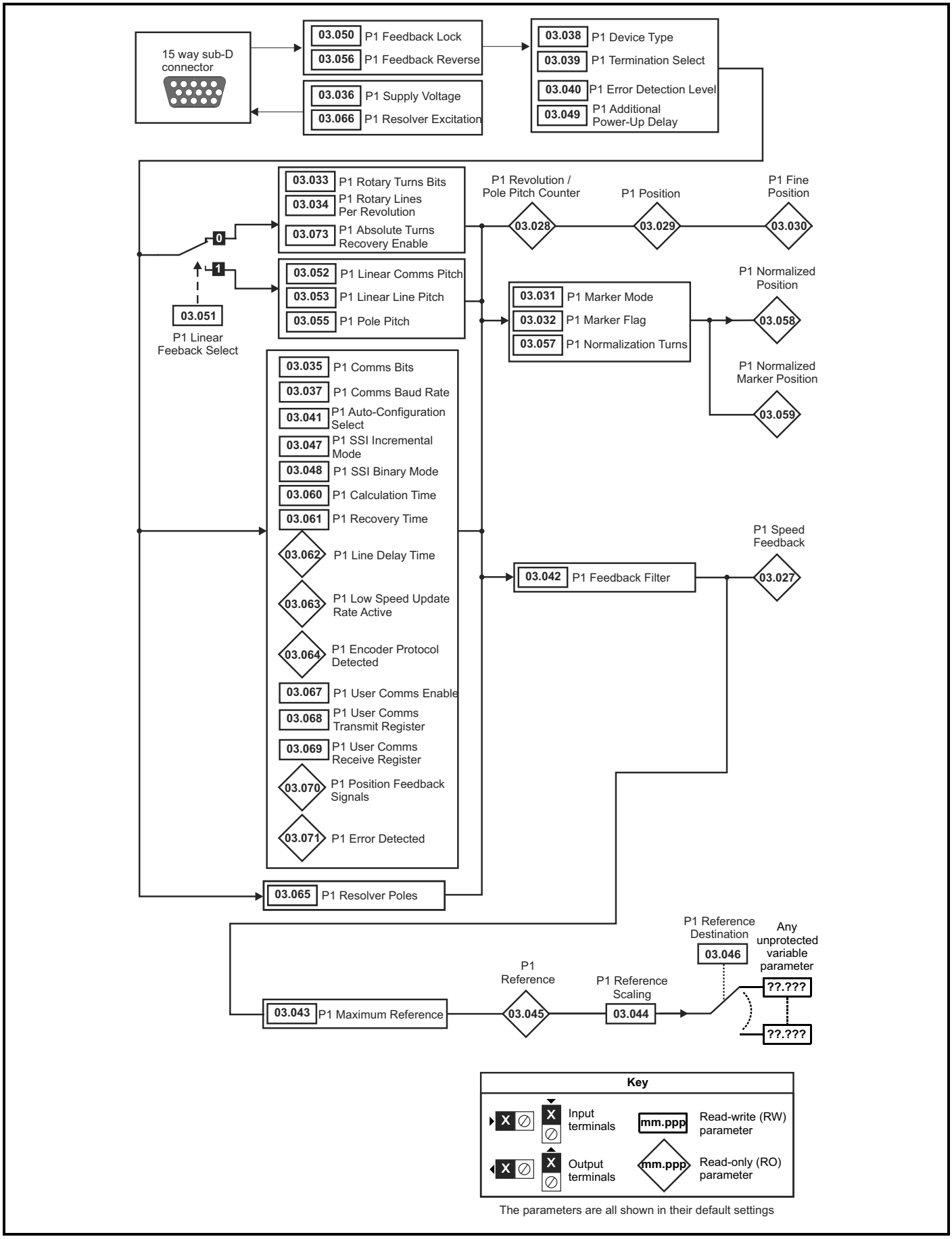
NOTE

* Automatic change over if the relevant 'bit' of *Position Feedback Initialized* (03.076) is 0.



The parameters are all shown in their default settings

Figure 12-5 P1 Interface



The parameters are all shown in their default settings

Figure 12-6 P2 Interface

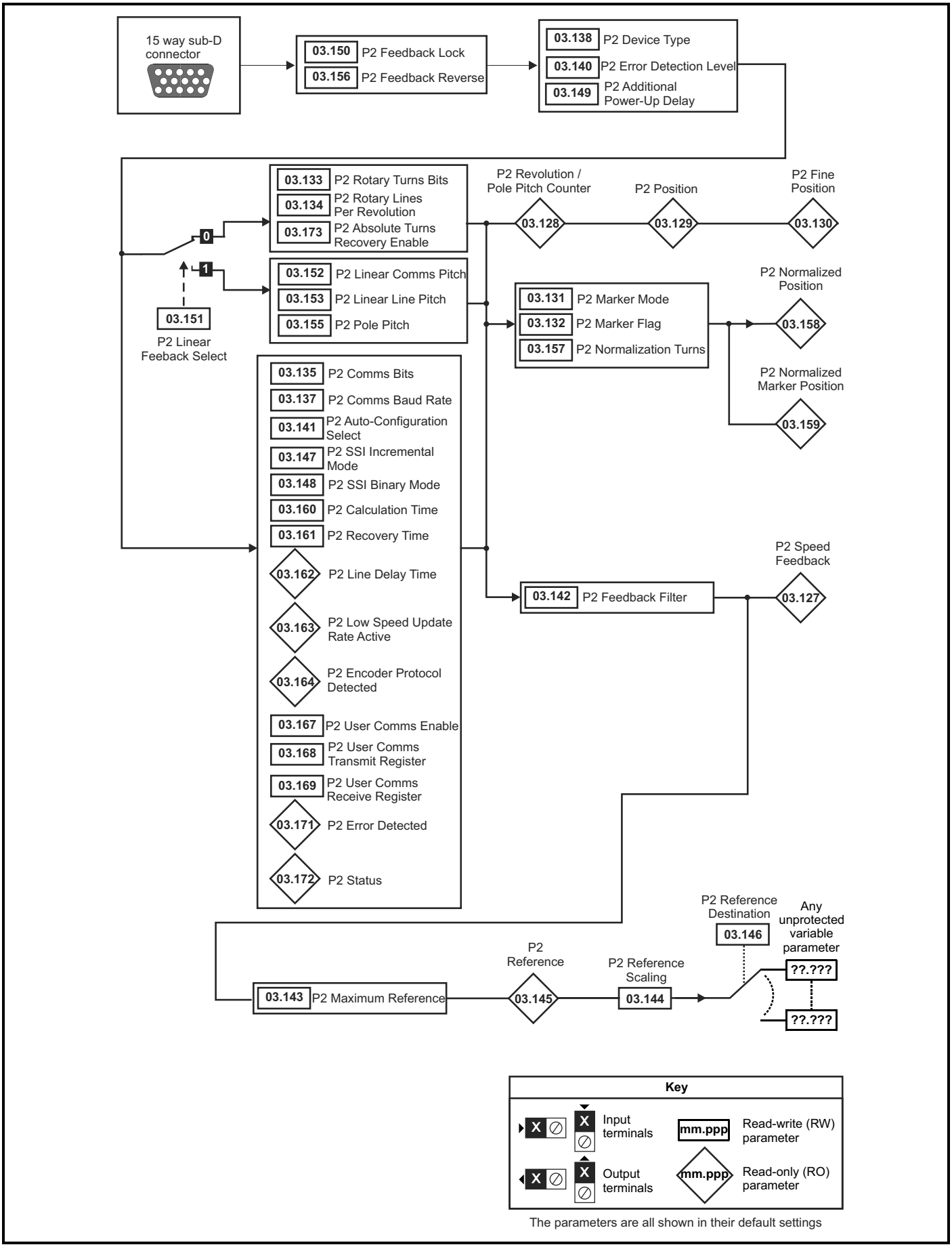
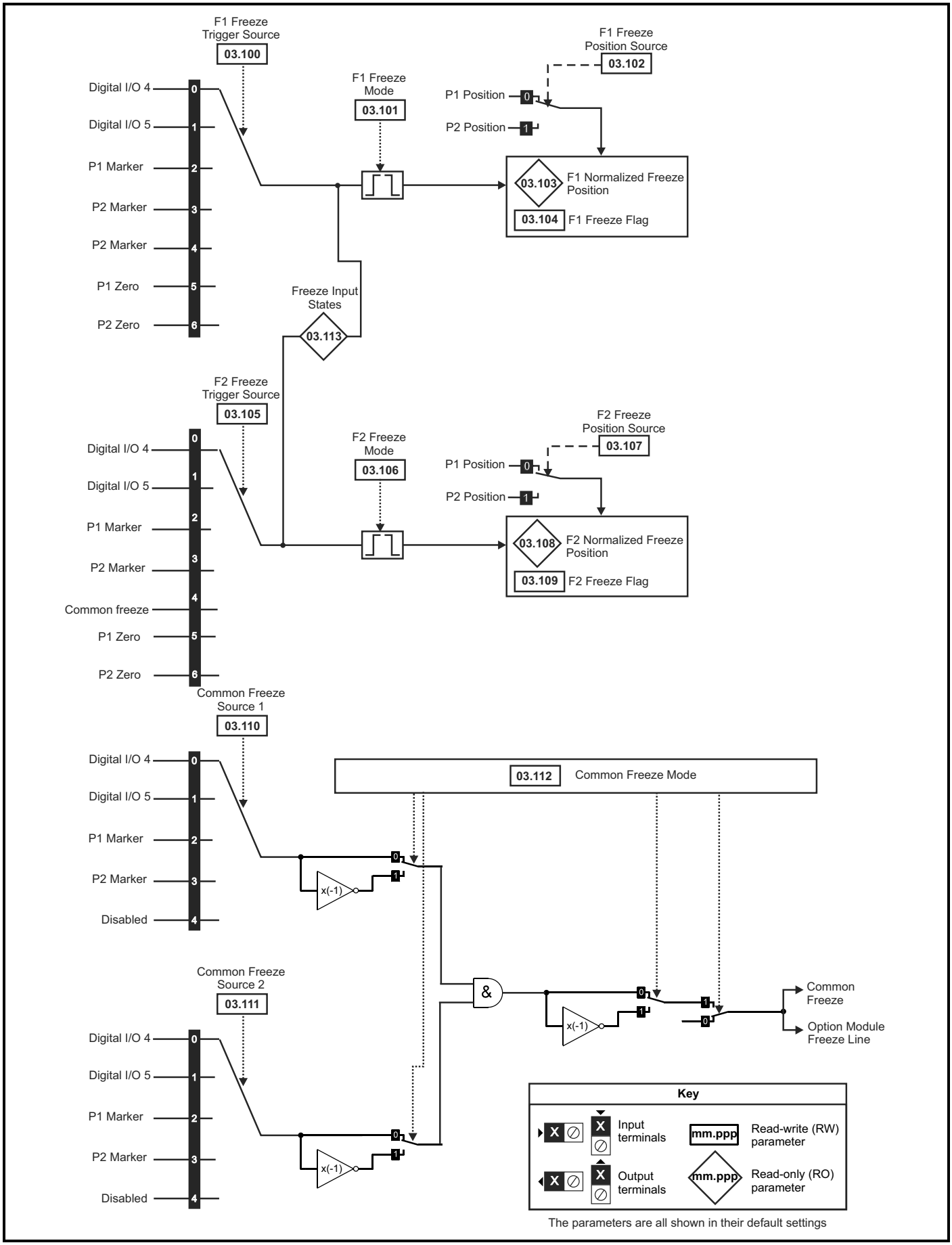


Figure 12-7 Freeze system logic



The parameters are all shown in their default settings

Figure 12-8 P1 Position feedback interface thermistor input

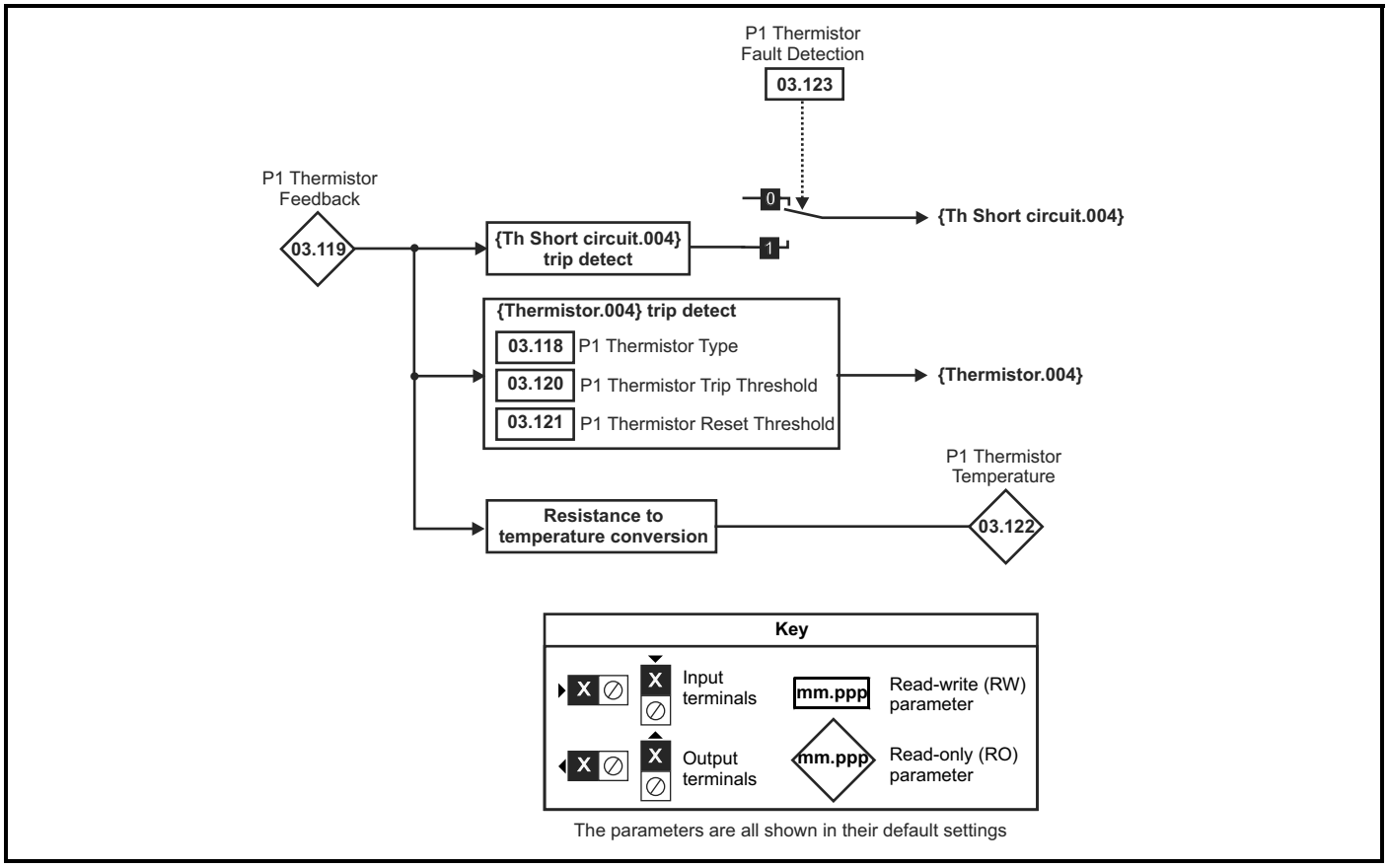
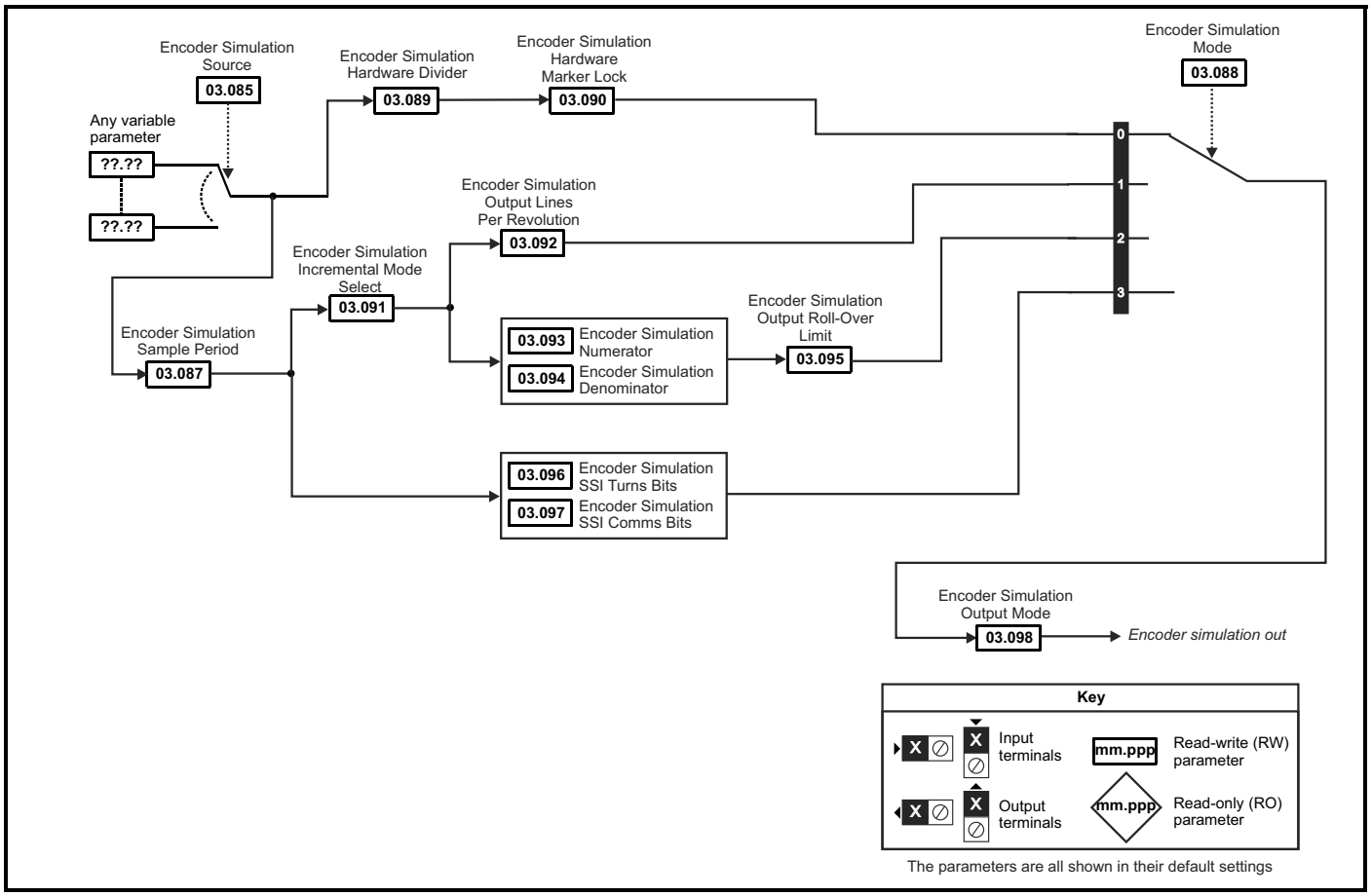


Figure 12-9 Encoder simulation



Parameter		Range			Default			Type					
		OL	RFC-A	RFC-S	OL	RFC-A	RFC-S						
03.001	Open-loop> Frequency Slaving Demand	±1000.0 Hz						RO	Num	ND	NC	PT	FI
	RFC> Final Speed Reference		VM_SPEED					RO	Num	ND	NC	PT	FI
03.002	Speed Feedback		VM_SPEED					RO	Num	ND	NC	PT	FI
03.003	Speed Error		VM_SPEED					RO	Num	ND	NC	PT	FI
03.004	Speed Controller Output		VM_TORQUE_CURRENT %					RO	Num	ND	NC	PT	FI
03.005	Zero Speed Threshold	0.0 to 20.0 Hz	0 to 200 rpm		1.0 Hz	5 rpm		RW	Num				US
03.006	At Speed Lower Limit	0.0 to 599.0 Hz	0 to 33,000 rpm		1.0 Hz	5 rpm		RW	Num				US
03.007	At Speed Upper Limit	0.0 to 599.0 Hz	0 to 33,000 rpm		1.0 Hz	5 rpm		RW	Num				US
03.008	Over Speed Threshold	0.0 to 599.0 Hz	0 to 33,000 rpm		0.0 Hz	0 rpm		RW	Num				US
03.009	Absolute At Speed Select	Off (0) or On (1)			Off (0)			RW	Bit				US
03.010	Speed Controller Proportional Gain Kp1		0.0000 to 200.0000 s/rad			0.0300 s/rad	0.0100 s/rad	RW	Num				US
03.011	Speed Controller Integral Gain Ki1		0.00 to 655.35 s^2/rad			0.10 s^2/rad	1.00 s^2/rad	RW	Num				US
03.012	Speed Controller Differential Feedback Gain Kd1		0.00000 to 0.65535 1/rad			0.00000 1/rad		RW	Num				US
03.013	Open-loop> Enable Frequency Slaving	Off (0) or On (1)			Off (0)			RW	Bit				US
	RFC> Speed Controller Proportional Gain Kp2		0.0000 to 200.0000 s/rad			0.0300 s/rad	0.0100 s/rad	RW	Num				US
03.014	Open-loop> Slaving Ratio Numerator	0.000 to 1.000			1.000			RW	Num				US
	RFC> Speed Controller Integral Gain Ki2		0.00 to 655.35 s^2/rad			0.10 s^2/rad	1.00 s^2/rad	RW	Num				US
03.015	Open-loop> Slaving Ratio Denominator	0.001 to 1.000			1.000			RW	Num				US
	RFC> Speed Controller Differential Feedback Gain Kd2		0.00000 to 0.65535 1/rad			0.00000 1/rad		RW	Num				US
03.016	Open-loop> Reference Frame Angle	0 to 65535						RO	Num	ND	NC	PT	
	RFC> Speed Controller Gain Select		Off (0) or On (1)			Off (0)		RW	Bit				US
03.017	Speed Controller Set-up Method		Disabled (0), Bandwidth (1), Comp Angle (2), Kp Gain Times 16 (3), Low Performance (4), Std Performance (5), High Performance (6), First Order (7)			Disabled (0)		RW	Txt				US
03.018	Motor And Load Inertia		0.00000 to 1000.00000 kgm^2			0.00000 kgm^2		RW	Num				US
03.019	Compliance Angle		0.0 to 360.0 °			4.0 °		RW	Num				US
03.020	Bandwidth		5 to 1000 Hz			10 Hz		RW	Num				US
03.021	Damping Factor		0.0 to 10.0			1.0		RW	Num				US
03.022	Hard Speed Reference		VM_SPEED_FREQ_REF			0.0		RW	Num				US
03.023	Hard Speed Reference Select		Off (0) or On (1)			Off (0)		RW	Bit				US
03.024	RFC Feedback Mode		Feedback (0), Sensorless (1), Feedback NoMax (2), Sensorless NoMax (3)			Feedback (0)		RW	Txt				US
03.025	Position Feedback Phase Angle			0.0 to 359.9 °			0.0 °	RW	Num	ND			US
03.026	Motor Control Feedback Select		P1 Drive (0), P2 Drive (1), P1 Slot 1 (2), P2 Slot 1 (3), P1 Slot 2 (4), P2 Slot 2 (5), P1 Slot 3 (6), P2 Slot 3 (7)			P1 Drive (0)		RW	Txt				US
03.027	P1 Speed Feedback	VM_SPEED						RO	Num	ND	NC	PT	FI
03.028	P1 Revolution/Pole Pitch Counter	0 to 65535						RO	Num	ND	NC	PT	PS
03.029	P1 Position	0 to 65535						RO	Num	ND	NC	PT	PS
03.030	P1 Fine Position	0 to 65535						RO	Num	ND	NC	PT	
03.031	P1 Marker Mode	0000 to 1111			0100			RW	Bin				US
03.032	P1 Marker Flag	Off (0) or On (1)			Off (0)			RW	Bit		NC		
03.033	P1 Rotary Turns Bits	0 to 16			16			RW	Num				US
03.034	P1 Rotary Lines Per Revolution	1 to 100000			1024		4096	RW	Num				US
03.035	P1 Comms Bits	0 to 48			0			RW	Num				US
03.036	P1 Supply Voltage	5V (0), 8V (1), 15V (2)			5V (0)			RW	Txt				US
03.037	P1 Comms Baud Rate	100k (0), 200k (1), 300k (2), 400k (3), 500k (4), 1M (5), 1.5M (6), 2M (7), 4M (8)			300k (2)			RW	Txt				US
03.038	P1 Device Type	AB (0), FD (1), FR (2), AB Servo (3), FD Servo (4), FR Servo (5), SC (6), SC Hiperface (7), EnDat (8), SC EnDat (9), SSI (10), SC SSI (11), SC Servo (12), BiSS (13), Resolver (14), SC SC (15), Commutation Only (16), SC BiSS (17), Option Slot 1 (18), Option Slot 2 (19), Option Slot 3 (20), Option Slot 4 (21)			AB (0)		AB Servo (3)	RW	Txt				US
03.039	P1 Termination Select	0 to 2			1			RW	Num				US
03.040	P1 Error Detection Level	00000000 to 11111111			00000000	00000001		RW	Bin				US
03.041	P1 Auto-configuration Select	Disabled (0) or Enabled (1)			Enabled (1)			RW	Txt				US

Parameter		Range			Default			Type					
		OL	RFC-A	RFC-S	OL	RFC-A	RFC-S						
03.042	P1 Feedback Filter	Disabled (0), 1 (1), 2 (2), 4 (3), 8 (4), 16 (5) ms			Disabled (0)			RW	Txt				US
03.043	P1 Maximum Reference	0 to 35,940 rpm	0 to 33,000 rpm		1500 rpm		3000 rpm	RW	Txt				US
03.044	P1 Reference Scaling	0.000 to 4.000			1.000			RW	Num				US
03.045	P1 Reference	±100.0 %						RO	Num	ND	NC	PT	FI
03.046	P1 Reference destination	0.000 to 59.999			0.000			RW	Num	DE		PT	US
03.047	P1 SSI Incremental Mode	Off (0) or On (1)			Off (0)			RW	Bit				US
03.048	P1 SSI Binary Mode	Off (0) or On (1)			Off (0)			RW	Bit				US
03.049	P1 Additional Power-up Delay	0.0 to 25.0 s			0.0 s			RW	Num				US
03.050	P1 Feedback Lock	Off (0) or On (1)			Off (0)			RW	Bit				US
03.051	P1 Linear Feedback Select	Off (0) or On (1)			Off (0)			RW	Bit				US
03.052	P1 Linear Comms Pitch	0.001 to 100.000			0.001			RW	Num				US
03.053	P1 Linear Line Pitch	0.001 to 100.000			0.001			RW	Num				US
03.054	P1 Linear Comms And Line Pitch Units	millimetres (0) or micrometres (1)			millimetres (0)			RW	Txt				US
03.055	P1 Pole Pitch	0.01 to 1000.00 mm			10.00 mm			RW	Num				US
03.056	P1 Feedback Reverse	Off (0) or On (1)			Off (0)			RW	Bit				US
03.057	P1 Normalization Turns	0 to 16			16			RW	Num				US
03.058	P1 Normalized Position	-2147483648 to 2147483647						RO	Num	ND	NC	PT	
03.059	P1 Normalized Marker Position	-2147483648 to 2147483647						RO	Num	ND	NC	PT	
03.060	P1 Calculation Time	0 to 20 µs			5 µs			RW	Num				US
03.061	P1 Recovery Time	5 to 100 µs			30 µs			RW	Num				US
03.062	P1 Line Delay Time	0 to 5000 ns						RO	Num	ND	NC	PT	US
03.063	P1 Low Speed Update Rate Active	Off (0) or On (1)						RO	Bit	ND	NC	PT	
03.064	P1 Encoder Protocol Detected	None (0), Hiperface (1), EnDat 2.1 (2), EnDat 2.2 (3), BiSS (4)						RO	Txt	ND	NC	PT	
03.065	P1 Resolver Poles	2 Poles (1) to 20 Poles (10)			2 Poles (1)			RW					US
03.066	P1 Resolver Excitation	6kHz 3V (0), 8kHz 3V (1), 6kHz 2V (2), 8kHz 2V (3), 6kHz 3V Fast (4), 8kHz 3V Fast (5), 6kHz 2V Fast (6), 8kHz 2V Fast (7)			6kHz 3V (0)			RW	Txt				US
03.067	P1 User Comms Enable	0 to 1			0			RW	Num		NC	PT	
03.068	P1 User Comms Transmit Register	0 to 65535			0			RW	Num		NC	PT	
03.069	P1 User Comms Receive Register	0 to 65535			0			RW	Num		NC	PT	
03.070	P1 Position Feedback Signals	000000 to 111111						RO	Bin	ND	NC	PT	
03.071	P1 Error Detected	Off (0) or On (1)						RO	Bit	ND	NC	PT	
03.073	P1 Absolute Turns Recovery Enable	Off (0) or On (1)			Off (0)			RW	Bit				US
03.074	P1 Additional Configuration	0 to 511116116			**0**			RW	Num				US
03.075	Initialise Position Feedback	Off (0) or On (1)			Off (0)			RW	Bit		NC		
03.076	Position Feedback Initialized	0000000000 to 1111111111			0000000000			RO	Bin		NC	PT	
03.078	Sensorless Mode Active		Off (0) or On (1)					RO	Bit	ND	NC	PT	
03.079	Sensorless Mode Filter		4 (0), 8 (1), 16 (2), 32 (3), 64 (4) ms			4 ms	64 ms	RW	Txt				US
03.080	Sensorless Position		-2147483648 to 2147483647					RO	Num	ND	NC	PT	
03.083	Full Motor Object Nameplate Transfer	Off (0) or On (1)			Off (0)			RW	Bit				US
03.085	Encoder Simulation Source	0.000 to 59.999			3.016	0.000		RW	Num			PT	US
03.086	Encoder Simulation Status	None (0), Full (1), No Marker Pulse (2)						RO	Txt	ND	NC	PT	
03.087	Encoder Simulation Sample Period	0.25 (0), 1 (1), 4, (2), 16 (3) ms			4 (2) ms	0.25 (0) ms		RW	Txt				US
03.088	Encoder Simulation Mode	Hardware (0), Lines Per Rev (1), Ratio (2), SSI (3)			Lines Per Rev (1)	Hardware (0)		RW	Txt				US
03.089	Encoder Simulation Hardware Divider	0 to 7			0			RW	Num				US
03.090	Encoder Simulation Hardware Marker Lock	Off (0) or On (1)			Off (0)			RW	Bit				US
03.091	Encoder Simulation Incremental Mode Select	Off (0) or On (1)			On (1)	Off (0)		RW	Bit				US
03.092	Encoder Simulation Output Lines Per Revolution	1 to 16384			1024	4096		RW	Num				US
03.093	Encoder Simulation Numerator	1 to 65536			65536			RW	Num				US
03.094	Encoder Simulation Denominator	1 to 65536			65536			RW	Num				US
03.095	Encoder Simulation Output Roll-over Limit	1 to 65535			65535			RW	Num				US
03.096	Encoder Simulation SSI Turns Bits	0 to 16			16			RW	Num				US
03.097	Encoder Simulation SSI Comms Bits	2 to 48			33			RW	Num				US
03.098	Encoder Simulation Output Mode	AB/Gray (0), FD/Binary (1), FR/Binary (2)			AB/Gray (0)			RW	Txt				US
03.100	F1 Freeze Trigger Source	Digital Input 4 (0), Digital Input 5 (1), P1 Marker (2), P2 Marker (3), Common (4), P1 Zero (5), P2 Zero (6)			Digital Input 4 (0)			RW	Txt				US
03.101	F1 Freeze Mode	Rising 1st (0), Falling 1st (1), Rising all (2), Falling all (3)			Rising 1st (0)			RW	Txt				US

Parameter		Range			Default			Type					
		OL	RFC-A	RFC-S	OL	RFC-A	RFC-S						
03.102	F1 Freeze Position Source	P1 (0), P2 (1), Time (2)			P1 (0)			RW	Txt				US
03.103	F1 Normalized Freeze Position	-2147483648 to 2147483647						RO	Num	ND	NC	PT	
03.104	F1 Freeze Flag	Off (0) or On (1)			Off (0)			RW	Bit	ND	NC	PT	
03.105	F2 Freeze Trigger Source	Digital Input 4 (0), Digital Input 5 (1), P1 Marker (2), P2 Marker (3), Common (4), P1 Zero (5), P2 Zero (6)			Digital Input 4 (0)			RW	Txt				US
03.106	F2 Freeze Mode	Rising 1st (0), Falling 1st (1), Rising all (2), Falling all (3)			Rising 1st (0)			RW	Txt				US
03.107	F2 Freeze Position Source	P1 (0), P2 (1), Time (2)			P1 (0)			RW	Txt				US
03.108	F2 Normalized Freeze Position	-2147483648 to 2147483647						RO	Num	ND	NC	PT	
03.109	F2 Freeze Flag	Off (0) or On (1)			Off (0)			RW	Bit	ND	NC	PT	
03.110	Common Freeze Source 1	Digital Input 4 (0), Digital Input 5 (1), P1 Marker (2), P2 Marker (3), Disabled (4)			Digital Input 4 (0)			RW	Txt				US
03.111	Common Freeze Source 2	Digital Input 4 (0), Digital Input 5 (1), P1 Marker (2), P2 Marker (3), Disabled (4)			Digital Input 4 (0)			RW	Txt				US
03.112	Common Freeze Mode	0000 to 1111			0000			RW	Bin				US
03.113	Freeze Input States	00 to 11						RO	Bin	ND	NC	PT	
03.118	P1 Thermistor Type	DIN44082 (0), KTY84 (1), 0.8mA (2), Encoder (3)			DIN44082 (0)			RW	Txt				US
03.119	P1 Thermistor Feedback	0 to 5000 Ω						RO	Num	ND	NC	PT	
03.120	P1 Thermistor Trip Threshold	0 to 5000 Ω			3300 Ω			RW	Num				US
03.121	P1 Thermistor Reset Threshold	0 to 5000 Ω			1800 Ω			RW	Num				US
03.122	P1 Thermistor Temperature	-50 to 300 °C						RO	Num	ND	NC	PT	
03.123	P1 Thermistor Fault Detection	None (0), Temperature (1), Temp or Short (2)			None (0)			RW	Txt				US
03.127	P2 Speed Feedback	±VM_SPEED						RO	Num	ND	NC	PT	FI
03.128	P2 Revolution/Pole Pitch Counter	0 to 65535						RO	Num	ND	NC	PT	PS
03.129	P2 Position	0 to 65535						RO	Num	ND	NC	PT	PS
03.130	P2 Fine Position	0 to 65535						RO	Num	ND	NC	PT	
03.131	P2 Marker Mode	0000 to 1111			0100			RW	Bin				US
03.132	P2 Marker Flag	Off (0) or On (1)			Off (0)			RW	Bit		NC		
03.133	P2 Rotary Turns Bits	0 to 16			16			RW	Num				US
03.134	P2 Rotary Lines Per Revolution	0 to 100000			1024		4096	RW	Num				US
03.135	P2 Comms Bits	0 to 48			0			RW	Num				US
03.137	P2 Comms Baud Rate	100k (0), 200k (1), 300k (2), 400k (3), 500k (4), 1M (5), 1.5M (6), 2M (7), 4M (8) Baud			300k (2) Baud			RW	Txt				US
03.138	P2 Device type	None (0), AB (1), FD (2), FR (3), EnDat (4), SSI (5), BiSS (6)			None (0)			RW	Txt				US
03.140	P2 Error Detection Level	00000 to 11111			00001			RW	Bin				US
03.141	P2 Auto-configuration Select	Disabled (0), Enabled (1)			Enabled (1)			RW	Txt				US
03.142	P2 Feedback Filter	Disabled (0), 1 (1), 2 (2), 4 (3), 8 (4), 16 (5) ms			Disabled (0)			RW	Txt				US
03.143	P2 Maximum Reference	0 to 35,940 rpm	0 to 33,000 rpm		1500 rpm		3000 rpm	RW	Txt				US
03.144	P2 Reference Scaling	0.000 to 4.000			1.000			RW	Num				US
03.145	P2 Reference	±100.0 %						RO	Num	ND	NC	PT	FI
03.146	P2 Reference Destination	0.000 to 59.999			0.000			RW	Num	DE		PT	US
03.147	P2 SSI Incremental Mode	Off (0) or On (1)			Off (0)			RW	Bit				US
03.148	P2 SSI Binary Mode	Off (0) or On (1)			Off (0)			RW	Bit				US
03.149	P2 Additional Power-up Delay	0.0 to 25.0 s			0.0 s			RW	Num				US
03.150	P2 Feedback Lock	Off (0) or On (1)			Off (0)			RW	Bit				US
03.151	P2 Linear Feedback Select	Off (0) or On (1)			Off (0)			RW	Bit				US
03.152	P2 Linear Comms Pitch	0.001 to 100.000			0.001			RW	Num				US
03.153	P2 Linear Line Pitch	0.001 to 100.000			0.001			RW	Num				US
03.154	P2 Linear Comms And Line Pitch Units	Millimetres (0) or Micrometres (1)			Millimetres (0)			RW	Txt				US
03.155	P2 Pole Pitch	0.01 to 1000.00 mm			10.00 mm			RW	Num				US
03.156	P2 Feedback Reverse	Off (0) or On (1)			Off (0)			RW	Bit				US
03.157	P2 Normalization Turns	0 to 16			16			RW	Num				US
03.158	P2 Normalized Position	-2147483648 to 2147483647						RO	Num	ND	NC	PT	
03.159	P2 Normalized Marker Position	--2147483648 to 2147483647						RO	Num	ND	NC	PT	
03.160	P2 Calculation Time	0 to 20 µs			5 µs			RW	Num				US

Parameter		Range			Default			Type					
		OL	RFC-A	RFC-S	OL	RFC-A	RFC-S						
03.161	P2 Recovery Time	5 to 100 µs			30 µs			RW	Num				US
03.162	P2 Line Delay Time	0 to 5000 ns						RO	Num	ND	NC	PT	US
03.163	P2 Low Speed Update Rate Active	Off (0) or On (1)						RO	Bit	ND	NC	PT	
03.164	P2 Encoder Protocol Detected	None (0), Hiperface (1), EnDat 2.1 (2), EnDat 2.2 (3), BiSS (4)						RO	Txt	ND	NC	PT	
03.167	P2 User Comms Enable	0 to 1			0			RW	Num		NC	PT	
03.168	P2 User Comms Transmit Register	0 to 65535			0			RW	Num		NC	PT	
03.169	P2 User Comms Receive Register	0 to 65535			0			RW	Num		NC	PT	
03.171	P2 Error Detected	Off (0) or On (1)						RO	Bit	ND	NC	PT	
03.172	P2 Status	None (0), AB (1), FD (2), FR (3), EnDat (4), SSI (5), BiSS (6), EnDat Alt (7), SSI Alt (8), BiSS Alt (9)						RO	Txt	ND	NC	PT	
03.173	P2 Absolute Turns Recovery Enable	Off (0) or On (1)			Off (0)			RW	Bit				US
03.174	P2 Additional Configuration	0 to 511116116			**0**			RW	Num				US

RW	Read / Write	RO	Read only	Num	Number parameter	Bit	Bit parameter	Txt	Text string	Bin	Binary parameter	FI	Filtered
ND	No default value	NC	Not copied	PT	Protected parameter	RA	Rating dependent	US	User save	PS	Power-down save	DE	Destination

12.5 Menu 4: Torque and current control

Figure 12-10 Menu 4 Open loop logic diagram

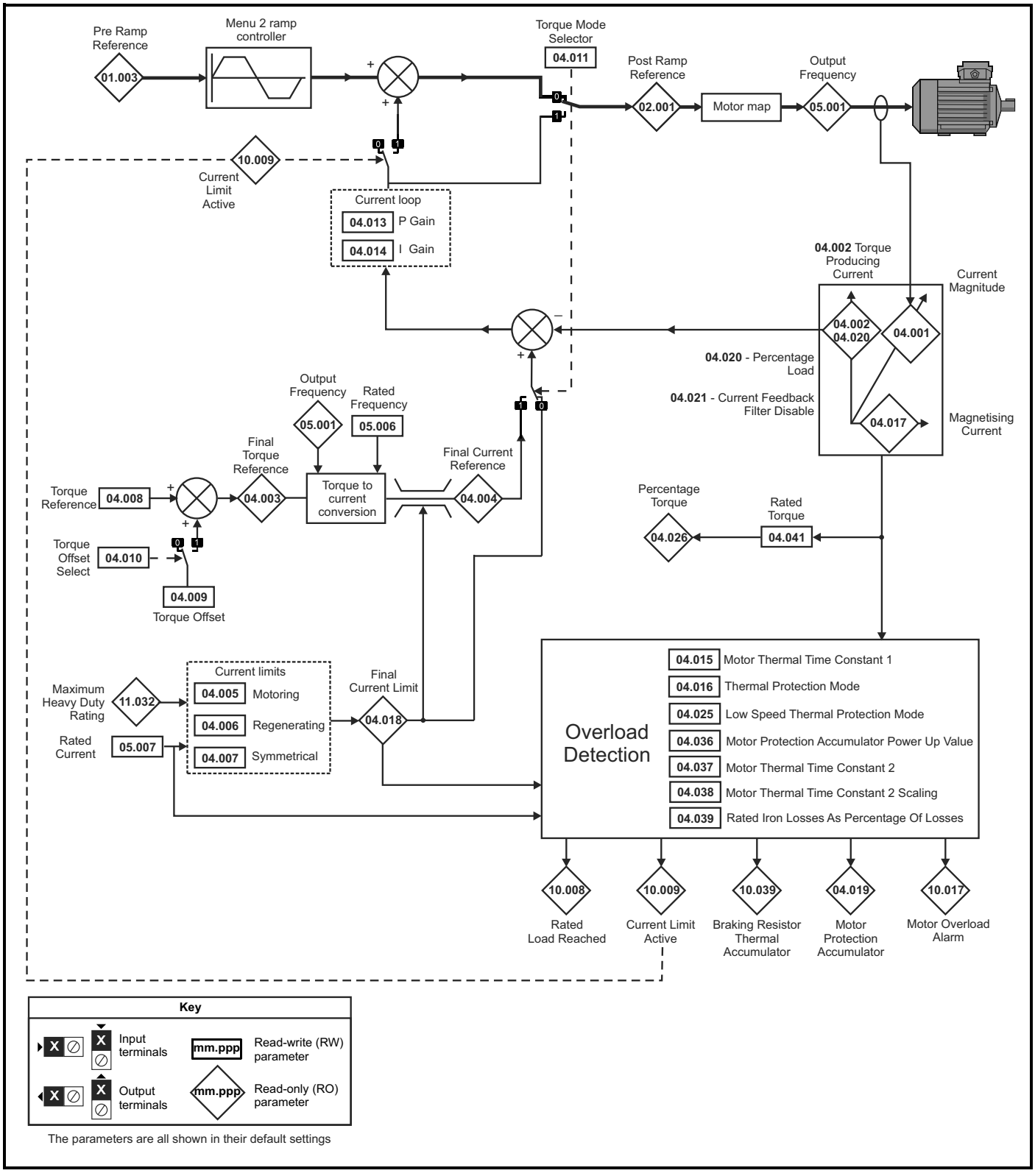


Figure 12-11 Menu 4 RFC-A logic diagram

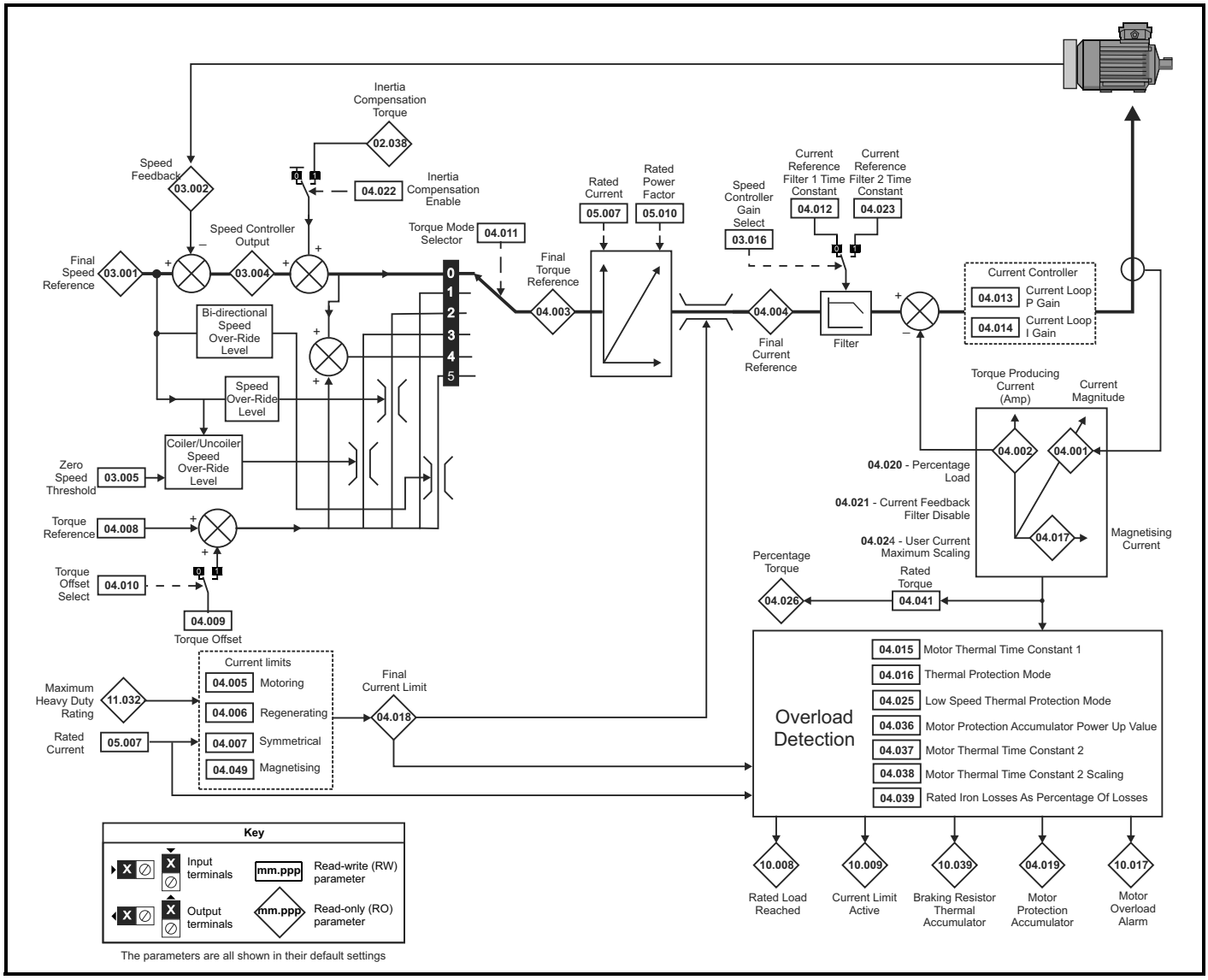
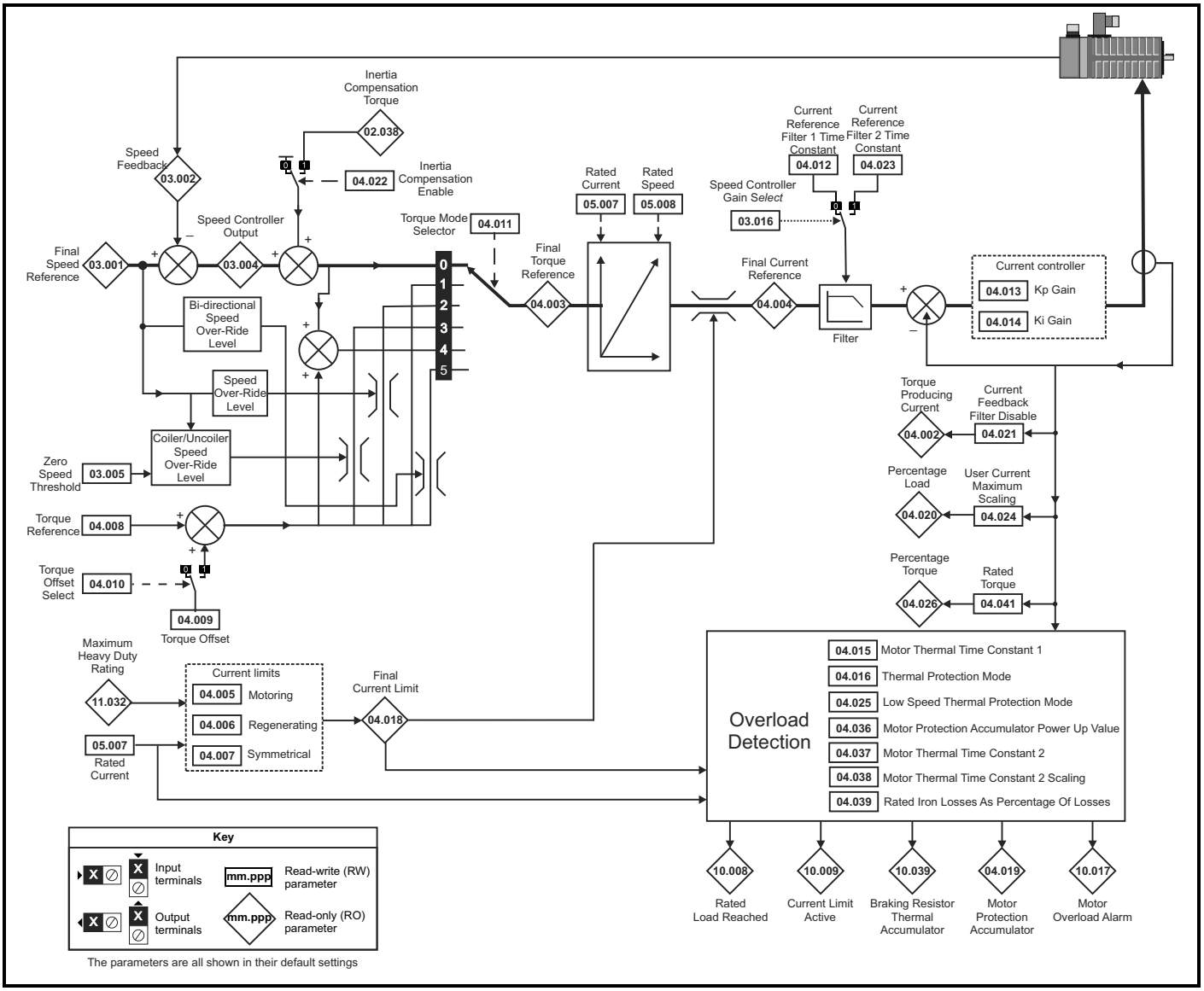


Figure 12-12 Menu 4 RFC-S logic diagram



Parameter		Range(⇳)		Default(⇨)			Type					
		OL	RFC-A / S	OL	RFC-A	RFC-S						
04.001	Current Magnitude	0.000 to VM_DRIVE_CURRENT_UNIPOLAR A					RO	Num	ND	NC	PT	FI
04.002	Torque Producing Current / Iq	VM_DRIVE_CURRENT A					RO	Num	ND	NC	PT	FI
04.003	Final Torque Reference	VM_TORQUE_CURRENT %					RO	Num	ND	NC	PT	FI
04.004	Final Current Reference	VM_TORQUE_CURRENT %					RO	Num	ND	NC	PT	FI
04.005	Motoring Current Limit	0.0 to VM_MOTOR1_CURRENT_LIMIT %		165.0 %*	175.0 %**		RW	Num		RA		US
04.006	Regenerating Current Limit	0.0 to VM_MOTOR1_CURRENT_LIMIT %		165.0 %*	175.0 %**		RW	Num		RA		US
04.007	Symmetrical Current Limit	0.0 to VM_MOTOR1_CURRENT_LIMIT %		165.0 %*	175.0 %**		RW	Num		RA		US
04.008	Torque Reference	VM_USER_CURRENT_HIGH_RES %		0.00 %			RW	Num				US
04.009	Torque Offset	VM_USER_CURRENT %		0.0 %			RW	Num				US
04.010	Torque Offset Select	Off (0) or On (1)		Off (0)			RW	Bit				US
04.011	Torque Mode Selector	0 to 1	0 to 5	0			RW	Num				US
04.012	Current Reference Filter 1 Time Constant		0.0 to 25.0 ms		0.0 ms		RW	Num				US
04.013	Current Controller Kp Gain	0 to 30000		20	150		RW	Num				US
04.014	Current Controller Ki Gain	0 to 30000		40	2000		RW	Num				US
04.015	Motor Thermal Time Constant 1	1.0 to 3000.0 s		89.0 s			RW	Num				US
04.016	Thermal Protection Mode	Motor Trip (0), Motor Limit (1), Drive Limit (2), Both Limit (3), Disabled (4)		Motor Trip (0)			RW	Bin				US
04.017	Magnetising Current / Id	VM_DRIVE_CURRENT A					RO	Num	ND	NC	PT	FI
04.018	Final Current Limit	VM_TORQUE_CURRENT %					RO	Num	ND	NC	PT	
04.019	Motor Protection Accumulator	0.0 to 100.0 %	0.0 to 200.0 %				RO	Num	ND	NC	PT	PS
04.020	Percentage Load	VM_USER_CURRENT %					RO	Num	ND	NC	PT	FI
04.021	Current Feedback Filter Disable	Off (0) or On (1)		Off (0)			RW	Bit				US
04.022	Inertia Compensation Enable		Off (0) or On (1)		Off (0)		RW	Bit				US
04.023	Current Reference Filter 2 Time Constant		0.0 to 25.0 ms		0.0 ms		RW	Num				US
04.024	User Current Maximum Scaling	0.0 to VM_TORQUE_CURRENT_UNIPOLAR %		165.0 %*	175.0 %**		RW	Num		RA		US
04.025	Low Speed Thermal Protection Mode	0 to 1		0			RW	Num				US
04.026	Percentage Torque	VM_USER_CURRENT %					RO	Num	ND	NC	PT	FI
04.027	Low Load Detection Level	0.0 to 100.0 %		0.0 %			RW	Num				US
04.028	Low Load Detection Speed/Frequency Threshold	0.0 to VM_SPEED_FREQ_REF_UNIPOLAR		0.0			RW	Num				US
04.029	Enable Trip On Low Load	Off (0) or On (1)		Off (0)			RW	Bit				US
04.030	Current Controller Mode		Off (0) or On (1)		Off (0)		RW	Bit				US
04.031	Notch Filter Centre Frequency		50 to 1000 Hz		100 Hz		RW	Num				US
04.032	Notch Filter Bandwidth		0 to 500 Hz		0 Hz		RW	Num				US
04.033	Inertia Times 1000		Off (0) or On (1)		Off (0)		RW	Bit				US
04.036	Motor Protection Accumulator Power-up Value	Power down (0), Zero (1), Real time (2)		Power down (0)			RW	Txt				US
04.037	Motor Thermal Time Constant 2	1.0 to 3000.0 s		89.0 s			RW	Num				US
04.038	Motor Thermal Time Constant 2 Scaling	0 to 100 %		0 %			RW	Num				US
04.039	Rated Iron Losses As Percentage Of Losses	0 to 100 %		0 %			RW	Num				US
04.041	Rated Torque	0.00 to 50000.00 N m		0.00 N m			RW	Num				US
04.042	Torque Estimation Minimum Frequency	0 to 100 %		5 %			RW	Num				US
04.043	Torque Correction Time Constant		0.00 to 10.00 s		0.00 s		RW	Num				US
04.044	Torque Correction Maximum		0 to 100 %		20 %		RW	Num				US
04.045	No-load Core Loss	0.000 to 99999.999 kW		0.000 kW			RW	Num				US
04.046	Rated Core Loss	0.000 to 99999.999 kW		0.000 kW			RW	Num				US
04.049	Magnetising Current Limit		0.0 to 100.0 %		100.0 %		RW	Num				US

* For size 9 and above the default is 141.9 %.

** For size 9 and above the default is 150.0 %.

RW	Read / Write	RO	Read only	Num	Number parameter	Bit	Bit parameter	Txt	Text string	Bin	Binary parameter	FI	Filtered
ND	No default value	NC	Not copied	PT	Protected parameter	RA	Rating dependent	US	User save	PS	Power-down save	DE	Destination

12.6 Menu 5: Motor control

Figure 12-13 Menu 5 Open-loop logic diagram

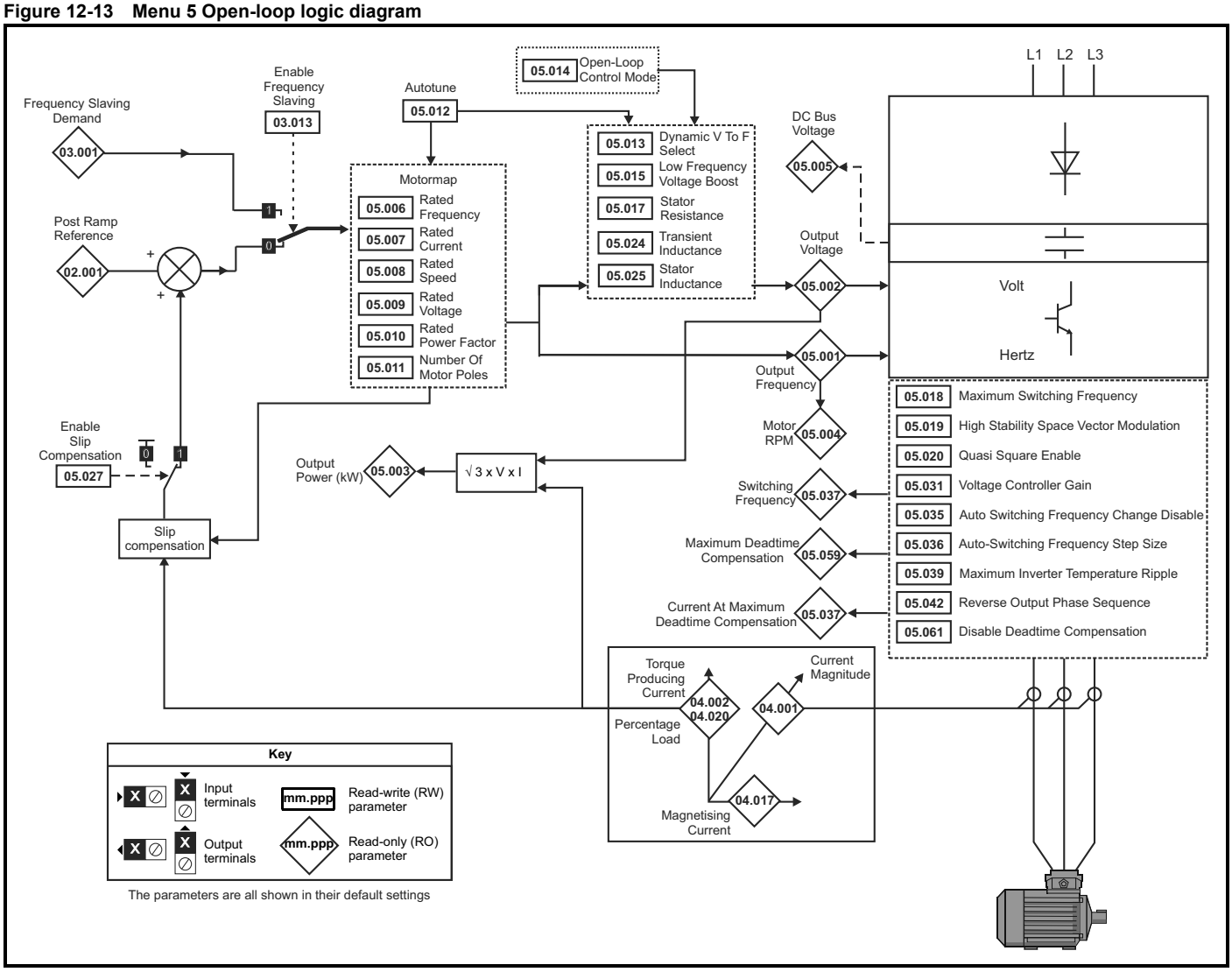
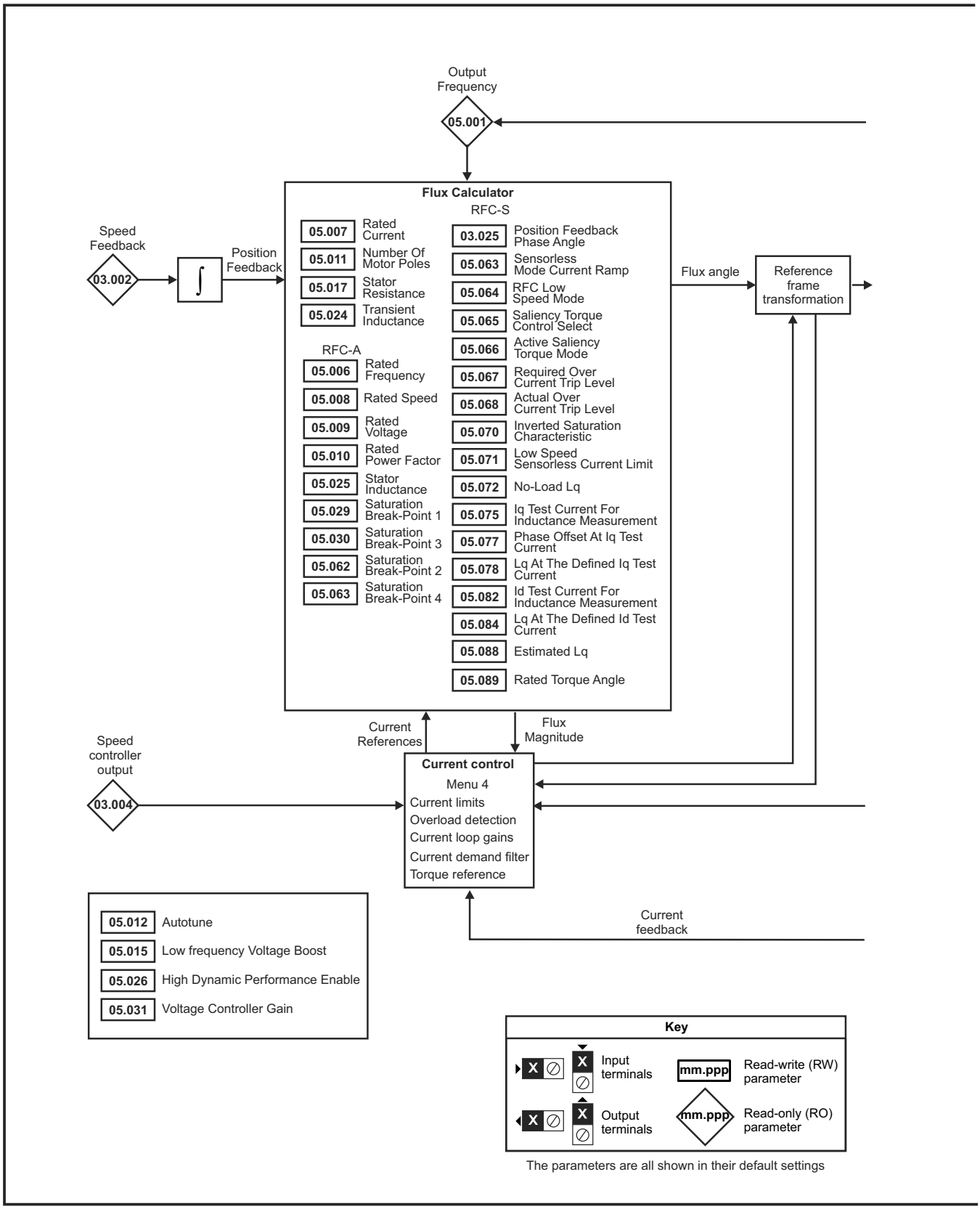
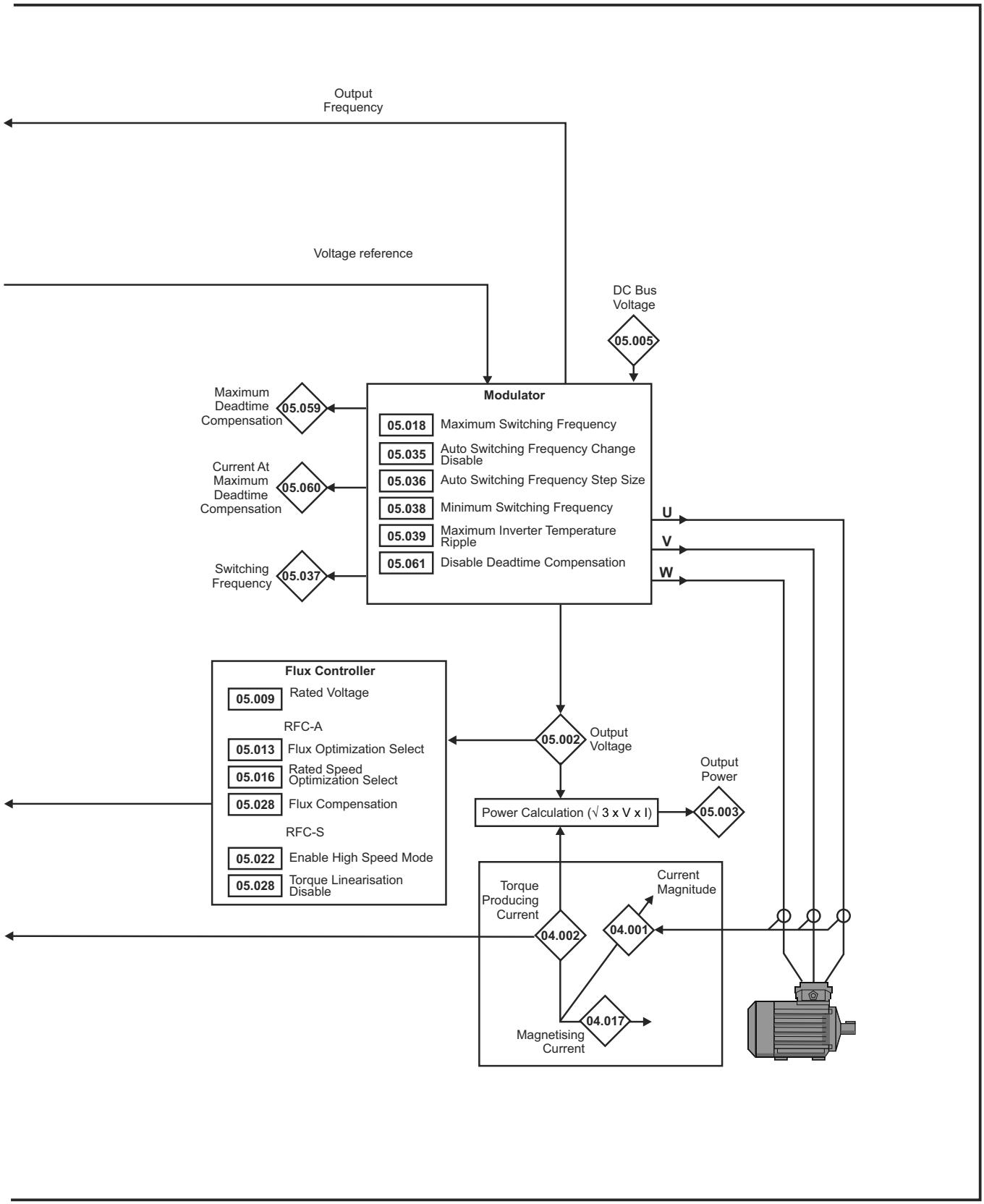


Figure 12-14 Menu 5 RFC-A, RFC-S logic diagram




Output Frequency
Voltage reference
DC Bus Voltage
05.005
Modulator
Maximum Deadtime Compensation
05.059
Current At Maximum Deadtime Compensation
05.060
Switching Frequency
05.037
05.018 Maximum Switching Frequency
05.035 Auto Switching Frequency Change Disable
05.036 Auto Switching Frequency Step Size
05.038 Minimum Switching Frequency
05.039 Maximum Inverter Temperature Ripple
05.061 Disable Deadtime Compensation
U
V
W
Flux Controller
05.009 Rated Voltage
RFC-A
05.013 Flux Optimization Select
05.016 Rated Speed Optimization Select
05.028 Flux Compensation
RFC-S
05.022 Enable High Speed Mode
05.028 Torque Linearisation Disable
05.002 Output Voltage
Output Power
Power Calculation (√ 3 x V x I)
05.003
Torque Producing Current
04.002
Current Magnitude
04.001
04.017
Magnetising Current

Parameter		Range(⇳)			Default(⇨)			Type					
		OL	RFC-A	RFC-S	OL	RFC-A	RFC-S						
05.001	Output Frequency	VM_SPEED_FREQ_REF	±2000.0 Hz					RO	Num	ND	NC	PT	FI
05.002	Output Voltage	0 to VM_AC_VOLTAGE V						RO	Num	ND	NC	PT	FI
05.003	Output Power	VM_POWER kW						RO	Num	ND	NC	PT	FI
05.004	Motor Rpm	±180000 rpm						RO	Num	ND	NC	PT	FI
05.005	D.c. Bus Voltage	0 to VM_DC_VOLTAGE V						RO	Num	ND	NC	PT	FI
05.006	Rated Frequency	0.0 to 599.0 Hz	0.0 to 550.0 Hz		50Hz: 50.0 60Hz: 60.0			RW	Num				US
05.007	Rated Current	0.000 to VM_RATED_CURRENT A			Maximum Heavy Duty Rating (11.032)			RW	Num		RA		US
05.008	Rated Speed	0 to 35940 rpm	0.00 to 33000.00 rpm		50Hz: 1500 rpm 60Hz: 1800 rpm	50Hz: 1450.00 rpm 60Hz: 1750.00 rpm	3000.00 rpm	RW	Num				US
05.009	Rated Voltage	0 to VM_AC_VOLTAGE_SET			200 V drive: 230 V 50 Hz - 400 V drive: 400 V 60 Hz - 400 V drive: 460 V 575 V drive: 575 V 690 V drive: 690 V			RW	Num		RA		US
05.010	Rated Power Factor	0.000 to 1.000			0.850			RW	Num		RA		US
05.011	Number Of Motor Poles	Automatic (0) to 480 Poles (240)			Automatic (0)		6 Poles (3)	RW	Num				US
05.012	Autotune	None (0), Basic (1), Improved (2)	None (0), Basic (1), Improved (2), Inertia 1 (3), Inertia 2 (4)	None (0), Stationary (1), Rotating (2), Inertia 1 (3), Inertia 2 (4), Full Stationary (5)	None (0)			RW	Num		NC		
05.013	Open Loop: Dynamic V To F Select	Off (0) or On (1)			Off (0)			RW	Bit				US
	RFC A: Flux Optimisation Select		Off (0) or On (1)			Off (0)		RW	Bit				US
	RFC S: Minimal Movement Phasing Test Mode			Free (0), Constrained (1)			Free (0)	RW	Txt				US
05.014	Open-loop Control Mode	Ur S (0), Ur (1), Fixed (2), Ur Auto (3), Ur I (4), Square (5),			Ur I (4)			RW	Txt				US
	Phasing Test On Enable			Disabled (0), Short, (1), Short Once (2), Long (3), Long Once (4)			Disabled (0)	RW	Txt				US
05.015	Low Frequency Voltage Boost	0.0 to 25.0 %			3.0 %			RW	Num				US
	Minimal Movement Phasing Test Current			1 % (0), 2 % (1), 3 % (2), 6 % (3), 12 % (4), 25 % (5), 50 % (6), 100 % (7)			1 % (0)	RW	Txt				US
05.016	Rated Speed Optimization Select		Disabled (0), Classic Slow (1), Classic Fast (2), Combined (3), VARs Only (4), Voltage Only (5)			Disabled (0)		RW	Txt				US
	Minimal Movement Phasing Test Angle			0.00 to 25.00 °			0.00 °	RW	Num				US
05.017	Stator Resistance	0.000000 to 1000.000000 Ω			0.000000 Ω			RW	Num		RA		US
05.018	Maximum Switching Frequency	2 kHz (0), 3 kHz (1), 4 kHz (2), 6 kHz (3), 8 kHz (4), 12 kHz (5), 16 kHz (6)			3 kHz (1)		6 kHz (3)	RW	Txt		RA		US
05.019	Open Loop: High Stability Space Vector Modulation	Off (0) or On (1)			Off (0)			RW	Bit				US
	RFC A: Rated Speed Optimisation Minimum Frequency		0 to 100 %			10 %		RW	Num				US
	RFC S: Minimal Movement Phasing Test Mechanical Load Phase			-180 to 179 °			-180 °	RW	Num				US
05.020	Quasi-square Enable	Off (0) or On (1)			Off (0)			RW	Bit				US
	Rated Speed Optimization Minimum Load		0 to 100 %			50 %		RW	Num				US
05.021	Mechanical Load Test Level		0 to 100 %			0 %		RW	Num				US
05.022	Enable High Speed Mode			Limit (-2), Limit (Servo) (-1), Disable (0), Enable (Servo) (1), Enable (2)			Disable (0)	RW	Txt				US
05.023	D.c. Bus Voltage High Range	0 to VM_HIGH_DC_VOLTAGE V						RO	Num	ND	NC	PT	FI
05.024	Transient Inductance	0.000 to 500.000 mH			0.000 mH			RW	Num		RA		US
	Ld			0.000 to 500.000 mH			0.000 mH	RW	Num		RA		US
05.025	Stator Inductance	0.00 to 5000.00 mH			0.00 mH			RW	Num		RA		US
05.026	High Dynamic Performance Enable		Off (0) or On (1)			Off (0)		RW	Bit				US

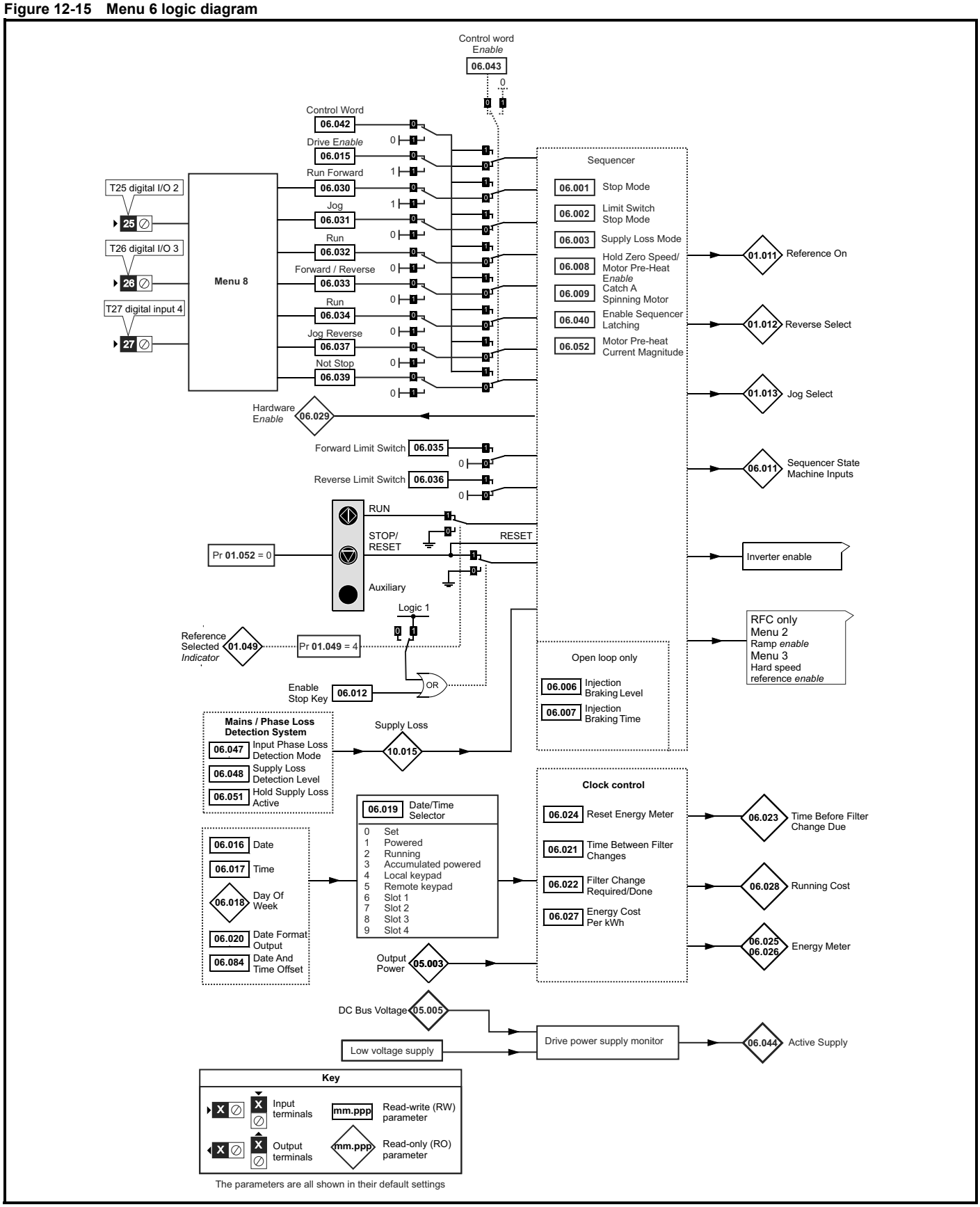
Parameter		Range(⇳)			Default(⇨)			Type					
		OL	RFC-A	RFC-S	OL	RFC-A	RFC-S						
05.027	Open Loop: Enable Slip Compensation	Off (0) or On (1)			On (1)			RW	Bit				US
	RFC A: Flux Control Gain		±10.0			1.0		RW	Num				US
	RFC S: Flux Control Gain			0.1 to 10.0			1.0	RW	Num				US
05.028	Flux Compensation		0 to 2			0		RW	Num				US
	Torque Linearization Disable			Off (0) or On (1)			Off (0)	RW	Bit				US
05.029	Saturation Breakpoint 1		0.0 to 100.0 %			50.0 %		RW	Num				US
05.030	Saturation Breakpoint 3		0.0 to 100.0 %			75.0 %		RW	Num				US
05.031	Voltage Controller Gain	1 to 30			1			RW	Num				US
05.032	Torque Per Amp		0.00 to 500.00 Nm/A					RO	Num	ND	NC	PT	
				0.00 to 500.00 Nm/A			1.60 Nm/A	RW	Num				US
05.033	Volts Per 1000 rpm			0 to 10,000 V			98	RW	Num				US
05.034	Percentage Flux		0.0 to 150.0 %					RO	Num	ND	NC	PT	FI
05.035	Auto-switching Frequency Change Disable	Enabled (0), Disabled (1), No Ripple Detect (2)			Enabled (0)			RW	Txt				US
05.036	Auto-switching Frequency Step Size	1 to 2			2			RW	Num				US
05.037	Switching Frequency	2 kHz (0), 3 kHz (1), 4 kHz (2), 6 kHz (3), 8 kHz (4), 12 kHz (5), 16 kHz (6)						RO	Txt	ND	NC	PT	
05.038	Minimum Switching Frequency	0 to VM_MIN_SWITCHING_FREQUENCY kHz			2 (0) kHz			RW	Txt				US
05.039	Maximum Inverter Temperature Ripple	20 to 60 °C			60 °C			RW	Num				US
05.040	Spin Start Boost	0.0 to 10.0			1.0			RW	Num				US
05.041	Voltage Headroom		0 to 20 %			0 %		RW	Num				US
05.042	Reverse Output Phase Sequence	Off (0) or On (1)			Off (0)			RW	Bit				US
05.044	Stator Temperature Source	An In 3 (0), User (1), P1 Drive (2), P1 Slot 1 (3), P1 Slot 2 (4), P1 Slot 3 (5), P1 Slot 4 (6)			An In 3 (0)*			RW	Txt				US
05.045	User Stator Temperature	-50 to 300 °C			0 °C			RW	Num				
05.046	Stator Temperature	-50 to 300 °C						RO	Num	ND	NC	PT	
05.047	Stator Temperature Coefficient	0.00000 to 0.10000 $°C^{-1}$			0.00390 $°C^{-1}$			RW	Num				US
05.048	Stator Base Temperature	-50 to 300 °C			0 °C			RW	Num				US
05.049	Enable Stator Compensation	Off (0) or On (1)			Off (0)			RW	Bit				US
05.050	Temperature Compensated Stator Resistance	0.000000 to 1000.000000 Ω	0.000000 to 1000.000000					RO	Num	ND	NC	PT	
05.051	Rotor Temperature Source	An In 3 (0), User (1), P1 Drive (2), P1 Slot 1 (3), P1 Slot 2 (4), P1 Slot 3 (5), P1 Slot 4 (6)			An In 3 (0)*			RW	Txt				US
05.052	User Rotor Temperature	-50 to 300 °C			0 °C			RW	Num				US
05.053	Rotor Temperature	-50 to 300 °C						RO	Num	ND	NC	PT	
05.054	Rotor Temperature Coefficient	0.00000 to 0.10000 $°C^{-1}$			0.00390$°C^{-1}$		0.00100 $°C^{-1}$	RW	Num				US
05.055	Rotor Base Temperature	-50 to 300 °C			0 °C			RW	Num				US
05.056	Enable Rotor Compensation	Off (0) or On (1)			Off (0)			RW	Bit				US
05.057	Temperature compensated rated speed	0.00 to 18000.00 rpm	0.00 to 50000.00 rpm					RO	Num	ND	NC	PT	
	Rotor Temperature Compensation			0.000 to 2.000				RO	Num	ND	NC	PT	
05.059	Maximum Deadtime Compensation	0.000 to 10.000 µs						RO	Num		NC	PT	US
05.060	Current At Maximum Deadtime Compensation	0.00 to 100.00 %						RO	Num		NC	PT	US
05.061	Disable Deadtime Compensation	Off (0) or On (1)			Off (0)			RW	Bit				US
05.062	Saturation Breakpoint 2		0.0 to 100.0 %			0.0 %		RW	Num				US
05.063	Saturation Breakpoint 4		0.0 to 100.0 %			0.0 %		RW	Num				US
	Sensorless Mode Current Ramp			0.00 to 1.00 s			0.20 s	RW	Num				US
05.064	RFC Low Speed Mode			Injection (0), Non-salient (1), Current (2), Current No Test (3), Current Step (4), Current Only (5)			Current (2)	RW	Txt				US
05.065	Saliency Torque Control Select			Disabled (0), Low (1), High (2), Auto (3)			Disabled (0)	RW	Txt				US
05.066	Active Saliency Torque Mode			Disabled (0), Low (1), High (2)				RO	Txt	ND	NC	PT	
05.067	Required Over-current Trip Level			0 to 100 %			0 %	RW	Num				US
05.068	Actual Over-current Trip Level			0 to 500 %				RO	Num	ND	NC	PT	
05.069	Over current Trip Level as Percentage of Rated Current			0 to 1000 %			0 %	RW	Num				US
05.070	Inverted Saturation Characteristic			Off (0) or On (1)			Off (0)	RW	Bit				US

Parameter		Range(⇳)			Default(⇨)			Type					
		OL	RFC-A	RFC-S	OL	RFC-A	RFC-S						
05.071	Low Speed Sensorless Mode Current Limit			0.0 to 1000.0 %			100.0 %	RW	Num		RA		US
05.072	No-load Lq			0.000 to 500.000 mH			0.000 mH	RW	Num		RA		US
05.075	q Axis Current For Inductance Values With Current			0 to 200 %			100 %	RW	Num				US
05.077	Phase Offset At Defined Iq Current			±90.0°			0.0°	RW	Num		RA		US
05.078	Lq At The Defined Iq Current			0.000 to 500.000 mH			0.000 mH	RW	Num		RA		US
05.079	Lq Incremental Inductance At Defined Iq Current			0.000 to 500.000 mH			0.000 mH	RW	Num		RA		US
05.082	d Axis Current For Inductance Values With Current			-100 to 0 %			-100%	RW	Num				US
05.084	Lq At The Defined Id Current			0.000 to 500.000 mH			0.000 mH	RW	Num		RA		US
05.085	Lq Incremental Inductance At Defined Id Current			0.000 to 500.000 mH			0.000 mH	RW	Num		RA		US
05.087	User Defined Rated Torque Angle			0 to 90 °			0 °	RW	Num				US
05.088	Estimated Lq			0.000 to 500.000 mH				RO	Num	ND	NC	PT	FI
05.089	Rated Torque Angle			0 to 90°				RO	Num	ND	NC	PT	

* User (1) on *Unidrive M702*.

12.7 Menu 6: Sequencer and clock

Figure 12-15 Menu 6 logic diagram

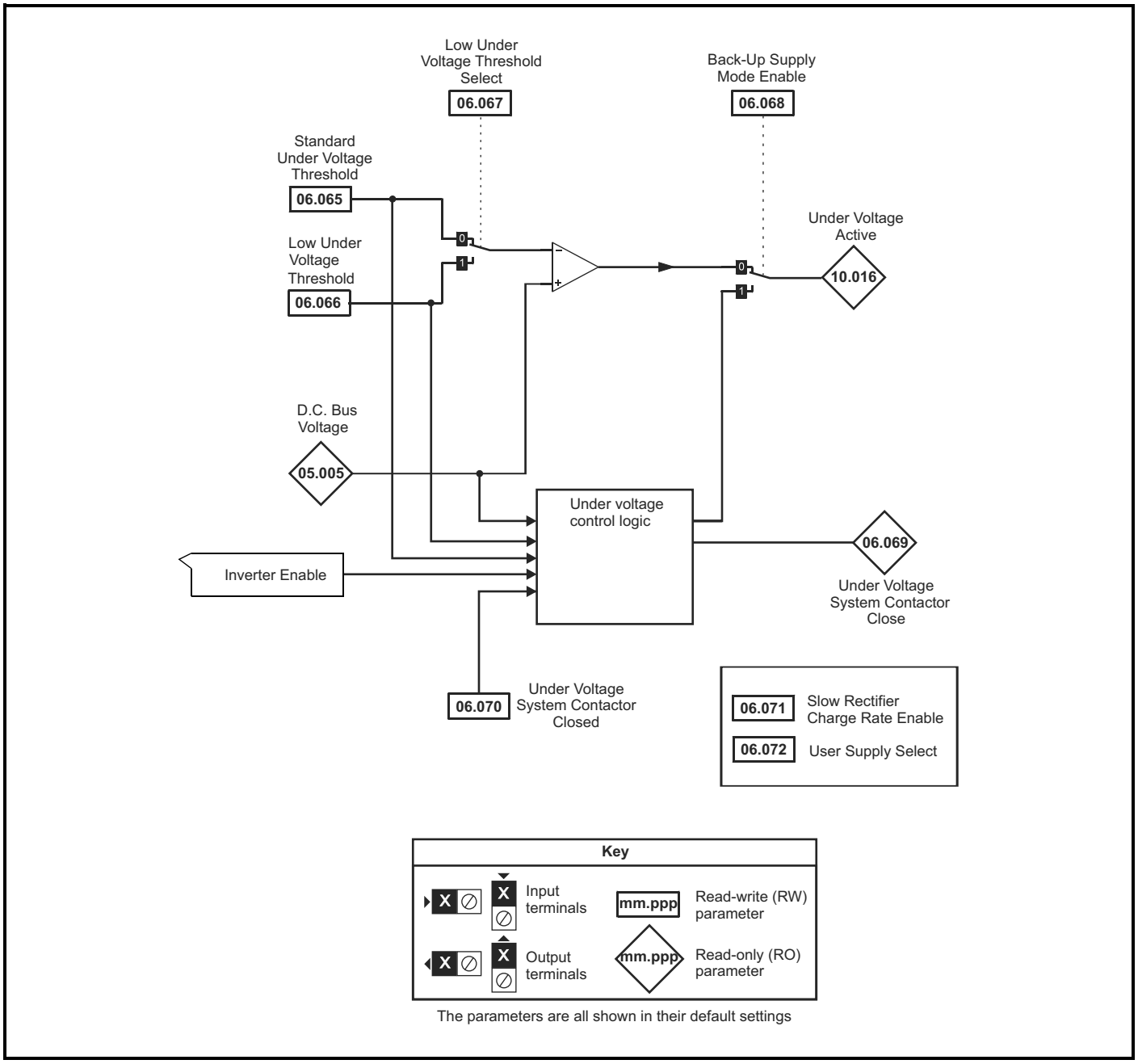


* Not available on *Unidrive M702*.

** Terminal 7 on *Unidrive M702*.

*** Terminal 8 on *Unidrive M702*.

Figure 12-16 Menu 6 logic diagram: Under voltage and power supply control



Parameter		Range(⇳)		Default(⇨)			Type					
		OL	RFC-A / S	OL	RFC-A	RFC-S						
06.001	Stop Mode	Coast (0), Ramp (1), Ramp dc I (2), dc I (3), Timed dc I (4), Disable (5)	Coast (0), Ramp (1), No Ramp (2)	Ramp (1)	Ramp (1)	No Ramp (2)	RW	Txt				US
06.002	Limit Switch Stop Mode		Stop (0) or Ramp (1)		Stop (0)		RW	Txt				US
06.003	Supply Loss Mode	Disable (0), Ramp Stop (1), Ride Thru (2)	Disable (0), Ramp Stop (1), Ride Thru (2), Limit Stop (3)	Disable (0)			RW	Txt				US
06.006	Injection Braking Level	0.0 to 150.0 %		100.0 %			RW	Num		RA		US
06.007	Injection Braking Time	0.0 to 100.0 s		1.0 s			RW	Num				US
06.008	Hold Zero Speed	Off (0) or On (1)		Off (0)		On (1)	RW	Bit				US
06.009	Catch A Spinning Motor	Disable (0), Enable (1), Fwd Only (2), Rev Only (3)		Disable (0)	Enable (1)		RW	Txt				US
06.010	Enable Conditions	000000000000 to 111111111111					RO	Bin	ND	NC	PT	
06.011	Sequencer State Machine Inputs	000000 to 111111					RO	Bin	ND	NC	PT	
06.012	Enable Stop Key	Off (0) or On (1)		Off (0)			RW	Bit				US
06.013	Enable Auxiliary Key	Disabled (0), Forward / Reverse (1), Run Reverse (2)		Disabled (0)			RW	Txt				US
06.015	Drive Enable	Off (0) or On (1)		On (1)			RW	Bit				US
06.016	Date	00-00-00 to 31-12-99		00-00-00			RW	Date	ND	NC	PT	
06.017	Time	00:00:00 to 23:59:59					RW	Time	ND	NC	PT	
06.018	Day Of Week	Sunday (0), Monday (1), Tuesday (2), Wednesday (3), Thursday (4), Friday (5), Saturday (6)					RO	Txt	ND	NC	PT	
06.019	Date/Time Selector	Set (0), Powered (1), Running (2), Acc Powered (3), Local Keypad (4), Remote Keypad (5), Slot 1 (6), Slot 2 (7), Slot 3 (8), Slot 4 (9)		Powered (1)			RW	Txt				US
06.020	Date Format	Std (0) or US (1)		Std (0)			RW	Txt				US
06.021	Time Between Filter Changes	0 to 30000 Hours		0 Hours			RW	Num				US
06.022	Filter Change Required / Change Done	Off (0) or On (1)		Off (0)			RW	Bit	ND	NC		
06.023	Time Before Filter Change Due	0 to 30000 Hours					RO	Num	ND	NC	PT	PS
06.024	Reset Energy Meter	Off (0) or On (1)		Off (0)			RW	Bit				
06.025	Energy Meter: MWh	-999.9 to 999.9 MWh					RO	Num	ND	NC	PT	PS
06.026	Energy Meter: kWh	±99.99 kWh					RO	Num	ND	NC	PT	PS
06.027	Energy Cost Per kWh	0.0 to 600.0		0.0			RW	Num				US
06.028	Running Cost	±32000					RO	Num	ND	NC	PT	
06.029	Hardware Enable	Off (0) or On (1)					RO	Bit	ND	NC	PT	
06.030	Run Forward	Off (0) or On (1)		Off (0)			RW	Bit		NC		
06.031	Jog	Off (0) or On (1)		Off (0)			RW	Bit		NC		
06.032	Run Reverse	Off (0) or On (1)		Off (0)			RW	Bit		NC		
06.033	Forward/Reverse	Off (0) or On (1)		Off (0)			RW	Bit		NC		
06.034	Run	Off (0) or On (1)		Off (0)			RW	Bit		NC		
06.035	Forward Limit Switch	Off (0) or On (1)		Off (0)			RW	Bit		NC		
06.036	Reverse Limit Switch	Off (0) or On (1)		Off (0)			RW	Bit		NC		
06.037	Jog Reverse	Off (0) or On (1)		Off (0)			RW	Bit		NC		
06.039	Not Stop	Off (0) or On (1)		Off (0)			RW	Bit		NC		
06.040	Enable Sequencer Latching	Off (0) or On (1)		Off (0)			RW	Bit				US
06.041	Drive Event Flags	00 to 11		00			RW	Bin		NC		
06.042	Control Word	000000000000000 to 111111111111111		000000000000000			RW	Bin		NC		
06.043	Control Word Enable	Off (0) or On (1)		Off (0)			RW	Bit				US
06.044	Active Supply	Off (0) or On (1)					RO	Bit	ND	NC	PT	
06.045	Cooling Fan control	-10 to 11		10			RW	Num				US
06.046	Cooling Fan Speed	0 to 10					RO	Num	ND	NC	PT	
06.047	Input Phase Loss Detection Mode	Full (0), Ripple Only (1), Disabled (2)		Full (0)			RW	Txt				US
06.048	Supply Loss Detection Level	0 to VM_SUPPLY_LOSS_LEVEL V		200 V drive: 205 V 400 V drive: 410 V 575 V drive: 540 V 690 V drive: 540 V			RW	Num		RA		US
06.051	Hold Supply Loss Active	Off (0) or On (1)		Off (0)			RW	Bit		NC		
06.052	Motor Pre-heat Current Magnitude	0 to 100 %		0 %			RW	Num				US
06.053	Sleep / Wake Threshold	0.0 to VM_SPEED_FREQ_REF_UNIPOLAR		0.0			RW	Num				US
06.054	Sleep Time	0.0 to 250.0 s		10.0 s			RW	Num				US
06.055	Wake Time	0.0 to 250.0 s		10.0 s			RW	Num				US
06.056	Sleep Required	Off (0) or On (1)					RO	Bit	ND	NC	PT	
06.057	Sleep Active	Off (0) or On (1)					RO	Bit	ND	NC	PT	

Parameter		Range(⇳)		Default(⇨)			Type					
		OL	RFC-A / S	OL	RFC-A	RFC-S						
06.058	Output Phase Loss Detection Time	0.5 s (0), 1.0 s (1), 2.0 s (2), 4.0 s (3)		0.5 s (0)			RW	Txt				US
06.059	Output Phase Loss Detection Enable	Disabled (0) or Enabled (1)		Disabled (0)			RW	Txt				US
06.060	Standby Mode Enable	Off (0) or On (1)		Off (0)			RW	Bit				US
06.061	Standby Mode Mask	0000000 to 1111111		0000000			RW	Bin				US
06.065	Standard Under Voltage Threshold	0 to VM_STD_UNDER_VOLTS V		200 V drive: 175 V 400 V drive: 330 V 575 V drive: 435 V 690 V drive: 435 V			RW	Num		RA		US
06.066	Low Under Voltage Threshold	24 to VM_LOW_UNDER_VOLTS V		200 V drive: 175 V 400 V drive: 330 V 575 V drive: 435 V 690 V drive: 435 V			RW	Num		RA		US
06.067	Low Under Voltage Threshold Select	Off (0) or On (1)		Off (0)			RW	Bit				US
06.068	Back Up Supply Mode Enable	Off (0) or On (1)		Off (0)			RW	Bit				US
06.069	Under-Voltage System Contactor Close	Off (0) or On (1)					RO	Bit	ND	NC	PT	
06.070	Under-Voltage System Contactor Closed	Off (0) or On (1)		Off (0)			RW	Bit				
06.071	Slow Rectifier Charge Rate Enable	Off (0) or On (1)		Off (0)			RW	Bit				US
06.072	User Supply Select	Off (0) or On (1)		Off (0)			RW	Bit				US
06.073	Braking IGBT Lower Threshold	0 to VM_DC_VOLTAGE_SET V		200 V drive: 390 V 400 V drive: 780 V 575 V drive: 930 V 690 V drive: 1120 V			RW	Num		RA		US
06.074	Braking IGBT Upper Threshold	0 to VM_DC_VOLTAGE_SET V		200 V drive: 390 V 400 V drive: 780 V 575 V drive: 930 V 690 V drive: 1120 V			RW	Num		RA		US
06.075	Low Voltage Braking IGBT Threshold	0 to VM_DC_VOLTAGE_SET V		0V			RW	Num		RA		US
06.076	Low Voltage Braking IGBT Threshold Select	Off (0) or On (1)		Off (0)			RW	Bit				
06.084	Date And Time Offset	± 12.00 Hours		0.00 Hours			RW	Num				US

RW	Read / Write	RO	Read only	Num	Number parameter	Bit	Bit parameter	Txt	Text string	Bin	Binary parameter	FI	Filtered
ND	No default value	NC	Not copied	PT	Protected parameter	RA	Rating dependent	US	User save	PS	Power-down save	DE	Destination

12.8 Menu 7: Analog I/O / Temperature Monitoring

Figure 12-17 Menu 7 logic diagram (*Unidrive M700 / 701*)

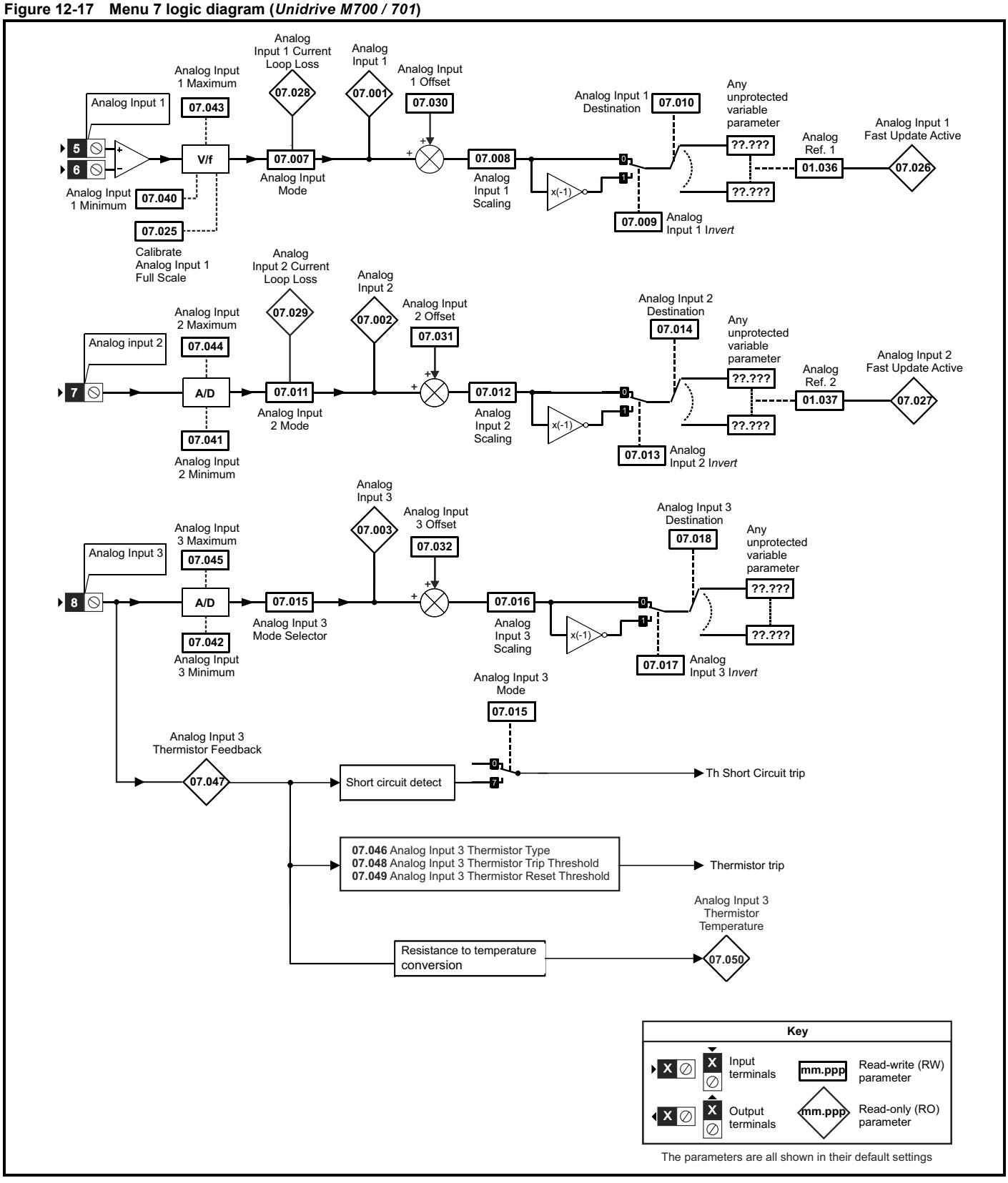


Figure 12-18 Menu 7 logic diagram (Unidrive M702 with date code 1710 or later)

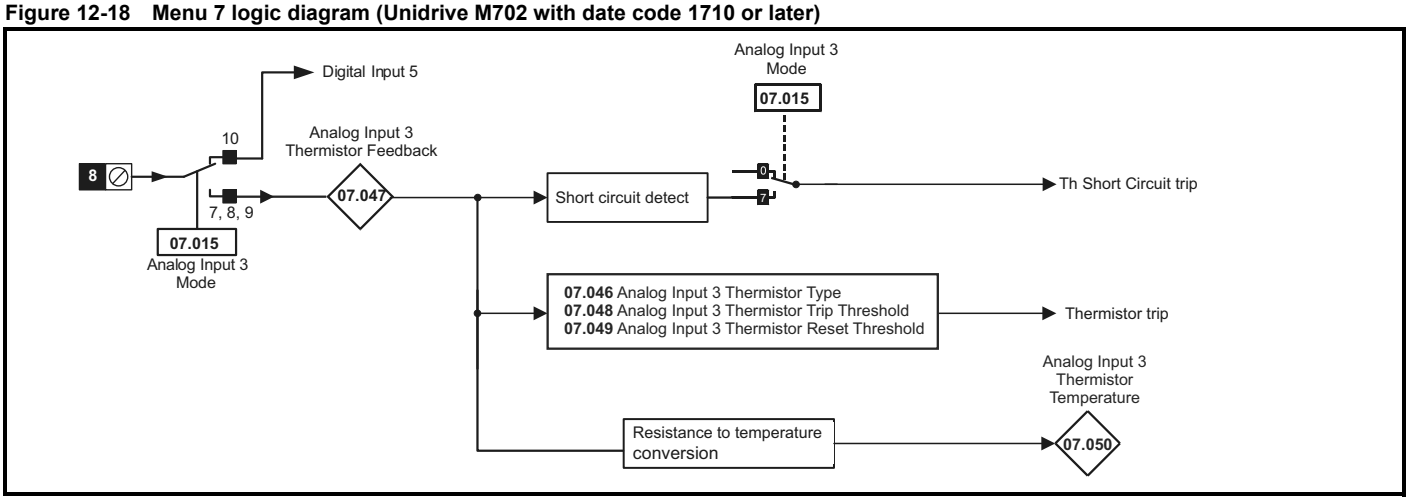


Figure 12-19 Menu 7 logic diagram: Analog outputs diagram (*Unidrive M700 / 701*)

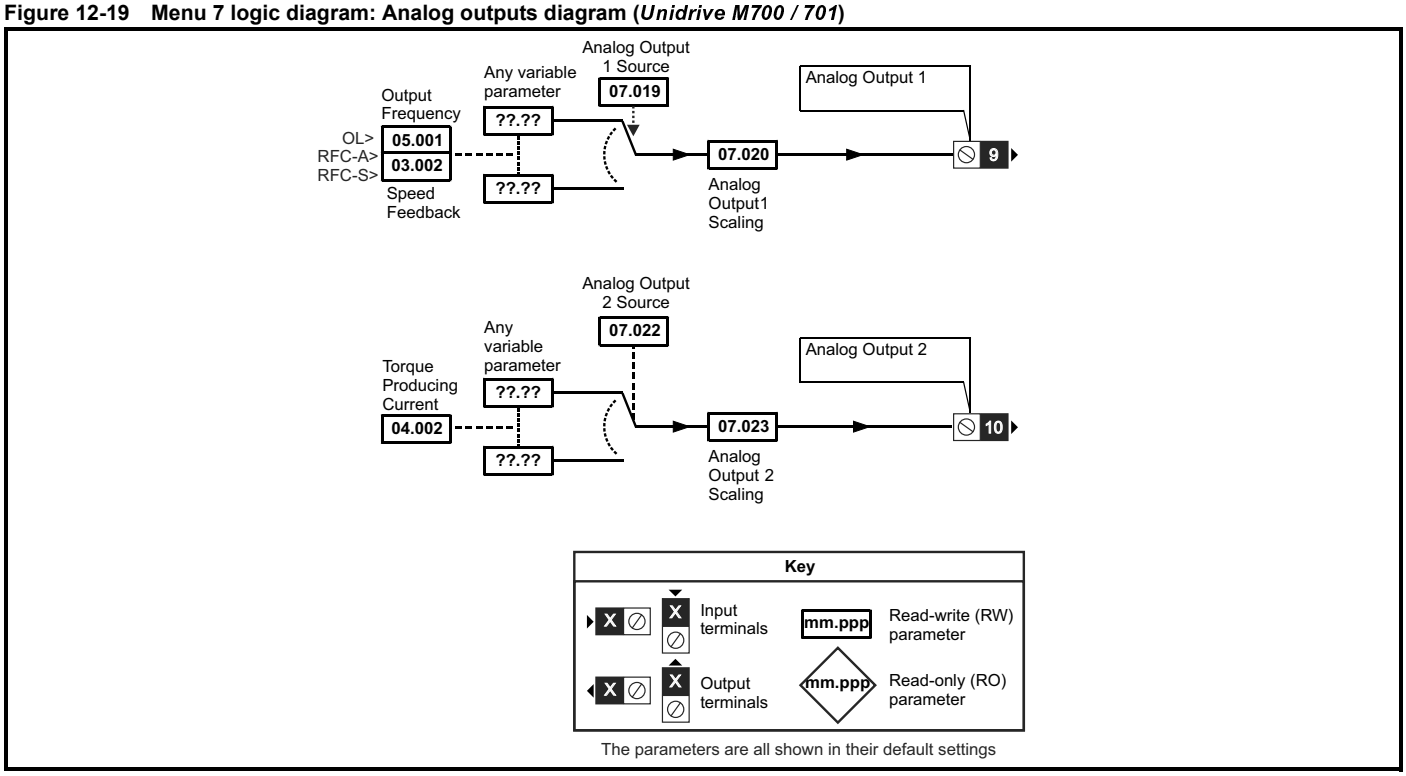
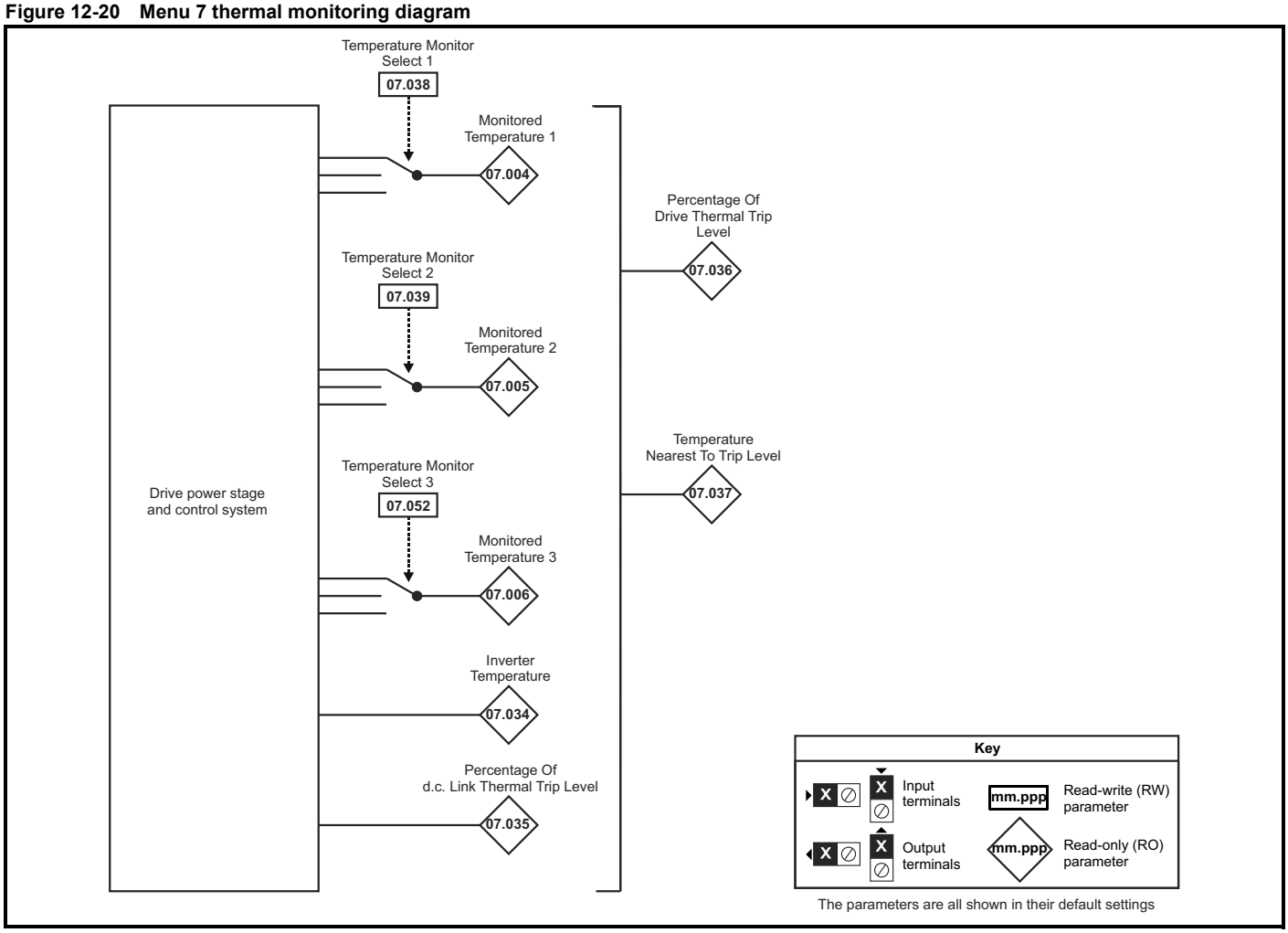


Figure 12-20 Menu 7 thermal monitoring diagram



Parameter		Range(⇳)		Default(⇨)			Type					
		OL	RFC-A / S	OL	RFC-A	RFC-S						
07.001	Analog Input 1*	±100.00 %					RO	Num	ND	NC	PT	FI
07.002	Analog Input 2*	±100.00 %					RO	Num	ND	NC	PT	FI
07.003	Analog Input 3	±100.00 %					RO	Num	ND	NC	PT	FI
07.004	Monitored Temperature 1	±250 °C					RO	Num	ND	NC	PT	
07.005	Monitored Temperature 2	±250 °C					RO	Num	ND	NC	PT	
07.006	Monitored Temperature 3	±250 °C					RO	Num	ND	NC	PT	
07.007	Analog Input 1 Mode*	4-20 mA Low (-4), 20-4 mA Low (-3), 4-20 mA Hold (-2), 20-4 mA Hold (-1), 0-20 mA (0), 20-0 mA (1), 4-20 mA Trip (2), 20-4 mA Trip (3), 4-20 mA (4), 20-4 mA (5), Volt (6)		Volt (6)			RW	Txt				US
07.008	Analog Input 1 Scaling*	0.000 to 10.000		1.000			RW	Num				US
07.009	Analog Input 1 Invert*	Off (0) or On (1)		Off (0)			RW	Bit				US
07.010	Analog Input 1 Destination*	0.000 to 59.999		1.036			RW	Num	DE		PT	US
07.011	Analog Input 2 Mode*	4-20 mA Low (-4), 20-4 mA Low (-3), 4-20 mA Hold (-2), 20-4 mA Hold (-1), 0-20 mA (0), 20-0 mA (1), 4-20 mA Trip (2), 20-4 mA Trip (3), 4-20 mA (4), 20-4 mA (5), Volt (6)		Volt (6)			RW	Txt				US
07.012	Analog Input 2 Scaling*	0.000 to 10.000		1.000			RW	Num				US
07.013	Analog Input 2 Invert*	Off (0) or On (1)		Off (0)			RW	Bit				US
07.014	Analog Input 2 Destination*	0.000 to 59.999		1.037			RW	Num	DE		PT	US
07.015	Analog Input 3 Mode	M700, M701: Volt (6), Therm Short Cct (7), Thermistor (8), Therm No Trip (9) M702**: Therm Short Cct (7), Thermistor (8), Therm No Trip (9), Disable (10)		M700, M701: Volt (6) M702**: Disable (10)			RW	Txt				US
07.016	Analog Input 3 Scaling*	0.000 to 10.000		1.000			RW	Num				US
07.017	Analog Input 3 Invert*	Off (0) or On (1)		Off (0)			RW	Bit				US
07.018	Analog Input 3 Destination*	0.000 to 59.999		0.000			RW	Num	DE		PT	US
07.019	Analog Output 1 Source*	0.000 to 59.999		5.001		3.002	RW	Num			PT	US
07.020	Analog Output 1 Scaling*	0.000 to 10.000		1.000			RW	Num				US
07.022	Analog Output 2 Source*	0.000 to 59.999		4.002			RW	Num			PT	US
07.023	Analog Output 2 Scaling*	0.000 to 10.000		1.000			RW	Num				US
07.025	Calibrate Analog Input 1 Full Scale*	Off (0) or On (1)		Off (0)			RW	Bit		NC		
07.026	Analog Input 1 Fast Update Active*	Off (0) or On (1)					RO	Bit	ND	NC	PT	
07.027	Analog Input 2 Fast Update Active*	Off (0) or On (1)					RO	Bit	ND	NC	PT	
07.028	Analog Input 1 Current Loop Loss*	Off (0) or On (1)					RO	Bit	ND	NC	PT	
07.029	Analog Input 2 Current Loop Loss*	Off (0) or On (1)					RO	Bit	ND	NC	PT	
07.030	Analog Input 1 Offset*	±100.00 %		0.00 %			RW	Num				US
07.031	Analog Input 2 Offset*	±100.00 %		0.00 %			RW	Num				US
07.032	Analog Input 3 Offset*	±100.00 %		0.00 %			RW	Num				US
07.033	Power Output	±100.0 %					RO	Num	ND	NC	PT	
07.034	Inverter Temperature	±250 °C					RO	Num	ND	NC	PT	
07.035	Percentage Of d.c. Bus Thermal Trip Level	0 to 100 %					RO	Num	ND	NC	PT	
07.036	Percentage Of Drive Thermal Trip Level	0 to 100 %					RO	Num	ND	NC	PT	
07.037	Temperature Nearest To Trip Level	0 to 20999					RO	Num	ND	NC	PT	
07.038	Temperature Monitor Select 1	0 to 1999		1001			RW	Num				US
07.039	Temperature Monitor Select 2	0 to 1999		1002			RW	Num				US
07.040	Analog Input 1 Minimum*	±100.00 %		-100.00 %			RW	Num				US
07.041	Analog Input 2 Minimum*	±100.00 %		-100.00 %			RW	Num				US
07.042	Analog Input 3 Minimum*	±100.00 %		-100.00 %			RW	Num				US
07.043	Analog Input 1 Maximum*	±100.00 %		100.00 %			RW	Num				US
07.044	Analog Input 2 Maximum*	±100.00 %		100.00 %			RW	Num				US
07.045	Analog Input 3 Maximum*	±100.00 %		100.00 %			RW	Num				US
07.046	Analog Input 3 Thermistor Type	DIN44082 (0), KTY84 (1), PT100 (4W) (2), PT1000 (4W) (3), PT2000 (4W) (4), 2.0 mA (4W) (5), PT100 (2W) (6), PT1000 (2W) (7), PT2000 (2W) (8), 2.0 mA (2W) (9)		DIN44082 (0)			RW	Txt				US
07.047	Analog Input 3 Thermistor Feedback	0 to 5000 Ω					RO	Num	ND	NC	PT	
07.048	Analog Input 3 Thermistor Trip Threshold	0 to 5000 Ω		3300 Ω			RW	Num				US
07.049	Analog Input 3 Thermistor Reset Threshold	0 to 5000 Ω		1800 Ω			RW	Num				US
07.050	Analog Input 3 Thermistor Temperature	-50 to 300 °C					RO	Num	ND	NC	PT	
07.051	Analog Input 1 Full Scale*	0 to 65535					RO	Num	ND	NC	PT	PS
07.052	Temperature Monitor Select 3	0 to 1999		1			RW	Num				US

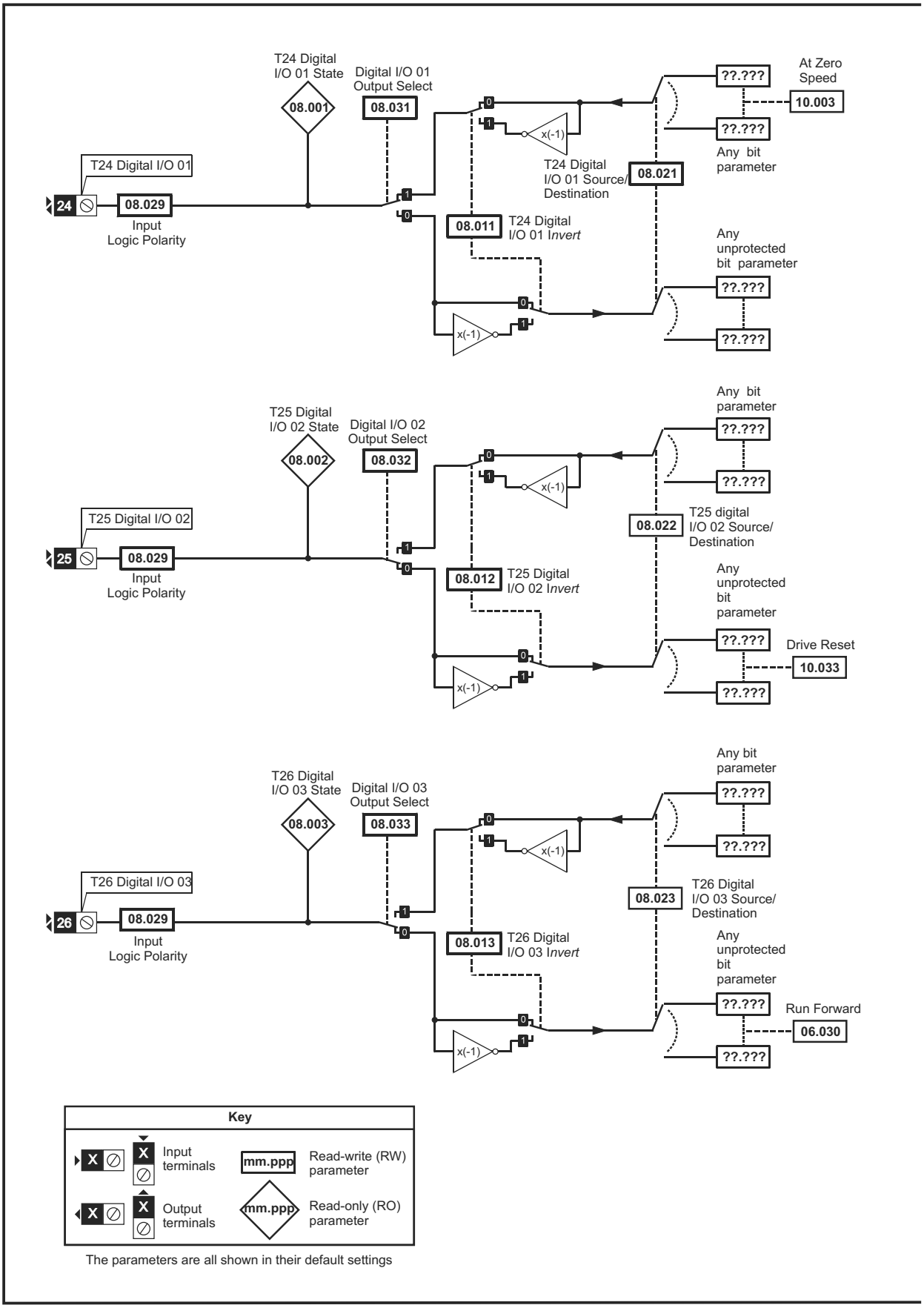
* Not available on Unidrive M702

** Not available on Unidrive M702 with date code earlier than 1710

RW	Read / Write	RO	Read only	Num	Number parameter	Bit	Bit parameter	Txt	Text string	Bin	Binary parameter	FI	Filtered
ND	No default value	NC	Not copied	PT	Protected parameter	RA	Rating dependent	US	User save	PS	Power-down save	DE	Destination

12.9 Menu 8: Digital I/O

Figure 12-21 Menu 8 Digital input and outputs logic diagram (*Unidrive M700 / M701*)



The parameters are all shown in their default settings

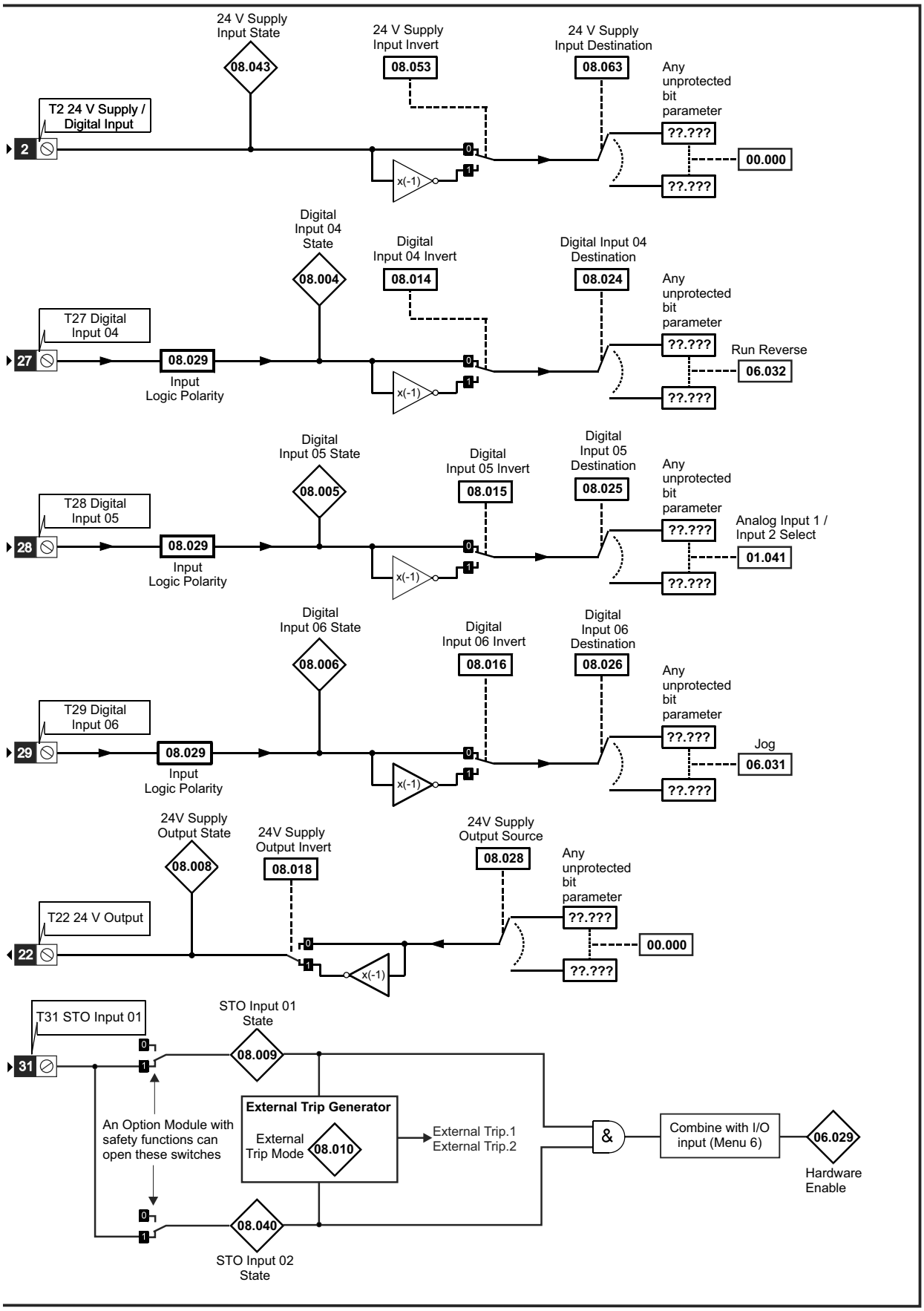
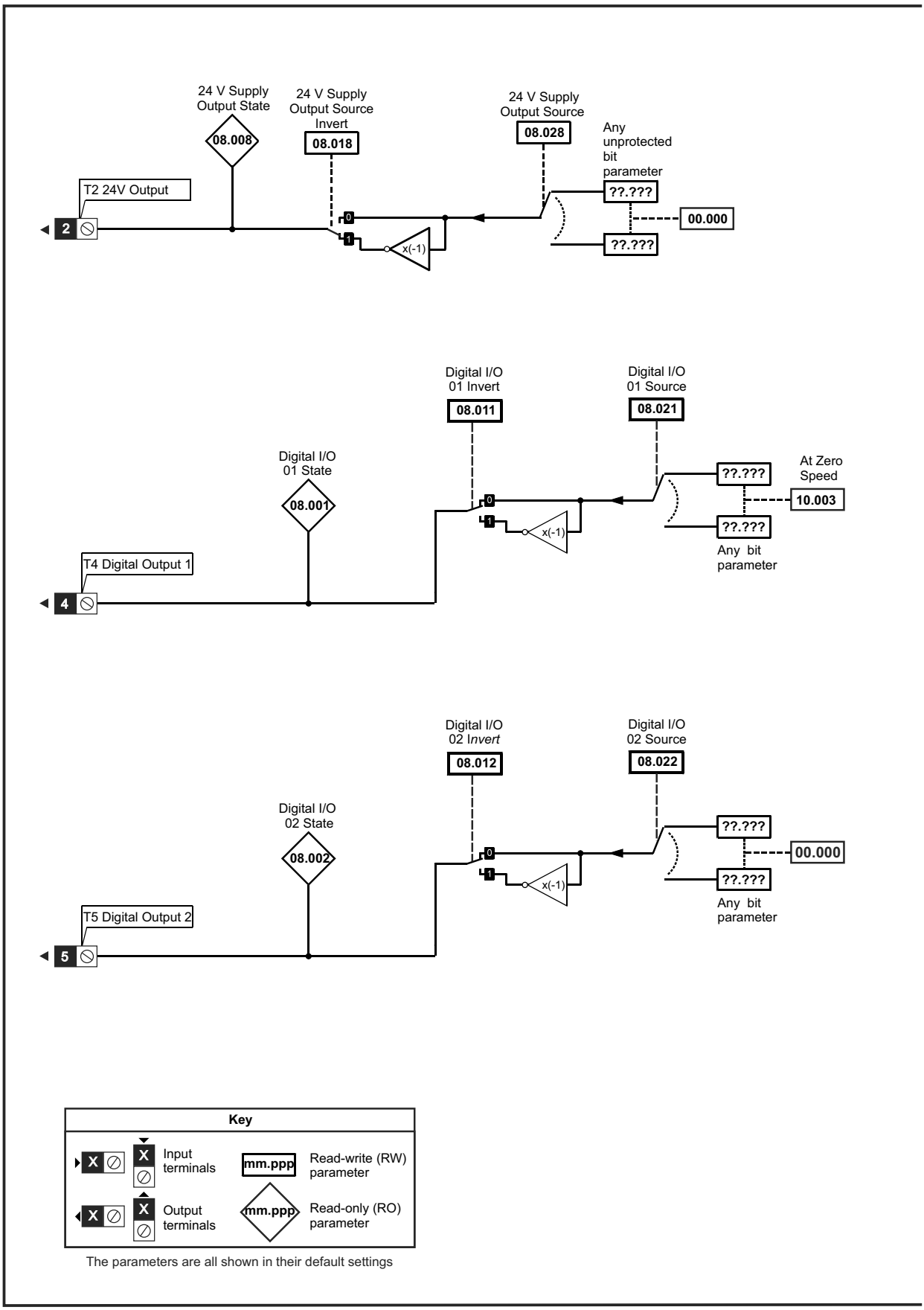

24 V Supply Input State
08.043
24 V Supply Input Invert
08.053
24 V Supply Input Destination
08.063
Any unprotected bit parameter
??.???
00.000
??.???
T2 24 V Supply / Digital Input
2
x(-1)
Digital Input 04 State
08.004
Digital Input 04 Invert
08.014
Digital Input 04 Destination
08.024
T27 Digital Input 04
27
08.029
Input Logic Polarity
Run Reverse
06.032
Digital Input 05 State
08.005
Digital Input 05 Invert
08.015
Digital Input 05 Destination
08.025
T28 Digital Input 05
28
Analog Input 1 / Input 2 Select
01.041
Digital Input 06 State
08.006
Digital Input 06 Invert
08.016
Digital Input 06 Destination
08.026
T29 Digital Input 06
29
Jog
06.031
24V Supply Output State
08.008
24V Supply Output Invert
08.018
24V Supply Output Source
08.028
T22 24 V Output
22
T31 STO Input 01
31
STO Input 01 State
08.009
External Trip Generator
External Trip Mode
08.010
External Trip.1
External Trip.2
An Option Module with safety functions can open these switches
08.040
STO Input 02 State
&
Combine with I/O input (Menu 6)
06.029
Hardware Enable

Figure 12-22 Menu 8 Digital input and outputs logic diagram (*Unidrive M702*)



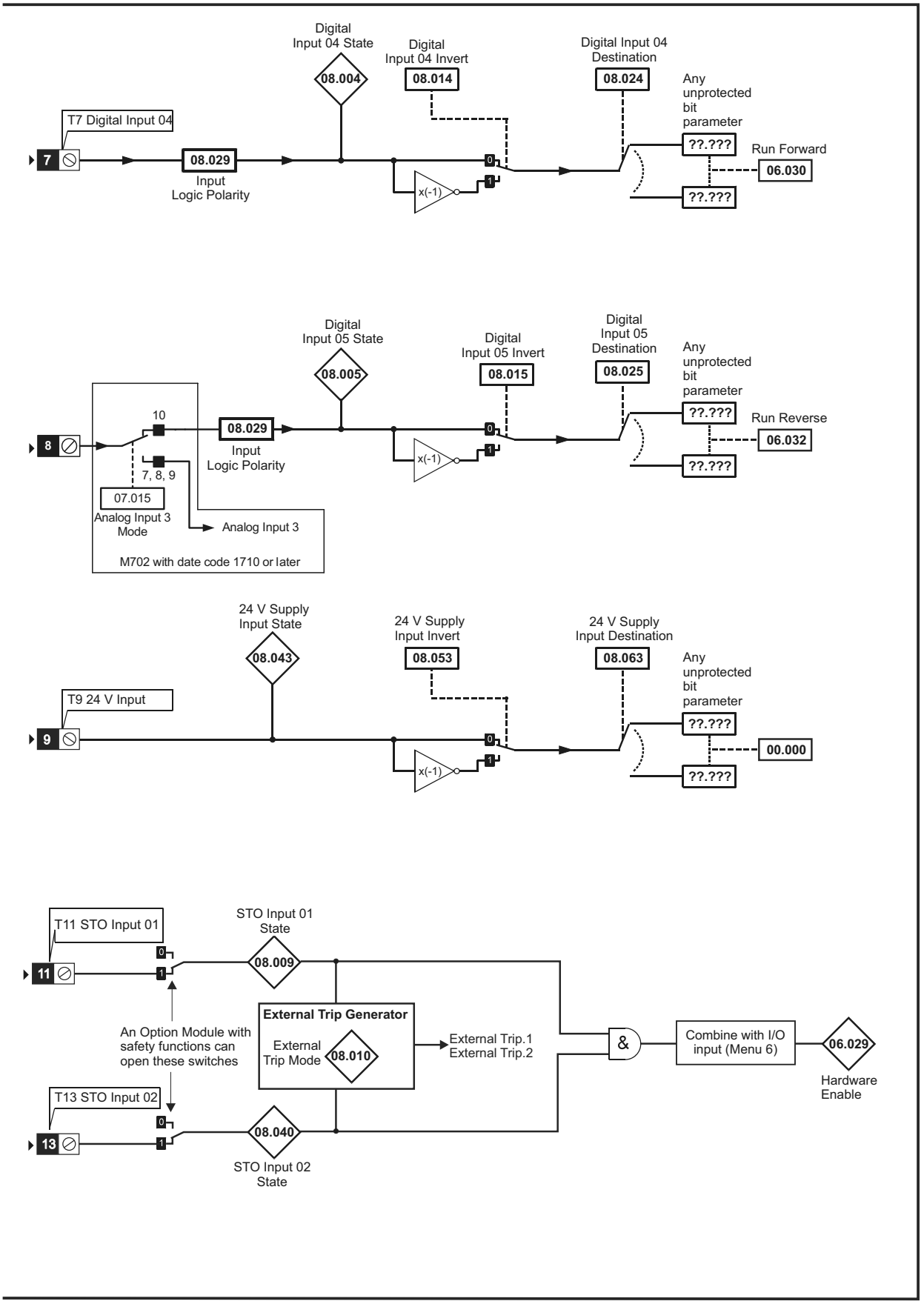

Digital Input 04 State
08.004
Digital Input 04 Invert
08.014
Digital Input 04 Destination
08.024
Any unprotected bit parameter
T7 Digital Input 04
7
08.029
Input Logic Polarity
x(-1)
??.???
??.???
Run Forward
06.030
Digital Input 05 State
08.005
Digital Input 05 Invert
08.015
Digital Input 05 Destination
08.025
Any unprotected bit parameter
8
10
7, 8, 9
07.015
Analog Input 3 Mode
Analog Input 3
M702 with date code 1710 or later
Run Reverse
06.032
24 V Supply Input State
08.043
24 V Supply Input Invert
08.053
24 V Supply Input Destination
08.063
Any unprotected bit parameter
T9 24 V Input
9
00.000
T11 STO Input 01
11
STO Input 01 State
08.009
External Trip Generator
External Trip Mode
08.010
External Trip.1
External Trip.2
An Option Module with safety functions can open these switches
T13 STO Input 02
13
08.040
STO Input 02 State
&
Combine with I/O input (Menu 6)
06.029
Hardware Enable

Figure 12-23 Menu 8 Relay output logic diagram

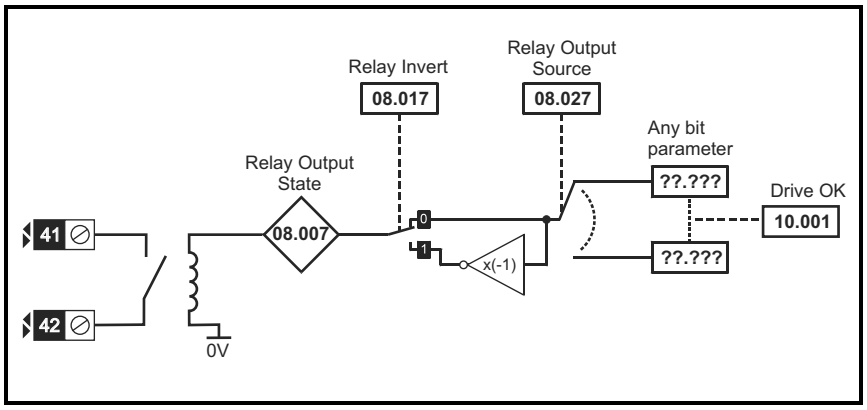
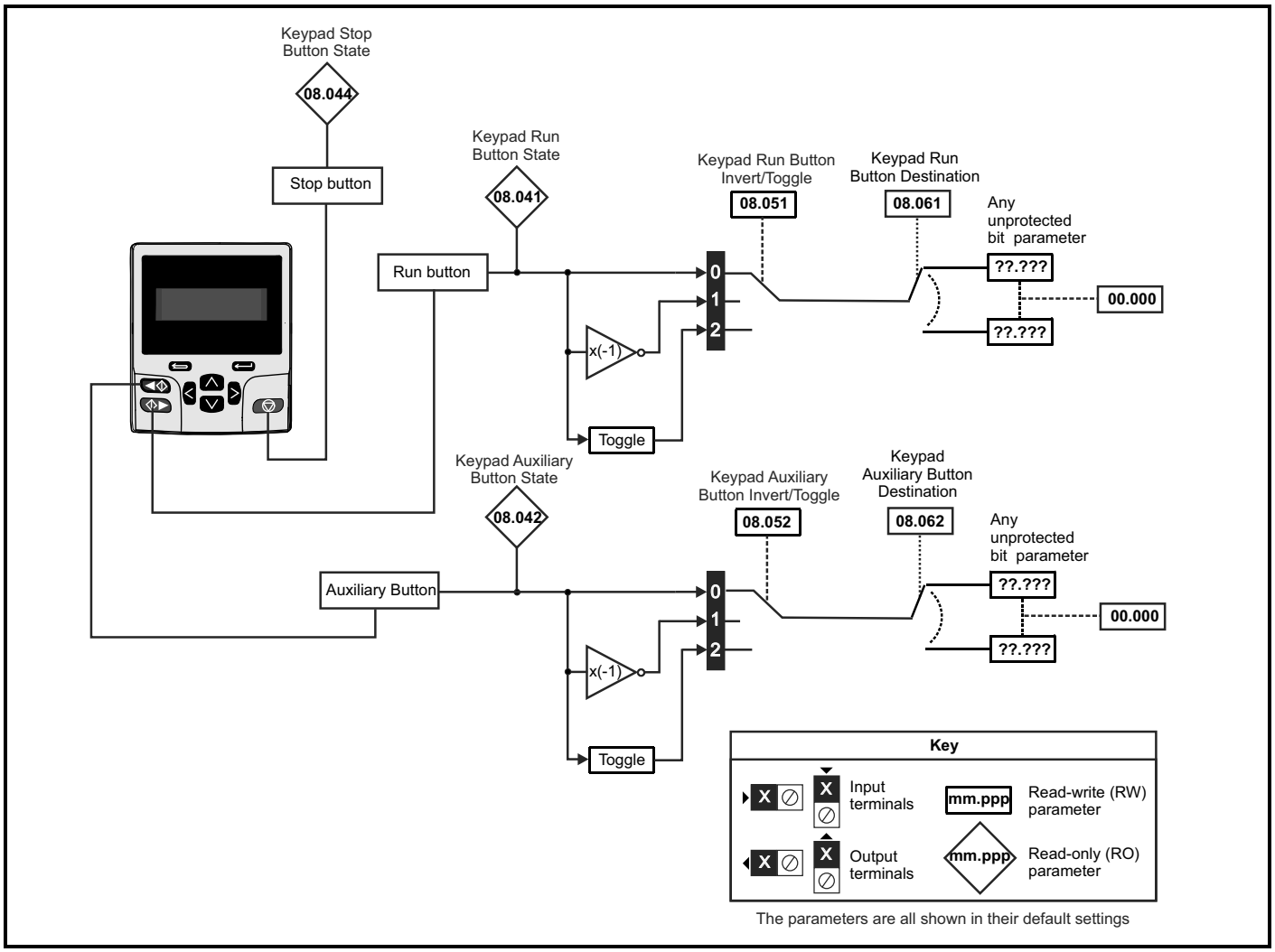


Figure 12-24 Menu 8 Keypad buttons logic diagram



Parameter		Range(⇳)		Default(⇨)			Type					
		OL	RFC-A / S	OL	RFC-A	RFC-S						
08.001	Digital I/O 01 State	Off (0) or On (1)					RO	Bit	ND	NC	PT	
08.002	Digital I/O 02 State	Off (0) or On (1)					RO	Bit	ND	NC	PT	
08.003	Digital I/O 03 State*	Off (0) or On (1)					RO	Bit	ND	NC	PT	
08.004	Digital Input 04 State	Off (0) or On (1)					RO	Bit	ND	NC	PT	
08.005	Digital Input 05 State	Off (0) or On (1)					RO	Bit	ND	NC	PT	
08.006	Digital Input 06 State*	Off (0) or On (1)					RO	Bit	ND	NC	PT	
08.007	Relay Output State	Off (0) or On (1)					RO	Bit	ND	NC	PT	
08.008	24V Supply Output State	Off (0) or On (1)					RO	Bit	ND	NC	PT	
08.009	STO Input 01 State	Off (0) or On (1)					RO	Bit	ND	NC	PT	
08.010	External Trip Mode	Disable (0), STO 1 (1), STO 2 (2), STO 1 OR STO 2 (3)		Disable (0)			RW	Txt				US
08.011	Digital I/O 01 Invert	Not Invert (0) or Invert (1)		Not Invert (0)			RW	Txt				US
08.012	Digital I/O 02 Invert	Not Invert (0) or Invert (1)		Not Invert (0)			RW	Txt				US
08.013	Digital I/O 03 Invert*	Not Invert (0) or Invert (1)		Not Invert (0)			RW	Txt				US
08.014	Digital Input 04 Invert	Not Invert (0) or Invert (1)		Not Invert (0)			RW	Txt				US
08.015	Digital Input 05 Invert	Not Invert (0) or Invert (1)		Not Invert (0)			RW	Txt				US
08.016	Digital Input 06 Invert*	Not Invert (0) or Invert (1)		Not Invert (0)			RW	Txt				US
08.017	Relay Invert	Not Invert (0) or Invert (1)		Not Invert (0)			RW	Txt				US
08.018	24V Supply Output Invert	Not Invert (0) or Invert (1)		Invert (1)			RW	Txt				US
08.020	Digital I/O Read Word	0 to 511					RO	Num	ND	NC	PT	
08.021	Digital I/O 01 Source/Destination	0.000 to 59.999		10.003			RW	Num	DE		PT	US
08.022	Digital I/O 02 Source/Destination	0.000 to 59.999		10.033**			RW	Num	DE		PT	US
08.023	Digital I/O 03 Source/Destination*	0.000 to 59.999		6.030			RW	Num	DE		PT	US
08.024	Digital Input 04 Destination	0.000 to 59.999		6.032***			RW	Num	DE		PT	US
08.025	Digital Input 05 Destination	0.000 to 59.999		1.041****			RW	Num	DE		PT	US
08.026	Digital Input 06 Destination*	0.000 to 59.999		6.031			RW	Num	DE		PT	US
08.027	Relay Output Source	0.000 to 59.999		10.001			RW	Num			PT	US
08.028	24V Supply Output Source	0.000 to 59.999		0.000			RW	Num			PT	US
08.029	Input Logic Polarity	Negative Logic (0) or Positive Logic (1)		Positive Logic (1)			RW	Txt				US
08.031	Digital I/O 01 Output Select*	Off (0) or On (1)		On (1)			RW	Bit				US
08.032	Digital I/O 02 Output Select*	Off (0) or On (1)		Off (0)			RW	Bit				US
08.033	Digital I/O 03 Output Select*	Off (0) or On (1)		Off (0)			RW	Bit				US
08.040	STO Input 02 State	Off (0) or On (1)					RO	Bit	ND	NC	PT	
08.041	Keypad Run Button State	Off (0) or On (1)					RO	Bit	ND	NC	PT	
08.042	Keypad Auxiliary Button State	Off (0) or On (1)					RO	Bit	ND	NC	PT	
08.043	24V Supply Input State	Off (0) or On (1)					RO	Bit	ND	NC	PT	
08.044	Keypad Stop Button State	Off (0) or On (1)					RO	Bit	ND	NC	PT	
08.051	Keypad Run Button Invert/Toggle	Not Invert (0), Invert (1) or Toggle (2)		Not Invert (0)			RW	Txt				US
08.052	Keypad Auxiliary Button Invert/Toggle	Not Invert (0), Invert (1) or Toggle (2)		Not Invert (0)			RW	Txt				US
08.053	24V Supply Input Invert	Not Invert (0) or Invert (1)		Not Invert (0)			RW	Txt				US
08.061	Keypad Run Button Destination	0.000 to 59.999		0.000			RW	Num	DE		PT	US
08.062	Keypad Auxiliary Button Destination	0.000 to 59.999		0.000			RW	Num	DE		PT	US
08.063	24V Supply Input Destination	0.000 to 59.999		0.000			RW	Num	DE		PT	US
08.071	DI/O Output Enable Register 1	0000000000000000 to 1111111111111111		0000000000000000			RW	Bin			PT	US
08.072	DI/O Input Register 1	0000000000000000 to 1111111111111111					RO	Bin	ND	NC	PT	
08.073	DI/O Output Register 1	0000000000000000 to 1111111111111111		0000000000000000			RW	Bin			PT	US

* Not available on *Unidrive M702*.

** 0.000 with *Unidrive M702*.

*** 06.030 with *Unidrive M702*.

**** 06.032 with *Unidrive M702*.

RW	Read / Write	RO	Read only	Num	Number parameter	Bit	Bit parameter	Txt	Text string	Bin	Binary parameter	FI	Filtered
ND	No default value	NC	Not copied	PT	Protected parameter	RA	Rating dependent	US	User save	PS	Power-down save	DE	Destination

12.10 Menu 9: Programmable logic, motorized pot, binary sum and timers

Figure 12-25 Menu 9 logic diagram: Programmable logic

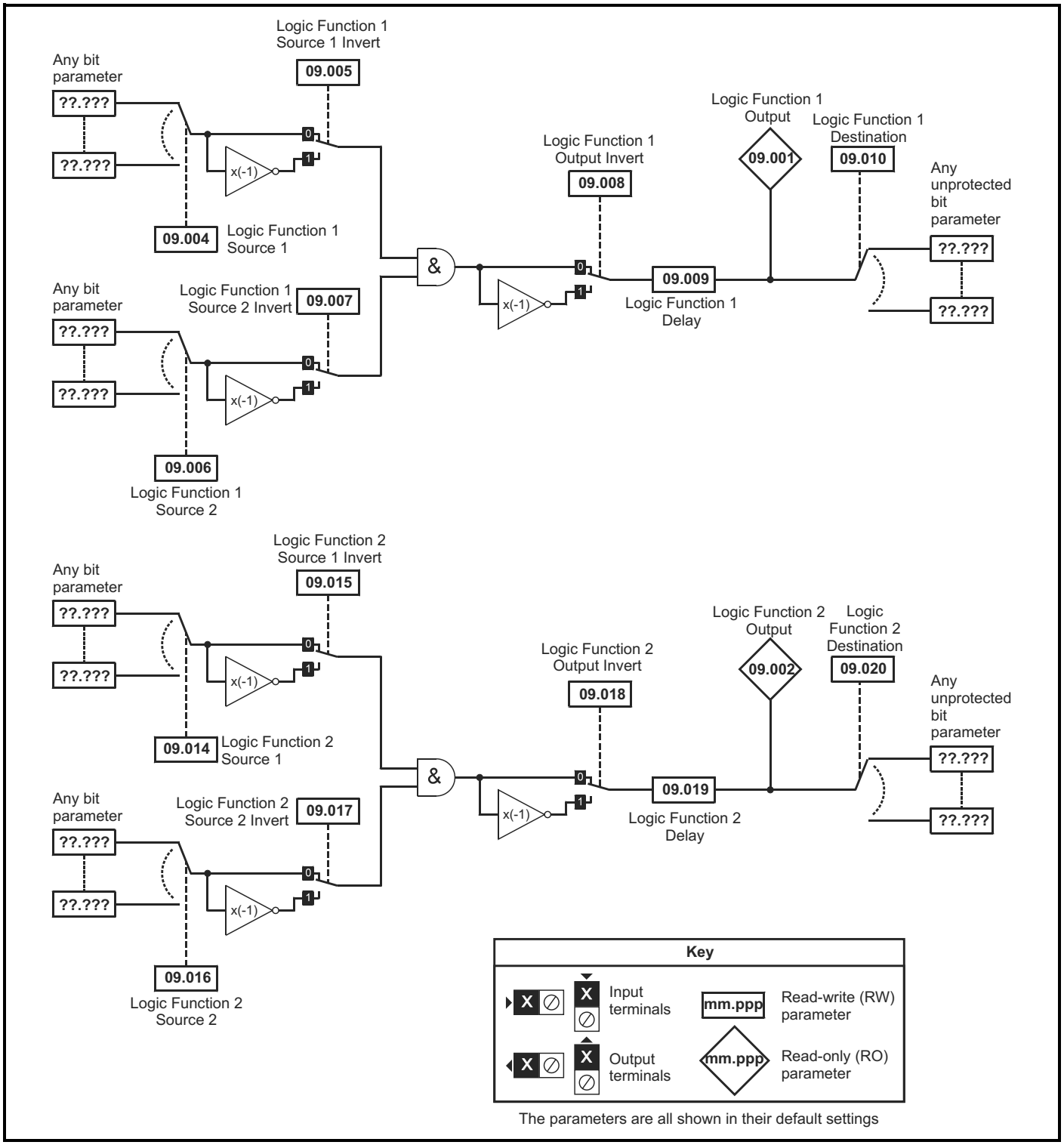
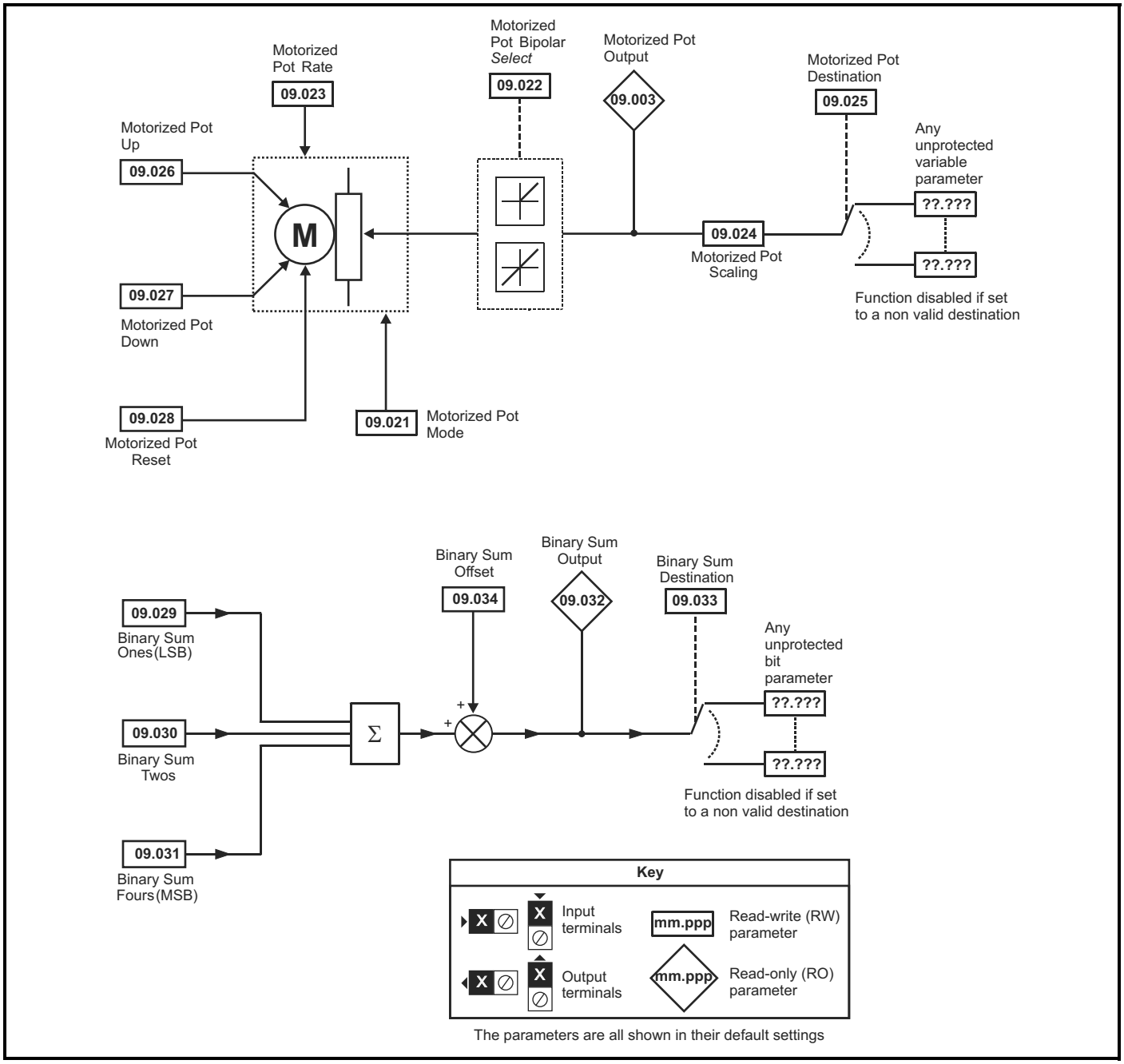
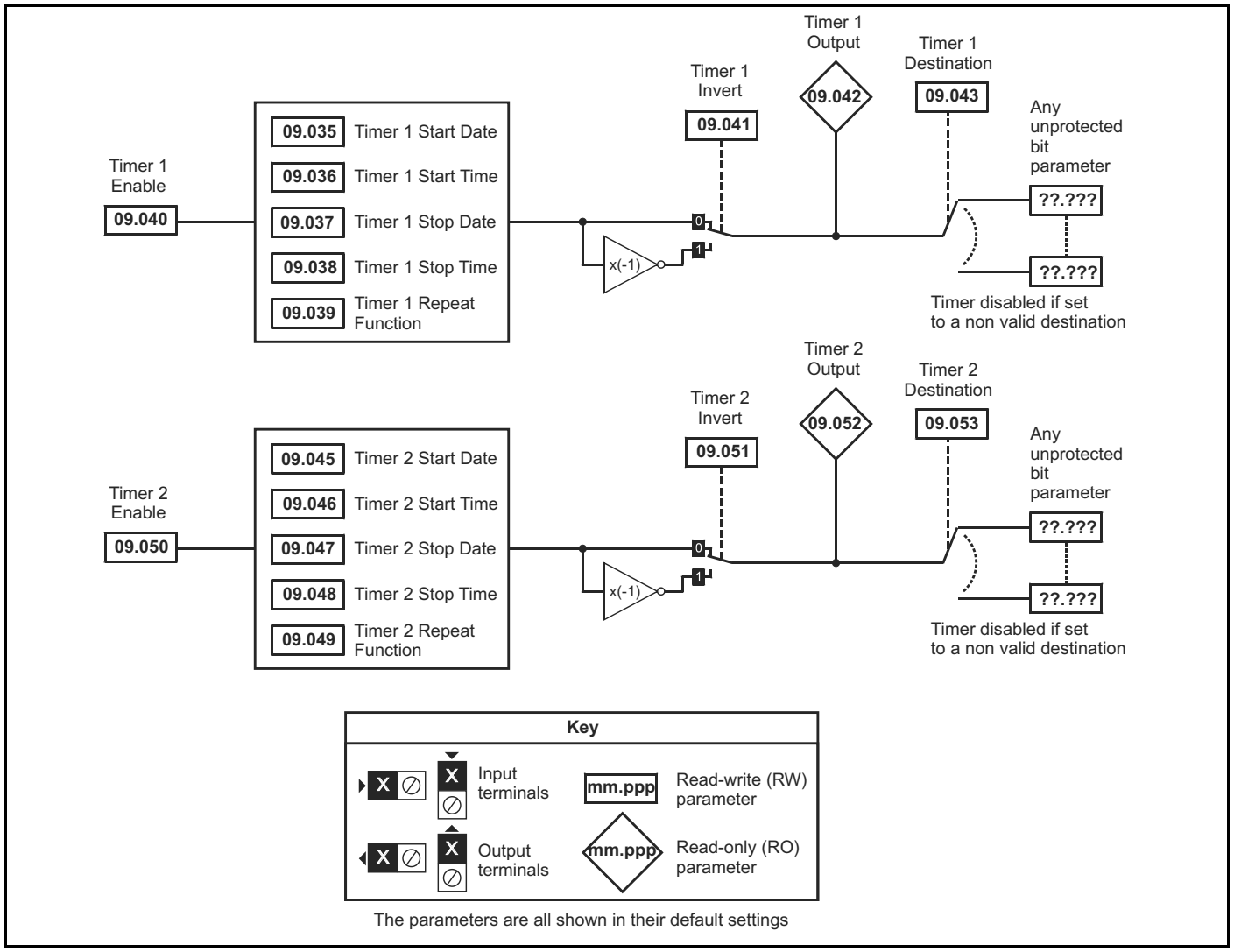


Figure 12-26 Menu 9 logic diagram: Motorized pot and binary sum



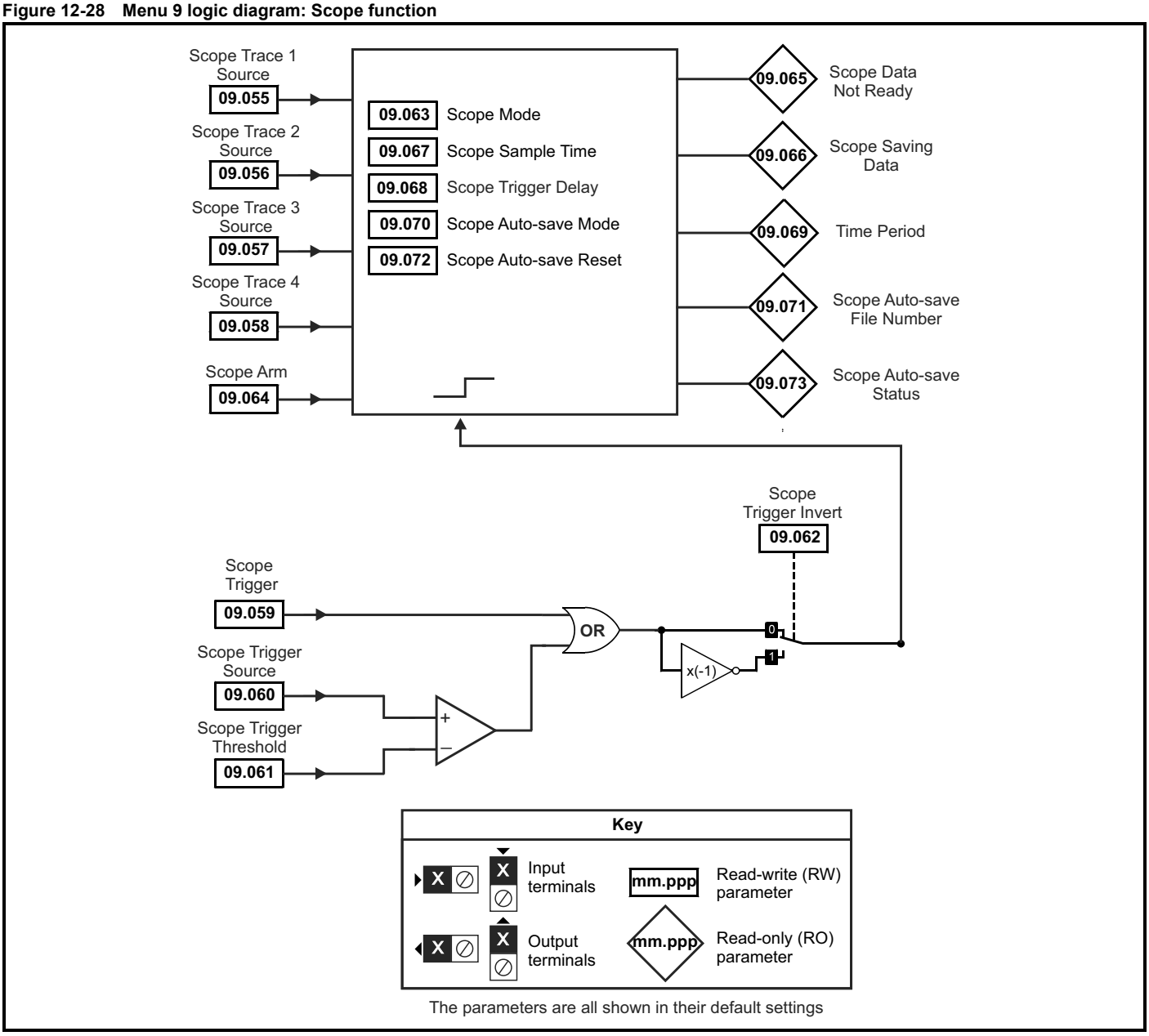
The parameters are all shown in their default settings

Figure 12-27 Menu 9 logic diagram: Timers



The parameters are all shown in their default settings

Figure 12-28 Menu 9 logic diagram: Scope function



The parameters are all shown in their default settings

Parameter		Range(⇳)		Default(⇨)			Type					
		OL	RFC-A / S	OL	RFC-A	RFC-S						
09.001	Logic Function 1 Output	Off (0) or On (1)					RO	Bit	ND	NC	PT	
09.002	Logic Function 2 Output	Off (0) or On (1)					RO	Bit	ND	NC	PT	
09.003	Motorized Pot Output	±100.00 %					RO	Num	ND	NC	PT	PS
09.004	Logic Function 1 Source 1	0.000 to 59.999		0.000			RW	Num			PT	US
09.005	Logic Function 1 Source 1 Invert	Off (0) or On (1)		Off (0)			RW	Bit				US
09.006	Logic Function 1 Source 2	0.000 to 59.999		0.000			RW	Num			PT	US
09.007	Logic Function 1 Source 2 Invert	Off (0) or On (1)		Off (0)			RW	Bit				US
09.008	Logic Function 1 Output Invert	Off (0) or On (1)		Off (0)			RW	Bit				US
09.009	Logic Function 1 Delay	±25.0 s		0.0 s			RW	Num				US
09.010	Logic Function 1 Destination	0.000 to 59.999		0.000			RW	Num	DE		PT	US
09.014	Logic Function 2 Source 1	0.000 to 59.999		0.000			RW	Num			PT	US
09.015	Logic Function 2 Source 1 Invert	Off (0) or On (1)		Off (0)			RW	Bit				US
09.016	Logic Function 2 Source 2	0.000 to 59.999		0.000			RW	Num			PT	US
09.017	Logic Function 2 Source 2 Invert	Off (0) or On (1)		Off (0)			RW	Bit				US
09.018	Logic Function 2 Output Invert	Off (0) or On (1)		Off (0)			RW	Bit				US
09.019	Logic Function 2 Delay	±25.0 s		0.0 s			RW	Num				US
09.020	Logic Function 2 Destination	0.000 to 59.999		0.000			RW	Num	DE		PT	US
09.021	Motorized Pot Mode	0 to 4		0			RW	Num				US
09.022	Motorized Pot Bipolar Select	Off (0) or On (1)		Off (0)			RW	Bit				US
09.023	Motorized Pot Rate	0 to 250 s		20 s			RW	Num				US
09.024	Motorized Pot Scaling	0.000 to 4.000		1.000			RW	Num				US
09.025	Motorized Pot Destination	0.000 to 59.999		0.000			RW	Num	DE		PT	US
09.026	Motorized Pot Up	Off (0) or On (1)		Off (0)			RW	Bit		NC		
09.027	Motorized Pot Down	Off (0) or On (1)		Off (0)			RW	Bit		NC		
09.028	Motorized Pot Reset	Off (0) or On (1)		Off (0)			RW	Bit		NC		
09.029	Binary Sum Ones	Off (0) or On (1)		Off (0)			RW	Bit		NC		
09.030	Binary Sum Twos	Off (0) or On (1)		Off (0)			RW	Bit		NC		
09.031	Binary Sum Fours	Off (0) or On (1)		Off (0)			RW	Bit		NC		
09.032	Binary Sum Output	0 to 255					RO	Num	ND	NC	PT	
09.033	Binary Sum Destination	0.000 to 59.999		0.000			RW	Num	DE		PT	US
09.034	Binary Sum Offset	0 to 248		0			RW	Num				US
09.035	Timer 1 Start Date	00-00-00 to 31-12-99		00-00-00			RW	Date				US
09.036	Timer 1 Start Time	00:00:00 to 23:59:59		00:00:00			RW	Time				US
09.037	Timer 1 Stop Date	00-00-00 to 31-12-99		00-00-00			RW	Date				US
09.038	Timer 1 Stop Time	00:00:00 to 23:59:59		00:00:00			RW	Time				US
09.039	Timer 1 Repeat Function	None (0), Hour (1), Day (2), Week (3), Month (4), Year (5), One off (6), Minute (7)		None (0)			RW	Txt				US
09.040	Timer 1 Enable	Off (0) or On (1)		Off (0)			RW	Bit				US
09.041	Timer 1 Invert	Off (0) or On (1)		Off (0)			RW	Bit				US
09.042	Timer 1 Output	Off (0) or On (1)					RO	Bit	ND	NC	PT	
09.043	Timer 1 Destination	0.000 to 59.999		0.000			RW	Num	DE		PT	US
09.045	Timer 2 Start Date	00-00-00 to 31-12-99		00-00-00			RW	Date				US
09.046	Timer 2 Start Time	00:00:00 to 23:59:59		00:00:00			RW	Time				US
09.047	Timer 2 Stop Date	00-00-00 to 31-12-99		00-00-00			RW	Date				US
09.048	Timer 2 Stop Time	00:00:00 to 23:59:59		00:00:00			RW	Time				US
09.049	Timer 2 Repeat Function	None (0), Hour (1), Day (2), Week (3), Month (4), Year (5), One off (6), Minute (7)		None (0)			RW	Txt				US
09.050	Timer 2 Enable	Off (0) or On (1)		Off (0)			RW	Bit				US
09.051	Timer 2 Invert	Off (0) or On (1)		Off (0)			RW	Bit				US
09.052	Timer 2 Output	Off (0) or On (1)					RO	Bit	ND	NC	PT	
09.053	Timer 2 Destination	0.000 to 59.999		0.000			RW	Num	DE		PT	US
09.055	Scope Trace 1 Source	0.000 to 59.999		0.000			RW	Num			PT	US
09.056	Scope Trace 2 Source	0.000 to 59.999		0.000			RW	Num			PT	US
09.057	Scope Trace 3 Source	0.000 to 59.999		0.000			RW	Num			PT	US
09.058	Scope Trace 4 Source	0.000 to 59.999		0.000			RW	Num			PT	US
09.059	Scope Trigger	Off (0) or On (1)		Off (0)			RW	Bit				
09.060	Scope Trigger Source	0.000 to 59.999		0.000			RW	Num			PT	US
09.061	Scope Trigger Threshold	-2147483648 to 2147483647		0			RW	Num				US
09.062	Scope Trigger Invert	Off (0) or On (1)		Off (0)			RW	Bit				US

Parameter		Range(⇳)		Default(⇨)			Type					
		OL	RFC-A / S	OL	RFC-A	RFC-S						
09.063	Scope Mode	Single (0), Normal (1), Auto (2)		Single (0)			RW	Txt				US
09.064	Scope Arm	Off (0) or On (1)		Off (0)			RW	Bit		NC		
09.065	Scope Data Not Ready	Off (0) or On (1)					RO	Bit	ND	NC	PT	
09.066	Scope Saving Data	Off (0) or On (1)					RO	Bit	ND	NC	PT	
09.067	Scope Sample Time	1 to 200		1			RW	Num				US
09.068	Scope Trigger Delay	0 to 100 %		0 %			RW	Num				US
09.069	Scope Time Period	0.00 to 200000.00 ms					RO	Num	ND	NC	PT	
09.070	Scope Auto-save Mode	Disabled (0), Overwrite (1), Keep (2)		Disabled (0)			RW	Txt				US
09.071	Scope Auto-save File Number	0 to 99					RO	Num				PS
09.072	Scope Auto-save Reset	Off (0) or On (1)		Off (0)			RW	Bit				
09.073	Scope Auto-save Status	Disabled (0), Active (1), Stopped (2), Failed (3)					RO	Txt				PS

RW	Read / Write	RO	Read only	Num	Number parameter	Bit	Bit parameter	Txt	Text string	Bin	Binary parameter	FI	Filtered
ND	No default value	NC	Not copied	PT	Protected parameter	RA	Rating dependent	US	User save	PS	Power-down save	DE	Destination
IP	IP address	Mac	Mac address	Date	Date parameter	Time	Time parameter	SMP	Slot,menu,parameter	Chr	Character parameter	Ver	Version number

12.11 Menu 10: Status and trips

Parameter		Range(⇳)		Default(⇨)			Type					
		OL	RFC-A / S	OL	RFC-A	RFC-S						
10.001	Drive OK	Off (0) or On (1)					RO	Bit	ND	NC	PT	
10.002	Drive Active	Off (0) or On (1)					RO	Bit	ND	NC	PT	
10.003	Zero Speed	Off (0) or On (1)					RO	Bit	ND	NC	PT	
10.004	Running At Or Below Minimum Speed	Off (0) or On (1)					RO	Bit	ND	NC	PT	
10.005	Below Set Speed	Off (0) or On (1)					RO	Bit	ND	NC	PT	
10.006	At Speed	Off (0) or On (1)					RO	Bit	ND	NC	PT	
10.007	Above Set Speed	Off (0) or On (1)					RO	Bit	ND	NC	PT	
10.008	Rated Load Reached	Off (0) or On (1)					RO	Bit	ND	NC	PT	
10.009	Current Limit Active	Off (0) or On (1)					RO	Bit	ND	NC	PT	
10.010	Regenerating	Off (0) or On (1)					RO	Bit	ND	NC	PT	
10.011	Braking IGBT Active	Off (0) or On (1)					RO	Bit	ND	NC	PT	
10.012	Braking Resistor Alarm	Off (0) or On (1)					RO	Bit	ND	NC	PT	
10.013	Reverse Direction Commanded	Off (0) or On (1)					RO	Bit	ND	NC	PT	
10.014	Reverse Direction Running	Off (0) or On (1)					RO	Bit	ND	NC	PT	
10.015	Supply Loss	Off (0) or On (1)					RO	Bit	ND	NC	PT	
10.016	Under Voltage Active	Off (0) or On (1)					RO	Bit	ND	NC	PT	
10.017	Motor Overload Alarm	Off (0) or On (1)					RO	Bit	ND	NC	PT	
10.018	Drive Over-temperature Alarm	Off (0) or On (1)					RO	Bit	ND	NC	PT	
10.019	Drive Warning	Off (0) or On (1)					RO	Bit	ND	NC	PT	
10.020	Trip 0	0 to 255					RO	Txt	ND	NC	PT	PS
10.021	Trip 1	0 to 255					RO	Txt	ND	NC	PT	PS
10.022	Trip 2	0 to 255					RO	Txt	ND	NC	PT	PS
10.023	Trip 3	0 to 255					RO	Txt	ND	NC	PT	PS
10.024	Trip 4	0 to 255					RO	Txt	ND	NC	PT	PS
10.025	Trip 5	0 to 255					RO	Txt	ND	NC	PT	PS
10.026	Trip 6	0 to 255					RO	Txt	ND	NC	PT	PS
10.027	Trip 7	0 to 255					RO	Txt	ND	NC	PT	PS
10.028	Trip 8	0 to 255					RO	Txt	ND	NC	PT	PS
10.029	Trip 9	0 to 255					RO	Txt	ND	NC	PT	PS
10.030	Braking Resistor Rated Power	0.000 to 99999.999 kW		See Table 12-5			RW	Num				US
10.031	Braking Resistor Thermal Time Constant	0.000 to 1500.000 s		See Table 12-5			RW	Num				US
10.032	External Trip	Off (0) or On (1)		Off (0)			RW	Bit		NC		
10.033	Drive Reset	Off (0) or On (1)		Off (0)			RW	Bit		NC		
10.034	Number Of Auto-reset Attempts	None (0), 1 (1), 2 (2), 3 (3), 4 (4), 5 (5), Infinite (6)		None (0)			RW	Txt				US
10.035	Auto-reset Delay	1.0 to 600.0 s		1.0 s			RW	Num				US
10.036	Auto-reset Hold Drive ok	Off (0) or On (1)		Off (0)			RW	Bit				US
10.037	Action On Trip Detection	00000 to 11111		00000			RW	Bin				US
10.038	User Trip	0 to 255		0			RW	Num	ND	NC		
10.039	Braking Resistor Thermal Accumulator	0.0 to 100.0 %					RO	Num	ND	NC	PT	
10.040	Status Word	000000000000000 to 111111111111111					RO	Bin	ND	NC	PT	
10.041	Trip 0 Date	00-00-00 to 31-12-99					RO	Date	ND	NC	PT	PS
10.042	Trip 0 Time	00:00:00 to 23:59:59					RO	Time	ND	NC	PT	PS
10.043	Trip 1 Date	00-00-00 to 31-12-99					RO	Date	ND	NC	PT	PS
10.044	Trip 1 Time	00:00:00 to 23:59:59					RO	Time	ND	NC	PT	PS
10.045	Trip 2 Date	00-00-00 to 31-12-99					RO	Date	ND	NC	PT	PS
10.046	Trip 2 Time	00:00:00 to 23:59:59					RO	Time	ND	NC	PT	PS
10.047	Trip 3 Date	00-00-00 to 31-12-99					RO	Date	ND	NC	PT	PS
10.048	Trip 3 Time	00:00:00 to 23:59:59					RO	Time	ND	NC	PT	PS
10.049	Trip 4 Date	00-00-00 to 31-12-99					RO	Date	ND	NC	PT	PS
10.050	Trip 4 Time	00:00:00 to 23:59:59					RO	Time	ND	NC	PT	PS
10.051	Trip 5 Date	00-00-00 to 31-12-99					RO	Date	ND	NC	PT	PS
10.052	Trip 5 Time	00:00:00 to 23:59:59					RO	Time	ND	NC	PT	PS
10.053	Trip 6 Date	00-00-00 to 31-12-99					RO	Date	ND	NC	PT	PS
10.054	Trip 6 Time	00:00:00 to 23:59:59					RO	Time	ND	NC	PT	PS
10.055	Trip 7 Date	00-00-00 to 31-12-99					RO	Date	ND	NC	PT	PS
10.056	Trip 7 Time	00:00:00 to 23:59:59					RO	Time	ND	NC	PT	PS
10.057	Trip 8 Date	00-00-00 to 31-12-99					RO	Date	ND	NC	PT	PS

Parameter		Range(⇳)		Default(⇨)			Type					
		OL	RFC-A / S	OL	RFC-A	RFC-S						
10.058	Trip 8 Time	00:00:00 to 23:59:59					RO	Time	ND	NC	PT	PS
10.059	Trip 9 Date	00-00-00 to 31-12-99					RO	Date	ND	NC	PT	PS
10.060	Trip 9 Time	00:00:00 to 23:59:59					RO	Time	ND	NC	PT	PS
10.061	Braking Resistor Resistance	0.00 to 10000.00 Ω		See Table 12-5			RW	Num				US
10.062	Low Load Detected Alarm	Off (0) or On (1)					RO	Bit	ND	NC	PT	
10.063	Local Keypad Battery Low	Off (0) or On (1)					RO	Bit	ND	NC	PT	
10.064	Remote Keypad Battery Low	Off (0) or On (1)					RO	Bit	ND	NC	PT	
10.065	Auto-tune Active	Off (0) or On (1)					RO	Bit	ND	NC	PT	
10.066	Limit Switch Active	Off (0) or On (1)					RO	Bit	ND	NC	PT	
10.068	Hold Drive Healthy On Under Voltage	Off (0) or On (1)		Off (0)			RW	Bit				US
10.069	Additional Status Bits	0000000000 to 1111111111					RO	Bin	ND	NC	PT	
10.070	Trip 0 Sub-trip Number	0 to 65535					RO	Num	ND	NC	PT	PS
10.071	Trip 1 Sub-trip Number	0 to 65535					RO	Num	ND	NC	PT	PS
10.072	Trip 2 Sub-trip Number	0 to 65535					RO	Num	ND	NC	PT	PS
10.073	Trip 3 Sub-trip Number	0 to 65535					RO	Num	ND	NC	PT	PS
10.074	Trip 4 Sub-trip Number	0 to 65535					RO	Num	ND	NC	PT	PS
10.075	Trip 5 Sub-trip Number	0 to 65535					RO	Num	ND	NC	PT	PS
10.076	Trip 6 Sub-trip Number	0 to 65535					RO	Num	ND	NC	PT	PS
10.077	Trip 7 Sub-trip Number	0 to 65535					RO	Num	ND	NC	PT	PS
10.078	Trip 8 Sub-trip Number	0 to 65535					RO	Num	ND	NC	PT	PS
10.079	Trip 9 Sub-trip Number	0 to 65535					RO	Num	ND	NC	PT	PS
10.080	Stop Motor	Off (0) or On (1)					RO	Bit	ND	NC	PT	
10.081	Phase Loss	Off (0) or On (1)					RO	Bit	ND	NC	PT	
10.101	Drive Status	Inhibit (0), Ready (1), Stop (2), Scan (3), Run (4), Supply Loss (5), Deceleration (6), dc Injection (7), Position (8), Trip (9), Active (10), Off (11), Hand (12), Auto (13), Heat (14), Under Voltage (15), Phasing (16)					RO	Txt	ND	NC	PT	
10.102	Trip Reset Source	0 to 1023					RO	Num	ND	NC	PT	PS
10.103	Trip Time Identifier	-2147483648 to 2147483647 ms					RO	Num	ND	NC	PT	
10.104	Active Alarm	None (0), Brake Resistor (1), Motor Overload (2), Ind Overload (3), Drive Overload (4), Auto Tune (5), Limit Switch (6), Fire Mode (7), Low Load (8), Option Slot 1 (9), Option Slot 2 (10), Option Slot 3 (11), Option Slot 4 (12)					RO	Txt	ND	NC	PT	
10.105	Hand Off Auto State	Not Active (0), Off (1), Hand (2), Auto (3)					RO	Txt	ND	NC	PT	PS
10.106	Potential Drive Damage Conditions	0000 to 1111					RO	Bin	ND	NC	PT	PS
10.107	Auto tune State	Not Active (0), Resistance (1), pLs (2), Ls (3), Flux (4), Flux Repeat (5), Ld Lq No load (6), Lq (7), Ke (8), Inertia (9)					RO	Txt	ND	NC	PT	

RW	Read / Write	RO	Read only	Num	Number parameter	Bit	Bit parameter	Txt	Text string	Bin	Binary parameter	FI	Filtered
ND	No default value	NC	Not copied	PT	Protected parameter	RA	Rating dependent	US	User save	PS	Power-down save	DE	Destination
IP	IP address	Mac	Mac address	Date	Date parameter	Time	Time parameter	SMP	Slot,menu,parameter	Chr	Character parameter	Ver	Version number

Table 12-5 Defaults for Pr 10.030, Pr 10.031 and Pr 10.061

Drive size	Pr 10.030	Pr 10.031	Pr 10.061
Size 3	50 W	3.3 s	75 Ω
Size 4 and 5	100 W	2.0 s	38 Ω
All other ratings and frame sizes	0.000		0.00

12.12 Menu 11: General drive set-up

Parameter		Range(⇳)		Default(⇨)			Type					
		OL	RFC-A / S	OL	RFC-A	RFC-S						
11.001	Option Synchronisation Select	Not Active (0), Slot 1 (1), Slot 2 (2), Slot 3 (3), Slot 4 (4), Automatic (5)		Slot 4 (4)			RW	Txt				US
11.002	Option synchronisation Active	Not Active (0), Slot 1 (1), Slot 2 (2), Slot 3 (3), Slot 4 (4)					RO	Txt	ND	NC	PT	
11.018	Status Mode Parameter 1	0.000 to 59.999		0.000			RW	Num			PT	US
11.019	Status Mode Parameter 2	0.000 to 59.999		0.000			RW	Num			PT	US
11.020	Reset Serial Communications*	Off (0) or On (1)		Off (0)			RW	Bit	ND	NC		
11.021	Parameter 00.030 Scaling	0.000 to 10.000		1.000			RW	Num				US
11.022	Parameter Displayed At Power-up	0.000 to 0.080		0.010			RW	Num			PT	US
11.023	Serial Address*	1 to 247		1			RW	Num				US
11.024	Serial Mode*	8 2 NP (0), 8 1 NP (1), 8 1 EP (2), 8 1 OP (3), 8 2 NP M (4), 8 1 NP M (5), 8 1 EP M (6), 8 1 OP M (7), 7 2 NP (8), 7 1 NP (9), 7 1 EP (10), 7 1 OP (11), 7 2 NP M (12), 7 1 NP M (13), 7 1 EP M (14), 7 1 OP M (15)		8 2 NP (0)			RW	Txt				US
11.025	Serial Baud Rate*	300 (0), 600 (1), 1200 (2), 2400 (3), 4800 (4), 9600 (5), 19200 (6), 38400 (7), 57600 (8), 76800 (9), 115200 (10)		19200 (6)			RW	Txt				US
11.026	Minimum Comms Transmit Delay*	0 to 250 ms		2 ms			RW	Num				US
11.027	Silent Period*	0 to 250 ms		0 ms			RW	Num				US
11.028	Drive Derivative	0 to 255					RO	Num	ND	NC	PT	
11.029	Software Version	00.00.00.00 to 99.99.99.99					RO	Num	ND	NC	PT	
11.030	User Security Code	0 to 2147483647		0			RW	Num	ND	NC	PT	US
11.031	User Drive Mode	Open-loop (1), RFC-A (2), RFC-S (3), Regen (4)		Open-loop (1)	RFC-A (2)	RFC-S (3)	RW	Txt	ND	NC	PT	
11.032	Maximum Heavy Duty Rating	0.000 to 99999.999 A					RO	Num	ND	NC	PT	
11.033	Drive Rated Voltage	200 V (0), 400 V (1), 575 V (2), 690 V (3)					RO	Txt	ND	NC	PT	
11.034	Software Sub Version	0 to 99					RO	Num	ND	NC	PT	
11.035	Number Of Power Modules Test	-1 to 20		-1			RW	Num				US
11.036	NV Media Card File Previously Loaded	0 to 999					RO	Num		NC	PT	
11.037	NV Media Card File Number	0 to 999		0			RW	Num				
11.038	NV Media Card File Type	None (0), Open-loop (1), RFC-A (2), RFC-S (3), Regen (4), User Prog (5)					RO	Txt	ND	NC	PT	
11.039	NV Media Card File Version	0 to 9999					RO	Num	ND	NC	PT	
11.040	NV Media Card File Checksum	--2147483648 to 2147483647					RO	Num	ND	NC	PT	
11.042	Parameter Cloning	None (0), Read (1), Program (2), Auto (3), Boot (4)		None (0)			RW	Txt		NC		US
11.043	Load Defaults	None (0), Standard (1), US (2)		None (0)			RW	Txt		NC		
11.044	User Security Status	Menu 0 (0), All Menus (1), Read-only Menu 0 (2), Read-only (3), Status Only (4), No Access (5)		Menu 0 (0)			RW	Txt	ND		PT	
11.045	Select Motor 2 Parameters	Motor 1 (0) or Motor 2 (1)		Motor 1 (0)			RW	Txt				US
11.046	Defaults Previously Loaded	0 to 2000					RO	Num	ND	NC	PT	US
11.047	Onboard User Program: Enable	Reset And Run (-1), Stop (0), Run (1)		Run (1)			RW	Txt				US
11.048	Onboard User Program: Status	-2147483648 to 2147483647					RO	Num	ND	NC	PT	
11.049	Onboard User Program: Programming Events	0 to 65535					RO	Num	ND	NC	PT	
11.050	Onboard User Program: Freewheeling Tasks Per Second	0 to 65535					RO	Num	ND	NC	PT	
11.051	Onboard User Program: Clock Task Time Used	0.0 to 100.0 %					RO	Num	ND	NC	PT	
11.052	Serial Number LS	000000000 to 999999999					RO	Num	ND	NC	PT	
11.053	Serial Number MS	0 to 999999999					RO	Num	ND	NC	PT	
11.054	Drive Date Code	0 to 65535					RO	Num	ND	NC	PT	
11.055	Onboard User Program: Clock Task Scheduled Interval	0 to 262140 ms					RO	Num	ND	NC	PT	
11.056	Option Slot Identifiers	1234 (0), 1243 (1), 1324 (2), 1342 (3), 1423 (4), 1432 (5), 4123 (6), 3124 (7), 4132 (8), 2134 (9), 3142 (10), 2143 (11), 3412 (12), 4312 (13), 2413 (14), 4213 (15), 2314 (16), 3214 (17), 2341 (18), 2431 (19), 3241 (20), 3421 (21), 4231 (22), 4321 (23)		1234 (0)			RW	Txt			PT	
11.060	Maximum Rated Current	0.000 to 99999.999 A					RO	Num	ND	NC	PT	
11.061	Full Scale Current Kc	0.000 to 99999.999 A					RO	Num	ND	NC	PT	
11.062	Power Board Software Version Number	0.00 to 99.99					RO	Num	ND	NC	PT	
11.063	Product Type	0 to 255					RO	Num	ND	NC	PT	
11.064	Product Identifier Characters	M700 / M701 / M702					RO	Chr	ND	NC	PT	
11.065	Drive Rating And Configuration	00000000 to 99999999					RO	Num	ND	NC	PT	
11.066	Power Stage Identifier	0 to 255					RO	Num	ND	NC	PT	
11.067	Control Board Identifier	0.000 to 65.535					RO	Num	ND	NC	PT	

Parameter		Range(⇳)		Default(⇨)			Type					
		OL	RFC-A / S	OL	RFC-A	RFC-S						
11.068	Internal I/O Identifier	0 to 255					RO	Num	ND	NC	PT	
11.069	Position Feedback Interface Identifier	0 to 255					RO	Num	ND	NC	PT	
11.070	Core Parameter Database Version	0.00 to 99.99					RO	Num	ND	NC	PT	
11.071	Number Of Power Modules Detected	0 to 20					RO	Num	ND	NC	PT	US
11.072	NV Media Card Create Special File	0 to 1		0			RW	Num		NC		
11.073	NV Media Card Type	None (0), SMART Card (1), SD Card (2)					RO	Txt	ND	NC	PT	
11.075	NV Media Card Read-only Flag	Off (0) or On (1)					RO	Bit	ND	NC	PT	
11.076	NV Media Card Warning Suppression Flag	Off (0) or On (1)					RO	Bit	ND	NC	PT	
11.077	NV Media Card File Required Version	0 to 9999		0			RW	Num	ND	NC	PT	
11.079	Drive Name Characters 1-4	- - - - (-2147483648) to - - - (2147483647)		- - - - (0)			RW	Chr			PT	US
11.080	Drive Name Characters 5-8	- - - - (-2147483648) to - - - (2147483647)		- - - - (0)			RW	Chr			PT	US
11.081	Drive Name Characters 9-12	- - - - (-2147483648) to - - - (2147483647)		- - - - (0)			RW	Chr			PT	US
11.082	Drive Name Characters 13-16	- - - - (-2147483648) to - - - (2147483647)		- - - - (0)			RW	Chr			PT	US
11.084	Drive Mode	Open-loop (1), RFC-A (2), RFC-S (3), Regen (4)					RO	Txt	ND	NC	PT	US
11.085	Security Status	None (0), Read-only (1), Status-only (2), No Access (3)					RO	Txt	ND	NC	PT	PS
11.086	Menu Access Status	Menu 0 (0) or All Menus (1)					RO	Txt	ND	NC	PT	PS
11.090	Keypad Port Serial Address	1 to 16		1			RW	Num				US
11.091	Additional Identifier Characters 1	- - - - (-2147483648) to - - - (2147483647)					RO	Chr	ND	NC	PT	
11.092	Additional Identifier Characters 2	- - - - (-2147483648) to - - - (2147483647)					RO	Chr	ND	NC	PT	
11.093	Additional Identifier Characters 3	- - - - (-2147483648) to - - - (2147483647)					RO	Chr	ND	NC	PT	
11.095	Number Of Rectifiers Detected	0 to 9					RO	Num	ND	NC	PT	
11.096	Number Of Rectifiers Expected	0 to 9		0			RW	Num				US

* On *Unidrive M701* only.

RW	Read / Write	RO	Read only	Num	Number parameter	Bit	Bit parameter	Txt	Text string	Bin	Binary parameter	FI	Filtered
ND	No default value	NC	Not copied	PT	Protected parameter	RA	Rating dependent	US	User save	PS	Power-down save	DE	Destination
IP	IP address	Mac	Mac address	Date	Date parameter	Time	Time parameter	SMP	Slot,menu,parameter	Chr	Character parameter	Ver	Version number

12.13 Menu 12: Threshold detectors, variable selectors and brake control function

Figure 12-29 Menu 12 logic diagram

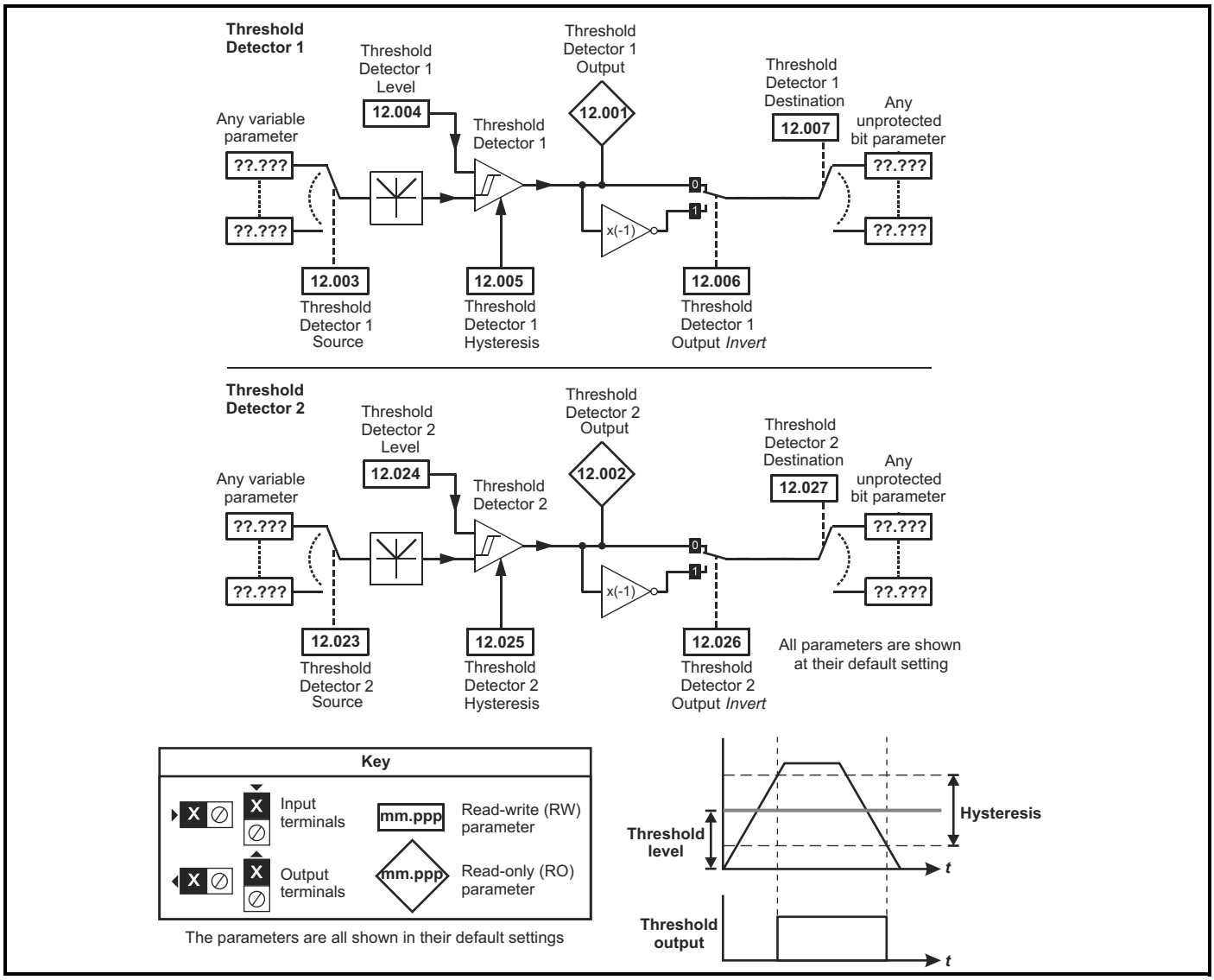
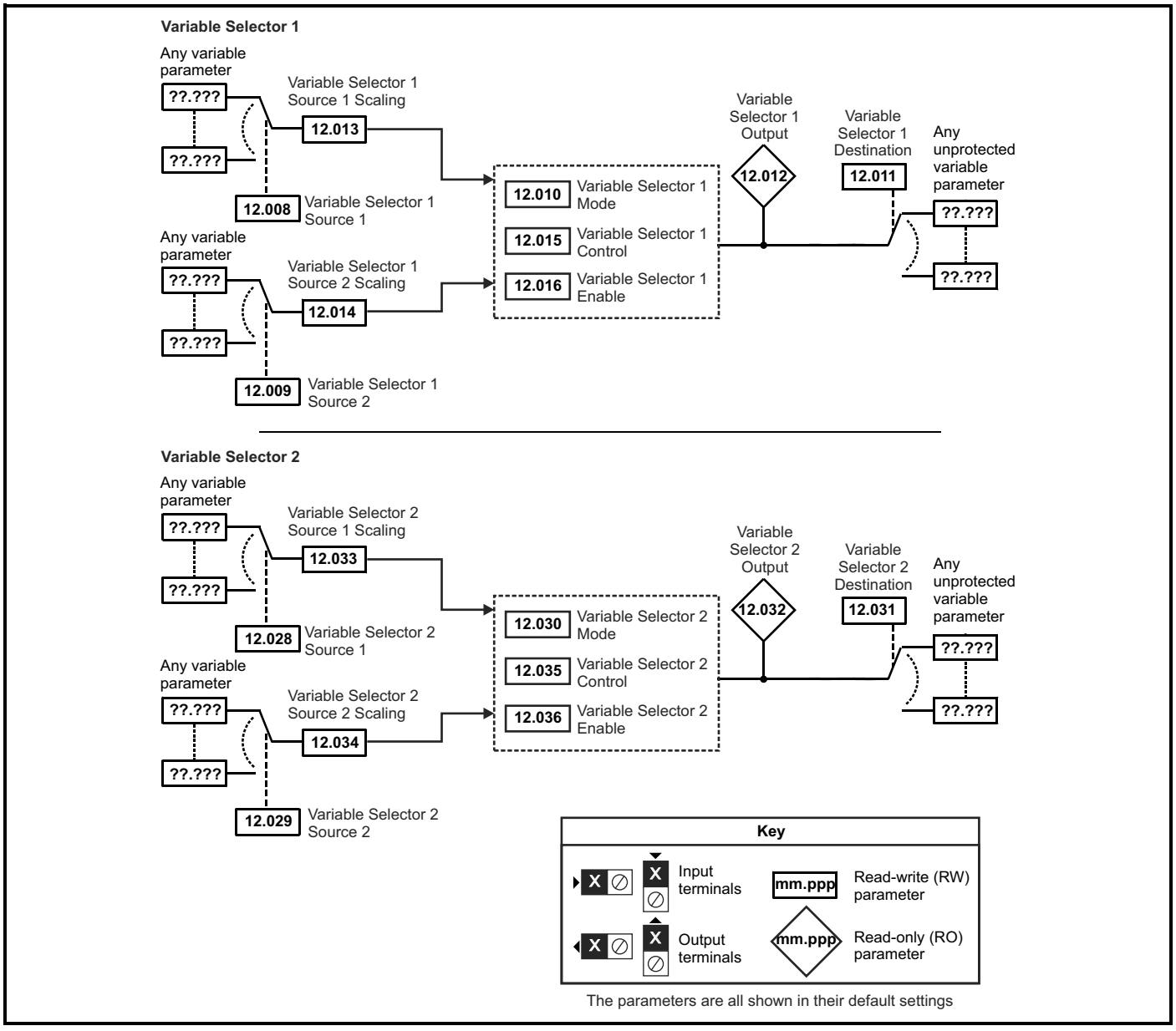


Figure 12-30 Menu 12 logic diagram (continued)



WARNING

The brake control functions are provided to allow well co-ordinated operation of an external brake with the drive. While both hardware and software are designed to high standards of quality and robustness, they are not intended for use as safety functions, i.e. where a fault or failure would result in a risk of injury. In any application where the incorrect operation of the brake release mechanism could result in injury, independent protection devices of proven integrity must also be incorporated.

WARNING

The control terminal relay can be selected as an output to release a brake. If a drive is set up in this manner and a drive replacement takes place, prior to programming the drive on initial power up, the brake may be released.
When drive terminals are programmed to non default settings the result of incorrect or delayed programming must be considered. The use of a NV media card in boot mode or an SI-Applications module can ensure drive parameters are immediately programmed to avoid this situation.

Figure 12-31 Open-loop brake function

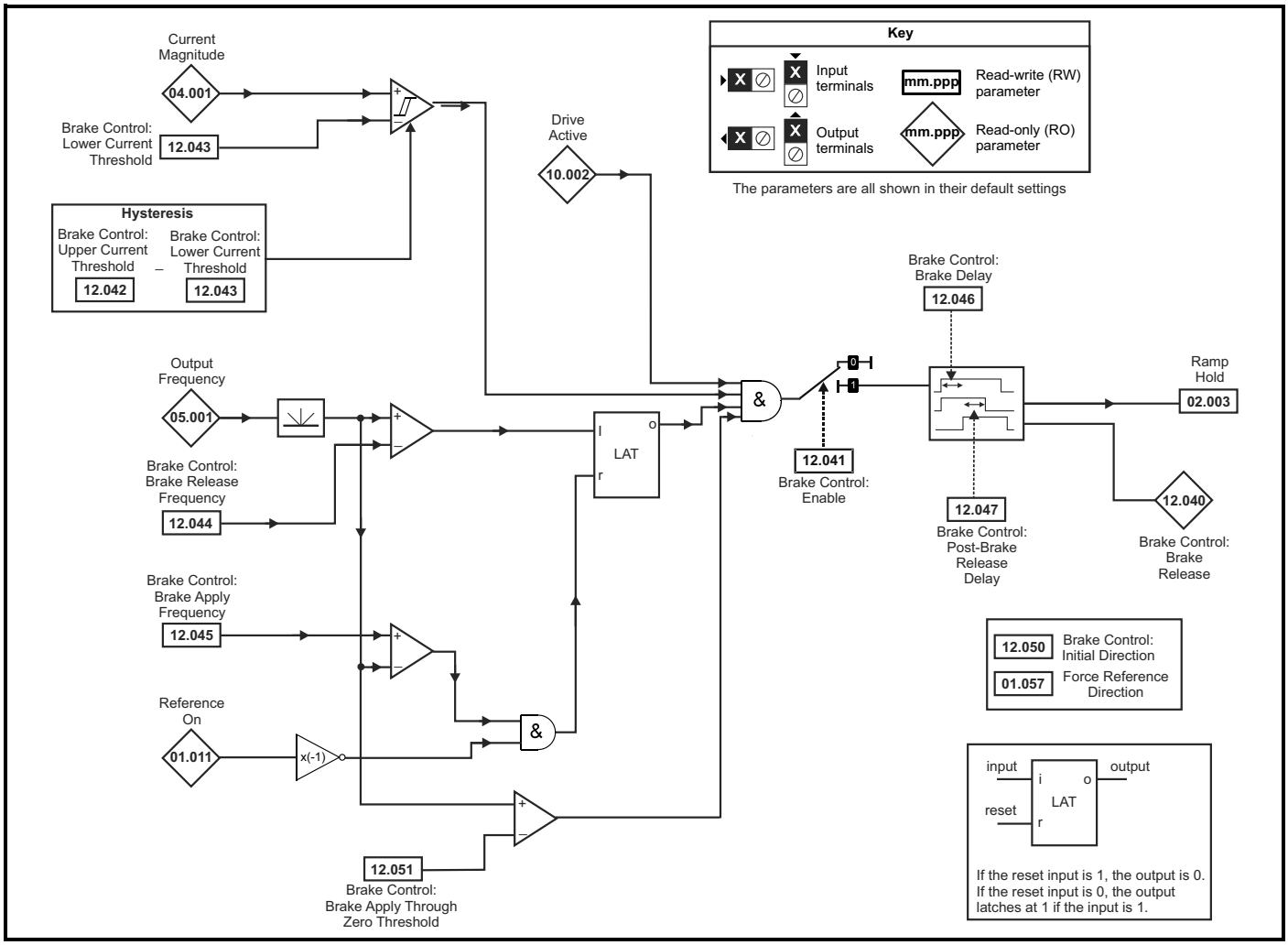
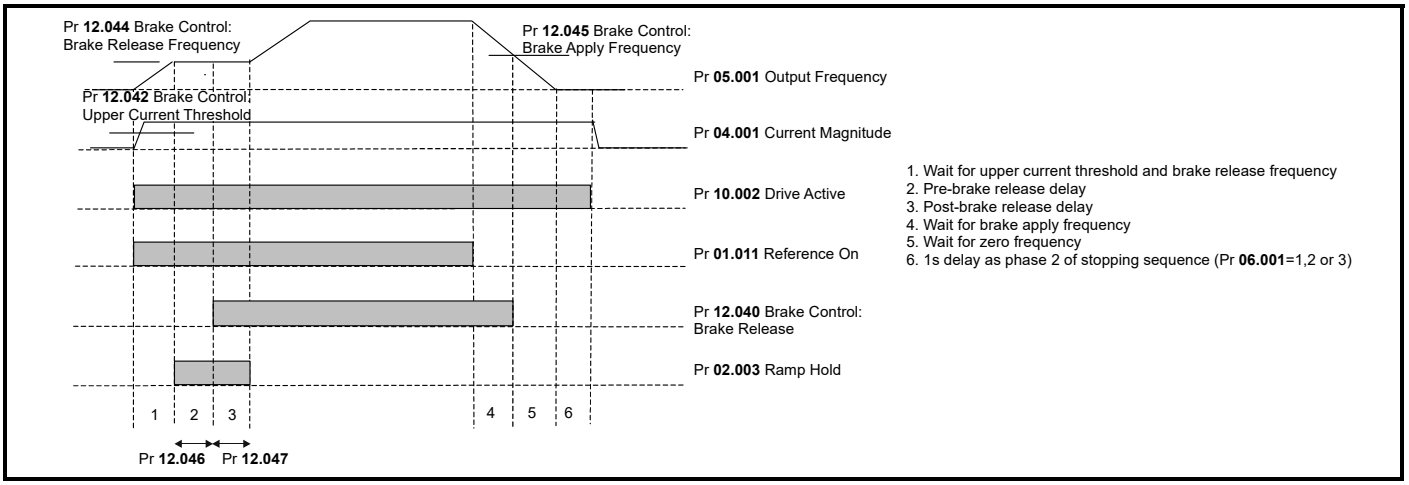


Figure 12-32 Open-loop brake sequence



WARNING

The brake control functions are provided to allow well co-ordinated operation of an external brake with the drive. While both hardware and software are designed to high standards of quality and robustness, they are not intended for use as safety functions, i.e. where a fault or failure would result in a risk of injury. In any application where the incorrect operation of the brake release mechanism could result in injury, independent protection devices of proven integrity must also be incorporated.

WARNING

The control terminal relay can be selected as an output to release a brake. If a drive is set up in this manner and a drive replacement takes place, prior to programming the drive on initial power up, the brake may be released.
When drive terminals are programmed to non default settings the result of incorrect or delayed programming must be considered. The use of a NV media card in boot mode or an SI-Applications module can ensure drive parameters are immediately programmed to avoid this situation.

Figure 12-33 RFC-A mode with brake controller mode (12.052) =0 (RFC-A with position feedback mode)

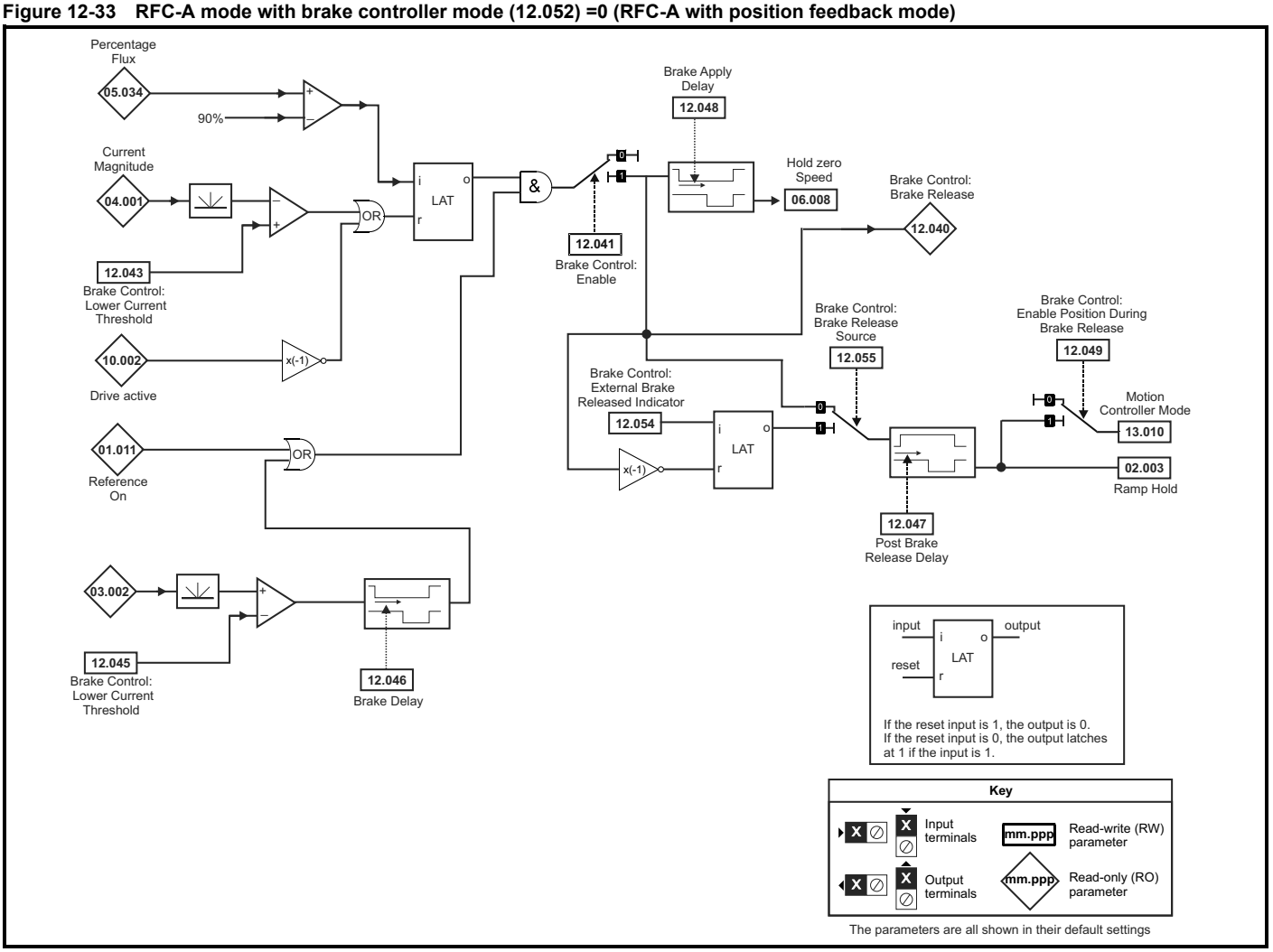
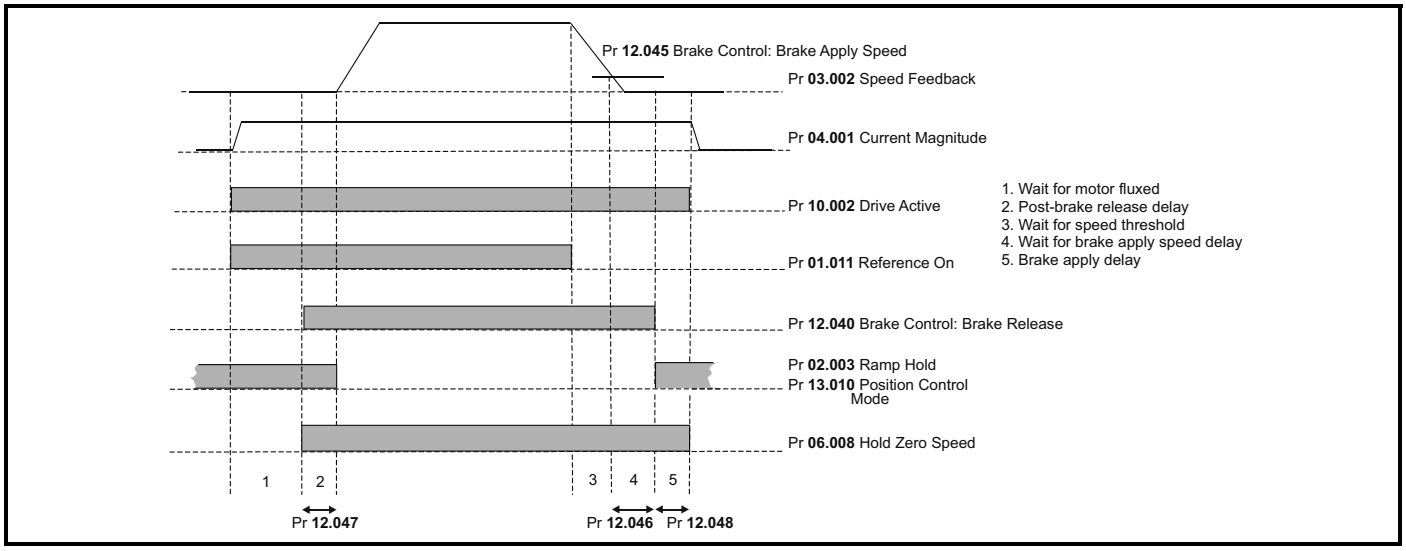


Figure 12-34 RFC-A with position feedback brake sequence



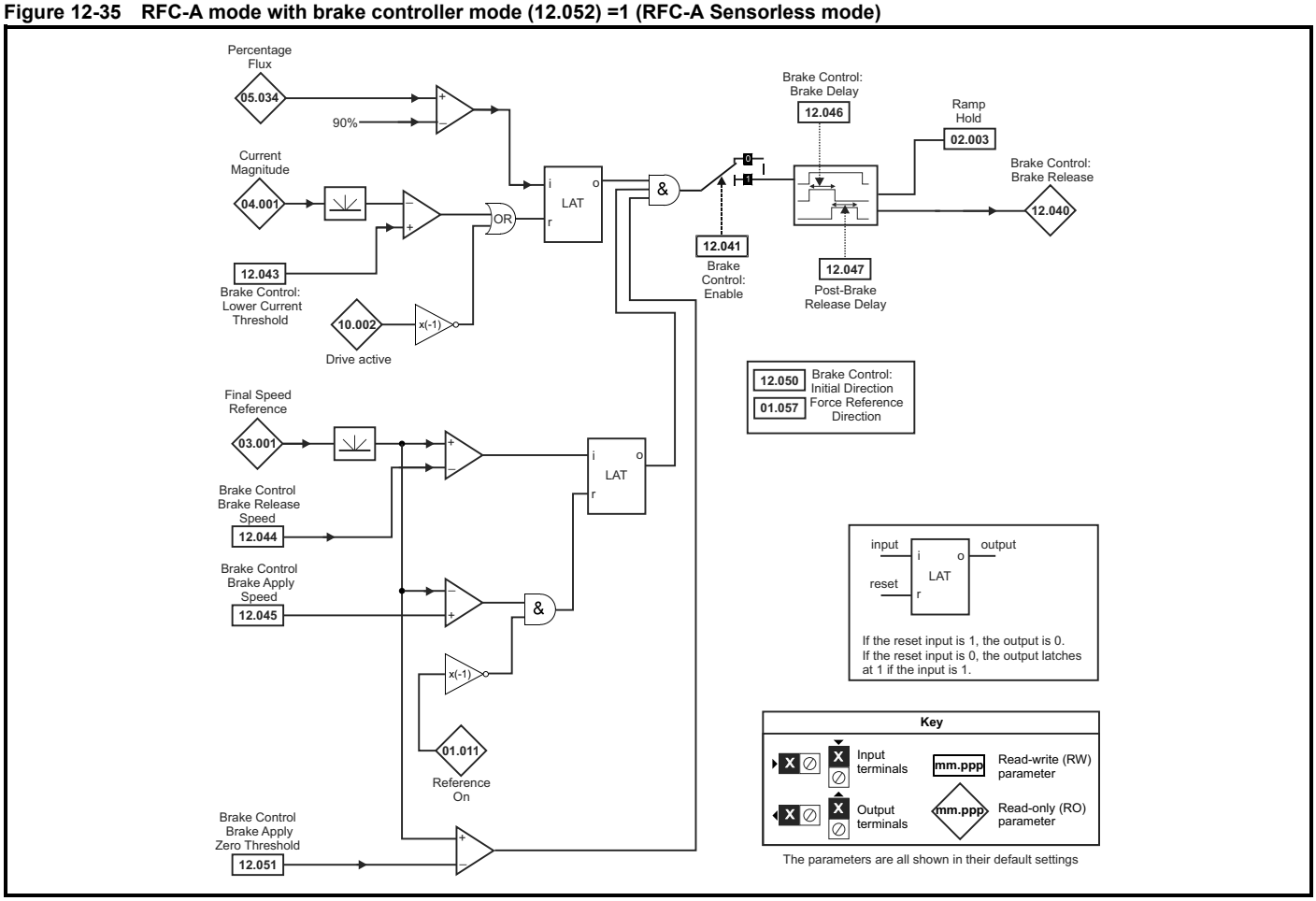
WARNING

The brake control functions are provided to allow well co-ordinated operation of an external brake with the drive. While both hardware and software are designed to high standards of quality and robustness, they are not intended for use as safety functions, i.e. where a fault or failure would result in a risk of injury. In any application where the incorrect operation of the brake release mechanism could result in injury, independent protection devices of proven integrity must also be incorporated.

WARNING

The control terminal relay can be selected as an output to release a brake. If a drive is set up in this manner and a drive replacement takes place, prior to programming the drive on initial power up, the brake may be released.
When drive terminals are programmed to non default settings the result of incorrect or delayed programming must be considered. The use of a NV media card in boot mode or an SI-Applications module can ensure drive parameters are immediately programmed to avoid this situation.

Figure 12-35 RFC-A mode with brake controller mode (12.052) =1 (RFC-A Sensorless mode)



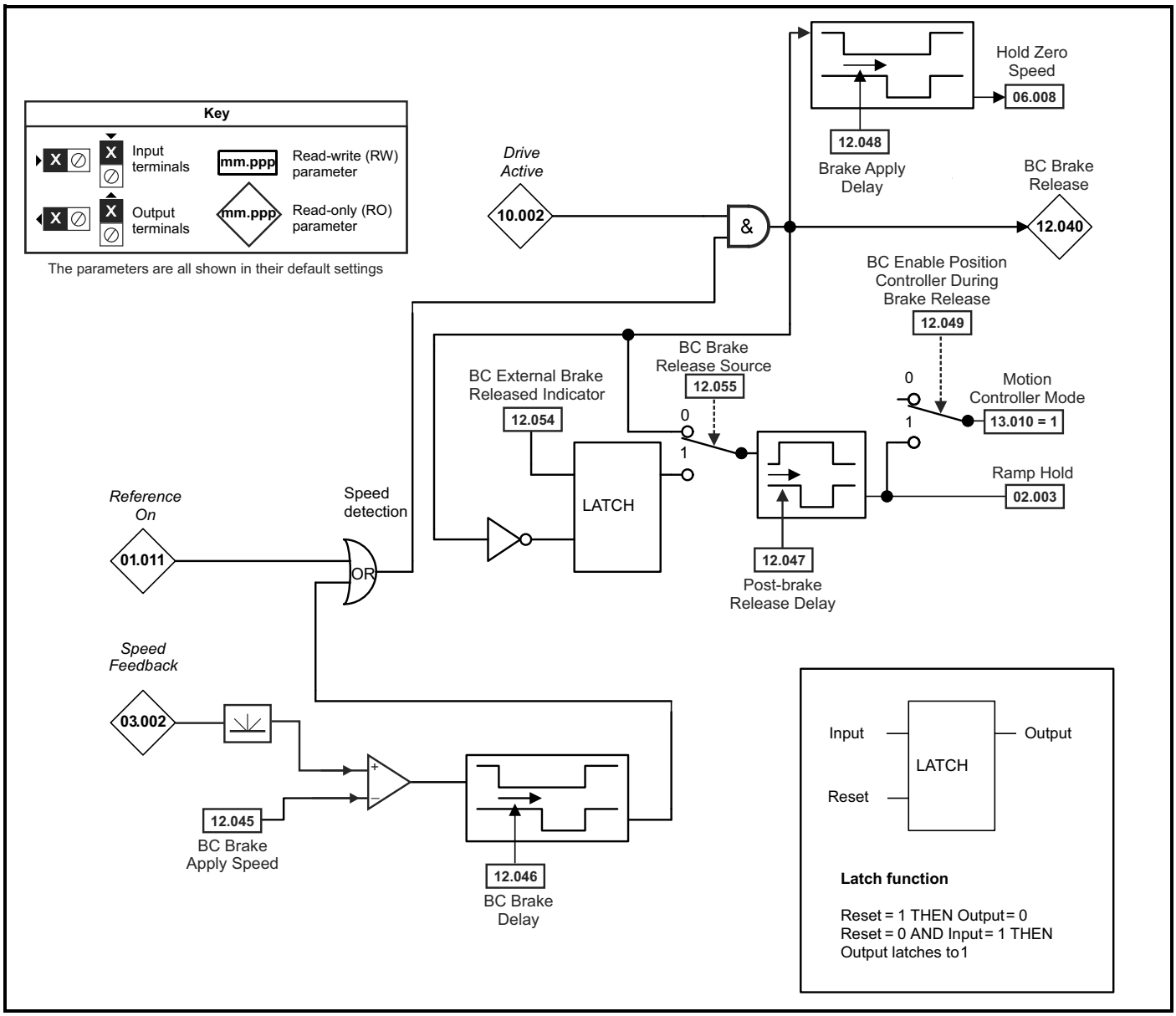
WARNING

The brake control functions are provided to allow well co-ordinated operation of an external brake with the drive. While both hardware and software are designed to high standards of quality and robustness, they are not intended for use as safety functions, i.e. where a fault or failure would result in a risk of injury. In any application where the incorrect operation of the brake release mechanism could result in injury, independent protection devices of proven integrity must also be incorporated.

WARNING

The control terminal relay can be selected as an output to release a brake. If a drive is set up in this manner and a drive replacement takes place, prior to programming the drive on initial power up, the brake may be released.
When drive terminals are programmed to non default settings the result of incorrect or delayed programming must be considered. The use of a NV media card in boot mode or an SI-Applications module can ensure drive parameters are immediately programmed to avoid this situation.

Figure 12-36 RFC-S brake function

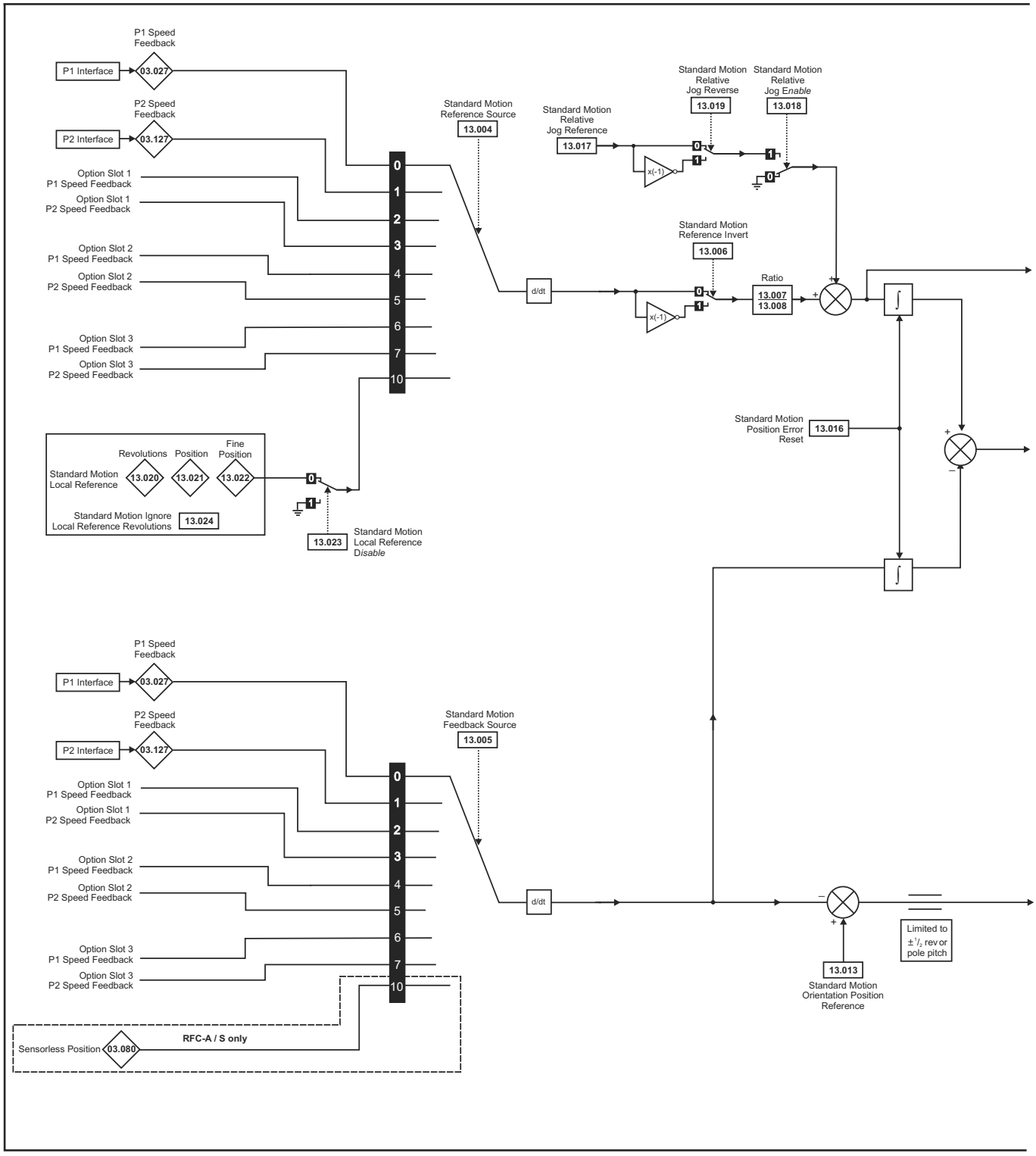


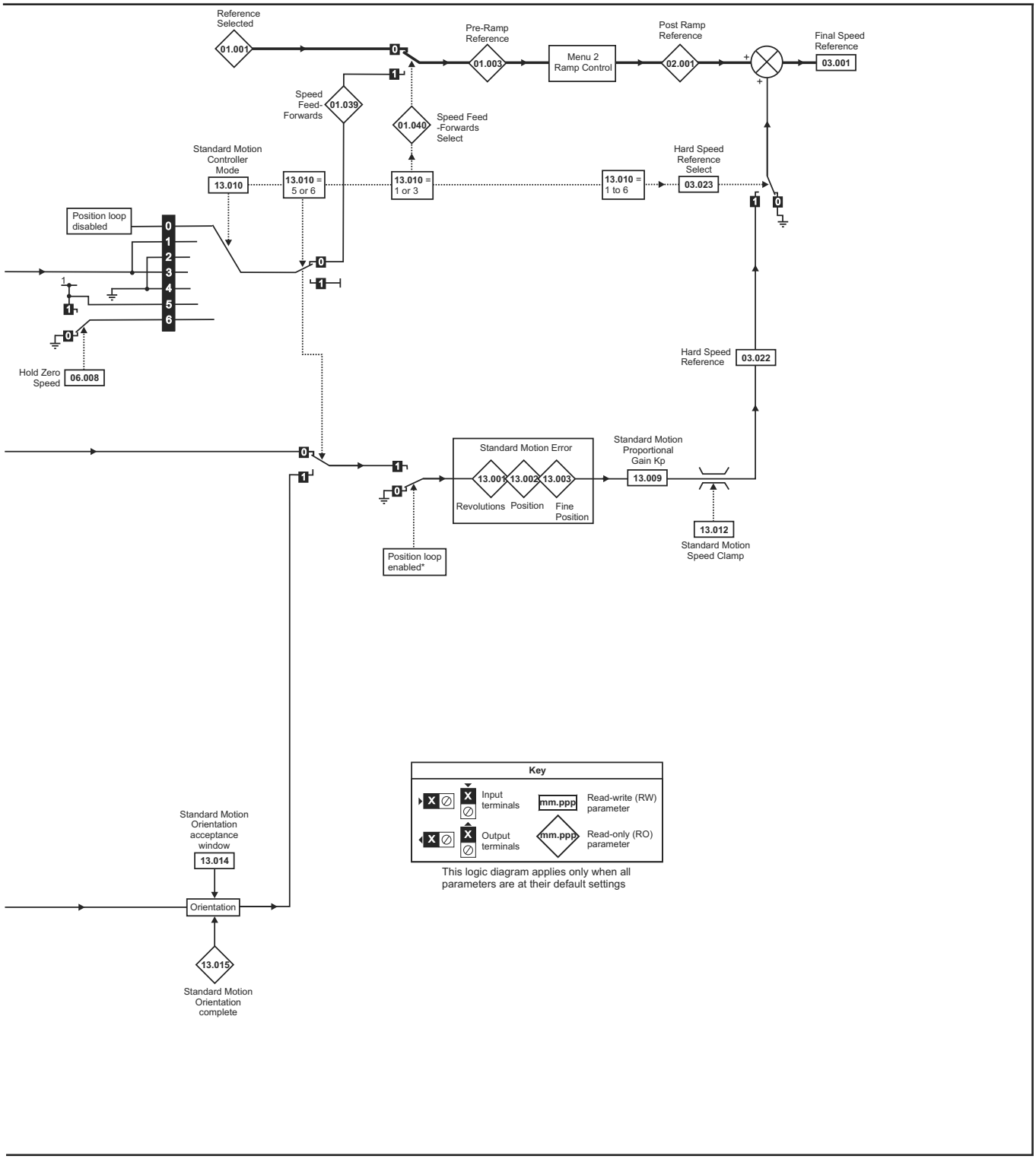
Parameter		Range(⇳)			Default(⇨)			Type					
		OL	RFC- A	RFC- S	OL	RFC-A	RFC-S						
12.001	Threshold Detector 1 Output	Off (0) or On (1)						RO	Bit	ND	NC	PT	
12.002	Threshold Detector 2 Output	Off (0) or On (1)						RO	Bit	ND	NC	PT	
12.003	Threshold Detector 1 Source	0.000 to 59.999			0.000			RW	Num			PT	US
12.004	Threshold Detector 1 Level	0.00 to 100.00 %			0.00 %			RW	Num				US
12.005	Threshold Detector 1 Hysteresis	0.00 to 25.00 %			0.00 %			RW	Num				US
12.006	Threshold Detector 1 Output Invert	Off (0) or On (1)			Off (0)			RW	Bit				US
12.007	Threshold Detector 1 Destination	0.000 to 59.999			0.000			RW	Num	DE		PT	US
12.008	Variable Selector 1 Source 1	0.000 to 59.999			0.000			RW	Num			PT	US
12.009	Variable Selector 1 Source 2	0.000 to 59.999			0.000			RW	Num			PT	US
12.010	Variable Selector 1 Mode	Input 1 (0), Input 2 (1), Add (2), Subtract (3), Multiply (4), Divide (5), Time Const (6), Ramp (7), Modulus (8), Powers (9), Sectional (10)			Input 1 (0)			RW	Txt				US
12.011	Variable Selector 1 Destination	0.000 to 59.999			0.000			RW	Num	DE		PT	US
12.012	Variable Selector 1 Output	±100.00 %						RO	Num	ND	NC	PT	
12.013	Variable Selector 1 Source 1 Scaling	±4.000			1.000			RW	Num				US
12.014	Variable Selector 1 Source 2 Scaling	±4.000			1.000			RW	Num				US
12.015	Variable Selector 1 Control	0.00 to 100.00			0.00			RW	Num				US
12.016	Variable Selector 1 Enable	Off (0) or On (1)			On (1)			RW	Bit				US
12.023	Threshold Detector 2 Source	0.000 to 59.999			0.000			RW	Num			PT	US
12.024	Threshold Detector 2 Level	0.00 to 100.00 %			0.00 %			RW	Num				US
12.025	Threshold Detector 2 Hysteresis	0.00 to 25.00 %						RW	Num				US
12.026	Threshold Detector 2 Output Invert	Off (0) or On (1)			Off (0)			RW	Bit				US
12.027	Threshold Detector 2 Destination	0.000 to 59.999			0.000			RW	Num	DE		PT	US
12.028	Variable Selector 2 Source 1	0.000 to 59.999			0.000			RW	Num			PT	US
12.029	Variable Selector 2 Source 2	0.000 to 59.999			0.000			RW	Num			PT	US
12.030	Variable Selector 2 Mode	Input 1 (0), Input 2 (1), Add (2), Subtract (3), Multiply (4), Divide (5), Time Const (6), Ramp (7), Modulus (8), Powers (9), Sectional (10)			Input 1 (0)			RW	Txt				US
12.031	Variable Selector 2 Destination	0.000 to 59.999			0.000			RW	Num	DE		PT	US
12.032	Variable Selector 2 Output	±100.00 %						RO	Num	ND	NC	PT	
12.033	Variable Selector 2 Source 1 Scaling	±4.000			1.000			RW	Num				US
12.034	Variable Selector 2 Source 2 Scaling	±4.000			1.000			RW	Num				US
12.035	Variable Selector 2 Control	0.00 to 100.00			0.00			RW	Num				US
12.036	Variable Selector 2 Enable	Off (0) or On (1)			On (1)			RW	Bit				US
12.040	Brake Control: Brake Release	Off (0) or On (1)						RO	Bit	ND	NC	PT	
12.041	Brake Control: Enable	Off (0) or On (1)			Off (0)			RW	Bit				US
12.042	Brake Control: Upper Current Threshold	0 to 200 %			50 %			RW	Num				US
12.043	Brake Control: Lower Current Threshold	0 to 200 %			10 %			RW	Num				US
12.044	Brake Control: Brake Release Frequency	0.0 to 20.0 Hz			1.0 Hz			RW	Num				US
	Brake Control: Brake Release Speed		0 to 200 rpm			10 rpm		RW	Num				US
12.045	Brake Control: Brake Apply Frequency	0.0 to 20.0 Hz			2.0 Hz			RW	Num				US
	Brake Control: Brake Apply Speed		0 to 200 rpm			5 rpm		RW	Num				US
12.046	Brake Control: Brake Delay	0.0 to 25.0 s			1.0 s			RW	Num				US
12.047	Brake Control: Post-brake Release Delay	0.0 to 25.0 s			1.0 s			RW	Num				US
12.048	Brake Control: Brake Apply Delay		0.0 to 25.0 s			1.0 s		RW	Num				US
12.049	Brake Control: Enable Position Control During Brake Release		Off (0) or On (1)			Off (0)		RW	Bit				US
12.050	Brake Control: Initial Direction	Ref (0), Forward (1), Reverse (2)			Ref (0)			RW	Txt				US
12.051	Brake Control: Brake Apply Through Zero Threshold	0.0 to 20.0 Hz	0 to 200 rpm		1.0 Hz	5 rpm		RW	Num				US
12.052	Brake Control: Mode		Off (0) or On (1)			Off (0)		RW	Bit				US
12.054	External Brake Released Indicator		Off (0) or On (1)			Off (0)		RW	Bit				
12.055	Brake Release Source		Off (0) or On (1)			Off (0)		RW	Bit				US

RW	Read / Write	RO	Read only	Num	Number parameter	Bit	Bit parameter	Txt	Text string	Bin	Binary parameter	FI	Filtered
ND	No default value	NC	Not copied	PT	Protected parameter	RA	Rating dependent	US	User save	PS	Power-down save	DE	Destination

12.14 Menu 13: Standard motion controller

Figure 12-37 Menu 13 logic diagram





*The position controller is disabled and the error integrator is also reset under the following conditions:

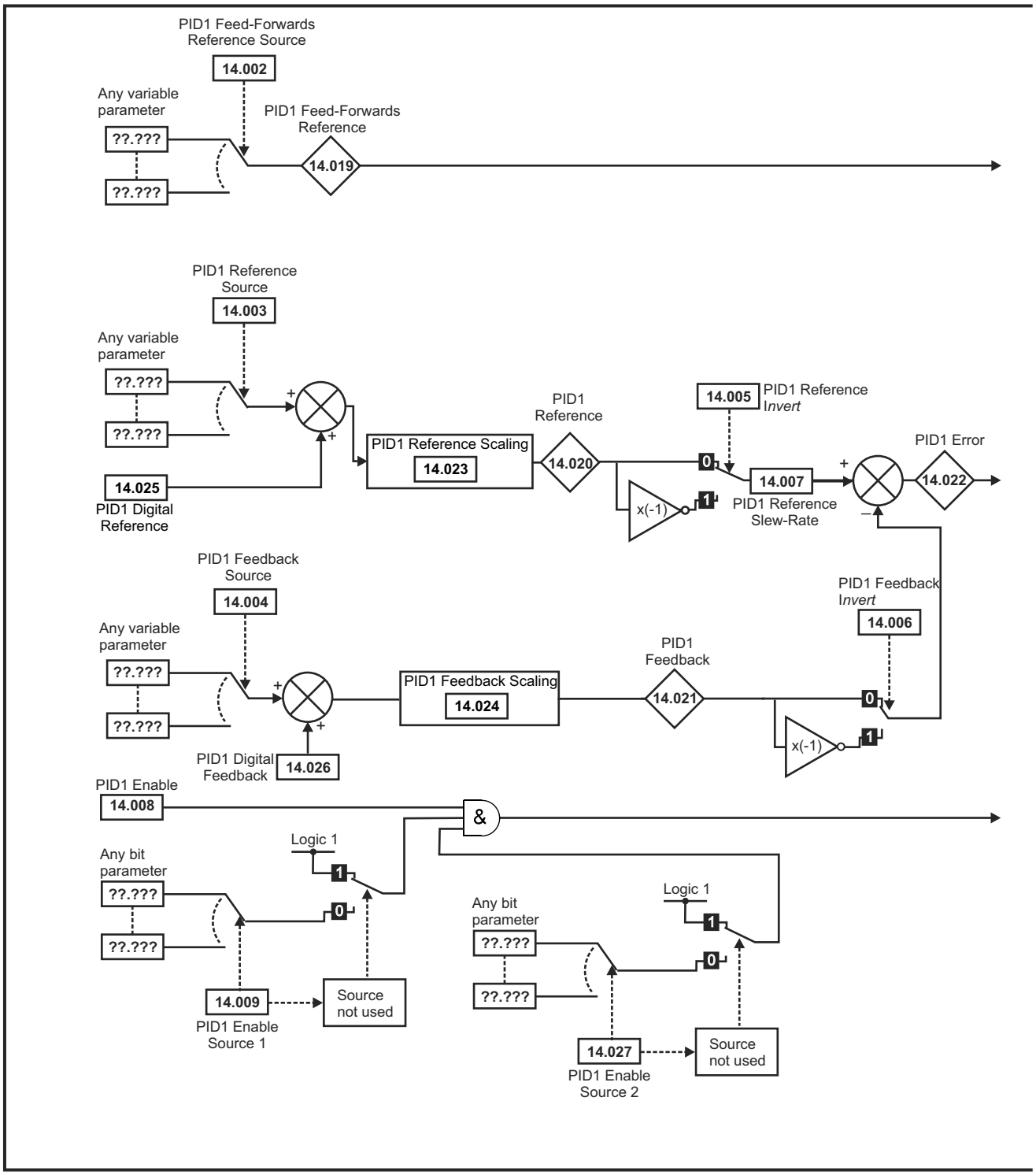
1. If the drive is disabled (i.e. inhibited, ready or tripped)
2. If the position controller mode (Pr **13.010**) is changed. The position controller is disabled transiently to reset the error integrator.
3. The absolute mode parameter (Pr **13.011**) is changed. The position controller is disabled transiently to reset the error integrator.
4. One of the position sources is invalid.
5. The position feedback initialized parameter (Pr **03.048**) is zero.

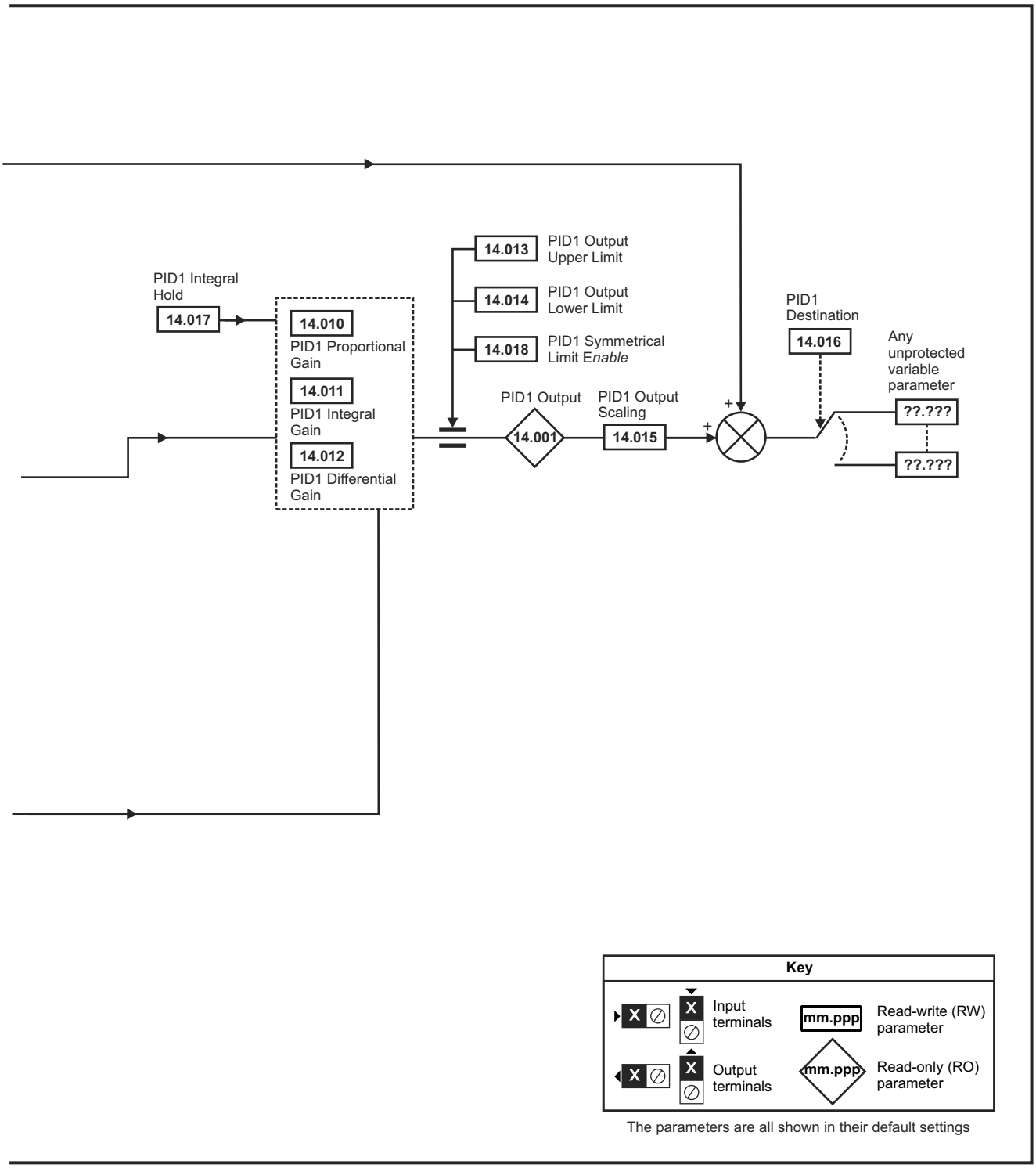
Parameter		Range(⇳)		Default(⇨)			Type					
		OL	RFC-A / S	OL	RFC-A	RFC-S						
13.001	Standard Motion Revolutions Error	-32768 to 32767 revs					RO	Num	ND	NC	PT	
13.002	Standard Motion Position Error	-32768 to 32767					RO	Num	ND	NC	PT	
13.003	Standard Motion Fine Position Error	-32768 to 32767					RO	Num	ND	NC	PT	
13.004	Standard Motion Reference Source	P1 Drive (0), P2 Drive (1), P1 Slot 1 (2), P2 Slot 1 (3), P1 Slot 2 (4), P2 Slot 2 (5), P1 Slot 3 (6), P2 Slot 3 (7), Local (10)		P1 Drive (0)			RW	Txt				US
13.005	Standard Motion Feedback Source	P1 Drive (0), P2 Drive (1), P1 Slot 1 (2), P2 Slot 1 (3), P1 Slot 2 (4), P2 Slot 2 (5), P1 Slot 3 (6), P2 Slot 3 (7)	P1 Drive (0), P2 Drive (1), P1 Slot 1 (2), P2 Slot 1 (3), P1 Slot 2 (4), P2 Slot 2 (5), P1 Slot 3 (6), P2 Slot 3 (7), Sensorless (10)	P1 Drive (0)			RW	Txt				US
13.006	Standard Motion Reference Invert	Off (0) or On (1)		Off (0)			RW	Bit				US
13.007	Standard Motion Ratio Numerator	0.000 to 10.000		1.000			RW	Num				US
13.008	Standard Motion Ratio Denominator	0.000 to 4.000		1.000			RW	Num				US
13.009	Standard Motion Proportional Gain Kp	0.00 to 100.00		25.00			RW	Num				US
13.010	Standard Motion Controller Mode	Disabled (0), Rigid Spd FF (1), Rigid (2), Non-rigid Spd FF(3), Non-Rigid (4)	Disabled (0), Rigid Spd FF (1), Rigid (2), Non-rigid Spd FF (3), Non-Rigid (4), Orientate Stop (5), Orientate (6)	Disabled (0)			RW	Txt				US
13.011	Standard Motion Absolute Mode Enable	Off (0) or On (1)		Off (0)			RW	Bit				US
13.012	Standard Motion Speed Clamp	0 to 250 rpm		150 rpm			RW	Num				US
13.013	Standard Motion Orientation Position Reference	0 to 65535		0			RW	Num				US
13.014	Standard Motion Orientation Acceptance Window	0 to 4096		256			RW	Num				US
13.015	Standard Motion Orientation Complete	Off (0) or On (1)					RO	Bit	ND	NC	PT	
13.016	Standard Motion Position Error Reset	Off (0) or On (1)		Off (0)			RW	Bit		NC		
13.017	Standard Motion Relative Jog Reference	0.0 to 4000.0 rpm		0.0 rpm			RW	Num				US
13.018	Standard Motion Relative Jog Enable	Off (0) or On (1)		Off (0)			RW	Bit		NC		
13.019	Standard Motion Relative Jog Reverse	Off (0) or On (1)		Off (0)			RW	Bit		NC		
13.020	Standard Motion Local Reference Revolutions	0 to 65535 revs		0 revs			RW	Num		NC		
13.021	Standard Motion Local Reference Position	0 to 65535		0			RW	Num		NC		
13.022	Standard Motion Local Reference Fine Position	0 to 65535		0			RW	Num		NC		
13.023	Standard Motion Local Reference Disable	Off (0) or On (1)		Off (0)			RW	Bit		NC		
13.024	Standard Motion Ignore Local Reference Revolutions	Off (0) or On (1)		Off (0)			RW	Bit				US
13.026	Standard Motion Sample Rate	Not Active (0), 4ms (1)					RO	Txt				US

RW	Read / Write	RO	Read only	Num	Number parameter	Bit	Bit parameter	Txt	Text string	Bin	Binary parameter	FI	Filtered
ND	No default value	NC	Not copied	PT	Protected parameter	RA	Rating dependent	US	User save	PS	Power-down save	DE	Destination

12.15 Menu 14: User PID controller

Figure 12-38 Menu 14 Logic diagram





The parameters are all shown in their default settings

NOTE

The same logic diagram above (Menu 14) can also be used for PID2 as they are the same.

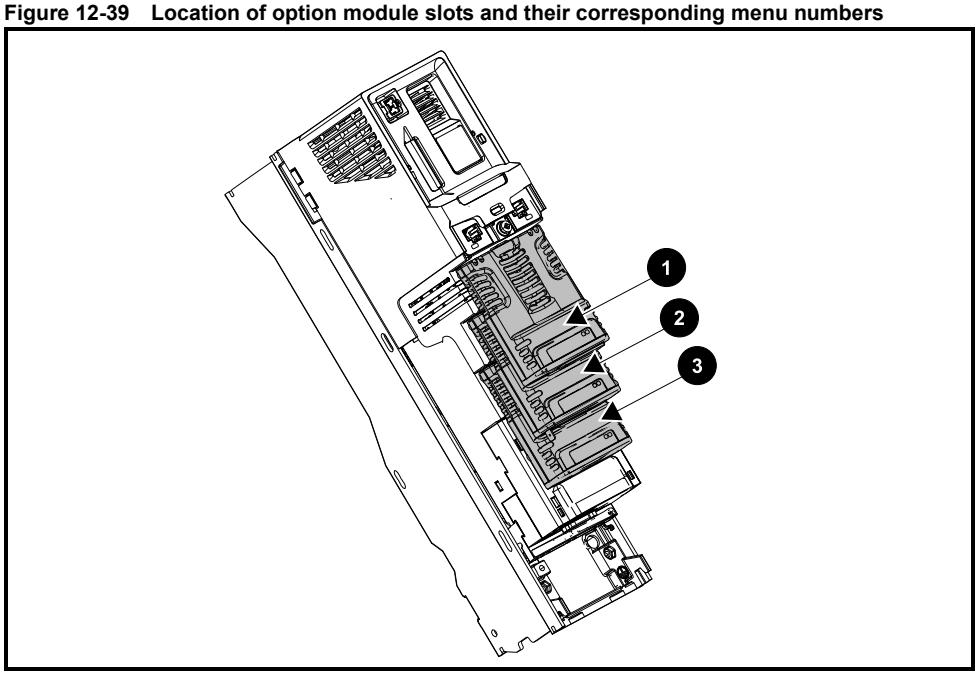
Parameter		Range(⇳)		Default(⇨)			Type					
		OL	RFC-A / S	OL	RFC-A	RFC-S						
14.001	PID1 Output	±100.00 %					RO	Num	ND	NC	PT	
14.002	PID1 Feed-forwards Reference Source	0.000 to 59.999		0.000			RW	Num			PT	US
14.003	PID1 Reference Source	0.000 to 59.999		0.000			RW	Num			PT	US
14.004	PID1 Feedback Source	0.000 to 59.999		0.000			RW	Num			PT	US
14.005	PID1 Reference Invert	Off (0) or On (1)		Off (0)			RW	Bit				US
14.006	PID1 Feedback Invert	Off (0) or On (1)		Off (0)			RW	Bit				US
14.007	PID1 Reference Slew Rate	0.0 to 3200.0 s		0.0 s			RW	Num				US
14.008	PID1 Enable	Off (0) or On (1)		Off (0)			RW	Bit				US
14.009	PID1 Enable Source 1	0.000 to 59.999		0.000			RW	Num			PT	US
14.010	PID1 Proportional Gain	0.000 to 4.000		1.000			RW	Num				US
14.011	PID1 Integral Gain	0.000 to 4.000		0.500			RW	Num				US
14.012	PID1 Differential Gain	0.000 to 4.000		0.000			RW	Num				US
14.013	PID1 Output Upper Limit	0.00 to 100.00 %		100.00 %			RW	Num				US
14.014	PID1 Output Lower Limit	±100.00 %		-100.00 %			RW	Num				US
14.015	PID1 Output Scaling	0.000 to 4.000		1.000			RW	Num				US
14.016	PID1 Destination	0.000 to 59.999		0.000			RW	Num	DE		PT	US
14.017	PID1 Integral Hold	Off (0) or On (1)		Off (0)			RW	Bit				
14.018	PID1 Symmetrical Limit Enable	Off (0) or On (1)		Off (0)			RW	Bit				US
14.019	PID1 Feed-forwards Reference	±100.00 %					RO	Num	ND	NC	PT	
14.020	PID1 Reference	±100.00 %					RO	Num	ND	NC	PT	
14.021	PID1 Feedback	±100.00 %					RO	Num	ND	NC	PT	
14.022	PID1 Error	±100.00 %					RO	Num	ND	NC	PT	
14.023	PID1 Reference Scaling	0.000 to 4.000		1.000			RW	Num				US
14.024	PID1 Feedback Scaling	0.000 to 4.000		1.000			RW	Num				US
14.025	PID1 Digital Reference	±100.00 %		0.00 %			RW	Num				US
14.026	PID1 Digital Feedback	±100.00 %		0.00 %			RW	Num				US
14.027	PID1 Enable Source 2	0.000 to 59.999		0.000			RW	Num			PT	US
14.028	PID1 Pre-sleep Boost Level	0.00 to 100.00 %		0.00 %			RW	Num				US
14.029	PID1 Maximum Boost Time	0.0 to 250.0 s		0.0 s			RW	Num				US
14.030	PID1 Pre-sleep Boost Level Enable	Off (0) or On (1)					RO	Bit	ND	NC	PT	
14.031	PID2 Output	±100.00 %					RO	Num	ND	NC	PT	
14.032	PID2 Feed-forwards Reference Source	0.000 to 59.999		0.000			RW	Num			PT	US
14.033	PID2 Reference Source	0.000 to 59.999		0.000			RW	Num			PT	US
14.034	PID2 Feedback Source	0.000 to 59.999		0.000			RW	Num			PT	US
14.035	PID2 Reference Invert	Off (0) or On (1)		Off (0)			RW	Bit				US
14.036	PID2 Feedback Invert	Off (0) or On (1)		Off (0)			RW	Bit				US
14.037	PID2 Reference Slew Rate Limit	0.0 to 3200.0 s		0.0 s			RW	Num				US
14.038	PID2 Enable	Off (0) or On (1)		Off (0)			RW	Bit				US
14.039	PID2 Enable Source 1	0.000 to 59.999		0.000			RW	Num			PT	US
14.040	PID2 Proportional Gain	0.000 to 4.000		1.000			RW	Num				US
14.041	PID2 Integral Gain	0.000 to 4.000		0.500			RW	Num				US
14.042	PID2 Differential Gain	0.000 to 4.000		0.000			RW	Num				US
14.043	PID2 Output Upper Limit	0.00 to 100.00 %		100.00 %			RW	Num				US
14.044	PID2 Output Lower Limit	±100.00 %		-100.00 %			RW	Num				US
14.045	PID2 Output Scaling	0.000 to 4.000		1.000			RW	Num				US
14.046	PID2 Destination	0.000 to 59.999		0.000			RW	Num	DE		PT	US
14.047	PID2 Integral Hold	Off (0) or On (1)		Off (0)			RW	Bit				
14.048	PID2 Symmetrical Limit Enable	Off (0) or On (1)		Off (0)			RW	Bit				US
14.049	PID2 Feed-forwards Reference	±100.00 %					RO	Num	ND	NC	PT	
14.050	PID2 Reference	±100.00 %					RO	Num	ND	NC	PT	
14.051	PID2 Feedback	±100.00 %					RO	Num	ND	NC	PT	

Parameter		Range(⇳)		Default(⇨)			Type					
		OL	RFC-A / S	OL	RFC-A	RFC-S						
14.052	PID2 Error	±100.00 %					RO	Num	ND	NC	PT	
14.053	PID2 Reference Scaling	0.000 to 4.000		1.000			RW	Num				US
14.054	PID2 Feedback Scaling	0.000 to 4.000		1.000			RW	Num				US
14.055	PID2 Digital Reference	±100.00 %		0.00 %			RW	Num				US
14.056	PID2 Digital Feedback	±100.00 %		0.00 %			RW	Num				US
14.057	PID2 Enable Source 2	0.000 to 59.999		0.000			RW	Num			PT	US
14.058	PID1 Feedback Output Scaling	0.000 to 4.000		1.000			RW	Num				US
14.059	PID1 Mode Selector	Fbk1 (0), Fbk2 (1), Fbk1 + Fbk2 (2), Min Fbk (3), Max Fbk (4), Av Fbk (5), Min Error (6), Max Error (7)		Fbk1 (0)			RW	Txt				US
14.060	PID1 Feedback Square Root Enable 1	Off (0) or On (1)		Off (0)			RW	Bit				US
14.061	PID2 Feedback Square Root Enable	Off (0) or On (1)		Off (0)			RW	Bit				US
14.062	PID1 Feedback Square Root Enable 2	Off (0) or On (1)		Off (0)			RW	Bit				US

RW	Read / Write	RO	Read only	Num	Number parameter	Bit	Bit parameter	Txt	Text string	Bin	Binary parameter	FI	Filtered
ND	No default value	NC	Not copied	PT	Protected parameter	RA	Rating dependent	US	User save	PS	Power-down save	DE	Destination

12.16 Menus 15, 16 and 17: Option module set-up

Figure 12-39 Location of option module slots and their corresponding menu numbers



1. Solutions Module Slot 1 - Menu 15
2. Solutions Module Slot 2 - Menu 16
3. Solutions Module Slot 3 - Menu 17

12.16.1 Parameters common to all categories

Parameter		Range(⇳)	Default(⇨)	Type					
mm.001	Module ID	0 to 65535		RO	Num	ND	NC	PT	
mm.002	Software Version	00.00.00.00 to 99.99.99.99		RO	Ver	ND	NC	PT	
mm.003	Hardware Version	0.00 to 99.99		RO	Num	ND	NC	PT	
mm.004	Serial Number LS	0 to 99999999		RO	Num	ND	NC	PT	
mm.005	Serial Number MS			RO	Num	ND	NC	PT	
mm.006	Module Status	Initialising (0) to Error (3)		RO	Txt	ND	NC	PT	
mm.007	Module Reset	Off (0) or On (1)	Off (0)	RW	Bit		NC		

The option module ID indicates the type of module that is installed in the corresponding slot. See the relevant option module user guide for more information regarding the module.

Option module ID	Module	Category
0	No module installed	
0*	SI-Safety	Safety
105	SI-Encoder	Feedback
106	SI-Universal Encoder	
209	SI-I/O	Automation (I/O Expansion)
304	SI-Applications Plus	Automation (Applications)
310	MCi210	
311	MCi200	
431	SI-EtherCAT	Fieldbus
432	SI-PROFINET RT	
433	SI-Ethernet	
434	SI-PROFINET V2	
443	SI-PROFIBUS	
447	SI-DeviceNet	
448	SI-CANopen	

* There is no communication between the SI-Safety option module and the host drive via the option module connector, this is why the SI-Safety module ID is displayed as zero.

12.17 Menu 18: Application menu 1

Parameter		Range(⇳)		Default(⇨)			Type					
		OL	RFC-A / S	OL	RFC-A	RFC-S						
18.001	Application Menu 1 Power-down Save Integer	-32768 to 32767		0			RW	Num				PS
18.002 to 18.010	Application Menu 1 Read-only Integer	-32768 to 32767					RO	Num	ND	NC		US
18.011 to 18.030	Application Menu 1 Read-write Integer	-32768 to 32767		0			RW	Num				US
18.031 to 18.050	Application Menu 1 Read-write bit	Off (0) or On (1)		Off (0)			RW	Bit				US
18.051 to 18.054	Application Menu 1 Power-down Save long Integer	-2147483648 to 2147483647		0			RW	Num				PS

12.18 Menu 19: Application menu 2

Parameter		Range(⇳)		Default(⇨)			Type					
		OL	RFC-A / S	OL	RFC-A	RFC-S						
19.001	Application Menu 2 Power-down Save Integer	-32768 to 32767		0			RW	Num				PS
19.002 to 19.010	Application Menu 2 Read-only Integer	-32768 to 32767					RO	Num	ND	NC		US
19.011 to 19.030	Application Menu 2 Read-write Integer	-32768 to 32767		0			RW	Num				US
19.031 to 19.050	Application Menu 2 Read-write bit	Off (0) or On (1)		Off (0)			RW	Bit				US
19.051 to 19.054	Application Menu 2 Power-down Save long Integer	-2147483648 to 2147483647		0			RW	Num				PS

12.19 Menu 20: Application menu 3

Parameter		Range(⇳)		Default(⇨)			Type					
		OL	RFC-A / S	OL	RFC-A	RFC-S						
20.001 to 20.020	Application Menu 3 Read-write Integer	-32768 to 32767		0			RW	Num				
20.021 to 20.040	Application Menu 3 Read-write Long Integer	-2147483648 to 2147483647		0			RW	Num				

RW	Read / Write	RO	Read only	Num	Number parameter	Bit	Bit parameter	Txt	Text string	Bin	Binary parameter	FI	Filtered
ND	No default value	NC	Not copied	PT	Protected parameter	RA	Rating dependent	US	User save	PS	Power-down save	DE	Destination

12.20 Menu 21: Second motor parameters

Parameter		Range(⇳)			Default(⇨)			Type					
		OL	RFC-A	RFC-S	OL	RFC-A	RFC-S						
21.001	M2 Maximum Reference Clamp	VM_POSITIVE_REF_CLAMP2 Hz	VM_POSITIVE_REF_CLAMP2 rpm		50 Hz: 50.0 60 Hz: 60.0	50 Hz: 1500.0 60 Hz: 1800.0	3000.0	RW	Num				US
21.002	M2 Minimum Reference Clamp	VM_NEGATIVE_REF_CLAMP2 Hz	VM_NEGATIVE_REF_CLAMP2 rpm		0.0			RW	Num				US
21.003	M2 Reference Selector	A1 A2 (0), A1 Preset (1), A2 Preset (2), Preset (3), Keypad (4), Precision (5), Keypad Ref (6)			A1 A2 (0)			RW	Txt				US
21.004	M2 Acceleration Rate 1	0.0 to VM_ACCEL_RATE s/100 Hz	0.000 to VM_ACCEL_RATE s/100 rpm		5.0 s	2.000 s	0.200 s	RW	Num				US
21.005	M2 Deceleration Rate 1	0.0 to VM_ACCEL_RATE s/100 Hz	0.000 to VM_ACCEL_RATE s/100 rpm		10.0 s	2.000 s	0.200 s	RW	Num				US
21.006	M2 Rated Frequency	0.0 to 599.0 Hz	0.0 to 550.0 Hz		50Hz: 50.0 Hz 60Hz: 60.0 Hz			RW	Num				US
21.007	M2 Rated Current	0.000 to VM_RATED_CURRENT A			Maximum Heavy Duty Rating (11.032)			RW	Num		RA		US
21.008	M2 Rated Speed	0 to 35940 rpm	0.00 to 33000.00 rpm		50 Hz: 1500 rpm 60 Hz: 1800 rpm	50 Hz: 1450.00 rpm 60 Hz: 1750.00 rpm	3000.00 rpm	RW	Num				US
21.009	M2 Rated Voltage	0 to VM_AC_VOLTAGE_SET V			200V drive: 230 V 400V drive 50Hz: 400 V 400V drive 60Hz: 460 V 575V drive: 575 V 690V drive: 690 V			RW	Num		RA		US
21.010	M2 Rated Power Factor	0.000 to 1.000			0.850			RW	Num		RA		US
21.011	M2 Number Of Motor Poles	Automatic (0) to 480 Poles (240)			Automatic (0)		6 Poles (3)	RW	Txt				US
21.012	M2 Stator Resistance	0.000000 to 1000.000000 Ω			0.000000 Ω			RW	Num		RA		US
21.014	M2 Transient Inductance / Ld	0.000 to 500.000 mH			0.000 mH			RW	Num		RA		US
21.015	Motor 2 Active	Off (0) or On (1)						RO	Bit	ND	NC	PT	
21.016	M2 Motor Thermal Time Constant 1	1.0 to 3000.0 s			89.0 s			RW	Num				US
21.017	M2 Speed Controller Proportional Gain Kp1		0.0000 to 200.0000 s/rad			0.0300 s/rad	0.0100 s/rad	RW	Num				US
21.018	M2 Speed Controller Integral Gain Ki1		0.00 to 655.35 s^2/rad			0.10 s^2/rad	1.00 s^2/rad	RW	Num				US
21.019	M2 Speed Controller Differential Feedback Gain Kd1		0.00000 to 0.65535 1/rad			0.00000 1/rad		RW	Num				US
21.020	M2 Position Feedback Phase Angle			0.0 to 359.9 °			0.0 °	RW	Num	ND			US
21.021	M2 Motor Control Feedback Select		P1 Drive (0), P2 Drive (1), P1 Slot 1 (2), P2 Slot 1 (3), P1 Slot 2 (4), P2 Slot 2 (5), P1 Slot 3 (6), P2 Slot 3 (7)			P1 Drive (0)		RW	Txt				US
21.022	M2 Current Controller Kp Gain	0 to 30000			20	150		RW	Num				US
21.023	M2 Current Controller Ki Gain	0 to 30000			40	2000		RW	Num				US
21.024	M2 Stator Inductance	0.00 to 5000.00 mH			0.00 mH			RW	Num		RA		US
21.025	M2 Saturation Breakpoint 1		0.0 to 100.0 %			50.0 %		RW	Num				US
21.026	M2 Saturation Breakpoint 3		0.0 to 100.0 %			75.0 %		RW	Num				US
21.027	M2 Motoring Current Limit	0.0 to VM_MOTOR2_CURRENT_LIMIT %			165.0 %*	175.0 %**		RW	Num		RA		US
21.028	M2 Regenerating Current Limit	0.0 to VM_MOTOR2_CURRENT_LIMIT %			165.0 %*	175.0 %**		RW	Num		RA		US
21.029	M2 Symmetrical Current Limit	0.0 to VM_MOTOR2_CURRENT_LIMIT %			165.0 %*	175.0 %**		RW	Num		RA		US
21.030	M2 Volts Per 1000 rpm			0 to 10,000 V			98 V	RW	Num				US
21.032	M2 Current Reference Filter Time Constant 1		0.0 to 25.0 ms			0.0 ms		RW	Num				US
21.033	M2 Low Speed Thermal Protection Mode	0 to 1			0			RW	Num				US
21.034	M2 Current Controller Mode		Off (0) or On (1)			Off (0)		RW	Bit				US
21.035	M2 Notch Filter Centre Frequency		50 to 1000 Hz			100 Hz		RW	Num				US
21.036	M2 Notch Filter Bandwidth		0 to 500 Hz			0 Hz		RW	Num				US
21.039	M2 Motor Thermal Time Constant 2	1.0 to 3000.0 s			89.0 s			RW	Num				US
21.040	M2 Motor Thermal Time Constant 2 Scaling	0 to 100 %			0 %			RW	Num				US
21.041	M2 Saturation Breakpoint 2		0.0 to 100.0 %			0.0 %		RW	Num				US
21.042	M2 Saturation Breakpoint 4		0.0 to 100.0 %			0.0 %		RW	Num				US
21.043	M2 Torque Per Amp		0.00 to 500.00 Nm/A					RO	Num	ND	NC	PT	
	M2 Torque Per Amp			0.00 to 500.00 Nm/A			1.60 Nm/A	RW	Num				US

Parameter		Range(⇳)			Default(⇨)			Type					
		OL	RFC-A	RFC-S	OL	RFC-A	RFC-S						
21.044	M2 No-load Core Loss	0.000 to 99999.999 kW			0.000 kW			RW	Num				US
21.045	M2 Rated Core Loss	0.000 to 99999.999 kW			0.000 kW			RW	Num				US
21.046	RFC A: M2 Magnetising Current Limit		0.0 to 100.0 %			100.0 %		RW	Num				US
	RFC S: M2 Inverted Motor Saturation Characteristic			Off (0) or On (1)			Off (0)	RW	Bit				US
21.048	M2 No-load Lq			0.000 to 500.000 mH			0.000 mH	RW	Num		RA		US

* For size 9 and above the default is 141.9 %

** For size 9 and above the default is 150.0 %

RW	Read / Write	RO	Read only	Num	Number parameter	Bit	Bit parameter	Txt	Text string	Bin	Binary parameter	FI	Filtered
ND	No default value	NC	Not copied	PT	Protected parameter	RA	Rating dependent	US	User save	PS	Power-down save	DE	Destination

12.21 Menu 22: Additional Menu 0 set-up

Parameter		Range(⇳)			Default(⇨)			Type					
		OL	RFC-A	RFC-S	OL	RFC-A	RFC-S						
22.001	Parameter 00.001 Set-up	0.000 to 59.999			1.007			RW	Num			PT	US
22.002	Parameter 00.002 Set-up	0.000 to 59.999			1.006			RW	Num			PT	US
22.003	Parameter 00.003 Set-up	0.000 to 59.999			2.011			RW	Num			PT	US
22.004	Parameter 00.004 Set-up	0.000 to 59.999			2.021			RW	Num			PT	US
22.005	Parameter 00.005 Set-up	0.000 to 59.999			1.014			RW	Num			PT	US
22.006	Parameter 00.006 Set-up	0.000 to 59.999			4.007			RW	Num			PT	US
22.007	Parameter 00.007 Set-up	0.000 to 59.999			5.014	3.010		RW	Num			PT	US
22.008	Parameter 00.008 Set-up	0.000 to 59.999			5.015	3.011		RW	Num			PT	US
22.009	Parameter 00.009 Set-up	0.000 to 59.999			5.013	3.012		RW	Num			PT	US
22.010	Parameter 00.010 Set-up	0.000 to 59.999			5.004	3.002		RW	Num			PT	US
22.011	Parameter 00.011 Set-up	0.000 to 59.999			5.001		3.029	RW	Num			PT	US
22.012	Parameter 00.012 Set-up	0.000 to 59.999			4.001			RW	Num			PT	US
22.013	Parameter 00.013 Set-up	0.000 to 59.999			4.002			RW	Num			PT	US
22.014	Parameter 00.014 Set-up	0.000 to 59.999			4.011			RW	Num			PT	US
22.015	Parameter 00.015 Set-up	0.000 to 59.999			2.004			RW	Num			PT	US
22.016	Parameter 00.016 Set-up	0.000 to 59.999			0.000	2.002		RW	Num			PT	US
22.017	Parameter 00.017 Set-up	0.000 to 59.999			8.026	4.012		RW	Num			PT	US
22.018	Parameter 00.018 Set-up	0.000 to 59.999			3.123			RW	Num			PT	US
22.019	Parameter 00.019 Set-up	0.000 to 59.999			7.011*			RW	Num			PT	US
22.020	Parameter 00.020 Set-up	0.000 to 59.999			7.014*			RW	Num			PT	US
22.021	Parameter 00.021 Set-up	0.000 to 59.999			7.015*			RW	Num			PT	US
22.022	Parameter 00.022 Set-up	0.000 to 59.999			1.010			RW	Num			PT	US
22.023	Parameter 00.023 Set-up	0.000 to 59.999			1.005			RW	Num			PT	US
22.024	Parameter 00.024 Set-up	0.000 to 59.999			1.021			RW	Num			PT	US
22.025	Parameter 00.025 Set-up	0.000 to 59.999			1.022			RW	Num			PT	US
22.026	Parameter 00.026 Set-up	0.000 to 59.999			1.023	3.008		RW	Num			PT	US
22.027	Parameter 00.027 Set-up	0.000 to 59.999			1.024	3.034		RW	Num			PT	US
22.028	Parameter 00.028 Set-up	0.000 to 59.999			6.013			RW	Num			PT	US
22.029	Parameter 00.029 Set-up	0.000 to 59.999			11.036			RW	Num			PT	US
22.030	Parameter 00.030 Set-up	0.000 to 59.999			11.042			RW	Num			PT	US
22.031	Parameter 00.031 Set-up	0.000 to 59.999			11.033			RW	Num			PT	US
22.032	Parameter 00.032 Set-up	0.000 to 59.999			11.032			RW	Num			PT	US
22.033	Parameter 00.033 Set-up	0.000 to 59.999			6.009	5.016	0.000	RW	Num			PT	US
22.034	Parameter 00.034 Set-up	0.000 to 59.999			11.030			RW	Num			PT	US
22.035	Parameter 00.035 Set-up	0.000 to 59.999			11.024**			RW	Num			PT	US
22.036	Parameter 00.036 Set-up	0.000 to 59.999			11.025**			RW	Num			PT	US
22.037	Parameter 00.037 Set-up	0.000 to 59.999			11.023** / 24.010***			RW	Num			PT	US
22.038	Parameter 00.038 Set-up	0.000 to 59.999			4.013			RW	Num			PT	US
22.039	Parameter 00.039 Set-up	0.000 to 59.999			4.014			RW	Num			PT	US
22.040	Parameter 00.040 Set-up	0.000 to 59.999			5.012			RW	Num			PT	US
22.041	Parameter 00.041 Set-up	0.000 to 59.999			5.018			RW	Num			PT	US
22.042	Parameter 00.042 Set-up	0.000 to 59.999			5.011			RW	Num			PT	US
22.043	Parameter 00.043 Set-up	0.000 to 59.999			5.010		3.025	RW	Num			PT	US
22.044	Parameter 00.044 Set-up	0.000 to 59.999			5.009			RW	Num			PT	US
22.045	Parameter 00.045 Set-up	0.000 to 59.999			5.008		0.000	RW	Num			PT	US
22.046	Parameter 00.046 Set-up	0.000 to 59.999			5.007			RW	Num			PT	US
22.047	Parameter 00.047 Set-up	0.000 to 59.999			5.006		5.033	RW	Num			PT	US
22.048	Parameter 00.048 Set-up	0.000 to 59.999			11.031			RW	Num			PT	US
22.049	Parameter 00.049 Set-up	0.000 to 59.999			11.044			RW	Num			PT	US
22.050	Parameter 00.050 Set-up	0.000 to 59.999			11.029			RW	Num			PT	US
22.051	Parameter 00.051 Set-up	0.000 to 59.999			10.037			RW	Num			PT	US
22.052	Parameter 00.052 Set-up	0.000 to 59.999			11.020**			RW	Num			PT	US
22.053	Parameter 00.053 Set-up	0.000 to 59.999			4.015			RW	Num			PT	US
22.054	Parameter 00.054 Set-up	0.000 to 59.999			0.000			RW	Num			PT	US
22.055	Parameter 00.055 Set-up	0.000 to 59.999			0.000			RW	Num			PT	US
22.056	Parameter 00.056 Set-up	0.000 to 59.999			0.000			RW	Num			PT	US
22.057	Parameter 00.057 Set-up	0.000 to 59.999			0.000			RW	Num			PT	US

Parameter		Range(⇳)			Default(⇨)			Type					
		OL	RFC-A	RFC-S	OL	RFC-A	RFC-S						
22.058	Parameter 00.058 Set-up	0.000 to 59.999			0.000			RW	Num			PT	US
22.059	Parameter 00.059 Set-up	0.000 to 59.999			0.000			RW	Num			PT	US
22.060	Parameter 00.060 Set-up	0.000 to 59.999			0.000			RW	Num			PT	US
22.061	Parameter 00.061 Set-up	0.000 to 59.999			0.000			RW	Num			PT	US
22.062	Parameter 00.062 Set-up	0.000 to 59.999			0.000			RW	Num			PT	US
22.063	Parameter 00.063 Set-up	0.000 to 59.999			0.000			RW	Num			PT	US
22.064	Parameter 00.064 Set-up	0.000 to 59.999			0.000			RW	Num			PT	US
22.065	Parameter 00.065 Set-up	0.000 to 59.999			0.000			RW	Num			PT	US
22.066	Parameter 00.066 Set-up	0.000 to 59.999			0.000			RW	Num			PT	US
22.067	Parameter 00.067 Set-up	0.000 to 59.999			0.000			RW	Num			PT	US
22.068	Parameter 00.068 Set-up	0.000 to 59.999			0.000			RW	Num			PT	US
22.069	Parameter 00.069 Set-up	0.000 to 59.999			0.000			RW	Num			PT	US
22.070	Parameter 00.070 Set-up	0.000 to 59.999			0.000			RW	Num			PT	US
22.071	Parameter 00.071 Set-up	0.000 to 59.999			0.000			RW	Num			PT	US
22.072	Parameter 00.072 Set-up	0.000 to 59.999			0.000			RW	Num			PT	US
22.073	Parameter 00.073 Set-up	0.000 to 59.999			0.000			RW	Num			PT	US
22.074	Parameter 00.074 Set-up	0.000 to 59.999			0.000			RW	Num			PT	US
22.075	Parameter 00.075 Set-up	0.000 to 59.999			0.000			RW	Num			PT	US
22.076	Parameter 00.076 Set-up	0.000 to 59.999			0.000			RW	Num			PT	US
22.077	Parameter 00.077 Set-up	0.000 to 59.999			0.000			RW	Num			PT	US
22.078	Parameter 00.078 Set-up	0.000 to 59.999			0.000			RW	Num			PT	US
22.079	Parameter 00.079 Set-up	0.000 to 59.999			0.000			RW	Num			PT	US
22.080	Parameter 00.080 Set-up	0.000 to 59.999			0.000			RW	Num			PT	US

* 0.000 on *Unidrive M702.*

** On *Unidrive M701.*

*** On *Unidrive M700 / M702.*

RW	Read / Write	RO	Read only	Num	Number parameter	Bit	Bit parameter	Txt	Text string	Bin	Binary parameter	FI	Filtered
ND	No default value	NC	Not copied	PT	Protected parameter	RA	Rating dependent	US	User save	PS	Power-down save	DE	Destination

12.22 Menu 24: Ethernet interface information (*Unidrive M700 / M702*)

Parameter		Range			Default			Type					
		OL	RFC-A	RFC-S	OL	RFC-A	RFC-S						
24.001	Module ID	0 to 65535						RO	Num	ND	NC	PT	
24.002	Software Version	00.00.00.00 to 99.99.99.99						RO	Num	ND	NC	PT	
24.003	Hardware Version	0.00 to 99.99						RO	Num	ND	NC	PT	
24.004	Serial Number LS	00000000 to 99999999						RO	Num	ND	NC	PT	
24.005	Serial Number MS	0 to 99999999						RO	Num	ND	NC	PT	
24.006	Status	Bootldr-Update (-2), Bootldr-Idle (-1), Initializing (0), OK (1), Config (2), Error (3)						RO	Txt	ND	NC	PT	
24.007	Reset	Off (0) or On (1)			Off (0)			RW	Bit		NC		
24.008	Default	Off (0) or On (1)			Off (0)			RW	Bit		NC		
24.009	Active Alarm Bits	0000000000000000 to 1111111111111111						RO	Bin		NC		
24.010	Active IP Address	0.0.0.0 to 255.255.255.255						RO	IP		NC	PT	
24.011	Date Code	0 to 65535						RO	Num	ND	NC	PT	

RW	Read / Write	RO	Read only	Num	Number parameter	Bit	Bit parameter	Txt	Text string	Bin	Binary parameter	FI	Filtered
ND	No default value	NC	Not copied	PT	Protected parameter	RA	Rating dependent	US	User save	PS	Power-down save	DE	Destination
IP	IP address	Mac	Mac address	Date	Date parameter	Time	Time parameter	SMP	Slot,menu,parameter	Chr	Character parameter	Ver	Version number

12.23 Slot 4 Menus (*Unidrive M700 / M702*)

The following table shows the internal menus of the Ethernet interface.

Menu	Description
4.00	Module information
4.02	Ethernet configuration
4.09	Resources
4.10	RTMoE Easy mode cyclic data
4.11	RTMoE Synchronisation
4.15	Modbus TCP/IP Setup
4.20	EtherNet/IP Setup
4.21	EtherNet/IP Input mappings
4.22	EtherNet/IP Output mappings
4.23	EtherNet/IP Fault values
4.24	Profinet Setup

12.24 Slot 4 Menu 0: Ethernet interface information (*Unidrive M700 / M702*)

Parameter		Range			Default			Type					
		OL	RFC-A	RFC-S	OL	RFC-A	RFC-S						
4.00.001	Module ID	0 to 65535						RO	Num	ND	NC	PT	
4.00.002	Software Version	00.00.00.00 to 99.99.99.99						RO	Num	ND	NC	PT	
4.00.003	Hardware Version	0.00 to 99.99						RO	Num	ND	NC	PT	
4.00.004	Serial Number LS	00000000 to 99999999						RO	Num	ND	NC	PT	
4.00.005	Serial Number MS	0 to 99999999						RO	Num	ND	NC	PT	
4.00.006	Status	Bootldr-Update (-2), Bootldr-Idle (-1), Initializing (0), OK (1), Config (2), Error (3)						RO	Txt	ND	NC	PT	
4.00.007	Reset	Off (0) or On (1)			Off (0)			RW	Bit		NC		
4.00.008	Default	Off (0) or On (1)			Off (0)			RW	Bit		NC		
4.00.009	Active Alarm Bits	0000000000000000 to 1111111111111111						RO	Bin		NC		
4.00.010	Active IP Address	0.0.0.0 to 255.255.255.255						RO	IP		NC	PT	
4.00.011	Date Code	0 to 65535						RO	Num	ND	NC	PT	

RW	Read / Write	RO	Read only	Num	Number parameter	Bit	Bit parameter	Txt	Text string	Bin	Binary parameter	FI	Filtered
ND	No default value	NC	Not copied	PT	Protected parameter	RA	Rating dependent	US	User save	PS	Power-down save	DE	Destination
IP	IP address	Mac	Mac address	Date	Date parameter	Time	Time parameter	SMP	Slot,menu,parameter	Chr	Character parameter	Ver	Version number

12.25 Slot 4 Menu 2: Ethernet configuration (*Unidrive M700 / M702*)

Parameter		Range			Default			Type					
		OL	RFC-A	RFC-S	OL	RFC-A	RFC-S						
4.02.003	Network Status	Initializing (0), Links Down (1), DHCP In Progress (2), No Address (3), Ready (4), Active (5)						RO	Txt	ND	NC	PT	
4.02.004	Network Message Count	0 to 65535 Messages/s						RO	Num	ND	NC	PT	
4.02.005	DHCP Enable	Off (0) or On (1)			On (1)			RW	Bit				US
4.02.006	IP Address	0.0.0.0 to 255.255.255.255			192.168.001.100			RW	IP				US
4.02.007	Subnet Mask	0.0.0.0 to 255.255.255.255			255.255.255.000			RW	IP				US
4.02.008	Default Gateway	0.0.0.0 to 255.255.255.255			192.168.1.254			RW	IP				US
4.02.009	Primary DNS	0.0.0.0 to 255.255.255.255			0.0.0.0			RW	IP				US
4.02.010	Secondary DNS	0.0.0.0 to 255.255.255.255			0.0.0.0			RW	IP				US
4.02.011	MAC Address	00:00:00:00:00:00 to FF:FF:FF:FF:FF:FF						RO	Mac	ND	NC	PT	
4.02.018	Protocol Mode Select	Ethernet/IP (1) to Profinet (2)			Ethernet/IP (1)			RW	Txt				US
4.02.019	Active Protocol Mode	Ethernet/IP (1) to Profinet (2)						RO	Txt		NC	PT	
4.02.020	Priority Protocol	None (0), Modbus TCP (1), EtherNet/IP (2)			0			RW	Txt				US
4.02.021	Web Server Enable	Off (0) or On (1)			On (1)			RW	Bit				US
4.02.022	Web Server Port	0 to 65535			80			RW	Num				US
4.02.024	Ethernet MTU*	158 to 1500 Bytes			1500 Bytes			RW	Num				US
4.02.025	Gateway Mode	Switch (0), Gateway (1), Strict Gateway (2)			Switch (0)			RW	Txt				US
4.02.030	VLAN Enable	Off (0) or On (1)			Off (0)			RW	Bit				US
4.02.034	Drive compatibility mode	Unidrive M (0) or Unidrive SP (1)			Unidrive M (0)			RW	Txt				US
4.02.035	Non cyclic enable	Off (0) or On (1)			Off (0)			RW	Bit				US
4.02.036	Non cyclic base parameter	0.00.000 to 0.59.999			0.00.000			RW	SMP				US

RW	Read / Write	RO	Read only	Num	Number parameter	Bit	Bit parameter	Txt	Text string	Bin	Binary parameter	FI	Filtered
ND	No default value	NC	Not copied	PT	Protected parameter	RA	Rating dependent	US	User save	PS	Power-down save	DE	Destination
IP	IP address	Mac	Mac address	Date	Date parameter	Time	Time parameter	SMP	Slot,menu,parameter	Chr	Character parameter	Ver	Version number

* This parameter is now not used, the maximum Ethernet packet size is limited to 400 bytes.

12.26 Slot 4 Menu 9: Resources (*Unidrive M700 / M702*)

Parameter		Range			Default			Type					
		OL	RFC-A	RFC-S	OL	RFC-A	RFC-S						
4.09.001	Cyclic Tx Links Free	0 to 255						RO	Num	ND	NC	PT	
4.09.002	Cyclic Rx Links Free	0 to 255						RO	Num	ND	NC	PT	
4.09.003	Fieldbus Links Free	0 to 255						RO	Num	ND	NC	PT	
4.09.004	Cyclic Mappings Free	0 to 255						RO	Num	ND	NC	PT	
4.09.008	Background cycles per second	0 to 65535						RO	Num	ND	NC	PT	
4.09.010	Synchronous Task % Free	0 to 255 %						RO	Num	ND	NC	PT	
4.09.011	Nonsync link update period	0.00 to 655.35						RO	Num	ND	NC	PT	
4.09.020	Synchronous Task % Worst Free	0 to 255 %						RO	Num	ND	NC	PT	
4.09.021	Max nonsync link update period	0.00 to 655.35						RO	Num	ND	NC	PT	
4.09.030	PCB Temperature	-128 to 127 °C						RO	Num	ND	NC	PT	

RW	Read / Write	RO	Read only	Num	Number parameter	Bit	Bit parameter	Txt	Text string	Bin	Binary parameter	FI	Filtered
ND	No default value	NC	Not copied	PT	Protected parameter	RA	Rating dependent	US	User save	PS	Power-down save	DE	Destination

12.27 Slot 4 Menu 10: RTMoE Easy Mode Cyclic Data (*Unidrive M700 / M702*)

Parameter		Range			Default			Type					
		OL	RFC-A	RFC-S	OL	RFC-A	RFC-S						
4.10.001	Enable	Off (0) or On (1)			On (1)			RW	Bit				US
4.10.002	Reset	Off (0) or On (1)			Off (0)			RW	Bit		NC		
4.10.003	Default	Off (0) or On (1)			Off (0)			RW	Bit		NC		
4.10.004	Cyclic Messages Per Second	0 to 65535 Messages/s						RO	Num	ND	NC	PT	
4.10.005	Configuration Valid	Off (0) or On (1)						RO	Bit	ND	NC	PT	
4.10.006	Operational	Off (0) or On (1)						RO	Bit	ND	NC	PT	
4.10.007	Active Configuration	None (0), Easy Mode (1), Offline (2)						RO	Txt	ND	NC	PT	
4.10.008	Timeout Count	0 to 65535						RO	Num	ND	NC	PT	
4.10.009	Data Late Count	0 to 65535						RO	Num	ND	NC	PT	
4.10.010	Tx1 Link Profile	Std (0), Sync (1)			Std (0)			RW	Txt				US
4.10.011	Tx1 Link Number	0 to 255			0			RW	Num				US
4.10.012	Tx1 Source Parameter	0.00.000 to 4.99.999			0.00.000			RW	SMP			PT	US
4.10.013	Tx1 Parameter Count	0 to 10			0			RW	Num				US
4.10.014	Tx1 Link Transmission Type	Unicast (0), Broadcast (1), Multicast1 (2), Multicast2 (3), Multicast3 (4), Multicast4 (5), Multicast5 (6), Multicast6 (7), Multicast7 (8), Multicast8 (9), Multicast9 (10), Multicast10 (11)			Unicast (0)			RW	Txt				US
4.10.015	Tx1 Destination Address	0.0.0.0 to 255.255.255.255			0.0.0.0			RW	IP				US
4.10.016	Tx1 Message Rate	0 to 100 ms			0 ms			RW	Num				US
4.10.019	Tx1 Link Status	Disabled (-31), VLAN disabled (-30), Invalid DST IP (-22), SYNC unsupported (-21), MEC offset (-20), Invalid tx rate (-19), Too many mapping (-18), Link busy (-17), Invalid profile (-16), Invalid mapping (-15), Read only param (-14), Msg mismatch (-13), Msg too long (-12), Attrib NA (-11), Attrib RO (-10), Attrib missing (-9), Timeout (-8), In error (-7), Link num in use (-6), Not editable (-5), Invalid link num (-4), Invalid args (-3), Too many links (-2), Out of memory (-1), OK (0), Not running (1), OK sync (2)						RO	Txt	ND	NC	PT	
4.10.020	Tx2 Link Profile	Std (0), Sync (1)			Std (0)			RW	Txt				US
4.10.021	Tx2 Link Number	0 to 255			0			RW	Num				US
4.10.022	Tx2 Source Parameter	0.00.000 to 4.99.999			0.00.000			RW	SMP			PT	US
4.10.023	Tx2 Parameter Count	0 to 10			0			RW	Num				US
4.10.024	Tx2 Link Transmission Type	Unicast (0), Broadcast (1), Multicast1 (2), Multicast2 (3), Multicast3 (4), Multicast4 (5), Multicast5 (6), Multicast6 (7), Multicast7 (8), Multicast8 (9), Multicast9 (10), Multicast10 (11)			Unicast (0)			RW	Txt				US
4.10.025	Tx2 Destination Address	0.0.0.0 to 255.255.255.255			0.0.0.0			RW	IP				US
4.10.026	Tx2 Message Rate	0 to 100 ms			0 ms			RW	Num				US
4.10.029	Tx2 Link Status	Disabled (-31), VLAN disabled (-30), Invalid DST IP (-22), SYNC unsupported (-21), MEC offset (-20), Invalid tx rate (-19), Too many mapping (-18), Link busy (-17), Invalid profile (-16), Invalid mapping (-15), Read only param (-14), Msg mismatch (-13), Msg too long (-12), Attrib NA (-11), Attrib RO (-10), Attrib missing (-9), Timeout (-8), In error (-7), Link num in use (-6), Not editable (-5), Invalid link num (-4), Invalid args (-3), Too many links (-2), Out of memory (-1), OK (0), Not running (1), OK sync (2)						RO	Txt	ND	NC	PT	
4.10.030	Tx3 Link Profile	Std (0), Sync (1)			Std (0)			RW	Txt				US
4.10.031	Tx3 Link Number	0 to 255			0			RW	Num				US
4.10.032	Tx3 Source Parameter	0.00.000 to 4.99.999			0.00.000			RW	SMP			PT	US
4.10.033	Tx3 Parameter Count	0 to 10			0			RW	Num				US
4.10.034	Tx3 Link Transmission Type	Unicast (0), Broadcast (1), Multicast1 (2), Multicast2 (3), Multicast3 (4), Multicast4 (5), Multicast5 (6), Multicast6 (7), Multicast7 (8), Multicast8 (9), Multicast9 (10), Multicast10 (11)			Unicast (0)			RW	Txt				US
4.10.035	Tx3 Destination Address	0.0.0.0 to 255.255.255.255			0.0.0.0			RW	IP				US
4.10.036	Tx3 Message Rate	0 to 100 ms			0 ms			RW	Num				US
4.10.039	Tx3 Link Status	Disabled (-31), VLAN disabled (-30), Invalid DST IP (-22), SYNC unsupported (-21), MEC offset (-20), Invalid tx rate (-19), Too many mapping (-18), Link busy (-17), Invalid profile (-16), Invalid mapping (-15), Read only param (-14), Msg mismatch (-13), Msg too long (-12), Attrib NA (-11), Attrib RO (-10), Attrib missing (-9), Timeout (-8), In error (-7), Link num in use (-6), Not editable (-5), Invalid link num (-4), Invalid args (-3), Too many links (-2), Out of memory (-1), OK (0), Not running (1), OK sync (2)						RO	Txt	ND	NC	PT	
4.10.040	Rx1 Link Profile	Std (0), Sync (1)			Std (0)			RW	Txt				US
4.10.041	Rx1 Link Number	0 to 255			0			RW	Num				US
4.10.042	Rx1 Destination Parameter	0.00.000 to 4.99.999			0.00.000			RW	SMP				US

Parameter		Range			Default			Type					
		OL	RFC-A	RFC-S	OL	RFC-A	RFC-S						
4.10.043	Rx1 Parameter Count	0 to 10			0			RW	Num				US
4.10.044	Rx1 Source Type	Direct (0), Multicast1 (1), Multicast2 (2), Multicast3 (3), Multicast4 (4), Local (5), Multicast5 (6), Multicast6 (7), Multicast7 (8), Multicast8 (9), Multicast9 (10), Multicast10 (11)			Direct (0)			RW	Txt				US
4.10.045	Rx1 Timeout	0 to 65535 ms			100 ms			RW	Num				US
4.10.046	Rx1 Timeout Action	Trip (0), Clear output (1), Hold last (2)			Trip (0)			RW	Txt				US
4.10.047	Rx1 Timeout Event Destination*	This slot (0), Slot 1 (1), Slot 2 (2), Slot 3 (3), Slot 4 (4)			This slot (0)			RW	Txt				US
4.10.048	Rx1 Timeout Event Type	No Event (0), Event (1), Event1 (2), Event2 (3), Event3 (4)			No Event (0)			RW	Txt				US
4.10.049	Rx1 Link Status	Disabled (-31) , VLAN disabled (-30), Invalid DST IP (-22), SYNC unsupported (-21), MEC offset (-20), Invalid tx rate (-19), Too many mapping (-18), Link busy (-17), Invalid profile (-16), Invalid mapping (-15), Read only param (-14), Msg mismatch (-13), Msg too long (-12), Attrib NA (-11), Attrib RO (-10), Attrib missing (-9), Timeout (-8), In error (-7), Link num in use (-6), Not editable (-5), Invalid link num (-4), Invalid args (-3), Too many links (-2), Out of memory (-1), OK (0), Not running (1), OK sync (2)						RO	Txt	ND	NC	PT	
4.10.050	Rx2 Link Profile	Std (0), Sync (1)			Std (0)			RW	Txt				US
4.10.051	Rx2 Link Number	0 to 255			0			RW	Num				US
4.10.052	Rx2 Destination Parameter	0.00.000 to 4.99.999			0.00.000			RW	SMP				US
4.10.053	Rx2 Parameter Count	0 to 10			0			RW	Num				US
4.10.054	Rx2 Source Type	Direct (0), Multicast1 (1), Multicast2 (2), Multicast3 (3), Multicast4 (4), Local (5), Multicast5 (6), Multicast6 (7), Multicast7 (8), Multicast8 (9), Multicast9 (10), Multicast10 (11)			Direct (0)			RW	Txt				US
4.10.055	Rx2 Timeout	0 to 65535 ms			100 ms			RW	Num				US
4.10.056	Rx2 Timeout Action	Trip (0), Clear output (1), Hold last (2)			Trip (0)			RW	Txt				US
4.10.057	Rx2 Timeout Event Destination*	This slot (0), Slot 1 (1), Slot 2 (2), Slot 3 (3), Slot 4 (4)			This slot (0)			RW	Txt				US
4.10.058	Rx2 Timeout Event Type	No Event (0), Event (1), Event1 (2), Event2 (3), Event3 (4)			No Event (0)			RW	Txt				US
4.10.059	Rx2 Link Status	Disabled (-31), VLAN disabled (-30), Invalid DST IP (-22), SYNC unsupported (-21), MEC offset (-20), Invalid tx rate (-19), Too many mapping (-18), Link busy (-17), Invalid profile (-16), Invalid mapping (-15), Read only param (-14), Msg mismatch (-13), Msg too long (-12), Attrib NA (-11), Attrib RO (-10), Attrib missing (-9), Timeout (-8), In error (-7), Link num in use (-6), Not editable (-5), Invalid link num (-4), Invalid args (-3), Too many links (-2), Out of memory (-1), OK (0), Not running (1), OK sync (2)						RO	Txt	ND	NC	PT	
4.10.060	Rx3 Link Profile	Std (0), Sync (1)			Std (0)			RW	Txt				US
4.10.061	Rx3 Link Number	0 to 255			0			RW	Num				US
4.10.062	Rx3 Destination Parameter	0.00.000 to 4.99.999			0.00.000			RW	SMP				US
4.10.063	Rx3 Parameter Count	0 to 10			0			RW	Num				US
4.10.064	Rx3 Source Type	Direct (0), Multicast1 (1), Multicast2 (2), Multicast3 (3), Multicast4 (4), Local (5), Multicast5 (6), Multicast6 (7), Multicast7 (8), Multicast8 (9), Multicast9 (10), Multicast10 (11)			Direct (0)			RW	Txt				US
4.10.065	Rx3 Timeout	0 to 65535 ms			100 ms			RW	Num				US
4.10.066	Rx3 Timeout Action	Trip (0), Clear output (1), Hold last (2)			Trip (0)			RW	Txt				US
4.10.067	Rx3 Timeout Event Destination*	This slot (0), Slot 1 (1), Slot 2 (2), Slot 3 (3), Slot 4 (4)			This slot (0)			RW	Txt				US
4.10.068	Rx3 Timeout Event Type	No Event (0), Event (1), Event1 (2), Event2 (3), Event3 (4)			No Event (0)			RW	Txt				US
4.10.069	Rx3 Link Status	Disabled (-31), VLAN disabled (-30), Invalid DST IP (-22), SYNC unsupported (-21), MEC offset (-20), Invalid tx rate (-19), Too many mapping (-18), Link busy (-17), Invalid profile (-16), Invalid mapping (-15), Read only param (-14), Msg mismatch (-13), Msg too long (-12), Attrib NA (-11), Attrib RO (-10), Attrib missing (-9), Timeout (-8), In error (-7), Link num in use (-6), Not editable (-5), Invalid link num (-4), Invalid args (-3), Too many links (-2), Out of memory (-1), OK (0), Not running (1), OK sync (2)						RO	Txt	ND	NC	PT	

RW	Read / Write	RO	Read only	Num	Number parameter	Bit	Bit parameter	Txt	Text string	Bin	Binary parameter	FI	Filtered
ND	No default value	NC	Not copied	PT	Protected parameter	RA	Rating dependent	US	User save	PS	Power-down save	DE	Destination
IP	IP address	Mac	Mac address	Date	Date parameter	Time	Time parameter	SMP	Slot,menu,parameter	Chr	Character parameter	Ver	Version number

* This feature is not currently supported

12.28 Slot 4 Menu 11: Synchronization (*Unidrive M700 / M702*)

Parameter		Range			Default			Type					
		OL	RFC-A	RFC-S	OL	RFC-A	RFC-S						
4.11.001	Preferred Sync Master	0 to 4			1			RW	Num				US
4.11.002	Master Clock Domain	0 to 3			0			RW	Num				US
4.11.005	Grandmaster MAC Address	00:00:00:00:00:00 to FF:FF:FF:FF:FF:FF						RO	Mac	ND	NC	PT	
4.11.006	Synchronisation Jitter From Grandmaster	-2147483648 to 2147483647 ns						RO	Num	ND	NC	PT	
4.11.007	Synchronisation Jitter Threshold	500 to 1000000 ns			1000 ns			RW	Num				US
4.11.008	Module Synchronised Flag	Off (0) or On (1)			Off (0)			RO	Bit				
4.11.009	Inhibit Drive Synchronisation	Off (0) or On (1)			Off (0)			RW	Bit				US
4.11.010	PTP Date	00-00-00 to 31-12-99						RO	Date	ND	NC	PT	
4.11.011	PTP Time	00:00:00 to 23:59:59						RO	Time	ND	NC	PT	
4.11.015	PTP Delay Measurement Select	P2P DELAY (1), OFF (2)			P2P DELAY (1)			RW	Txt				US
4.11.016	PTP Sync Rate	-4 to 0			-4			RW	Num				US
4.11.017	In sync window length	3 to 255 s			20 s			RW	Num				US
4.11.020	Network Error Count	0 to 4294967295						RO	Num	ND	NC	PT	
4.11.022	Interoption Sync Status	MASTER (0), PRODUCER (1), INDEPENDENT (2)						RO	Txt	ND	NC	PT	
4.11.030	Easy Mode Maximum Network Delay	1 to 100 ms			3 ms			RW	Num				US
4.11.040	Rx1 Late Synchronisation Frame Action	Trip (1), Do not use (2), Use (3)			Trip (1)			RW	Txt				US
4.11.041	Rx1 Late Synchronisation Frame Destination*	This slot (0), Slot 1 (1), Slot 2 (2), Slot 3 (3), Slot 4 (4)			This slot (0)			RW	Txt				US
4.11.042	Rx1 Late Synchronisation Frame Event	No Event (0), Event (1), Event1 (2), Event2 (3), Event3 (4)			No Event (0)			RW	Txt				US
4.11.050	Rx2 Late Synchronisation Frame Action	Trip (1), Do not use (2), Use (3)			Trip (1)			RW	Txt				US
4.11.051	Rx2 Late Synchronisation Frame Destination*	This slot (0), Slot 1 (1), Slot 2 (2), Slot 3 (3), Slot 4 (4)			This slot (0)			RW	Txt				US
4.11.052	Rx2 Late Synchronisation Frame Event	No Event (0), Event (1), Event1 (2), Event2 (3), Event3 (4)			No Event (0)			RW	Txt				US
4.11.060	Rx3 Late Synchronisation Frame Action	Trip (1), Do not use (2), Use (3)			Trip (1)			RW	Txt				US
4.11.061	Rx3 Late Synchronisation Frame Destination*	This slot (0), Slot 1 (1), Slot 2 (2), Slot 3 (3), Slot 4 (4)			This slot (0)			RW	Txt				US
4.11.062	Rx3 Late Synchronisation Frame Event	No Event (0), Event (1), Event1 (2), Event2 (3), Event3 (4)			No Event (0)			RW	Txt				US

RW	Read / Write	RO	Read only	Num	Number parameter	Bit	Bit parameter	Txt	Text string	Bin	Binary parameter	FI	Filtered
ND	No default value	NC	Not copied	PT	Protected parameter	RA	Rating dependent	US	User save	PS	Power-down save	DE	Destination
IP	IP address	Mac	Mac address	Date	Date parameter	Time	Time parameter	SMP	Slot,menu,parameter	Chr	Character parameter	Ver	Version number

* This feature is not currently supported

12.29 Slot 4 Menu 15: Modbus TCP/IP Set-up (*Unidrive M700 / M702*)

Parameter		Range			Default			Type					
		OL	RFC-A	RFC-S	OL	RFC-A	RFC-S						
4.15.001	Enable	Off (0) or On (1)			On (1)			RW	Bit				US
4.15.002	Reset	Off (0) or On (1)			Off (0)			RW	Bit		NC		
4.15.003	Default	Off (0) or On (1)			Off (0)			RW	Bit		NC		
4.15.004	Modbus Configuration Error	No error (0), Port in use (1), Timeout event (2), Num Connections (3)						RO	Txt	ND	NC	PT	
4.15.005	Modbus Listening Port	0 to 65535			502			RW	Num				US
4.15.006	Maximum Connections	0 to 10			2			RW	Num				US
4.15.007	Maximum Priority Connections	0 to 5			0			RW	Num				US
4.15.008	Maximum Connections Per Client	1 to 4			2			RW	Num				US
4.15.009	Modbus Timeout	1 to 10000 ms			100 ms			RW	Num				US
4.15.010	Modbus Timeout Action	Trip (0), No action (1)			No action (1)			RW	Txt				US
4.15.011	Modbus Timeout Event Destination*	This slot (0), Slot 1 (1), Slot 2 (2), Slot 3 (3), Slot 4 (4)			This slot (0)			RW	Txt				US
4.15.012	Modbus Timeout Event Type	No event (0), Trigger Event (1), Trigger Event 1 (2), Trigger Event 2 (3), Trigger Event 3 (4), Trigger Event 4 (5)			No event (0)			RW	Txt				US
4.15.013	Modbus Resister Addressing Mode	Standard (0), Modified (1)			Standard (0)			RW	Txt				US
4.15.020	Priority Connection 1	0.0.0.0 to 255.255.255.255			0.0.0.0			RW	IP				US
4.15.021	Priority Connection 2	0.0.0.0 to 255.255.255.255			0.0.0.0			RW	IP				US
4.15.022	Priority Connection 3	0.0.0.0 to 255.255.255.255			0.0.0.0			RW	IP				US
4.15.023	Priority Connection 4	0.0.0.0 to 255.255.255.255			0.0.0.0			RW	IP				US

RW	Read / Write	RO	Read only	Num	Number parameter	Bit	Bit parameter	Txt	Text string	Bin	Binary parameter	FI	Filtered
ND	No default value	NC	Not copied	PT	Protected parameter	RA	Rating dependent	US	User save	PS	Power-down save	DE	Destination
IP	IP address	Mac	Mac address	Date	Date parameter	Time	Time parameter	SMP	Slot,menu,parameter	Chr	Character parameter	Ver	Version number

* This feature is not currently supported

12.30 Slot 4 Menu 20: EtherNet/IP Set-up (*Unidrive M700 / M702*)

Parameter		Range			Default			Type					
		OL	RFC-A	RFC-S	OL	RFC-A	RFC-S						
4.20.001	Enable EtherNet/IP	Off (0) or On (1)			On (1)			RW	Bit				US
4.20.002	Reset	Off (0) or On (1)			Off (0)			RW	Bit		NC		
4.20.003	Default	Off (0) or On (1)			Off (0)			RW	Bit		NC		
4.20.004	Configuration error	No error (0), RPI event dst (1), RPI event type (2), IDLE event dst (3), IDLE event type (4), Input mapping (5), Output mapping (6), In cons trig pr (7), Out cons trig pr (8)						RO	Txt	ND	NC	PT	
4.20.007	Cyclic data transfers per second	0 to 65535 Messages/s						RO	Num	ND	NC	PT	
4.20.011	RPI timeout action	Trip (0), Send flt values (1), Clear output (2), Hold last (3), No Action (4)			Hold last (3)			RW	Txt				US
4.20.012	RPI timeout event destination*	This slot (0), Slot 1 (1), Slot 2 (2), Slot 3 (3), Slot 4 (4)			This slot (0)			RW	Txt				US
4.20.013	RPI timeout event type	No event (0), Trigger Event (1), Trigger Event 1 (2), Trigger Event 2 (3), Trigger Event 3 (4), Trigger Event 4 (5)			No event (0)			RW	Txt				US
4.20.015	PLC idle action	Trip (0), Send flt values (1), Clear output (2), Hold last (3), No Action (4)			No Action (4)			RW	Txt				US
4.20.016	PLC idle event destination*	This slot (0), Slot 1 (1), Slot 2 (2), Slot 3 (3), Slot 4 (4)			This slot (0)			RW	Txt				US
4.20.017	PLC idle event type	No event (0), Trigger Event (1), Trigger Event 1 (2), Trigger Event 2 (3), Trigger Event 3 (4), Trigger Event 4 (5)			No event (0)			RW	Txt				US
4.20.018	Active input assembly object	100-PrimaryI (0), 70-BscSpdCtrlI (1), 71-ExtSpdCtrlI (2), 72-SpdTqCtrlI (3), 73-ExtSpdTqCtrlI (4)						RO	Txt	ND	NC	PT	
4.20.019	Active output assembly object	101-PrimaryO (0), 20-BscSpdCtrlO (1), 21-ExtSpdCtrlO (2), 22-SpdTqCtrlO (3), 23-ExtSpdTqCtrlO (4)						RO	Txt	ND	NC	PT	
4.20.020	Input assembly object size	4 to 128 Bytes			8 Bytes			RW	Num				US
4.20.021	Output assembly object size	4 to 128 Bytes			8 Bytes			RW	Num				US
4.20.024	Input assembly object process time	0 to 65535 ms						RO	Num	ND	NC	PT	
4.20.025	Output assembly object process time	0 to 65535 ms						RO	Num	ND	NC	PT	
4.20.026	Input assembly object consistency enable	Off (0) or On (1)			Off (0)			RW	Bit				US
4.20.027	Input assembly object consistency trigger parameter	0.00.000 to 4.99.999			0.00.000			RW	SMP				US
4.20.028	Output assembly object consistency enable	Off (0) or On (1)			Off (0)			RW	Bit				US
4.20.029	Output assembly object consistency trigger parameter	0.00.000 to 4.99.999			0.00.000			RW	SMP				US
4.20.030	Custom Vendor ID	257 - CT (0), 553 - CT AMERICA (1)			257 - CT (0)			RW	Txt				US
4.20.031	Custom product code	0 to 65535			0			RW	Num				US
4.20.032	Custom product revision code	0 to 65535			0			RW	Num				US
4.20.033	Actual Product Code	0 to 65535						RO	Num	ND	NC	PT	
4.20.034	Actual Product Revision	0 to 65535						RO	Num	ND	NC	PT	
4.20.040	Type of Motor 1	2-FC DC (0), 6-WRI (1), 7-SCI (2), 9-Sin PM BL (3), 10-Trap PM BL (4)						RO	Txt			PT	US
4.20.041	Type of Motor 2	2-FC DC (0), 6-WRI (1), 7-SCI (2), 9-Sin PM BL (3), 10-Trap PM BL (4)						RO	Txt			PT	US

RW	Read / Write	RO	Read only	Num	Number parameter	Bit	Bit parameter	Txt	Text string	Bin	Binary parameter	FI	Filtered
ND	No default value	NC	Not copied	PT	Protected parameter	RA	Rating dependent	US	User save	PS	Power-down save	DE	Destination
IP	IP address	Mac	Mac address	Date	Date parameter	Time	Time parameter	SMP	Slot,menu,parameter	Chr	Character parameter	Ver	Version number

* This feature is not currently supported

12.31 Slot 4 Menu 21: EtherNet/IP In Mappings (*Unidrive M700 / M702*)

Parameter		Range			Default			Type					
		OL	RFC-A	RFC-S	OL	RFC-A	RFC-S						
4.21.001	Input Mapping Parameter 1	0.00.000 to 4.99.999			0.10.040			RW	SMP			PT	US
4.21.002	Input Mapping Parameter 2	0.00.000 to 4.99.999			0.02.001			RW	SMP			PT	US
4.21.003	Input Mapping Parameter 3	0.00.000 to 4.99.999			0.00.000			RW	SMP			PT	US
4.21.004	Input Mapping Parameter 4	0.00.000 to 4.99.999			0.00.000			RW	SMP			PT	US
4.21.005	Input Mapping Parameter 5	0.00.000 to 4.99.999			0.00.000			RW	SMP			PT	US
4.21.006	Input Mapping Parameter 6	0.00.000 to 4.99.999			0.00.000			RW	SMP			PT	US
4.21.007	Input Mapping Parameter 7	0.00.000 to 4.99.999			0.00.000			RW	SMP			PT	US
4.21.008	Input Mapping Parameter 8	0.00.000 to 4.99.999			0.00.000			RW	SMP			PT	US
4.21.009	Input Mapping Parameter 9	0.00.000 to 4.99.999			0.00.000			RW	SMP			PT	US
4.21.010	Input Mapping Parameter 10	0.00.000 to 4.99.999			0.00.000			RW	SMP			PT	US
4.21.011	Input Mapping Parameter 11	0.00.000 to 4.99.999			0.00.000			RW	SMP			PT	US
4.21.012	Input Mapping Parameter 12	0.00.000 to 4.99.999			0.00.000			RW	SMP			PT	US
4.21.013	Input Mapping Parameter 13	0.00.000 to 4.99.999			0.00.000			RW	SMP			PT	US
4.21.014	Input Mapping Parameter 14	0.00.000 to 4.99.999			0.00.000			RW	SMP			PT	US
4.21.015	Input Mapping Parameter 15	0.00.000 to 4.99.999			0.00.000			RW	SMP			PT	US
4.21.016	Input Mapping Parameter 16	0.00.000 to 4.99.999			0.00.000			RW	SMP			PT	US
4.21.017	Input Mapping Parameter 17	0.00.000 to 4.99.999			0.00.000			RW	SMP			PT	US
4.21.018	Input Mapping Parameter 18	0.00.000 to 4.99.999			0.00.000			RW	SMP			PT	US
4.21.019	Input Mapping Parameter 19	0.00.000 to 4.99.999			0.00.000			RW	SMP			PT	US
4.21.020	Input Mapping Parameter 20	0.00.000 to 4.99.999			0.00.000			RW	SMP			PT	US
4.21.021	Input Mapping Parameter 21	0.00.000 to 4.99.999			0.00.000			RW	SMP			PT	US
4.21.022	Input Mapping Parameter 22	0.00.000 to 4.99.999			0.00.000			RW	SMP			PT	US
4.21.023	Input Mapping Parameter 23	0.00.000 to 4.99.999			0.00.000			RW	SMP			PT	US
4.21.024	Input Mapping Parameter 24	0.00.000 to 4.99.999			0.00.000			RW	SMP			PT	US
4.21.025	Input Mapping Parameter 25	0.00.000 to 4.99.999			0.00.000			RW	SMP			PT	US
4.21.026	Input Mapping Parameter 26	0.00.000 to 4.99.999			0.00.000			RW	SMP			PT	US
4.21.027	Input Mapping Parameter 27	0.00.000 to 4.99.999			0.00.000			RW	SMP			PT	US
4.21.028	Input Mapping Parameter 28	0.00.000 to 4.99.999			0.00.000			RW	SMP			PT	US
4.21.029	Input Mapping Parameter 29	0.00.000 to 4.99.999			0.00.000			RW	SMP			PT	US
4.21.030	Input Mapping Parameter 30	0.00.000 to 4.99.999			0.00.000			RW	SMP			PT	US
4.21.031	Input Mapping Parameter 31	0.00.000 to 4.99.999			0.00.000			RW	SMP			PT	US
4.21.032	Input Mapping Parameter 32	0.00.000 to 4.99.999			0.00.000			RW	SMP			PT	US

RW	Read / Write	RO	Read only	Num	Number parameter	Bit	Bit parameter	Txt	Text string	Bin	Binary parameter	FI	Filtered
ND	No default value	NC	Not copied	PT	Protected parameter	RA	Rating dependent	US	User save	PS	Power-down save	DE	Destination
IP	IP address	Mac	Mac address	Date	Date parameter	Time	Time parameter	SMP	Slot,menu,parameter	Chr	Character parameter	Ver	Version number

12.32 Slot 4 Menu 22: EtherNet/IP Out Mappings (*Unidrive M700 / M702*)

Parameter		Range			Default			Type					
		OL	RFC-A	RFC-S	OL	RFC-A	RFC-S						
4.22.001	Output Mapping Parameter 1	0.00.000 to 4.99.999			0.06.042			RW	SMP			PT	US
4.22.002	Output Mapping Parameter 2	0.00.000 to 4.99.999			0.01.021			RW	SMP			PT	US
4.22.003	Output Mapping Parameter 3	0.00.000 to 4.99.999			0.00.000			RW	SMP			PT	US
4.22.004	Output Mapping Parameter 4	0.00.000 to 4.99.999			0.00.000			RW	SMP			PT	US
4.22.005	Output Mapping Parameter 5	0.00.000 to 4.99.999			0.00.000			RW	SMP			PT	US
4.22.006	Output Mapping Parameter 6	0.00.000 to 4.99.999			0.00.000			RW	SMP			PT	US
4.22.007	Output Mapping Parameter 7	0.00.000 to 4.99.999			0.00.000			RW	SMP			PT	US
4.22.008	Output Mapping Parameter 8	0.00.000 to 4.99.999			0.00.000			RW	SMP			PT	US
4.22.009	Output Mapping Parameter 9	0.00.000 to 4.99.999			0.00.000			RW	SMP			PT	US
4.22.010	Output Mapping Parameter 10	0.00.000 to 4.99.999			0.00.000			RW	SMP			PT	US
4.22.011	Output Mapping Parameter 11	0.00.000 to 4.99.999			0.00.000			RW	SMP			PT	US
4.22.012	Output Mapping Parameter 12	0.00.000 to 4.99.999			0.00.000			RW	SMP			PT	US
4.22.013	Output Mapping Parameter 13	0.00.000 to 4.99.999			0.00.000			RW	SMP			PT	US
4.22.014	Output Mapping Parameter 14	0.00.000 to 4.99.999			0.00.000			RW	SMP			PT	US
4.22.015	Output Mapping Parameter 15	0.00.000 to 4.99.999			0.00.000			RW	SMP			PT	US
4.22.016	Output Mapping Parameter 16	0.00.000 to 4.99.999			0.00.000			RW	SMP			PT	US
4.22.017	Output Mapping Parameter 17	0.00.000 to 4.99.999			0.00.000			RW	SMP			PT	US
4.22.018	Output Mapping Parameter 18	0.00.000 to 4.99.999			0.00.000			RW	SMP			PT	US
4.22.019	Output Mapping Parameter 19	0.00.000 to 4.99.999			0.00.000			RW	SMP			PT	US
4.22.020	Output Mapping Parameter 20	0.00.000 to 4.99.999			0.00.000			RW	SMP			PT	US
4.22.021	Output Mapping Parameter 21	0.00.000 to 4.99.999			0.00.000			RW	SMP			PT	US
4.22.022	Output Mapping Parameter 22	0.00.000 to 4.99.999			0.00.000			RW	SMP			PT	US
4.22.023	Output Mapping Parameter 23	0.00.000 to 4.99.999			0.00.000			RW	SMP			PT	US
4.22.024	Output Mapping Parameter 24	0.00.000 to 4.99.999			0.00.000			RW	SMP			PT	US
4.22.025	Output Mapping Parameter 25	0.00.000 to 4.99.999			0.00.000			RW	SMP			PT	US
4.22.026	Output Mapping Parameter 26	0.00.000 to 4.99.999			0.00.000			RW	SMP			PT	US
4.22.027	Output Mapping Parameter 27	0.00.000 to 4.99.999			0.00.000			RW	SMP			PT	US
4.22.028	Output Mapping Parameter 28	0.00.000 to 4.99.999			0.00.000			RW	SMP			PT	US
4.22.029	Output Mapping Parameter 29	0.00.000 to 4.99.999			0.00.000			RW	SMP			PT	US
4.22.030	Output Mapping Parameter 30	0.00.000 to 4.99.999			0.00.000			RW	SMP			PT	US
4.22.031	Output Mapping Parameter 31	0.00.000 to 4.99.999			0.00.000			RW	SMP			PT	US
4.22.032	Output Mapping Parameter 32	0.00.000 to 4.99.999			0.00.000			RW	SMP			PT	US

RW	Read / Write	RO	Read only	Num	Number parameter	Bit	Bit parameter	Txt	Text string	Bin	Binary parameter	FI	Filtered
ND	No default value	NC	Not copied	PT	Protected parameter	RA	Rating dependent	US	User save	PS	Power-down save	DE	Destination
IP	IP address	Mac	Mac address	Date	Date parameter	Time	Time parameter	SMP	Slot,menu,parameter	Chr	Character parameter	Ver	Version number

12.33 Slot 4 Menu 23: EtherNet/IP Fault Values (*Unidrive M700 / M702*)

Parameter		Range			Default			Type					
		OL	RFC-A	RFC-S	OL	RFC-A	RFC-S						
4.23.001	Output Fault Value 1	-2147483648 to 2147483647			0			RW	Num			PT	US
4.23.002	Output Fault Value 2	-2147483648 to 2147483647			0			RW	Num			PT	US
4.23.003	Output Fault Value 3	-2147483648 to 2147483647			0			RW	Num			PT	US
4.23.004	Output Fault Value 4	-2147483648 to 2147483647			0			RW	Num			PT	US
4.23.005	Output Fault Value 5	-2147483648 to 2147483647			0			RW	Num			PT	US
4.23.006	Output Fault Value 6	-2147483648 to 2147483647			0			RW	Num			PT	US
4.23.007	Output Fault Value 7	-2147483648 to 2147483647			0			RW	Num			PT	US
4.23.008	Output Fault Value 8	-2147483648 to 2147483647			0			RW	Num			PT	US
4.23.009	Output Fault Value 9	-2147483648 to 2147483647			0			RW	Num			PT	US
4.23.010	Output Fault Value 10	-2147483648 to 2147483647			0			RW	Num			PT	US
4.23.011	Output Fault Value 11	-2147483648 to 2147483647			0			RW	Num			PT	US
4.23.012	Output Fault Value 12	-2147483648 to 2147483647			0			RW	Num			PT	US
4.23.013	Output Fault Value 13	-2147483648 to 2147483647			0			RW	Num			PT	US
4.23.014	Output Fault Value 14	-2147483648 to 2147483647			0			RW	Num			PT	US
4.23.015	Output Fault Value 15	-2147483648 to 2147483647			0			RW	Num			PT	US
4.23.016	Output Fault Value 16	-2147483648 to 2147483647			0			RW	Num			PT	US
4.23.017	Output Fault Value 17	-2147483648 to 2147483647			0			RW	Num			PT	US
4.23.018	Output Fault Value 18	-2147483648 to 2147483647			0			RW	Num			PT	US
4.23.019	Output Fault Value 19	-2147483648 to 2147483647			0			RW	Num			PT	US
4.23.020	Output Fault Value 20	-2147483648 to 2147483647			0			RW	Num			PT	US
4.23.021	Output Fault Value 21	-2147483648 to 2147483647			0			RW	Num			PT	US
4.23.022	Output Fault Value 22	-2147483648 to 2147483647			0			RW	Num			PT	US
4.23.023	Output Fault Value 23	-2147483648 to 2147483647			0			RW	Num			PT	US
4.23.024	Output Fault Value 24	-2147483648 to 2147483647			0			RW	Num			PT	US
4.23.025	Output Fault Value 25	-2147483648 to 2147483647			0			RW	Num			PT	US
4.23.026	Output Fault Value 26	-2147483648 to 2147483647			0			RW	Num			PT	US
4.23.027	Output Fault Value 27	-2147483648 to 2147483647			0			RW	Num			PT	US
4.23.028	Output Fault Value 28	-2147483648 to 2147483647			0			RW	Num			PT	US
4.23.029	Output Fault Value 29	-2147483648 to 2147483647			0			RW	Num			PT	US
4.23.030	Output Fault Value 30	-2147483648 to 2147483647			0			RW	Num			PT	US
4.23.031	Output Fault Value 31	-2147483648 to 2147483647			0			RW	Num			PT	US
4.23.032	Output Fault Value 32	-2147483648 to 2147483647			0			RW	Num			PT	US

RW	Read / Write	RO	Read only	Num	Number parameter	Bit	Bit parameter	Txt	Text string	Bin	Binary parameter	FI	Filtered
ND	No default value	NC	Not copied	PT	Protected parameter	RA	Rating dependent	US	User save	PS	Power-down save	DE	Destination

12.34 Slot 4 Menu 24: Profinet Set-up (*Unidrive M700 / M702*)

Parameter		Range			Default			Type					
		OL	RFC-A	RFC-S	OL	RFC-A	RFC-S						
4.24.001	Enable Profinet Interface	Off (0) or On (1)			On (1)			RW	Bit				US
4.24.002	Reset Profinet	Off (0) or On (1)			Off (0)			RW	Bit		NC		
4.24.003	Profinet Default	Off (0) or On (1)			Off (0)			RW	Bit		NC		
4.24.004	Configuration Error	No Error (0), Input Mapping (1), Output Mapping (2), Data Size (3), Param Config (4)						RO	Txt		NC	PT	
4.24.005	Cyclic data transfers per second	o to 65535 Messages/s						RO	Num	ND	NC	PT	
4.24.006	Revision Counter	0 to 65535						RO	Num	ND		PT	
4.24.007	Profile ID	0 to 65535			62976			RO	Num			PT	
4.24.008	Installation Date	00-00-00 to 31-12-99						RO	Date	ND		PT	
4.24.009	Profinet Timeout Value	0 to 10000			100			RO	Num			PT	
4.24.010	Profinet Timeout Action	Trip (0), Reserved (1), Clear output (2), Hold last (3), No Action (4)			No Action (4)			RW	Txt			PT	US
4.24.011	Timeout Event Destination*	This slot (0), Slot 1 (1), Slot 2 (2), Slot 3 (3), Slot 4 (4)			This slot (0)			RW	Txt			PT	US
4.24.012	Profinet Timeout Event Type*	No Event (0), Trigger Event (1), Trigger Event 1 (2), Trigger Event 2 (3), Trigger Event 3 (4), Trigger Event 4 (5)			No Event (0)			RW	Txt			PT	US
4.23.026	Profinet Input Consistency Enable	Off (0) or On (1)			Off (0)			RW	Bit				US
4.23.027	Profinet Input Consistency Trigger	0 to 499999			0			RW	SMP				US
4.23.028	Profinet Output Consistency Enable	Off (0) or On (1)			Off (0)			RW	Bit				US
4.24.029	Profinet Output Consistency Trigger	0 to 499999			0			RW	SMP				US

RW	Read / Write	RO	Read only	Num	Number parameter	Bit	Bit parameter	Txt	Text string	Bin	Binary parameter	FI	Filtered
ND	No default value	NC	Not copied	PT	Protected parameter	RA	Rating dependent	US	User save	PS	Power-down save	DE	Destination

* This feature is not currently supported

13 Diagnostics

The keypad display on the drive gives various information about the status of the drive. The keypad display provides information on the following categories:

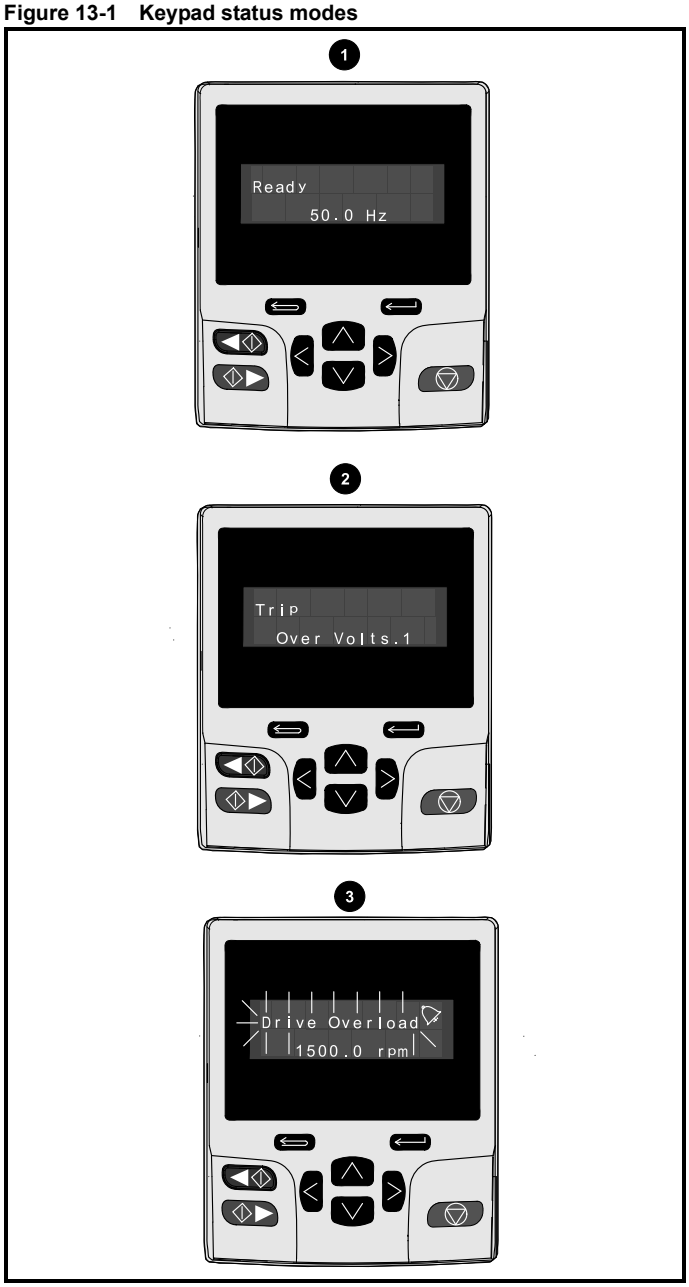
- Trip indications
- Alarm indications
- Status indications

WARNING

Users must not attempt to repair a drive if it is faulty, nor carry out fault diagnosis other than through the use of the diagnostic features described in this chapter.
If a drive is faulty, it must be returned to an authorized Control Techniques distributor for repair.

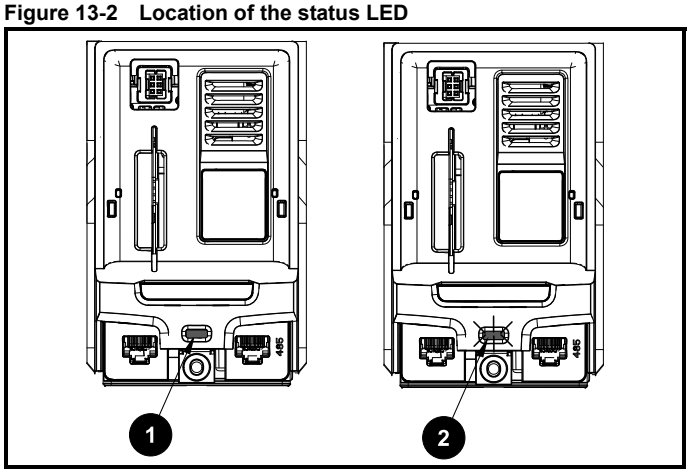
13.1 Status modes (Keypad and LED status)

Figure 13-1 Keypad status modes



1. Drive OK status
2. Trip status
3. Alarm status

Figure 13-2 Location of the status LED

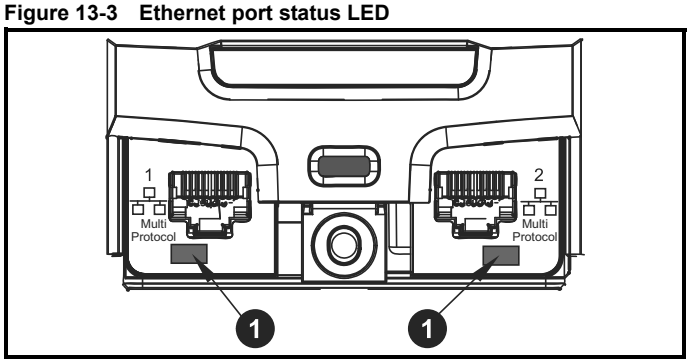


1. Non flashing: Normal status
2. Flashing: Trip status

13.1.1 *Unidrive M700 / M702* Ethernet status LED

Each of the Ethernet ports provide a status LED for diagnostic and information purposes. Refer to Table 13-1 for Ethernet LED status.

Figure 13-3 Ethernet port status LED



1. Ethernet port status LED.

Table 13-1 Ethernet LED status

LED status	Description
Off	Ethernet connection not detected
Solid green	Ethernet connection detected but no data
Flashing green	Ethernet connection detected and data flow

13.2 Trip indications

The output of the drive is disabled under any trip condition so that the drive stops controlling the motor. If the motor is running when the trip occurs it will coast to a stop.

During a trip condition, where a KI-Keypad is being used, the upper row of the display indicates that a trip has occurred and the lower row of the keypad display will display the trip string. Some trips have a sub-trip number to provide additional information about the trip. If a trip has a sub-trip number, the sub-trip number is flashed alternately with the trip string unless there is space on the second row for both the trip string and the sub-trip number in which case both the trip string and sub-trip information is displayed separated by a decimal place.

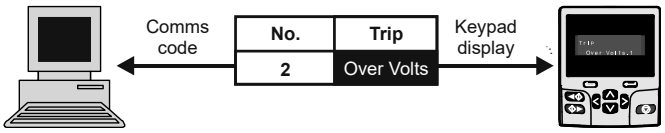
The back-light of the KI-Keypad display will also flash during a trip condition. If a display is not being used, the drive LED Status indicator will flash with 0.5 s duty cycle if the drive has tripped. Refer to Figure 13-2.

Trips are listed alphabetically in Table 13-4 based on the trip indication shown on the drive display. Alternatively, the drive status can be read in Pr **10.001** 'Drive OK' using communication protocols. The most recent trip can be read in Pr **10.020** providing a trip number. It must be noted that the hardware trips (HF01 to HF20) do not have trip numbers. The

trip number must be checked in Table 13-5 to identify the specific trip.

Example

1. Trip code 2 is read from Pr **10.020** via serial communications.
2. Checking Table 13-4 shows Trip 2 is an Over Volts trip.



3. Look up Over Volts in Table 13-4.
4. Perform checks detailed under *Diagnosis*.

13.3 Identifying a trip / trip source

Some trips only contain a trip string whereas some other trips have a trip string along with a sub-trip number which provides the user with additional information about the trip.

A trip can be generated from a control system or from a power system. The sub-trip number associated with the trips listed in Table 13-2 is in the form xxyzz and used to identify the source of the trip.

Table 13-2 Trips associated with xxyzz sub-trip number

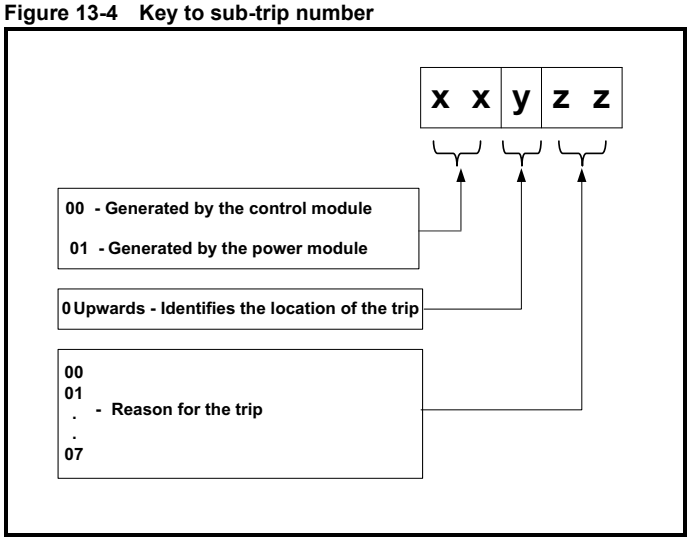
Over Volts	OHt dc bus
OI ac	Phase Loss
OI Brake	Power Comms
PSU	OI Snubber
OHt Inverter	Temp Feedback
OHt Power	Power Data
OHt Control	

The digits xx are 00 for a trip generated by the control system. For a single drive (not part of a multi-power module drive), if the trip is related to the power system then xx will have a value of 01, when displayed the leading zeros are suppressed.

The y digit is used to identify the location of a trip which is generated by a rectifier module connected to a power module (if xx is non zero). For a control system trip (xx is zero), the y digit, where relevant is defined for each trip. If not relevant, the y digit will have a value of zero.

The zz digits give the reason for the trip and are defined in each trip description.

Figure 13-4 Key to sub-trip number



For example, if the drive has tripped and the lower line of the display shows 'OHt Control.2', with the help of Table 13-3 below the trip can be interpreted as; an over temperature has been detected; the trip was generated by fault in the control module, the control board thermistor 2 over temperature. For further information on individual sub-trips, refer to the diagnosis column in Table 13-4.

Table 13-3 Sub-trip identification

Source	xx	y	zz	Description
Control system	00	0	01	Control board thermistor 1 over temperature
Control system	00	0	02	Control board thermistor 2 over temperature
Control system	00	0	03	Control board thermistor 3 over temperature

13.4 Trips, Sub-trip numbers

Table 13-4 Trip indications

Trip	Diagnosis
An Input 1 Loss	**Analog input 1 current loss (*Unidrive M700 / M701*)**
28	*An Input 1 Loss* trip indicates that a current loss was detected in current mode on Analog input 1 (Terminal 5, 6). In 4-20 mA and 20-4 mA modes loss of input is detected if the current falls below 3 mA. **Recommended actions:** • Check control wiring is correct • Check control wiring is undamaged • Check the *Analog Input 1 Mode* (07.007) • Current signal is present and greater than 3 mA
An Input 2 Loss	**Analog input 2 current loss (*Unidrive M700 / M701*)**
29	*An Input 2 Loss* indicates that a current loss was detected in current mode on Analog input 2 (Terminal 7). In 4-20 mA and 20-4 mA modes loss of input is detected if the current falls below 3 mA. **Recommended actions:** • Check control wiring is correct • Check control wiring is undamaged • Check the *Analog Input 2 Mode* (07.011) • Current signal is present and greater than 3 mA
An Output Calib	**Analog output calibration failed (*Unidrive M700 / M701*)**
219	The zero offset calibration of one or both of the analog outputs has failed. This indicates that the drive hardware has failed or a voltage is applied to the output via a low impedance, possibly due to a wiring error**.** The failed output can be identified by the sub-trip number. **Sub-trip** / **Reason** 1 – Output 1 failed (Terminal 9) 2 – Output 2 failed (Terminal 10) **Recommended actions:** • Check the wiring associated with analog outputs • Remove all the wiring that is connected to analog outputs and perform a re-calibration by power cycling the drive • If trip persists replace the drive
App Menu Changed	**Customization table for an application module has changed**
217	The *App Menu Changed* trip indicates that the customization table for an application menu has changed. The menu that has been changed can be identified by the sub-trip number. **Sub-trip** / **Reason** 1 – Menu 18 2 – Menu 19 3 – Menu 20 If more than one menu has changed the lowest menu has priority. Drive user parameters must be saved to prevent this trip on the next power-up. **Recommended actions:** • Reset the trip and perform a parameter save to accept the new settings

Trip	Diagnosis
Autotune 1	**Position feedback did not change or required speed could not be reached**
11	The drive has tripped during an autotune. The cause of the trip can be identified from the sub-trip number.

Sub-trip	Reason	Recommended actions
1	The position feedback did not change when position feedback is being used during rotating auto-tune.	Ensure that the motor is free to turn (i.e. mechanical brake is released). Check that the position feedback is selected correctly and operates correctly.
2	The motor did not reach the required speed during mechanical load measurement.	Ensure that the motor is free to turn and that the static load plus inertia is not too large for the drive to accelerate within the test time.
3	The required commutation signal edge could not be found during a rotating auto-tune with a Commutation Only position feedback device.	Check that the position feedback signals are connected correctly.
4	The required movement angle cannot be produced during a minimal movement test.	Reduce the angular movement required.
5	The second part of the minimal movement test during auto-tuning cannot locate the motor flux position accurately.	Reduce the angular movement required.
6	The phasing offset angle is measured twice during a stationary auto-tune and the results are not within 30^{o} of each other.	If a minimal movement test is being used and excessive motor movement is occurring during the test reduce the required angle movement. Otherwise try and increase the required angle movement.
7	The motor is moving when a phasing test on enable is selected and the drive is enabled, but the motor is still moving at a speed above the zero speed threshold.	Ensure that the motor is stationary before the drive is enabled.

Recommended actions:

- Ensure the motor is free to turn i.e. mechanical brake was released
- Ensure Pr **03.026** and Pr **03.038** are set correctly (or appropriate 2nd motor map parameters)
- Check feedback device wiring is correct
- Check encoder mechanical coupling to the motor

Trip	Diagnosis
Autotune 2	**Position feedback direction incorrect**
12	The drive has tripped during a rotating autotune. The cause of the trip can be identified from the associated sub-trip number.

Sub-trip	Reason
1	The position feedback direction is incorrect when position feedback is being used during a rotating autotune
2	A SINCOS encoder with comms is being used for position feedback and the comms position is rotating in the opposite direction to the sine wave based position.

Recommended actions:

- Check motor cable wiring is correct
- Check feedback device wiring is correct
- Swap any two motor phases

Trip	Diagnosis
Autotune 3	**Measured inertia has exceeded the parameter range or commutation signals changed in wrong direction**
13	The drive has tripped during a rotating autotune or mechanical load measurement test. The cause of the trip can be identified from the associated sub-trip number.

Sub-trip	Reason
1	Measured inertia has exceeded the parameter range during a mechanical load measurement
2	The commutation signals changed in the wrong direction during a rotating autotune
3	The mechanical load test has been unable to identify the motor inertia.

Recommended actions for sub-trip 2:

- Check motor cable wiring is correct
- Check feedback device U,V and W commutation signal wiring is correct

Recommended actions for sub-trip 3:

- Increase the test level
- If the test was carried out at standstill repeat the test with the motor rotating within the recommended speed range

Trip	Diagnosis
Autotune 4	**Drive encoder U commutation signal fail**
14	A position feedback device with commutation signals is being used (i.e. AB Servo, FD Servo, FR Servo, SC Servo, or Commutations only encoder) and the U commutation signal did not change during a rotating autotune. **Recommended actions:** • Check feedback device U commutation signal wiring is correct (Encoder terminals 7 and 8)
Autotune 5	**Drive encoder V commutation signal fail**
15	A position feedback device with commutation signals is being used (i.e. AB Servo, FD Servo, FR Servo, SC Servo, or Commutations only encoder) and the V commutation signal did not change during a rotating autotune. **Recommended actions:** • Check feedback device V commutation signal wiring is correct (Encoder terminals 9 and 10)
Autotune 6	**Drive encoder W commutation signal fail**
16	A position feedback device with commutation signals is being used (i.e. AB Servo, FD Servo, FR Servo, SC Servo, or Commutations only encoder) and the W commutation signal did not change during a rotating autotune. **Recommended actions:** • Check feedback device W commutation signal wiring is correct (Encoder terminals 11 and 12)
Autotune 7	**Motor number of poles / position feedback resolution set incorrectly**
17	An *Autotune 7* trip is initiated during a rotating autotune, if the motor poles or the position feedback resolution have been set up incorrectly where position feedback is being used. **Recommended actions:** • Check line per revolution for feedback device • Check the number of poles in Pr **05.011**
Autotune Stopped	**Autotune test stopped before completion**
18	The drive was prevented from completing an autotune test, because either the drive enable or the drive run were removed. **Recommended actions:** • Check the drive enable signal (terminal 31 on *Unidrive M700 / M701* and terminal 11 & 13 on *Unidrive M702*) was active during the autotune • Check the run command was active in Pr **08.005** during autotune
Brake R Too Hot	**Braking resistor overload timed out (I^2t)**
19	The *Brake R Too Hot* indicates that braking resistor overload has timed out. The value in *Braking Resistor Thermal Accumulator* (10.039) is calculated using *Braking Resistor Rated Power* (10.030), *Braking Resistor Thermal Time Constant* (10.031) and *Braking Resistor Resistance* (10.061). The *Brake R Too Hot* trip is initiated when *Braking Resistor Thermal Accumulator* (10.039) reaches 100 %. **Recommended actions:** • Ensure the values entered in Pr **10.030**, Pr **10.031** and Pr **10.061** are correct • If an external thermal protection device is being used and the braking resistor software overload protection is not required, set Pr **10.030**, Pr **10.031** or Pr **10.061** to 0 to disable the trip.
CAM	**Advanced motion controller CAM failure**
99	The *CAM* trip indicates that the advanced motion controller CAM has detected a problem. **Sub-trip** / **Reason** 1 — *AMC Cam Start Index* (35.001) > *AMC Cam Size* (35.003) or *AMC Cam Start Position In Segment* (35.002) > Cam Table In for the start index 2 — *AMC CAM Index* (35.007) has been made to change by more than 2 in one sample 3 — The rate of change at a segment boundary has exceeded the maximum value 4 — The sum of the *AMC Cam Position In Segment* (35.008) and the change of master position has exceeded the maximum value.
Card Access	**NV Media Card Write fail**
185	The *Card Access* trip indicates that the drive was unable to access the NV Media Card. If the trip occurs during the data transfer to the card then the file being written may be corrupted. If the trip occurs when the data being transferred to the drive then the data transfer may be incomplete. If a parameter file is transferred to the drive and this trip occurs during the transfer, the parameters are not saved to non-volatile memory, and so the original parameters can be restored by powering the drive down and up again. **Recommended actions:** • Check NV Media Card is installed / located correctly • Replace the NV Media Card

Trip	Diagnosis
Card Boot	**The Menu 0 parameter modification cannot be saved to the NV Media Card**
177	Menu 0 changes are automatically saved on exiting edit mode. The *Card Boot* trip will occur if a write to a Menu 0 parameter has been initiated via the keypad by exiting edit mode and Pr **11.042** is set for auto or boot mode, but the necessary boot file has not been created on the NV Media Card to take the new parameter value. This occurs when Pr **11.042** is changed to Auto (3) or Boot (4) mode, but the drive is not subsequently reset. The action of resetting the trip will create the necessary file and prevent further trips. **Recommended actions:** • Ensure that Pr **11.042** is correctly set, and then reset the drive to create the necessary file on the NV Media Card • Re-attempt the parameter write to the Menu 0 parameter
Card Busy	**NV Media Card cannot be accessed as it is being accessed by an option module**
178	The *Card Busy* trip indicates that an attempt has been made to access a file on NV Media Card, but the NV Media Card is already being accessed by an Option Module, such as one of the Applications modules. No data is transferred. **Recommended actions:** • Wait for the option module to finish accessing the NV Media Card and re-attempt the required function
Card Compare	**NV Media Card file/data is different to the one in the drive**
188	A compare has been carried out between a file on the NV Media Card and the drive. A Card Compare trip is initiated if the parameters on the NV Media Card are different to the drive. **Recommended actions:** • Set Pr **mm.000** to 0 and reset the trip • Check to ensure the correct data block on the NV Media Card has been used for the compare**.**
Card Data Exists	**NV Media Card data location already contains data**
179	The *Card Data Exists* trip indicates that an attempt has been made to store data on a NV Media Card in a data block which already contains data. No data is transferred. The data should be erased from the card first to prevent this trip. **Recommended actions:** • Erase the data in data location • Write data to an alternative data location
Card Drive Mode	**NV Media Card parameter set not compatible with current drive mode**
187	The *Card Drive Mode* trip is produced during a compare if the drive mode in the data block on the NV Media Card is different from the current drive mode. This trip is also produced if an attempt is made to transfer parameters from a NV Media Card to the drive if the operating mode in the data block is outside the allowed range of operating modes. **Recommended actions:** • Ensure the destination drive supports the drive operating mode in the parameter file. • Clear the value in Pr **mm.000** and reset the drive • Ensure destination drive operating mode is the same as the source parameter file
Card Error	**NV Media Card data structure error**
182	The *Card Error* trip indicates that an attempt has been made to access a NV Media Card but an error has been detected in the data structure on the card. Resetting the trip will cause the drive to erase and create the correct folder structure. The cause of the trip can be identified by the sub-trip. **Sub-trip** / **Reason** 1 – The required folder and file structure is not present 2 – The <000> file is corrupted. 3 – Two or more files in the <MCDF\> folder have the same file identification number. **Recommended actions:** • Erase all the data blocks and re-attempt the process • Ensure the card is located correctly • Replace the NV Media Card
Card Full	**NV Media Card full**
184	The *Card Full* trip indicates that an attempt has been made to create a data block on a NV Media Card, but there is not enough space left on the card. **Recommended actions:** • Delete a data block or the entire NV Media Card to create space • Use a different NV Media Card
Card No Data	**NV Media Card data not found**
183	The *Card No Data* trip indicates that an attempt has been made to access non-existent file or block on a NV Media Card. No data is transferred. **Recommended actions:** • Ensure data block number is correct

<table>
<tr><th>Trip</th><th>Diagnosis</th></tr>
<tr><td>Card Option</td><td>NV Media Card trip; option modules installed are different between source drive and destination drive</td></tr>
<tr><td>180</td><td>The Card Option trip indicates that parameter data or default difference data is being transferred from a NV Media Card to the drive, but the option module categories are different between source and destination drives. This trip does not stop the data transfer, but is a warning that the data for the option modules that are different will be set to the default values and not the values from the card. This trip also applies if a compare is attempted between the data block and the drive.
Recommended actions:
• Ensure the correct option modules are installed.
• Ensure the option modules are in the same option module slot as the parameter set stored.
• Press the red reset button to acknowledge that the parameters for one or more of the option modules installed will be at their default values
• This trip can be suppressed by setting Pr mm.000 to 9666 and resetting the drive.</td></tr>
<tr><td>Card Product</td><td>NV Media Card data blocks are not compatible with the drive derivative</td></tr>
<tr><td>175</td><td>If Drive Derivative (11.028) or Product Type (11.063) are different between the source and target drives then this trip is initiated either at power-up or when the card is accessed. It will have one of the following sub-trip numbers:
<table><tr><th>Sub-trip</th><th>Reason</th></tr><tr><td>1</td><td>If Drive Derivative (11.028) is different between the source and target drives, this trip is initiated either at power-up or when the SD Card is accessed. Data is still transferred, since this is a warning trip; the trip can be suppressed by entering code 9666 in parameter xx.000, and resetting the drive (this applies the warning suppression flag to the card).</td></tr><tr><td>2</td><td>If Product Type (11.063) is different between the source and target drives or if corruption is detected in the parameter file, this trip is initiated either at power-up or when the SD Card is accessed. This trip can be reset but no data are transferred in either direction between the drive and the card.</td></tr><tr><td>3</td><td>A Unidrive SP parameter value was found that has no equivalent parameter on the destination drive. Data is still transferred, since this is a warning trip; the trip can be suppressed by entering code 9666 in Pr xx.000, and resetting the drive (this applies the warning suppression flag to the card).</td></tr></table>Recommended actions:
• Use a different NV Media Card
• This trip can be suppressed by setting Pr mm.000 to 9666 and resetting the drive</td></tr>
<tr><td>Card Rating</td><td>NV Media Card Trip; The voltage and / or current rating of the source and destination drives are different</td></tr>
<tr><td>186</td><td>The Card Rating trip indicates that parameter data is being transferred from a NV Media Card to the drive, but the current and / or voltage ratings are different between source and destination drives. This trip also applies if a compare (using Pr mm.000 set to 8yyy) is attempted between the data block on a NV Media Card and the drive. The Card Rating trip does not stop the data transfer but is a warning that rating specific parameters with the RA attribute may not be transferred to the destination drive.
Recommended actions:
• Reset the drive to clear the trip
• Ensure that the drive rating dependent parameters have transferred correctly
• This trip can be suppressed by setting Pr mm.000 to 9666 and resetting the drive</td></tr>
<tr><td>Card Read Only</td><td>NV Media Card has the Read Only bit set</td></tr>
<tr><td>181</td><td>The Card Read Only trip indicates that an attempt has been made to modify a read-only NV Media Card or a read-only data block. A NV Media Card is read-only if the read-only flag has been set.
Recommended actions:
• Clear the read only flag by setting Pr mm.000 to 9777 and reset the drive. This will clear the read-only flag for all data blocks in the NV Media Card</td></tr>
<tr><td>Card Slot</td><td>NV Media Card Trip; Option module application program transfer has failed</td></tr>
<tr><td>174</td><td>The Card Slot trip is initiated, if the transfer of an option module application program to or from an application module failed because the option module does not respond correctly. If this happens this trip is produced with the sub-trip indicating the option module slot number.
Recommended actions:
• Ensure the source / destination option module is installed on the correct slot</td></tr>
</table>

Trip	Diagnosis
Configuration	**The number of power modules installed is different from the modules expected**
111	The *Configuration* trip indicates that the *Number Of Power Modules Detected* (11.071) does not match the previous value stored. The sub-trip value indicates the number of power modules expected. **Recommended actions:** • Ensure that all the power modules are correctly connected • Ensure all the power modules have powered up correctly • Ensure that the value in Pr **11.071** is set to the number of power modules connected • Set Pr **11.035** to 0 to disable the trip if it is not required This trip is also initiated if the number of external rectifiers connected to each power module is less than the number defined by *Number Of Rectifiers Expected* (11.096). If this is the reason for the trip the sub-trip is 10x where x is the number of external rectifiers that should be connected. **Recommended actions:** • Ensure that all the external rectifiers are connected correctly • Ensure that the value in *Number Of Rectifiers Expected* (11.096) is correct
Control Word	**Trip initiated from the *Control Word* (06.042)**
35	The Control Word trip is initiated by setting bit 12 on the control word in Pr **06.042** when the control word is enabled (Pr **06.043** = On). **Recommended actions:** • Check the value of Pr **06.042.** • Disable the control word in *Control Word Enable* (Pr **06.043**) Bit 12 of the control word set to a one causes the drive to trip on Control Word When the control word is enabled, the trip can only be cleared by setting bit 12 to zero
Current Offset	**Current feedback offset error**
225	The current feedback offset is too large to be trimmed correctly. The sub-trip relates to the output phase for which the offset error has been detected. **Sub-trip** / **Phase**: 1 – U; 2 – V; 3 – W **Recommended actions:** • Ensure that there is no possibility of current flowing in the output phases of the drive when the drive is not enabled • Hardware fault – Contact the supplier of the drive
Data Changing	**Drive parameters are being changed**
97	A user action or a file system write is active that is changing the drive parameters and the drive has been commanded to enable, i.e. *Drive Active* (10.002) = 1.The user actions that change drive parameters are loading defaults, changing drive mode, or transferring data from an NV memory card or a position feedback device to the drive. The file system actions that will cause this trip to be initiated if the drive is enabled during the transfer are writing a parameter or macro file to the drive, or transferring a derivative or user program to the drive. It should be noted that none of these actions can be started if the drive is active, and so the trip only occurs if the action is started and then the drive is enabled. **Recommended actions:** • Ensure the drive is not enabled when one of he following is being carried out Loading defaults Changing drive mode Transferring data from NV Media Card or position feedback device Transferring user programs
Derivative ID	**Derivative identification error**
247	There is a problem with the identifier associated with derivative image which customizes the drive. The reason for the trip is given by the sub-trip as follows: **Sub-trip** / **Reason**: 1 – There should be a derivative image in the product but this has been erased.; 2 – The identifier is out of range.; 3 – The derivative image has been changed. **Recommended actions:** Contact the supplier of the drive

<table>
<tr><th>Trip</th><th>Diagnosis</th></tr>
<tr><td>Derivative Image</td><td>Derivative Image error</td></tr>
<tr><td>248</td><td>The Derivative Image trip indicates that an error has been detected in the derivative image. The sub-trip number indicates the reason for the trip.
<table>
<tr><th>Sub-trip</th><th>Reason</th><th>Comments</th></tr>
<tr><td>1 to 52</td><td>An error has been detected in the derivative image, contact the supplier of the drive.</td><td></td></tr>
<tr><td>61</td><td>The option module fitted in slot 1 is not allowed with the derivative image</td><td rowspan="4">Occurs when the drive powers-up or the image is programmed. The image tasks will not run.</td></tr>
<tr><td>62</td><td>The option module fitted in slot 2 is not allowed with the derivative image</td></tr>
<tr><td>63</td><td>The option module fitted in slot 3 is not allowed with the derivative image</td></tr>
<tr><td>64</td><td>The option module fitted in slot 4 is not allowed with the derivative image</td></tr>
<tr><td>70</td><td>An option module that is required by the derivative image is not fitted in any slot</td><td rowspan="5">Occurs when the drive powers-up or the image is programmed. The image tasks will not run.</td></tr>
<tr><td>71</td><td>An option module specifically required to be fitted in slot 1 not present</td></tr>
<tr><td>72</td><td>An option module specifically required to be fitted in slot 2 not present</td></tr>
<tr><td>73</td><td>An option module specifically required to be fitted in slot 3 not present</td></tr>
<tr><td>74</td><td>An option module specifically required to be fitted in slot 4 not present</td></tr>
<tr><td>80 to 81</td><td>An error has been detected in the derivative image, contact the supplier of the drive.</td><td></td></tr>
</table>
Recommended action:
Contact the supplier of the drive</td></tr>
<tr><td>Destination</td><td>Two or more parameters are writing to the same destination parameter</td></tr>
<tr><td>199</td><td>The Destination trip indicates that destination parameters of two or more functions (Menus 3, 7, 8, 9, 12 or 14) within the drive are writing to the same parameter.
Recommended actions:
• Set Pr mm.000 to ‘Destinations’ or 12001 and check all visible parameters in all menus for parameter write conflicts</td></tr>
<tr><td>Drive Size</td><td>Power stage recognition: Unrecognized drive size</td></tr>
<tr><td>224</td><td>The Drive Size trip indicates that the control PCB has not recognized the drive size of the power circuit to which it is connected.
Recommended action:
• Ensure the drive is programmed to the latest firmware version
• Hardware fault - return drive to supplier</td></tr>
</table>

Trip	Diagnosis
EEPROM Fail	**Default parameters have been loaded**
31	The *EEPROM Fail* trip indicates that default parameters have been loaded. The exact cause/reason of the trip can be identified from the sub-trip number.

Sub-trip	Reason
1	The most significant digit of the internal parameter database version number has changed
2	The CRCs applied to the parameter data stored in internal non-volatile memory indicate that a valid set of parameters cannot be loaded
3	The drive mode restored from internal non-volatile memory is outside the allowed range for the product or the derivative image does not allow the previous drive mode
4	The drive derivative image has changed
5	The power stage hardware has changed
6	The internal I/O hardware has changed
7	The position feedback interface hardware has changed
8	The control board hardware has changed
9	The checksum on the non-parameter area of the EEPROM has failed

The drive holds two banks of user save parameters and two banks of power down save parameters in non-volatile memory. If the last bank of either set of parameters that was saved is corrupted a *User Save* or *Power Down Save* trip is produced. If one of these trips occurs the parameters values that were last saved successfully are used. It can take some time to save parameters when requested by the user and if the power is removed from the drive during this process it is possible to corrupt the data in the non-volatile memory.

If both banks of user save parameters or both banks of power down save parameters are corrupted or one of the other conditions given in the table above occurs EEPROM Fail.xxx trip is produced. If this trip occurs it is not possible to use the data that has been saved previously, and so the drive will be in lowest allowed drive mode with default parameters. The trip can only be reset if Pr **mm.000** (mm.000) is set to 10, 11, 1233 or 1244 or if *Load Defaults* (11.043) is set to a non-zero value.

Recommended actions:

- Default the drive and perform a reset
- Allow sufficient time to perform a save before the supply to the drive is removed
- If the trip persists - return drive to supplier

Encoder 1	**Drive position feedback interface power supply overload**
189	The *Encoder 1* trip indicates that the drive encoder power supply has been overloaded. Terminals 13 &14 of the 15 way D type connector can supply a maximum current of 200 mA @ 15 V or 300 mA @ 8 V and 5 V.

Recommended actions:

- Check encoder power supply wiring
- Disable the termination resistors (Pr **03.039** set to 0) to reduce current consumption
- For 5 V encoders with long cables, select 8 V (Pr **03.036**) and install a 5 V voltage regulator close to the encoder
- Check the encoder specification to confirm if it is compatible with the encoder port power supply current capability
- Replace the encoder
- Use an external power supply with higher current capability

Encoder 2	**Drive encoder (Feedback) wire break**
190	The *Encoder 2* trip indicates that the drive has detected a wire break on the 15 way D-type connector on the drive. The exact cause of the trip can be identified from the sub-trip number.

Sub-trip	Reason
1	Drive position feedback interface 1 on any input
2	Drive position feedback interface 2 on any input
11	Drive position feedback interface 1 on the A channel
12	Drive position feedback interface 1 on the B channel
13	Drive position feedback interface 1 on the Z channel

Recommended actions:

- Ensure that the position feedback device type selected in Pr **03.038** is correct for the position feedback device connected to the P1 interface on the drive.
- If wire break detection on the drive encoder input is not required, set Pr **03.040** = XXX0 to disable the Encoder 2 trip
- Check cable continuity
- Check wiring of feedback signals is correct
- Check encoder power supply is set correctly (Pr **03.036**)
- Replace encoder

Trip	Diagnosis
Encoder 3	**Phase offset incorrect while running**
191	The *Encoder 3* trip indicates that the drive has detected an incorrect UVW phase angle while running (RFC-S mode only) or SINCOS phase error. The feedback device which has caused the trip can be identified by the sub-trip number. **Sub-trip** / **Reason** 1 – Drive position feedback interface 1 2 – Drive position feedback interface 2 **Recommended actions:** • Check encoder shield connections • Ensure the encoder cable is one uninterrupted cable • Check the encoder signal for noise with an oscilloscope • Check the integrity of the encoder mechanical mounting • For a UVW servo encoder, ensure that the phase rotation of the UVW commutation signals is the same as • the phase rotation of the motor • For a SINCOS encoder, ensure that motor and incremental SINCOS connections are correct and that for forward rotation of the motor, the encoder rotates clockwise (when looking at the shaft of the encoder) • Repeat the offset measurement test
Encoder 4	**Feedback device comms failure**
192	The Encoder 4 trip indicates that the encoder communications has timed out or the communications position message transfer time is too long. This trip can also be caused due to wire break in the communication channel between the drive and the encoder. The feedback device which has caused the trip can be identified by the sub-trip number. **Sub-trip** / **Reason** 1 – Drive position feedback interface 1 2 – Drive position feedback interface 2 **Recommended actions:** • Ensure the encoder power supply setting (Pr **03.036**) is correct • Complete encoder auto-configuration (Pr **03.041**) • Check the encoder wiring • Replace the feedback device
Encoder 5	**Checksum or CRC error**
193	The *Encoder 5* trip indicates that there is a checksum or CRC error, or the SSI encoder is not ready. The Encoder 5 trip can also indicate a wire break to a communications based encoder. **Sub-trip** / **Reason** 1 – Drive position feedback interface 1 2 – Drive position feedback interface 2 **Recommended actions:** • Check the encoder cable shield connections • Ensure the cable is one uninterrupted cable - remove any connector blocks or if unavoidable minimise the length of any shield pigtails to the connector block • Check the encoder signal for noise with an oscilloscope • Check the comms resolution setting (Pr **03.035**) • If using a Hiperface, EnDat encoder carry out an encoder auto-configuration (Pr **03.041** = Enabled) • Replace the encoder
Encoder 6	**Encoder has indicated an error**
194	The *Encoder 6* trip indicates that the encoder has indicated an error or that the power supply has failed to an SSI encoder. The *Encoder 6* trip can also indicate a wire break to an SSI encoder. **Sub-trip** / **Reason** 1 – Drive position feedback interface 1 2 – Drive position feedback interface 2 **Recommended actions:** • For SSI encoders, check the wiring and encoder power supply setting (Pr **03.036**) • Replace the encoder / contact the supplier of the encoder

Trip	Diagnosis
Encoder 7	**Set-up parameters for position feedback device have changed**
195	The *Encoder 7* trip indicates that the set-up parameters for position feedback device has changed. The feedback device which has caused the trip can be identified by the sub-trip number. **Sub-trip** / **Reason** 1 – Drive position feedback interface 1 2 – Drive position feedback interface 2 **Recommended actions:** • Reset the trip and perform a save. • Ensure Pr **3.033** and Pr **03.035** are set correctly or carry out an encoder auto-configuration (Pr **03.041** = Enabled)
Encoder 8	**Position feedback interface has timed out**
196	The *Encoder 8* trip indicates that Position feedback interface communications time exceeds 250 µs. The feedback device which has caused the trip can be identified by the sub-trip number. **Sub-trip** / **Reason** 1 – Drive position feedback interface 1 2 – Drive position feedback interface 2 **Recommended actions:** • Ensure the encoder is connected correctly • Ensure that the encoder is compatible • Increase baud rate
Encoder 9	**Position feedback is selected from a option module slot which does not have a feedback option module installed**
197	The *Encoder 9* trip indicates that position feedback source selected in Pr **03.026** (or Pr **21.021** for the second motor map) is not valid **Recommended actions:** • Check the setting of Pr **03.026** (or Pr **21.021** if the second motor parameters have been enabled) • Ensure that the option slot selected in Pr **03.026** has a feedback option module installed
Encoder 12	**Encoder could not be identified during auto-configuration**
162	The *Encoder 12* trip indicates that the drive is communicating with the encoder but the encoder type is not recognized. **Sub-trip** / **Reason** 1 – Drive position feedback interface 1 2 – Drive position feedback interface 2 **Recommended actions:** • Enter the encoder setup parameters manually • Check to see the encoder supports auto-configuration
Encoder 13	**Data read from the encoder is out of range during auto-configuration**
163	The *Encoder 13* trip indicates that the data read from the encoder was out of the range during auto-configuration. No parameters will be modified with the data read from the encoder as a result of auto configuration. The tens in the sub-trip number indicate the interface number (i.e. 1 for P1 interface and 2 for P2 interface). **Sub-trip** / **Reason** x1 – Rotary lines per revolution error x2 – Linear comms pitch error x3 – Linear line pitch error x4 – Rotary turns bits error x5 – Communications bits error x6 – Calculation time is too long x7 – Line delay measured is longer than 5 µs **Recommended actions:** • Enter the encoder setup parameters manually • Check to see the encoder supports auto-configuration

Trip	Diagnosis
Encoder 14	**The data given in the additional configuration parameter for a position feedback interface is out of range**
164	The Encoder 14 trip indicates that the data given in the additional configuration parameter for a position feedback interface is out of range. If the sub-trip number is one then the data is out of range in *P1 Additional Configuration* (03.074), or if the sub-trip number is 2 the data is out of range in *P2 Additional Configuration* (03.174). Not all position feedback devices use the additional configuration, but those that do are listed below. **BiSS** Range checking is applied to the turns padding (decimal digits 5-3) and position padding (decimal digits 2-0). If these give a padding value outside +/-16 then the trip is initiated. Note that in each case the most significant digit indicates left (0) or right (1) padding, and the least significant 2 digits indicate the number of bits
External Trip	**An External trip is initiated**
6	An *External Trip* has occurred. The cause of the trip can be identified from the sub trip number displayed after the trip string. See table below. An external trip can also be initiated by writing a value of 6 in Pr **10.038**. **Sub-trip** / **Reason** 1 – *External Trip Mode* (08.010) = 1 or 3 and Safe Torque Off input 1 is low 2 – *External Trip Mode* (08.010) = 2 or 3 and Safe Torque Off input 2 is low 3 – *External Trip* (10.032) = 1 **Recommended actions:** • Check the Safe Torque Off signal voltage (on terminal 31 on *Unidrive M700 / M701* and terminal 11 & 13 on *Unidrive M702*) equals to 24 V. • Check the value of Pr **08.009** which indicates the digital state of terminal 31 on *Unidrive M700 / M701* and terminal 11 & 13 on *Unidrive M702*, equates to 'on'. • If external trip detection of the Safe Torque Off input is not required, set Pr **08.010** to OFF (0). • Check the value of Pr **10.032**. • Select 'Destinations' (or enter 12001) in Pr **mm.000** and check for a parameter controlling Pr **10.032**. • Ensure Pr **10.032** or Pr **10.038** (= 6) is not being controlled by serial comms
HF01	**Data processing error: CPU address error**
	The *HF01* trip indicates that a CPU address error has occurred. This trip indicates that the control PCB on the drive has failed. **Recommended actions:** • Hardware fault – Contact the supplier of the drive
HF02	**Data processing error: DMAC address error**
	The *HF02* trip indicates that a DMAC address error has occurred. This trip indicates that the control PCB on the drive has failed. **Recommended actions:** • Hardware fault – Contact the supplier of the drive
HF03	**Data processing error: Illegal instruction**
	The *HF03* trip indicates that an illegal instruction has occurred. This trip indicates that the control PCB on the drive has failed. **Recommended actions:** • Hardware fault – Contact the supplier of the drive
HF04	**Data processing error: Illegal slot instruction**
	The *HF04* trip indicates that an illegal slot instruction has occurred.This trip indicates that the control PCB on the drive has failed. **Recommended actions:** • Hardware fault – Contact the supplier of the drive
HF05	**Data processing error: Undefined exception**
	The *HF05* trip indicates that an undefined exception error has occurred. This trip indicates that the control PCB on the drive has failed. **Recommended actions:** • Hardware fault – Contact the supplier of the drive
HF06	**Data processing error: Reserved exception**
	The *HF06* trip indicates that a reserved exception error has occurred. This trip indicates that the control PCB on the drive has failed. **Recommended actions:** • Hardware fault – Contact the supplier of the drive

Trip	Diagnosis
HF07	**Data processing error: Watchdog failure**
	The *HF07* trip indicates that a watchdog failure has occurred. This trip indicates that the control PCB on the drive has failed. **Recommended actions:** • Hardware fault – Contact the supplier of the drive
HF08	**Data processing error: CPU Interrupt crash**
	The *HF08* trip indicates that a CPU interrupt crash has occurred. This trip indicates that the control PCB on the drive has failed. **Recommended actions:** • Hardware fault – Contact the supplier of the drive
HF09	**Data processing error: Free store overflow**
	The *HF09* trip indicates that a free store overflow has occurred. This trip indicates that the control PCB on the drive has failed. **Recommended actions:** • Hardware fault – Contact the supplier of the drive
HF10	**Data processing error: Parameter routing system error**
	The *HF10* trip indicates that a Parameter routing system error has occurred. This trip indicates that the control PCB on the drive has failed. **Recommended actions:** • Hardware fault – Contact the supplier of the drive
HF11	**Data processing error: Access to EEPROM failed**
	The *HF11* trip indicates that access to the drive EEPROM has failed. This trip indicates that the control PCB on the drive has failed. **Recommended actions:** • Hardware fault – Contact the supplier of the drive
HF12	**Data processing error: Main program stack overflow**
	The *HF12* trip indicates that the main program stack over flow has occurred. The stack can be identified by the sub-trip number. This trip indicates that the control PCB on the drive has failed. **Sub-trip** / **Stack** 1 – Background tasks 2 – Timed tasks 3 – Main system interrupts **Recommended actions:** • Hardware fault – Contact the supplier of the drive
HF13	**Data processing error: Firmware incompatible with hardware**
	The *HF13* trip indicates that the drive firmware is not compatible with the hardware. This trip indicates that the control PCB on the drive has failed. The sub-trip number gives the actual ID code of the control board hardware. **Recommended actions:** • Re-program the drive with the latest version of the drive firmware for *Unidrive M700 / M701 / M702* • Hardware fault – Contact the supplier of the drive
HF14	**Data processing error: CPU register bank error**
	The *HF14* trip indicates that a CPU register bank error has occurred. This trip indicates that the control PCB on the drive has failed. **Recommended actions:** • Hardware fault – Contact the supplier of the drive
HF15	**Data processing error: CPU divide error**
	The *HF15* trip indicates that a CPU divide error has occurred. This trip indicates that the control PCB on the drive has failed. **Recommended actions:** • Hardware fault – Contact the supplier of the drive
HF16	**Data processing error: RTOS error**
	The *HF16* trip indicates that a RTOS error has occurred. This trip indicates that the control PCB on the drive has failed. **Recommended actions:** • Hardware fault – Contact the supplier of the drive

Trip	Diagnosis
HF17	**Data processing error: Clock supplied to the control board is out of specification**
	The *HF17* trip indicates that the clock supplied to the control board logic is out of specification. This trip indicates that the control PCB on the drive has failed. **Recommended actions:** • Hardware fault – Contact the supplier of the drive
HF18	**Data processing error: Internal flash memory has failed**
	The *HF18* trip indicates that the internal flash memory has failed when writing option module parameter data. The reason for the trip can be identified by the sub-trip number. **Sub-trip** / **Reason** 1 – Programming error while writing menu in flash 2 – Erase flash block containing setup menus failed 3 – Erase flash block containing application menus failed **Recommended actions:** • Hardware fault - Contact the supplier of the drive.
HF19	**Data processing error: CRC check on the firmware has failed**
	The *HF19* trip indicates that the CRC check on the drive firmware has failed. **Recommended actions:** • Re-program the drive • Hardware fault - Contact the supplier of the drive
HF20	**Data processing error: ASIC is not compatible with the hardware**
	The *HF20* trip indicates that the ASIC version is not compatible with the drive firmware. The ASIC version can be identified from the sub-trip number. **Recommended actions:** • Hardware fault - Contact the supplier of the drive
HF23 to HF25	**Hardware fault**
	Recommended actions: • If this trip occurs please consult the drive supplier.

Trip	Diagnosis
Inductance	**Inductance measurement out of range or motor saturation not detected**
8	This trip occurs in RFC-S mode when the drive has detected that the motor inductances are not suitable for the operation being attempted. The trip is either caused because the ratio or difference between Ld and Lq is too small or because the saturation characteristic of the motor cannot be measured. If the inductance ratio or difference is too small this is because one of the following conditions is true: (*No-load Lq* (05.072)- *Ld* (05.024)) / *Ld* (05.024) < 0.1 (*No-load Lq* (05.072) - *Ld* (05.024)) < (K / *Full Scale Current Kc* (11.061))H where: **_Drive Rated voltage_ (11.033)** / **K**: 200 V / 0.0073; 400 V / 0.0146; 575 V / 0.0174; 690 V / 0.0209 If the saturation characteristic of the motor cannot be measured this is because when the flux in the motor is changed the measured value of Ld does change sufficiently due to saturation to be measured. When half of *Rated Current* (05.007) is applied in the d axis of the motor in each direction the inductance must fall change at least (K / (2 x *Full Scale Current Kc* (11.061)). The specific reasons for each of the sub-trips are given in the table below: **Sub-trip** / **Reason**: 1 — The inductance ratio or difference is too small when the drive has been started in sensorless mode. 2 — The saturation characteristic of the motor cannot be measured when the drive has been started in sensorless mode. 3 — The inductance ratio or difference is too small when an attempt is made to determine the location of the motor flux during a stationary auto-tune in RFC-S mode. This trip is also produced when the inductance ratio or inductance difference is too small when carrying out a phasing test on starting in RFC-S mode. If position feedback is being used the measured value for *Position Feedback Phase Angle* (03.025) may not be reliable. Also the measured values of *Ld* (05.024) and *No-load Lq* (05.072) may not correspond to the d and q axis respectively. 4 — The direction of the flux in the motor is detected by the change of inductance with different currents. This trip is initiated if the change cannot be detected when an attempt is made to perform a stationary auto-tune when position feedback is being used, or to perform a phasing test on starting in RFC-S mode. **Recommended actions for sub-trip 1:** • Ensure that *RFC Low Speed Mode* (05.064) is set to Non-salient (1), Current (2) or Current No test (3). **Recommended actions for sub-trip 2:** • Ensure that *RFC Low Speed Mode* (05.064) is set to Non-salient (1), Current (2) or Current No test (3). **Recommended actions for sub-trip 3:** • None. The trip acts as a warning. **Recommended actions for sub-trip 4:** • Stationary autotune is not possible. Perform a minimal movement or rotating autotune. • Phasing test on starting is not possible. Use a position feedback device with commutation signals or absolute position.
Inductor Too Hot	**The regen inductor has overloaded**
93	In Regen mode, this trip indicates a regen inductor thermal overload based on the *Rated Current* (Pr **05.007**) and the *Inductor Thermal Time Constant* (Pr **04.015**). Pr **04.019** displays the inductor temperature as a percentage of the maximum value. The drive will trip on *Inductor Too Hot* when Pr **04.019** gets to 100 %. **Recommended actions:** • Check the load / current through the inductor has not changed. • Ensure the *Rated Current* (Pr **05.007**) is not zero.
Inter-connect	**Multi-Power module drive interconnection cable error**
103	The Inter-connect trip indicates a multi-power module drive interconnection cable error. The sub-trip "xx.0.00" indicates which power module has detected the fault where xx is the power module number. It should be noted that this trip is also initiated if the communication fails either when a rectifier signals a fault or a trip is reset. In this case, the sub-trip is the number of modules that are still communicating correctly.

Trip	Diagnosis
I/O Overload	**Digital output overload**
26	The *I/O Overload* trip indicates that the total current drawn from 24 V user supply or from the digital output has exceeded the limit. A trip is initiated if one or more of the following conditions: • Maximum output current from one digital output is 100 mA. • The combined maximum output current from outputs 1 and 2 is 100 mA • The combined maximum output current from output 3 and +24 V output is 100 mA **Recommended actions:** • Check total loads on digital outputs • Check control wiring is correct • Check output wiring is undamaged
Island	**Island condition detected in regen mode**
160	The *Island* trip indicates that the AC mains is no longer present and the inverter would be an 'islanded' power supply if it continued to operate. The sub-trip indicates the reason for the trip. **Sub-trip** / **Description** 1 – Island detection system has been enabled and detected an island condition 2 – The minimum synchronization voltage is non-zero and the supply voltage has been below this threshold and been simulating its own supply synchronization for more than 2.0 s. **Recommended actions:** • Check the supply / supply connections to the regen drive
Keypad Mode	**Keypad has been removed when the drive is receiving the speed reference from the keypad**
34	The *Keypad Mode* trip indicates that the drive is in keypad mode [*Reference Selector* (01.014) = 4 or 6 or M2 reference selector (21.003 = 4 or 6 if motor map 2 is selected] and the keypad has been removed or disconnected from the drive. **Recommended actions:** • Re-install keypad and reset • Change *Reference Selector* (01.014) to select the reference from another source
Line Sync	**Synchronization to the power supply has been lost**
39	The *Line Sync* trip indicates that the inverter has lost the synchronization with the ac supply in Regen mode. **Recommended actions:** • Check the supply / supply connections to the regen drive
Low Load	**The load on the drive has fallen below the low load detection level**
38	When the low load detector is active, the low load condition is detected when the *Percentage Load* (Pr **04.020**) falls below the threshold defined by the *Low Load Detection Level* (Pr **04.027**). *Enable Trip On Low Load* (Pr **04.029**) defines the action taken when low load is detected. If *Enable Trip On Low Load* (Pr **04.029**) = 0, a Low Load warning is displayed and *Low Load Detected Alarm* (Pr **10.062**) = 1. If *Enable Trip On Low Load* (Pr **04.029**) = 1 no warning is given, but a Low Load trip is initiated. **Recommended actions:** • Check the load on the motor has not changed
Motor Too Hot	**Output current overload timed out (I^2t)**
20	The *Motor Too Hot* trip indicates a motor thermal overload based on the *Rated Current* (Pr **05.007**) and *Motor Thermal Time Constant* (Pr **04.015**). Pr **04.019** displays the motor temperature as a percentage of the maximum value. The drive will trip on *Motor Too Hot* when Pr **04.019** gets to 100 %. **Recommended actions:** • Ensure the load is not jammed / sticking • Check the load on the motor has not changed • If seen during an auto-tune test in RFC-S mode, ensure the motor *Rated Current* in Pr **05.007** is ≤ Heavy duty current rating of the drive • Tune the *Rated Speed* (Pr **05.008**) (RFC-A mode only) • Check feedback signal for noise • Ensure the motor rated current is not zero • This trip can be disabled and current limiting activated on the motor overload by setting thermal protection mode Pr **04.016** to 1.

<table>
<tr><th>Trip</th><th>Diagnosis</th></tr>
<tr><td>Name Plate</td><td>Electronic nameplate transfer has failed</td></tr>
<tr><td>176</td><td>The Name Plate trip is initiated if an electronic name plate transfer between the drive and the motor has failed. The exact reason for the trip can be identified from the sub-trip number.
<table>
<tr><th>Sub-trip</th><th>Reason</th></tr>
<tr><td>1</td><td>Not enough memory space to complete the transfer</td></tr>
<tr><td>2</td><td>Communication with encoder failed</td></tr>
<tr><td>3</td><td>The transfer has failed</td></tr>
<tr><td>4</td><td>The checksum of the stored object has failed</td></tr>
</table>
Recommended actions:
• Ensure that the device encoder memory has at least 128 bytes to store the nameplate data
• When writing the motor object (Pr mm.000 = 11000), ensure that the device encoder memory has at least 256 bytes to store all the nameplate data.
• When transferring between option module and encoder, ensure that the option slot has a feedback option module installed.
• Check if the encoder has been initialized in Position Feedback Initialized (03.076).
• Verify the encoder wiring.</td></tr>
<tr><td>OHt Brake</td><td>Braking IGBT over-temperature</td></tr>
<tr><td>101</td><td>The OHt Brake over-temperature trip indicates that braking IGBT over-temperature has been detected based on software thermal model.
Recommended actions:
• Check braking resistor value is greater than or equal to the minimum resistance value</td></tr>
<tr><td>OHt Control</td><td>Control stage over temperature</td></tr>
<tr><td>23</td><td>This OHt Control trip indicates that a control stage over-temperature has been detected. From the sub-trip ‘xxyzz’, the Thermistor location is identified by ‘zz’.
<table>
<tr><th>Source</th><th>xx</th><th>y</th><th>zz</th><th>Description</th></tr>
<tr><td>Control system</td><td>00</td><td>0</td><td>01</td><td>Control board thermistor 1 over temperature</td></tr>
<tr><td>Control system</td><td>00</td><td>0</td><td>02</td><td>Control board thermistor 2 over temperature</td></tr>
<tr><td>Control system</td><td>00</td><td>0</td><td>03</td><td>I/O board thermistor over temperature</td></tr>
</table>
Recommended actions:
• Check enclosure / drive fans are still functioning correctly
• Check enclosure ventilation paths
• Check enclosure door filters
• Increase ventilation
• Reduce the drive switching frequency
• Check ambient temperature</td></tr>
</table>

Trip	Diagnosis
OHt dc bus	**DC bus over temperature**
27	The *OHt dc bus* trip indicates a DC bus component over temperature based on a software thermal model. The drive includes a thermal protection system to protect the DC bus components within the drive. This includes the effects of the output current and DC bus ripple. The estimated temperature is displayed as a percentage of the trip level in Pr **07.035**. If this parameter reaches 100 % then an *OHt dc bus* trip with sub-trip 200 is initiated. The drive will attempt to stop the motor before tripping. If the motor does not stop in 10 seconds the drive trips immediately. **Source** | **xx** | **y** | **zz** | **Description** Control system | 00 | 2 | 00 | DC bus thermal model gives trip with sub-trip 0 It is also possible in a multi-power module system for DC bus over-temperature to be detected from within the power stage. From this source the estimated temperature as a percentage of trip is not available and the trip is indicated as follows: **Source** | **xx** | **y** | **zz** | **Description** Control system | 01 | 0 | 00 | Power stage gives trip with sub-trip 0 **Recommended actions:** • Check the AC supply voltage balance and levels • Check DC bus ripple level • Reduce duty cycle • Reduce motor load • Check the output current stability. If unstable; Check the motor map settings with motor nameplate (Pr **05.006**, Pr **05.007**, Pr **05.008**, Pr **05.009**, Pr **05.010**, Pr **05.011**) – (All Modes) Disable slip compensation (Pr **05.027** = 0) – (Open loop) Disable dynamic V to F operation (Pr **05.013** = 0) - (Open loop) Select fixed boost (Pr **05.014** = Fixed) – (Open loop) Select high stability space vector modulation (Pr **05.020** = 1) – (Open loop) Disconnect the load and complete a rotating auto-tune (Pr **05.012**) – (RFC-A, RFC-S) Auto-tune the rated speed value (Pr **05.016** = 1) – (RFC-A, RFC-S) Reduce speed loop gains (Pr **03.010**, Pr **03.011**, Pr **03.012**) – (RFC-A, RFC-S) Add a speed feedback filter value (Pr **03.042)** – (RFC-A, RFC-S) Add a current demand filter (Pr **04.012**) – (RFC-A, RFC-S) Check encoder signals for noise with an oscilloscope (RFC-A, RFC-S) Check encoder mechanical coupling - (RFC-A, RFC-S)
OHt Inverter	**Inverter over temperature based on thermal model**
21	This trip indicates that an IGBT junction over-temperature has been detected based on a software thermal model. The sub-trip indicates which model has initiated the trip in the form xxyzz as given below: **Source** | **xx** | **y** | **zz** | **Description** Control system | 00 | 1 | 00 | Inverter thermal model Control system | 00 | 3 | 00 | Braking IGBT thermal model **Recommended actions with sub-trip 100:** • Reduce the selected drive switching frequency • Ensure *Auto-switching Frequency Change Disable* (05.035) is set to Off • Reduce duty cycle • Increase acceleration / deceleration rates • Reduce motor load • Check DC bus ripple • Ensure all three input phases are present and balanced **Recommended actions with sub-trip 300:** • Reduce the braking load

<table>
<tr><th>Trip</th><th>Diagnosis</th></tr>
<tr><td>OHt Power</td><td>Power stage over temperature</td></tr>
<tr><td>22</td><td>
This trip indicates that a power stage over-temperature has been detected. From the sub-trip ‘xxyzz’, the Thermistor location which is indicating the over-temperature is identified by ‘zz’.The thermistor numbering is different for a single module type drive (i.e. no parallel board fitted) and a multi-module type drive (i.e. parallel board fitted with one or more power modules) as shown below:
Single module type drive:
<table>
<tr><th>Source</th><th>xx</th><th>y</th><th>zz</th><th>Description</th></tr>
<tr><td>Power system</td><td>01</td><td>0</td><td>zz</td><td>Thermistor location defined by zz in the power board</td></tr>
<tr><td>Power system</td><td>01</td><td>Rectifier number</td><td>zz</td><td>Thermistor location defined by zz in the rectifier</td></tr>
</table>
Multi-module type system:
<table>
<tr><th>Source</th><th>xx</th><th>y</th><th>zz</th><th>Description</th></tr>
<tr><td>Power system</td><td>power module number</td><td>0</td><td>01</td><td>U phase power device</td></tr>
<tr><td>Power system</td><td>power module number</td><td>0</td><td>02</td><td>V phase power device</td></tr>
<tr><td>Power system</td><td>power module number</td><td>0</td><td>03</td><td>W phase power device</td></tr>
<tr><td>Power system</td><td>power module number</td><td>0</td><td>04</td><td>Rectifier</td></tr>
<tr><td>Power system</td><td>power module number</td><td>0</td><td>05</td><td>General power system</td></tr>
<tr><td>Power system</td><td>power module number</td><td>0</td><td>00</td><td>Braking IGBT</td></tr>
</table>
Note that the power module that has caused the trip cannot be identified except for the braking IGBT temperature measurement
Recommended actions:
• Check enclosure / drive fans are still functioning correctly
• Force the heatsink fans to run at maximum speed
• Check enclosure ventilation paths
• Check enclosure door filters
• Increase ventilation
• Reduce the drive switching frequency
• Reduce duty cycle
• Increase acceleration / deceleration rates
• Use S ramp (Pr 02.006)
• Reduce motor load
• Check the derating tables and confirm the drive is correctly sized for the application.
• Use a drive with larger current / power rating
</td></tr>
<tr><td>OI ac</td><td>Instantaneous output over current detected</td></tr>
<tr><td>3</td><td>
The instantaneous drive output current has exceeded VM_DRIVE_CURRENT[MAX]. This trip cannot be reset until 10 s after the trip was initiated.
<table>
<tr><th>Source</th><th>xx</th><th>y</th><th>zz</th><th>Description</th></tr>
<tr><td>Control system</td><td>00</td><td>0</td><td rowspan="2">00</td><td rowspan="2">Instantaneous over-current trip when the measured AC current exceeds VM_DRIVE_CURRENT[MAX].</td></tr>
<tr><td>Power system</td><td>Power module number</td><td>0</td></tr>
</table>
Recommended actions:
• Acceleration/deceleration rate is too short
• If seen during auto-tune reduce the voltage boost
• Check for short circuit on the output cabling
• Check integrity of the motor insulation using an insulation tester
• Check feedback device wiring
• Check feedback device mechanical coupling
• Check feedback signals are free from noise
• Is motor cable length within limits for the frame size
• Reduce the values in the speed loop gain parameters - (Pr 03.010, 03.011, 03.012) or (Pr 03.013, 03.014, 03.015)
• Has the phase angle autotune been completed? (RFC-S mode only)
• Reduce the values in current loop gain parameters (RFC-A, RFC-S modes only)
</td></tr>
</table>

<table>
<tr><th>Trip</th><th>Diagnosis</th></tr>
<tr><td>OI Brake</td><td>Braking IGBT over current detected: short circuit protection for the braking IGBT activated</td></tr>
<tr><td>4</td><td>The OI Brake trip indicates that over current has been detected in braking IGBT or braking IGBT protection has been activated.This trip cannot be reset until 10 s after the trip was initiated.
<table>
<tr><th>Source</th><th>xx</th><th>y</th><th>zz</th><th>Description</th></tr>
<tr><td>Power system</td><td>Power module number</td><td>0</td><td>00</td><td>Braking IGBT instantaneous over-current trip</td></tr>
</table>
Recommended actions:
• Check brake resistor wiring
• Check braking resistor value is greater than or equal to the minimum resistance value
• Check braking resistor insulation</td></tr>
<tr><td>OI dc</td><td>Power module over current detected from IGBT on state voltage monitoring</td></tr>
<tr><td>109</td><td>The OI dc trip indicates that the short circuit protection for the drive output stage has been activated. The table below shows where the trip has been detected. This trip cannot be reset until 10 s after the trip was initiated.
<table>
<tr><th>Source</th><th>xx</th><th>y</th><th>zz</th></tr>
<tr><td>Control system</td><td>00</td><td>0</td><td>00</td></tr>
<tr><td>Power system</td><td>Power module number</td><td>0</td><td>00</td></tr>
</table>
Recommended actions:
• Disconnect the motor cable at the drive end and check the motor and cable insulation with an insulation tester
• Replace the drive</td></tr>
<tr><td>Option Disable</td><td>Option module does not acknowledge during drive mode changeover</td></tr>
<tr><td>215</td><td>The Option Disable trip indicates that the option module did not acknowledge to the drive that communications with the drive has been stopped during the drive mode changeover with in the allocated time.
Recommended trip:
• Reset the trip
• If the trip persists, replace the option module</td></tr>
<tr><td>Out Phase Loss</td><td>Output phase loss detected</td></tr>
<tr><td>98</td><td>The Out Phase Loss trip indicates that phase loss has been detected at the drive output.
<table>
<tr><th>Sub-trip</th><th>Reason</th></tr>
<tr><td>1</td><td>U phase detected as disconnected when drive enabled to run.</td></tr>
<tr><td>2</td><td>V phase detected as disconnected when drive enabled to run.</td></tr>
<tr><td>3</td><td>W phase detected as disconnected when drive enabled to run.</td></tr>
<tr><td>4</td><td>Output phase loss detected when the drive is running.</td></tr>
</table>
NOTE
If Pr 05.042 = 1 the physical output phases are reversed, and so sub-trip 3 refers to physical output phase V and sub-trip 2 refers to physical output phase W.
Recommended actions:
• Check motor and drive connections
• To disable the trip set Output Phase Loss Detection Enable (06.059) = 0</td></tr>
<tr><td>Over Speed</td><td>Motor speed has exceeded the over speed threshold</td></tr>
<tr><td>7</td><td>In open loop mode, if the Output Frequency (05.001) exceeds the threshold set in Over Speed Threshold (03.008) in either direction an Over Speed trip is produced. In RFC-A and RFC-S mode, if the Speed Feedback (03.002) exceeds the Over Speed Threshold in Pr 03.008 in either direction an Over Speed trip is produced. If Pr 03.008 is set to 0.0 the threshold is then equal to 1.2 x the value set in Pr 01.006.
In RFC-A and RFC-S mode, if an SSI encoder is being used and Pr 03.047 is set to 0 an Over Speed trip will be produced when the encoder passes through the boundary between its maximum position and zero.
Recommended actions:
• Check the motor is not being driven by another part of the system
• Reduce the Speed Controller Proportional Gain (03.010) to reduce the speed overshoot (RFC-A, RFC-S modes only)
• If an SSI encoder is being used set Pr 03.047 to 1
The above description relates to a standard Over Speed trip, however in RFC-S mode it is possible to produce an Over Speed.1 trip. This is caused if the speed is allowed to exceed the safe level in RFC-S mode with flux weakening when Enable High Speed Mode (05.022) is set to -1.</td></tr>
</table>

Trip	Diagnosis
Over Volts	**DC bus voltage has exceeded the peak level or maximum continuous level for 15 seconds**
2	The *Over Volts* trip indicates that the DC bus voltage has exceeded the VM_DC_VOLTAGE[MAX] or VM_DC_VOLTAGE_SET[MAX] for 15 s. The trip threshold varies depending on voltage rating of the drive as shown below. **Voltage rating / VM_DC_VOLTAGE[MAX] / VM_DC_VOLTAGE_SET[MAX]** 200 / 415 / 410 400 / 830 / 815 575 / 990 / 970 690 / 1190 / 1175 **Sub-trip Identification** **Source / xx / y / zz** Control system / 00 / 0 / 01: Instantaneous trip when the DC bus voltage exceeds VM_DC_VOLTAGE[MAX]. Control system / 00 / 0 / 02: Time delayed trip indicating that the DC bus voltage is above VM_DC_VOLTAGE_SET[MAX]. **Recommended actions:** • Increase deceleration ramp (Pr **00.004**) • Decrease the braking resistor value (staying above the minimum value) • Check nominal AC supply level • Check for supply disturbances which could cause the DC bus to rise • Check motor insulation using an insulation tester
Phase Loss	**Supply phase loss**
32	The Phase Loss trip indicates that the drive has detected an input phase loss or large supply imbalance. Phase loss can be detected directly from the supply where the drive has a thyristor base charge system (Frame size 8 and above). If phase loss is detected using this method the drive trips immediately and the xx part of the sub-trip is set to 01. In all sizes of drive phase loss is also detected by monitoring the ripple in the DC bus voltage in which case the drive attempts to stop the drive before tripping unless bit 2 of *Action On Trip Detection* (10.037) is set to one. When phase loss is detected by monitoring the ripple in the DC bus voltage the xx part of the sub-trip is zero. **Source / xx / y / zz** Control system / 00 / 0 / 00: Phase loss detected from DC bus ripple Power system (1) / Power module number / Rectifier number (2) / 00: Phase loss detected directly from the supply (1) Input phase loss detection can be disabled when the drive required to operate from the DC supply or from a single phase supply in *Input Phase Loss Detection Mode* (06.047). (2) For a parallel power-module system the rectifier number will be one as it is not possible to determine which rectifier has detected the fault. This trip does not occur in regen mode. **Recommended actions:** • Check the AC supply voltage balance and level at full load • Check the DC bus ripple level with an isolated oscilloscope • Check the output current stability • Check for mechanical resonance with the load • Reduce the duty cycle • Reduce the motor load • Disable the phase loss detection, set Pr **06.047** to 2.
Phasing Error	**RFC-S mode phasing failure due to incorrect phase angle**
198	The *Phasing Error* trip indicates that the phase offset angle in Pr **03.025** (or Pr **21.020** if the second motor map is being used) is incorrect if position feedback is being used and the drive is unable to control the motor correctly. **Recommended actions:** • Check the encoder wiring • Check the encoder signals for noise with an oscilloscope • Check the encoder mechanical coupling • Perform an auto-tune to measure the encoder phase angle or manually enter the correct phase angle into Pr **03.025** • Spurious *Phasing Error* trips can sometimes be seen in very dynamic applications. This trip can be disabled by setting the over-speed threshold in Pr **03.008** to a value greater than zero. If sensorless control is being used this indicates that significant instability has occurred and the motor has accelerated without control. **Recommended actions:** • Ensure that the motor parameters are set-up correctly. • Reduce the speed controller gains.

<table>
<tr><th>Trip</th><th>Diagnosis</th></tr>
<tr><td>Power Comms</td><td>Communication has been lost / errors detected between power, control and rectifier modules</td></tr>
<tr><td>90</td><td>A Power Comms trip indicates a communications problem within the power system of the drive. The reason for the trip can be identified by the sub-trip number.
<table>
<tr><th>Type of drive</th><th>xx</th><th>y</th><th>zz</th></tr>
<tr><td>Single power module system</td><td>01</td><td>Rectifier number*</td><td>00: Excessive communications errors detected by the rectifier module.</td></tr>
</table>
* For a parallel power-module system the rectifier number will be one as it is not possible to determine which rectifier has detected the fault.
Recommended actions:
• Hardware fault – Contact the supplier of the drive</td></tr>
<tr><td>Power Data</td><td>Power system configuration data error</td></tr>
<tr><td>220</td><td>The Power Data trip indicates that there is an error in the configuration data stored in the power system.
<table>
<tr><th>Source</th><th>xx</th><th>y</th><th>zz</th><th>Description</th></tr>
<tr><td>Control system</td><td>00</td><td>0</td><td>02</td><td>There is no data table to be uploaded to the control board</td></tr>
<tr><td>Control system</td><td>00</td><td>0</td><td>03</td><td>The power system data table is bigger than the space available in the control pod to store it.</td></tr>
<tr><td>Control system</td><td>00</td><td>0</td><td>04</td><td>The size of the table given in the table is incorrect.</td></tr>
<tr><td>Control system</td><td>00</td><td>0</td><td>05</td><td>Table CRC error.</td></tr>
<tr><td>Control system</td><td>00</td><td>0</td><td>06</td><td>The version number of the generator software that produced the table is too low. i.e. a table from a newer generator is required that includes features that have been added to the table that may not be present.</td></tr>
<tr><td>Control system</td><td>00</td><td>0</td><td>07</td><td>The power board data table does not match the power board hardware identifier.</td></tr>
<tr><td>Power system</td><td>01</td><td>0</td><td>00</td><td>The power data table used internally by the power module has an error. (For a multi-power module drive this indicates any error with the code tables in the power system).</td></tr>
<tr><td>Power system</td><td>01</td><td>0</td><td>01</td><td>The power data table that should be uploaded to the control system on power up has an error.</td></tr>
<tr><td>Power system</td><td>01</td><td>0</td><td>02</td><td>The power data table used internally by the power module does not match the hardware identification of the power module.</td></tr>
</table>
Recommended actions:
• Hardware fault – Contact the supplier of the drive</td></tr>
<tr><td>Power Down Save</td><td>Power down save error</td></tr>
<tr><td>37</td><td>The Power Down Save trip indicates that an error has been detected in the power down save parameters saved in non-volatile memory.
Recommended actions:
• Perform a 1001 save in Pr mm.000 to ensure that the trip doesn’t occur the next time the drive is powered up.</td></tr>
<tr><td>PSU</td><td>Internal power supply fault</td></tr>
<tr><td>5</td><td>The PSU trip indicates that one or more internal power supply rails are outside limits or overloaded.
<table>
<tr><th>Source</th><th>xx</th><th>y</th><th>zz</th><th>Description</th></tr>
<tr><td>Control system</td><td>00</td><td>0</td><td rowspan="2">00</td><td>Internal power supply overload</td></tr>
<tr><td>Power system</td><td>Power module number</td><td>Rectifier number*</td><td>Rectifier internal power supply overload</td></tr>
</table>
* For a parallel power-module system the rectifier number will be zero as it is not possible to determine which rectifier has detected the fault.
Recommended actions:
• Remove any option modules and perform a reset
• Remove encoder connection and perform a reset
• Hardware fault within the drive – return the drive to the supplier</td></tr>
</table>

<table>
<tr><th>Trip</th><th>Diagnosis</th></tr>
<tr><td>PSU 24V</td><td>24V internal power supply overload</td></tr>
<tr><td>9</td><td>The total user load of the drive and option modules has exceeded the internal 24 V power supply limit. The user load consists of the drive digital outputs and main encoder supply.
Recommended actions:
• Reduce the load and reset
• Provide an external 24 V power supply on control terminal 2
• Remove all option modules</td></tr>
<tr><td>Rating Mismatch</td><td>Power stage recognition: Multi module voltage or current rating mismatch</td></tr>
<tr><td>223</td><td>The Rating Mismatch trip indicates that there is a voltage rating or current rating mismatch in a multi-module drive system. This trip is only applicable to modular drives that are connected in parallel. A mixture of power modules with different voltage or current ratings within the same multi-module drive system is not allowed and will cause a Rating Mismatch trip.
Recommended action:
• Ensure that all modules in a multi-modular drive system are of the same frame size and rating (voltage and current)
• Hardware fault – Contact the supplier of the drive</td></tr>
<tr><td>Rectifier Set-up</td><td>A rectifier has not been set-up correctly in a multi-power module system</td></tr>
<tr><td>94</td><td>A rectifier has not been set-up correctly in a multi-power module system
Recommended action:
• Check the inter-power module wiring</td></tr>
<tr><td>Reserved</td><td>Reserved trips</td></tr>
<tr><td>01
95
104 – 108
165 – 168
170 – 173
222, 228 - 246</td><td>These trip numbers are reserved trip numbers for future use. These trips should not be used by the user application programs.
<table>
<tr><th>Trip Number</th><th>Description</th></tr>
<tr><td>01</td><td>Reserved resettable trip</td></tr>
<tr><td>95</td><td>Reserved resettable trip</td></tr>
<tr><td>104 - 108</td><td>Reserved resettable trip</td></tr>
<tr><td>165 - 168</td><td>Reserved resettable trip</td></tr>
<tr><td>170 - 173</td><td>Reserved resettable trip</td></tr>
<tr><td>222, 228 - 246</td><td>Reserved non-resettable trip</td></tr>
</table></td></tr>
<tr><td>Resistance</td><td>Measured resistance has exceeded the parameter range</td></tr>
<tr><td>33</td><td>This trip indicates that either the value being used for motor stator resistance is too high or that an attempt to do a test involving measuring motor stator resistance has failed. The maximum for the stator resistance parameters is generally higher than the maximum value that can be used in the control algorithms. If the value exceeds (V_{FS} / v2) / Full Scale Current Kc (11.061), where V_{FS} is the full scale DC bus voltage then this trip is initiated. If the value is the result of a measurement made by the drive then sub-trip 1 is applied, or if it is because the parameter has been changed by the user then sub-trip 3 is applied. During the stator resistance section of auto-tuning an additional test is performed to measured the drive inverter characteristics to provide the compensation necessary for dead-times. If the inverter characteristic measurement fails then sub-trip 2 is applied.
<table>
<tr><th>Sub-trip</th><th>Reason</th></tr>
<tr><td>1</td><td>Measured stator resistance exceeded the allowed range</td></tr>
<tr><td>2</td><td>It was not possible to measure the inverter characteristic</td></tr>
<tr><td>3</td><td>The stator resistance associated with the presently selected motor map exceeds the allowed range</td></tr>
</table>
Recommended actions:
• Check that the value that has been entered in the stator resistance does not exceed the allowed range (for the presently selected motor map)
• Check the motor cable / connections
• Check the integrity of the motor stator winding using a insulation tester
• Check the motor phase to phase resistance at the drive terminals
• Check the motor phase to phase resistance at the motor terminals
• Ensure the stator resistance of the motor falls within the range of the drive model
• Select fixed boost mode (Pr 05.014 = Fixed) and verify the output current waveforms with an oscilloscope
• Replace the motor</td></tr>
</table>

Trip	Diagnosis
Slot4 Different	**Ethernet interface in slot 4 has changed (*Unidrive M700* / *M702*)**
254	The *Slot4 Different* trip indicates that the Ethernet interface in slot 4 has changed / not found. The reason for the trip can be identified by the sub-trip number.

Sub-trip	Reason
1	No module was installed previously
2	A module with the same identifier is installed, but the set-up menu for this option slot has been changed, and so default parameters have been loaded for this menu.
3	A module with the same identifier is installed, but the applications menu for this option slot has been changed, and so default parameters have been loaded for this menu.
4	A module with the same identifier is installed, but the set-up and applications menu for this option slot have been changed, and so default parameters have been loaded for these menus.
>99	Shows the identifier of the module previously installed.

Recommended actions:

- Turn off the power, ensure that the correct option module is installed in the option slot and re-apply the power.
- Confirm that the currently installed option module is correct, ensure the option module parameters are set correctly and perform a *User Save* in Pr **mm.000**.
- If the trip persists - Contact the supplier of the drive.

Trip	Diagnosis
Slot4 Error	**Ethernet interface in slot 4 has detected a fault (*Unidrive M700 / M702*)**
252	The *Slot4 Error* trip indicates that the Ethernet interface in slot 4 on the drive has detected an error. The reason for the trip can be identified by the sub-trip number.

Sub-trip	Trip string	Description
100	Link Loss	Network link has been lost
101	E/IP Timeout	An EtherNet/IP RPI timeout trip has occurred
102	E/IP Read Param	Invalid read consistency parameter
103	E/IP Write Param	Invalid write consistency parameter
104	E/IP Fault	An unexpected EtherNet/IP error has occurred
105	Modbus Timeout	The Modbus connection has timed out
106	DA-RT Timeout	DA-RX Rx link has timeout
107	DA-RT Rx Late	Rx data was received late
108	INIT Switch	Ethernet switch initialisation error
109	INIT PTP	IEEE1588 (Precision Time Protocol) initialisation error
110	INIT DA-RT	Cyclic data initialisation error
111	INIT Modbus	Modbus TCP initialisation error
112	INIT SMTP	Email (SMTP) initialisation error
113	INIT EtherNet/IP	Ethernet/IP initialisation error
114	INIT TCP/IP	TCP/IP initialisation error
115	Ethernet Failure	Ethernet controller initialisation error
116	E/IP PLC IDLE	Ethernet/IP PLC Idle
117	Sync Task ORun	Synchronous task overrun
118	INIT Param Chann	Parameter channel initialization error
119	Link Overload	Too many links to be handled in the same cycle
120	Mcast Over Limit	Too many multicast addresses being used
121	Init Profinet	Profinet initialisation error
122	Profinet Start	Profinet start error
123	Profinet Plug	Profinet failed to load the slots
124	Invalid IM	Invalid Identification and Maintenance data
125	CPM Watchdog	Profinet cyclic timeout error
200	Software Fault	Software Fault
201	BG Overrun	Background task overrun
202	Firmware Invalid	Firmware is not compatible for the hardware version
203	Drive Unknown	Unknown drive type
204	DriveUnsupported	Unsupported drive type
205	Mode Unknown	Unknown drive mode
206	Mode Unsupported	Unsupported drive mode
207	FLASH Error	Corrupted Non-volatile FLASH
208	Database Init	Database initialization error
209	File System Init	File system initialization error
210	Mem Allocation	Memory allocation error
211	Filesystem Error	File system error
212	Config Save	Configuration file save error
213	Over Temperature	Option module over temperature
214	Drive Timeout	The drive has not responded within watchdog period
215	eCMP Comms Error	eCMP communication failure
216	TO eCMP Slot1	eCMP communication to slot 1 timeout
217	TO eCMP Slot2	eCMP communication to slot 2 timeout
228	EEPROM Error	EEPROM Initialisation error

Recommended actions:

- Identify the reason for the trip from the trip string or from sub-trip number and resolve the error.
- Reset the trip, If the trip persists, Hardware fault - Contact the supplier of the drive.

<table>
<tr><th>Trip</th><th>Diagnosis</th></tr>
<tr><td>Slot4 HF</td><td>Ethernet interface in slot 4 hardware fault (Unidrive M700 / M702)</td></tr>
<tr><td>250</td><td>The Slot4 HF trip indicates that the Ethernet interface in slot 4 cannot operate. The reason for the error can be identified by the sub-trip number.
<table>
<tr><th>Sub-trip</th><th>Reason</th></tr>
<tr><td>1</td><td>The module category cannot be identified</td></tr>
<tr><td>2</td><td>All the required customized menu table information has not been supplied or the tables supplied are corrupt</td></tr>
<tr><td>3</td><td>There is insufficient memory available to allocate the comms buffers for this module</td></tr>
<tr><td>4</td><td>The module has not indicated that it is running correctly during drive power-up</td></tr>
<tr><td>5</td><td>Module has been removed after power-up or it has stopped working</td></tr>
<tr><td>6</td><td>The module has not indicated that it has stopped accessing drive parameters during a drive mode change</td></tr>
<tr><td>7</td><td>The module has failed to acknowledge that a request has been made to reset the drive processor</td></tr>
<tr><td>8</td><td>The drive failed to correctly read the menu table from the module during drive power up</td></tr>
<tr><td>9</td><td>The drive failed to upload menu tables from the module and timed out (5 s)</td></tr>
<tr><td>10</td><td>Menu table CRC invalid</td></tr>
</table>
Recommended actions:
• Ensure the Ethernet interface is installed correctly
• Hardware fault - Contact the supplier of the drive.</td></tr>
<tr><td>Slot4 Not Fitted</td><td>Ethernet interface in slot 4 has been removed (Unidrive M700 / M702)</td></tr>
<tr><td>253</td><td>The Slot4 Not Fitted trip indicates that the Ethernet interface in slot 4 on the drive has been removed since the last power-up.
Recommended actions:
• Ensure the Ethernet interface is installed correctly
• Hardware fault - Contact the supplier of the drive.</td></tr>
<tr><td>Slot4 Watchdog</td><td>Ethernet interface watchdog service error (Unidrive M700 / M702)</td></tr>
<tr><td>251</td><td>The Slot4 Watchdog trip indicates that the Ethernet interface installed in slot 4 has started the option watchdog function and then failed to service the watchdog correctly.
Recommended actions:
• Hardware fault - Contact the supplier of the drive.</td></tr>
<tr><td>Slot App Menu</td><td>Application menu Customization conflict error</td></tr>
<tr><td>216</td><td>The Slot App Menu trip indicates that more than one option slot has requested to customize the application menus 18, 19 and 20. The sub-trip number indicates which option slot has been allowed to customize the menus.
Recommended actions:
• Ensure that only one of the Application modules is configured to customize the application menus 18, 19 and 20</td></tr>
<tr><td>SlotX Different</td><td>Option module in option slot X has changed</td></tr>
<tr><td>204
209
214</td><td>The SlotX Different trip indicates that the option module in option slot X on the drive is a different type to that installed when parameters were last saved on the drive. The sub-trip number gives the identification code of the module that was originally fitted.The reason for the trip can be identified by the sub-trip number.
<table>
<tr><th>Sub-trip</th><th>Reason</th></tr>
<tr><td>1</td><td>No module was installed previously</td></tr>
<tr><td>2</td><td>A module with the same identifier is installed, but the set-up menu for this option slot has been changed, and so default parameters have been loaded for this menu.</td></tr>
<tr><td>3</td><td>A module with the same identifier is installed, but the applications menu for this option slot has been changed, and so default parameters have been loaded for this menu.</td></tr>
<tr><td>4</td><td>A module with the same identifier is installed, but the set-up and applications menu for this option slot have been changed, and so default parameters have been loaded for these menus.</td></tr>
<tr><td>>99</td><td>Shows the identifier of the module previously installed.</td></tr>
</table>
Recommended actions:
• Turn off the power, ensure the correct option modules are installed in the correct option slots and re-apply the power.
• Confirm that the currently installed option module is correct, ensure option module parameters are set correctly and perform a user save in Pr mm.000.</td></tr>
</table>

<table>
<tr><th>Trip</th><th>Diagnosis</th></tr>
<tr><td>SlotX Error</td><td>Option module in option slot X has detected a fault</td></tr>
<tr><td>202
207
212</td><td>The SlotX Error trip indicates that the option module in option slot X on the drive has detected an error. The reason for the error can be identified by the sub-trip number.
Recommended actions:
• See the relevant Option Module User Guide for details of the trip</td></tr>
<tr><td>SlotX HF</td><td>Option module X hardware fault</td></tr>
<tr><td>200
205
210</td><td>The SlotX HF trip indicates that the option module in option slot X cannot operate. The possible causes of the trip can be identified by the sub-trip number.
<table>
<tr><th>Sub-trip</th><th>Reason</th></tr>
<tr><td>1</td><td>The module category cannot be identified</td></tr>
<tr><td>2</td><td>All the required customized menu table information has not been supplied or the tables supplied are corrupt</td></tr>
<tr><td>3</td><td>There is insufficient memory available to allocate the comms buffers for this module</td></tr>
<tr><td>4</td><td>The module has not indicated that it is running correctly during drive power-up</td></tr>
<tr><td>5</td><td>Module has been removed after power-up or it has stopped working</td></tr>
<tr><td>6</td><td>The module has not indicated that it has stopped accessing drive parameters during a drive mode change</td></tr>
<tr><td>7</td><td>The module has failed to acknowledge that a request has been made to reset the drive processor</td></tr>
<tr><td>8</td><td>The drive failed to correctly read the menu table from the module during drive power up</td></tr>
<tr><td>9</td><td>The drive failed to upload menu tables from the module and timed out (5 s)</td></tr>
<tr><td>10</td><td>Menu table CRC invalid</td></tr>
</table>
Recommended actions:
• Ensure the option module is installed correctly
• Replace the option module
• Replace the drive</td></tr>
<tr><td>SlotX Not Fitted</td><td>Option module in option slot X has been removed</td></tr>
<tr><td>203
208
213</td><td>The SlotX Not Fitted trip indicates that the option module in option slot X on the drive has been removed since the last power up.
Recommended actions:
• Ensure the option module is installed correctly.
• Re-install the option module.
• To confirm that the removed option module is no longer required perform a save function in Pr mm.000.</td></tr>
<tr><td>SlotX Watchdog</td><td>Option module watchdog function service error</td></tr>
<tr><td>201
206
211</td><td>The SlotX Watchdog trip indicates that the option module installed in Slot X has started the option watchdog function and then failed to service the watchdog correctly.
Recommended actions:
• Replace the option module</td></tr>
<tr><td>Soft Start</td><td>Soft start relay failed to close, soft start monitor failed</td></tr>
<tr><td>226</td><td>The Soft Start trip indicates that the soft start relay in the drive failed to close or the soft start monitoring circuit has failed.
Recommended actions:
• Hardware fault – Contact the supplier of the drive</td></tr>
<tr><td>Stored HF</td><td>Hardware trip has occurred during last power down</td></tr>
<tr><td>221</td><td>The Stored HF trip indicates that a hardware trip (HF01 –HF20) has occurred and the drive has been power cycled. The sub-trip number identifies the HF trip i.e. stored HF.17.
Recommended actions:
• Enter 1299 in Pr mm.000 and press reset to clear the trip</td></tr>
</table>

Trip	Diagnosis
Sub-array RAM	**RAM allocation error**
227	The Sub-array RAM indicates that an option module, derivative image or user program image has requested more parameter RAM than is allowed. The RAM allocation is checked in order of resulting sub-trip numbers, and so the failure with the highest sub-trip number is given. The sub-trip is calculated as (parameter size) + (parameter type) + sub-array number.

Parameter size	Value
1 bit	1000
8 bit	2000
16 bit	3000
32 bit	4000
64 bit	5000

Parameter type	Value
Volatile	0
User save	100
Power-down save	200

Sub-array	Menus	Value
Applications menus	18-20	1
Derivative image	29	2
User program image	30	3
Option slot 1 set-up	15	4
Option slot 1 applications	25	5
Option slot 2 set-up	16	6
Option slot 2 applications	26	7
Option slot 3 set-up	17	8
Option slot 3 applications	27	9
Option slot 4 set-up	24	10
Option slot 4 applications	28	11

Temp Feedback — **Internal thermistor has failed**

218

The *Temp Feedback* trip indicates that an internal thermistor has failed. The thermistor location can be identified by the sub-trip number.

Source	xx	y	zz
Control PCB	00	0	01: Control PCB thermistor 1 02: Control PCB thermistor 2 03: I/O PCB thermistor
Power system	Power module number	0	00: Temperature feedback provided via power system comms.
Power system	01	Rectifier number*	Always zero

	Frame 7	Frame 8	Frame 9 & 10
21:	Rectifier thermistor	Power PCB thermistor 1	SMPS thermistor
22:	Power PCB thermistor	Power PCB thermistor 2	Heat Sink Fan SMPS thermistor
23:	Power PCB thermistor	Rectifier thermistor	Power PCB thermistor

* For a parallel power-module system the rectifier number will be zero as it is not possible to determine which rectifier has detected the fault.

Recommended actions:

- Hardware fault – Contact the supplier of the drive

Th Brake Res — **Brake resistor over temperature**

10

The *Th Brake Res* is initiated, If hardware based braking resistor thermal monitoring is connected and the resistor overheats. If the braking resistor is not used then this trip must be disabled with bit 3 of Action *On Trip Detection* (10.037) to prevent this trip.

Recommended actions:

- Check brake resistor wiring
- Check braking resistor value is greater than or equal to the minimum resistance value
- Check braking resistor insulation

<table>
<tr><th>Trip</th><th>Diagnosis</th></tr>
<tr><td>Th Short Circuit</td><td>Motor thermistor short circuit</td></tr>
<tr><td>25</td><td>The Th Short Circuit trip indicates that the motor thermistor connected to the drive is short circuit or low impedance i.e. < 50 Ω. The location of the trip can be identified by the sub-trip number.
<table><tr><th>Sub-trip</th><th>Source</th></tr><tr><td>3</td><td>Analog input 3</td></tr><tr><td>4</td><td>Position feedback interface</td></tr></table>Recommended actions:
• Check thermistor continuity
• Replace motor / motor thermistor</td></tr>
<tr><td>Thermistor</td><td>Motor thermistor over-temperature</td></tr>
<tr><td>24</td><td>The Thermistor trip indicates that the motor thermistor connected to the drive has indicated a motor over temperature. The location of the trip can be identified by the sub-trip number.
<table><tr><th>Sub-trip</th><th>Source</th></tr><tr><td>3</td><td>Analog input 3</td></tr><tr><td>4</td><td>Position feedback interface</td></tr></table>Recommended actions:
• Check motor temperature
• Check Threshold Level (07.048)
• Check thermistor continuity</td></tr>
<tr><td>Undefined</td><td>Drive has tripped and the cause of the trip is Undefined</td></tr>
<tr><td>110</td><td>The Undefined trip indicates that the power system has generated but did not identify the trip from the power system. The cause of the trip is unknown.
Recommended actions:
• Hardware fault – return the drive to the supplier</td></tr>
<tr><td>User 24V</td><td>User 24 V supply is not present on control terminals (1,2)</td></tr>
<tr><td>91</td><td>A User 24 V trip is initiated, if User Supply Select (Pr 06.072) is set to 1 or Low Under Voltage Threshold Select (06.067) = 1 or Backup Supply Mode Enable (06.068) = 1 and no user 24 V supply is present on control terminals 1 and 2.
Recommended actions:
• Ensure the user 24 V supply is present on control terminals 1 (0V) and 2 (24V)</td></tr>
</table>

Trip	Diagnosis
User Program	**On board user program error**
249	The *User Program* trip indicates that an error has been detected in the onboard user program image. The reason for the trip can be identified by the sub-trip number.

Sub-trip	Reason	Comments
1	Divide by zero	
2	Undefined trip	
3	Attempted fast parameter access set-up with non-existent parameter	
4	Attempted access to non-existent parameter	
5	Attempted write to read-only parameter	
6	Attempted an over-range write	
7	Attempted read from write-only parameter	
30	The image has failed because either its CRC is incorrect, or there are less than 6 bytes in the image or the image header version is less than 5.	Occurs when the drive powers-up or the image is programmed. The image tasks will not run
31	The image requires more RAM for heap and stack than can be provided by the drive.	As 30
32	The image requires an OS function call that is higher than the maximum allowed	As 30
33	The ID code within the image is not valid	As 30
40	The timed task has not completed in time and has been suspended	*Onboard User Program: Enable* (11.047) is reset to zero when the trip is initiated
41	Undefined function called, i.e. a function in the host system vector table that has not been assigned.	As 40
52	Customized menu table CRC check failed	As 30
53	Customized menu table changed	Occurs when the drive powers-up or the image is programmed and the table has changed. Defaults are loaded for the user program menu and the trip will keep occurring until drive parameters are saved.
80	Image is not compatible with the control board	Initiated from within the image code
81	Image is not compatible with the control board serial number	As 80
100	Image has detected and prevented attempted pointer access outside of the IEC task's heap area.	
101	Image has detected and prevented misaligned pointer usage.	
102	Image has detected an array bounds violation and prevented its access.	
103	Image has attempted to convert a data type to or from an unknown data type, has failed and has shut itself down.	
104	Image has attempted to use an unknown user service function.	
200	User program has invoked a "divide" service with a denominator of zero. (Note that this is raised by the downloaded image and has therefore been given a distinct error code despite being the same fundamental problem as sub-trip 1.)	
201	Parameter access is not supported. An attempt to read database other than the host drive.	
202	Parameter does not exist. Database was host drive but the specified parameter does not exist.	
203	Parameter is read-only.	
204	Parameter is write-only.	
205	Unknown parameter error.	
206	Invalid bit present in parameter. The parameter does not contain the specified bit.	
207	Parameter format lookup failed. Failed to get parameter information data.	
208	An over-range write has been attempted.	

Trip	Diagnosis
User Prog Trip	**Trip generated by an onboard user program**
96	This trip can be initiated from within an onboard user program using a function call which defines the sub-trip number. **Recommended actions:** • Check the user program
User Save	**User Save error / not completed**
36	The *User Save* trip indicates that an error has been detected in the user save parameters saved in non-volatile memory. For example, following a user save command, If the power to the drive was removed when the user parameters were being saved. **Recommended actions:** • Perform a user save in Pr **mm.000** to ensure that the trip doesn't occur the next time the drive is powered up. • Ensure that the drive has enough time to complete the save before removing the power to the drive.
User Trip	**User generated trip**
40 -89 **112 -159**	These trips are not generated by the drive and are to be used by the user to trip the drive through an application program. **Recommended actions:** • Check the user program
Voltage Range	**Supply voltage out of range detected in Regen mode**
169	The *Voltage Range* trip is initiated, if the Regen *Minimum Voltage* (03.026) is set to a non-zero value and the supply voltage is outside the range defined by *Regen Maximum Voltage* (03.027) and *Regen Minimum Voltage* (03.026) for more than 100 ms. **Recommended actions:** • Ensure the supply voltage is operating within the drive specification. • Ensure Pr **03.026** and Pr **03.027** are set correctly • Check the supply voltage waveform using an oscilloscope • Reduce the level of supply disturbance • Set *Maximum Voltage* (03.027) to zero to disable the trip.
Watchdog	**Control word watchdog has timed out**
30	The *Watchdog* trip indicates that the control word has been enabled and has timed out. **Recommended actions:** Once Pr **06.042** bit 14 has been changed from 0 to 1 to enable the watchdog, this must be repeated every 1 s or a Watchdog trip will be initiated. The watchdog is disabled when the trip occurs and must be re-enabled if required when the trip is reset.

Table 13-5 Serial communications look up table

No	Trip	No	Trip	No	Trip
1	**Reserved 001**	94	**Rectifier Set-up**	195	**Encoder 7**
2	**Over Volts**	95	**Reserved 95**	196	**Encoder 8**
3	**OI ac**	96	**User Prog Trip**	198	**Phasing Error**
4	**OI Brake**	97	**Data Changing**	199	**Destination**
5	**PSU**	98	**Out Phase Loss**	200	**Slot1 HF**
6	**External Trip**	99	**CAM**	201	**Slot1 Watchdog**
7	**Over Speed**	100	**Reset**	202	**Slot1 Error**
8	**Inductance**	101	**OHt Brake**	203	**Slot1 Not Fitted**
9	**PSU 24V**	102	**Reserved 102**	204	**Slot1 Different**
10	**Th Brake Res**	103	**Inter-connect**	205	**Slot2 HF**
11	**Autotune 1**	104 - 108	**Reserved 104 - 108**	206	**Slot2 Watchdog**
12	**Autotune 2**	109	**OI dc**	207	**Slot2 Error**
13	**Autotune 3**	110	**Undefined**	208	**Slot2 Not Fitted**
14	**Autotune 4**	111	**Configuration**	209	**Slot2 Different**
15	**Autotune 5**	112 - 159	**User Trip 112 - 159**	210	**Slot3 HF**
16	**Autotune 6**	160	**Island**	211	**Slot3 Watchdog**
17	**Autotune 7**	161	**Reserved**	212	**Slot3 Error**
18	**Autotune Stopped**	162	**Encoder 12**	213	**Slot3 Not Fitted**
19	**Brake R Too Hot**	163	**Encoder 13**	214	**Slot3 Different**
20	**Motor Too Hot**	164	**Encoder 14**	215	**Option Disable**
21	**OHt Inverter**	165 - 168	**Reserved 165 - 168**	216	**Slot App Menu**
22	**OHt Power**	169	**Voltage Range**	217	**App Menu Changed**
23	**OHt Control**	170 - 173	**Reserved 170 - 173**	218	**Temp Feedback**
24	**Thermistor**	174	**Card Slot**	219	**An Output Calib**
25	**Th Short Circuit**	175	**Card Product**	220	**Power Data**
26	**I/O Overload**	176	**Name Plate**	221	**Stored HF**
27	**OHt dc bus**	177	**Card Boot**	222	**Reserved 222**
28	**An Input Loss 1**	178	**Card Busy**	223	**Rating Mismatch**
29	**An Input Loss 2**	179	**Card Data Exists**	224	**Drive Size**
30	**Watchdog**	180	**Card Option**	225	**Current Offset**
31	**EEPROM Fail**	181	**Card Read Only**	226	**Soft Start**
32	**Phase Loss**	182	**Card Error**	227	**Sub-array RAM**
33	**Resistance**	183	**Card No Data**	228 - 246	**Reserved 228 - 246**
34	**Keypad Mode**	184	**Card Full**	247	**Derivative ID**
35	**Control Word**	185	**Card Access**	248	**Derivative Image**
36	**User Save**	186	**Card Rating**	249	**User Program**
37	**Power Down Save**	187	**Card Drive Mode**	250	**Slot4 HF**
38	**Low Load**	188	**Card Compare**	251	**Slot4 Watchdog**
39	**Line Sync**	189	**Encoder 1**	252	**Slot4 Error**
40 -89	**User Trip 40 - 89**	190	**Encoder 2**	253	**Slot4 Not Fitted**
90	**Power Comms**	191	**Encoder 3**	254	**Slot4 Different**
91	**User 24V**	192	**Encoder 4**	255	**Reset Logs**
92	**OI Snubber**	193	**Encoder 5**		
93	**Inductor Too Hot**	194	**Encoder 6**		

The trips can be grouped into the following categories. It should be noted that a trip can only occur when the drive is not tripped or is already tripped but with a trip with a lower priority number.

Table 13-6 Trip categories

Priority	Category	Trips	Comments
1	Internal faults	HFxx	These indicate internal problems and cannot be reset. All drive features are inactive after any of these trips occur. If an KI-Keypad is installed it will show the trip, but the keypad will not function.
1	Stored HF trip	{Stored HF}	This trip cannot be cleared unless 1299 is entered into *Parameter* (**mm.000**) and a reset is initiated.
2	Non-resettable trips	Trip numbers 218 to 247, {Slot1 HF}, {Slot2 HF}, {Slot3 HF} or {Slot4 HF}	These trips cannot be reset.
3	Volatile memory failure	{EEPROM Fail}	This can only be reset if Parameter **mm.000** is set to 1233 or 1244, or if *Load Defaults* (11.043) is set to a non-zero value.
4	NV Media Card trips	Trip numbers 174, 175 and 177 to 188	These trips are priority 5 during power-up.
4	Internal 24V and position feedback interface power supply	{PSU 24V} and {Encoder 1}	These trips can override {Encoder 2} to {Encoder 6} trips.
5	Trips with extended reset times	{OI ac}, {OI Brake}, and OI dc}	These trips cannot be reset until 10 s after the trip was initiated.
5	Phase loss and d.c. link power circuit protection	{Phase Loss} and {Oht dc bus}	The drive will attempt to stop the motor before tripping if a {Phase Loss}. 000 trip occurs unless this feature has been disabled (see *Action On Trip Detection* (10.037). The drive will always attempt to stop the motor before tripping if an {Oht dc bus} occurs.
5	Standard trips	All other trips	

13.5 Internal / Hardware trips

Trips {HF01} to {HF25} are internal faults that do not have trip numbers. If one of these trips occurs, the main drive processor has detected an irrecoverable error. All drive functions are stopped and the trip message will be displayed on the drive keypad. If a non permanent trip occurs this may be reset by power cycling the drive. On power up after it has been power cycled the drive will trip on Stored HF. The sub-trip code is the number of the original HF trip. Enter 1299 in **mm.000** to clear the Stored HF trip.

13.6 Alarm indications

In any mode, an alarm is an indication given on the display by alternating the alarm string with the drive status string on the first row and showing the alarm symbol in the last character in the first row. If an action is not taken to eliminate any alarm except "Auto Tune and Limit Switch" the drive may eventually trip. Alarms are not displayed when a parameter is being edited, but the user will still see the alarm character on the upper row.

Table 13-7 Alarm indications

Alarm string	Description
Brake Resistor	Brake resistor overload. *Braking Resistor Thermal Accumulator* (10.039) in the drive has reached 75.0 % of the value at which the drive will trip.
Motor Overload	*Motor Protection Accumulator* (04.019) in the drive has reached 75.0 % of the value at which the drive will trip and the load on the drive is >100 %.
Ind Overload	Regen inductor overload. *Inductor Protection Accumulator* (04.019) in the drive has reached 75.0 % of the value at which the drive will trip and the load on the drive is >100 %.
Drive Overload	Drive over temperature. *Percentage Of Drive Thermal Trip Level* (07.036) in the drive is greater than 90 %.
Auto Tune	The autotune procedure has been initialized and an autotune in progress.
Limit Switch	Limit switch active. Indicates that a limit switch is active and that is causing the motor to be stopped.

13.7 Status indications

Table 13-8 Status indications

Upper row string	Description	Drive output stage
Inhibit	The drive is inhibited and cannot be run. The Safe Torque Off signal is not applied to Safe Torque Off terminals or Pr **06.015** is set to 0	Disabled
Ready	The drive is ready to run. The drive enable is active, but the drive inverter is not active because the final drive run is not active	Disabled
Stop	The drive is stopped / holding zero speed.	Enabled
Run	The drive is active and running	Enabled
Scan	The drive is enabled in Regen mode and is trying to synchronize to the supply	Enabled
Supply Loss	Supply loss condition has been detected	Enabled
Deceleration	The motor is being decelerated to zero speed / frequency because the final drive run has been deactivated.	Enabled
dc injection	The drive is applying dc injection braking	Enabled
Position	Positioning / position control is active during an orientation stop	Enabled
Trip	The drive has tripped and no longer controlling the motor. The trip code appears in the lower display	Disabled
Active	The regen unit is enabled and synchronized to the supply	Enabled
Under Voltage	The drive is in the under voltage state either in low voltage or high voltage mode	Disabled
Heat	The motor pre-heat function is active	Enabled
Phasing	The drive is performing a ‘phasing test on enable’.	Enabled

Table 13-9 Option module and NV Media Card and other status indications at power-up

First row string	Second row string	Status
Booting	**Parameters**	Parameters are being loaded
Drive parameters are being loaded from a NV Media Card		
Booting	**User Program**	User program being loaded
User program is being loaded from a NV Media Card to the drive		
Booting	**Option Program**	User program being loaded
User program is being loaded from a NV Media Card to the option module in slot X		
Writing To	**NV Card**	Data being written to NV Media Card
Data is being written to a NV Media Card to ensure that its copy of the drive parameters is correct because the drive is in Auto or Boot mode		
Waiting For	**Power System**	Waiting for power stage
The drive is waiting for the processor in the power stage to respond after power-up		
Waiting For	**Options**	Waiting for an option module
The drive is waiting for the Options Modules to respond after power-up		
Uploading From	**Options**	Loading parameter database
At power-up it may be necessary to update the parameter database held by the drive because an option module has changed or because an applications module has requested changes to the parameter structure. This may involve data transfer between the drive an option modules. During this period ‘Uploading From Options’ is displayed		

13.8 Programming error indications

Following are the error message displayed on the drive keypad when an error occurs during programming of drive firmware.

Table 13-10 Programming error indications

Error String	Reason	Solution
Error 1	There is not enough drive memory requested by all the option modules.	Power down drive and remove some of the option modules until the message disappears.
Error 2	At least one option module did not acknowledge the reset request.	Power cycle drive
Error 3	The boot loader failed to erase the processor flash	Power cycle drive and try again. If problem persists, return drive
Error 4	The boot loader failed to program the processor flash	Power cycle drive and try again. If problem persists, return drive
Error 5	One option module did not initialize correctly. Option module did not set Ready to Run flag.	Remove faulty option module.

13.9 Displaying the trip history

The drive retains a log of the last ten trips that have occurred. *Trip 0* (10.020) to *Trip 9* (10.029) store the most recent 10 trips that have occurred where *Trip 0* (10.020) is the most recent and *Trip 9* (10.029) is the oldest. When a new trip occurs it is written to *Trip 0* (10.020) and all the other trips move down the log, with oldest being lost. The date and time when each trip occurs are also stored in the date and time log, i.e. *Trip 0 Date* (10.041) to *Trip 9 Time* (10.060). The date and time are taken from *Date* (06.016) and *Time* (06.017). Some trips have sub-trip numbers which give more detail about the reason for the trip. If a trip has a sub-trip number its value is stored in the sub-trip log, i.e. *Trip 0 Sub-trip Number* (10.070) to *Trip 9 Sub-trip Number* (10.079). If the trip does not have a sub-trip number then zero is stored in the sub-trip log.

If any parameter between Pr **10.020** and Pr **10.029** inclusive is read by serial communication, then the trip number in Table 13-5 is the value transmitted.

NOTE

The trip logs can be reset by writing a value of 255 in Pr **10.038**.

13.10 Behaviour of the drive when tripped

If the drive trips, the output of the drive is disabled so the load coasts to a stop. If any trip occurs the following read only parameters are frozen until the trip is cleared. This is to help in diagnose the cause of the trip.

Parameter	Description
01.001	Frequency / speed reference
01.002	Pre-skip filter reference
01.003	Pre-ramp reference
02.001	Post-ramp reference
03.001	Frequency slaving demand / Final speed ref
03.002	Speed feedback
03.003	Speed error
03.004	Speed controller output
04.001	Current magnitude
04.002	Active current
04.017	Reactive current
05.001	Output frequency
05.002	Output voltage
05.003	Power
05.005	DC bus voltage
07.001	Analog input 1*
07.002	Analog input 2*
07.003	Analog input 3*

*On *Unidrive M700 / 701* only.

If the parameters are not required to be frozen then this can be disabled by setting bit 4 of Pr **10.037**.

14 UL information

14.1 UL file reference

All models are UL Listed to both Canadian and US requirements. The UL file reference is: NMMS/7.E171230.

Products that incorporate the Safe Torque Off (STO) function are Certified for Functional Safety. The UL file reference is: FSPC.E171230.

14.2 Option modules, kits and accessories

Option Modules, Control Pods, Installation Kits and other accessories for use with these drives are UL Listed.

14.3 Enclosure ratings

With the exception of free-standing cubicle drives, all models are Open Type as supplied.

The drive enclosure is not classified as a fire enclosure. A separate fire enclosure must be provided. A UL/ NEMA Type 12 enclosure is suitable. Refer to relevant *Power Installation Guide for further information*.

When fitted with a conduit box the drives meet the requirements for UL Type 1. Type 1 enclosures are intended for indoor use, primarily to provide a degree of protection against limited amounts of falling dirt.

The drives meet the requirements for UL Type 12 when installed inside a Type 12 enclosure and through-hole mounted using the sealing kit and the high-IP insert (where provided).

When through-hole mounted, the drives have been evaluated as suitable for use in surrounding air temperatures up to 40 °C.

Remote Keypads are UL Type 12 when installed with the sealing washer and fixing kit provided.

When installed in a Type 1 or Type 12 enclosure, the drives may be operated in a compartment handling conditioned air. Refer to relevant *Power Installation Guide for further information*.

14.4 Mounting

Drives may be surface, through-panel or tile mounted using the appropriate brackets. Drives may be mounted singly or side by side with suitable space between them (bookcase mounting). Refer to relevant *Power Installation Guide for further information*.

14.5 Environment

Drives must be installed in a Pollution Degree 2 environment or better (dry, non-conductive pollution only).

The drives have been evaluated for use at ambient temperatures up to 40 °C. The drives have additionally been evaluated for 50 °C and 55 °C ambient air temperatures with a derated output. Refer to relevant *Power Installation Guide for further information*.

14.6 Electrical Installation

OVERVOLTAGE CATEGORY

OVC III

SUPPLY

The drives are suitable for use on a circuit capable of delivering not more than 100,000 RMS symmetrical amperes, 600 Volts AC Maximum.

TERMINAL TORQUE

Terminals must be tightened to the rated torque as specified in the Installation Instructions. Refer to relevant *Power Installation Guide for further information*.

WIRING TERMINALS

Drives must be installed using cables rated for 75 °C operation, copper wire only.

Where possible, UL Listed closed-loop connectors sized according to the field wiring shall be used for all field power wiring connections. Refer to relevant *Power Installation Guide for further information*.

GROUND CONNECTION INSTRUCTIONS

UL Listed closed-loop connectors sized according to the field wiring shall be used for grounding connections. Refer to relevant *Power Installation Guide for further information*.

BRANCH CIRCUIT PROTECTION

The fuses and circuit breakers required for branch circuit protection are specified in the Installation Instructions. Refer to relevant *Power Installation Guide for further information*.

OPENING OF BRANCH CIRCUIT

Opening of the branch-circuit protective device may be an indication that a fault has been interrupted. To reduce the risk of fire or electric shock, the equipment should be examined and replaced if damaged. If burnout of the current element of an overload relay occurs, the complete overload relay must be replaced.

Integral solid state short circuit protection does not provide branch circuit protection. Branch circuit protection must be provided in accordance with the National Electrical Code (NEC), The Canadian Electrical Code, and any additional local codes.

REGENERATIVE OPERATION

Drives can be configured as an AC Regenerative Unit (also known as a Regen drive). Regen operation allows bi-directional power flow to and from the AC supply. The AC supply voltage must not exceed 600 Vac. Contact the supplier of the drive for more information on building a Regen system.

14.7 Motor overload protection and thermal memory retention

All drives incorporate internal overload protection for the motor load that does not require the use of an external or remote overload protection device.

The protection level is adjustable and the method of adjustment is provided in section 8.4 *Motor thermal protection* on page 108. Maximum current overload is dependent on the values entered into the current limit parameters (motoring current limit, regenerative current limit and symmetrical current limit entered as percentage) and the motor rated current parameter (entered in amperes).

The duration of the overload is dependent on motor thermal time constant. The maximum programmable time constant depends on the drive model. The method of adjustment of the overload protection is provided. Refer to the relevant *Power Installation Guide for further information*.

The drives are provided with user terminals that can be connected to a motor thermistor to protect the motor from high temperature, in the event of a motor cooling fan failure. Refer to the relevant *Power Installation Guide for further information*.

14.8 External Class 2 supply

The external power supply used to power the 24 V control circuit shall be marked: “UL Class 2”. The power supply voltage shall not exceed 24 Vdc. Refer to the relevant P*ower Installation Guide for further information*.

14.9 Modular Drive Systems

Drives with DC+ and DC- supply connections, rated 230 V or 480 V have been investigated for use in Modular Drive Systems as inverters when supplied by the converter sections from the Unidrive-M range. In these applications the inverters are required to be additionally protected by supplemental fuses.

Alternatively, the inverters may be supplied by converter models: Mentor MP25A, 45A, 75A, 105A, 155A or 210A.

Modular drives with frame sizes 9, 10 and 11 are not certified for Canada when used in a modular/parallel setup without DC fuses.

Contact the supplier of the drive for more information.

14.10 Requirement for Transient Surge Suppression

This requirement only applies to Frame Size 7 drives with rated input voltage = 575 V.

TRANSIENT SURGE SUPPRESSION SHALL BE INSTALLED ON THE LINE SIDE OF THIS EQUIPMENT AND SHALL BE RATED 575 Vac (PHASE TO GROUND), 575 Vac (PHASE TO PHASE), SUITABLE FOR OVERVOLTAGE CATEGORY III, AND SHALL PROVIDE PROTECTION FOR A RATED IMPULSE VOLTAGE TO WITHSTAND VOLTAGE PEAK OF 6 kV AND A CLAMPING VOLTAGE OF MAXIMUM 2400 V.

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