



MC3000 Series Drives Metasys N2 Communications Guide

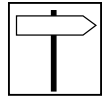
About These Instructions

This documentation applies to the use of an MC3000 Series Variable Frequency Drive with Metasys N2 protocol and should be used in conjunction with the MC3000 Series Installation and Operation Manual (Document M301) that shipped with the drive. These documents should be read in their entirety as they contain important technical data and describe the installation and operation of the drive.

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1 Safety Information

1.1 Warnings, Cautions and Notes

1.1.1 General

Some parts of Lenze controllers (frequency inverters, servo inverters, DC controllers) can be live, moving and rotating. Some surfaces can be hot.

Non-authorized removal of the required cover, inappropriate use, and incorrect installation or operation creates the risk of severe injury to personnel or damage to equipment.

All operations concerning transport, installation, and commissioning as well as maintenance must be carried out by qualified, skilled personnel (IEC 364 and CENELEC HD 384 or DIN VDE 0100 and IEC report 664 or DIN VDE0110 and national regulations for the prevention of accidents must be observed).

According to this basic safety information, qualified skilled personnel are persons who are familiar with the installation, assembly, commissioning, and operation of the product and who have the qualifications necessary for their occupation.

1.1.2 Application

Drive controllers are components designed for installation in electrical systems or machinery. They are not to be used as appliances. They are intended exclusively for professional and commercial purposes according to EN 61000-3-2. The documentation includes information on compliance with EN 61000-3-2.

When installing the drive controllers in machines, commissioning (i.e. the starting of operation as directed) is prohibited until it is proven that the machine complies with the regulations of the EC Directive 98/37/EC (Machinery Directive); EN 60204 must be observed.

Commissioning (i.e. starting drive as directed) is only allowed when there is compliance to the EMC Directive (89/336/EEC).

The drive controllers meet the requirements of the Low Voltage Directive 73/23/EEC. The harmonised standards of the series EN 50178/DIN VDE 0160 apply to the controllers.

The availability of controllers is restricted according to EN 61800-3. These products can cause radio interference in residential areas. In the case of radio interference, special measures may be necessary for drive controllers.

1.1.3 Installation

Ensure proper handling and avoid excessive mechanical stress. Do not bend any components and do not change any insulation distances during transport or handling. Do not touch any electronic components and contacts. Controllers contain electrostatically sensitive components, which can easily be damaged by inappropriate handling. Do not damage or destroy any electrical components since this might endanger your health! When installing the drive ensure optimal airflow by observing all clearance distances in the drive's user manual. Do not expose the drive to excessive: vibration, temperature, humidity, sunlight, dust, pollutants, corrosive chemicals or other hazardous environments.



Safety Information

1.1.4 Electrical Connection

When working on live drive controllers, applicable national regulations for the prevention of accidents (e.g. VBG 4) must be observed.

The electrical installation must be carried out in accordance with the appropriate regulations (e.g. cable cross-sections, fuses, PE connection). Additional information can be obtained from the regulatory documentation.

The regulatory documentation contains information about installation in compliance with EMC (shielding, grounding, filters and cables). These notes must also be observed for CE-marked controllers.

The manufacturer of the system or machine is responsible for compliance with the required limit values demanded by EMC legislation.

1.1.5 Operation

Systems including controllers must be equipped with additional monitoring and protection devices according to the corresponding standards (e.g. technical equipment, regulations for prevention of accidents, etc.). You are allowed to adapt the controller to your application as described in the documentation.



DANGER!

- After the controller has been disconnected from the supply voltage, do not touch the live components and power connection until the capacitors have discharged. Please observe the corresponding notes on the controller.
- Do not continuously cycle input power to the controller more than once every three minutes.
- Close all protective covers and doors during operation.



WARNING!

Network control permits automatic starting and stopping of the inverter drive. The system design must incorporate adequate protection to prevent personnel from accessing moving equipment while power is applied to the drive system.

Table 1: Pictographs used in these instructions

Pictograph	Signal word	Meaning	Consequences if ignored
	DANGER!	Warning of Hazardous Electrical Voltage.	Reference to an imminent danger that may result in death or serious personal injury if the corresponding measures are not taken.
	WARNING!	Impending or possible danger for persons	Death or injury
	STOP!	Possible damage to equipment	Damage to drive system or its surroundings
	NOTE	Useful tip: If observed, it will make using the drive easier	

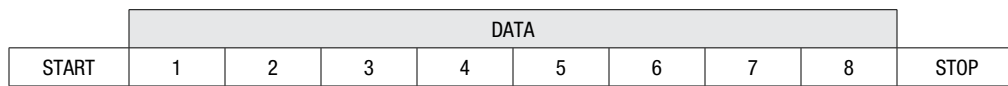


2 Introduction

This document will explain how to operate a Lenze-AC Tech MC3000 Variable Frequency Drive using Metasys N2 protocol. It is intended as a serial communications supplement only and will not discuss normal drive operations. For more information regarding normal drive setup and functionality, refer to the MC3000 Installation and Operation Manual (M301).

2.1 Metasys N2 Communications

MC3000 drives running N2 protocol act as N2 devices on a Metasys® Network and function as slaves only. Thus the device communicating with an MC3000 drive must be an N2 master. The communication rate is 9600 bps with 8 data bits, no parity, 1 start bit and 1 stop bit. The bit sequence is as follows:



2.2 Serial Communications Wiring

Figure 1 illustrates the MC3000 Series Terminal Strip and connections for the N2 Metasys network.

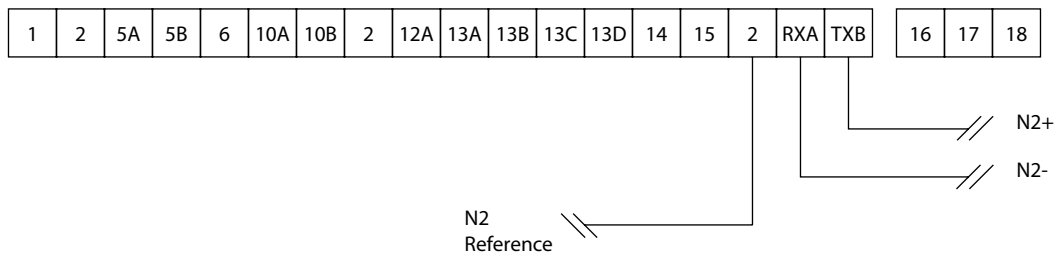
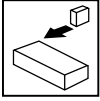


Figure 1: MC3000 Terminal Strip

The **N2+** terminal is connected to MC3000 drive terminal RXA.

The **N2-** terminal is connected to MC3000 drive terminal TXB.

The **N2 Reference** is connected to MC3000 drive terminal 2.



Drive Setup & Programming

3 Drive Setup and Programming

Most drive parameters (including those required for serial communications) are not accessible through the N2 Network. They can only be accessed by entering the Programming Mode of the drive itself. Refer to the MC3000 Installation and Operation Manual (M301) for more information.

When in Programming Mode, the drive will not accept any write, memorize or characterize commands from the N2 Network. This is necessary to prevent conflicts between the two modes of parameter modification.

3.1 Serial Communication Setup

The factory default values for all drive parameters are setup to allow immediate serial communications (without serial start and serial speed/setpoint commands). For serial speed/setpoint and/or serial start control, modify the setting of Drive Parameter #30 (Control). The drive parameters that are required for serial communications, including Drive Parameter #30, are described below.

30 CONTROL should be set to accommodate the specific application intent. The action of a Watchdog timeout depends on the setting of the CONTROL parameter. If the CONTROL parameter is set for:

- LOCAL : the drive will stop when a serial timeout occurs.
- KEYPAD 2 (LOCAL control without the need for TB-1 to run): the drive will stop when a serial timeout occurs.
- REMOTE: serial timeout will not work since the drive cannot be unlocked in REMOTE mode.

MC3000 drives STOP when a serial timeout occurs. There is no fault for this. Any time CONTROL is changed from LOCAL to REMOTE the drive STOPS immediately.

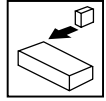
The Control Parameter on MC drives (Programming Parameter #30 / AC Tech Register #81) determines how much control a user has over a drive via the serial link. The Control Parameter must be appropriately programmed for a particular application. Refer to the MC Series Installation and Operation Manual (M301) for a detailed explanation on programming the drive parameters.

Table 2: Control (Parameter #30)

MC3000	
Setting	Description
00	LOCAL (default)
01	REMOTE
02	SERIAL
03	KEYPAD
04	TB STRIP
05	KEYPAD 2

All control options are subject to the Parameter and Control Locking/Unlocking procedures.

Drive Setup & Programming



- 57 SERIAL Must be set to WITH TIMER (default) or W/O TIMER for the drive to communicate with the N2 Network. Serial communications will not work if this parameter is set to DISABLED. The timeout period is fixed at a value of 30 seconds.
- 58 SERIAL ADDRESS This point contains the address of the N2 Network device. It is adjustable from 1–255. The default address (30) is intended for configuration purposes only.

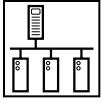
3.2 Communication Overrides

Overrides are also released under the following circumstances:

- Drive Parameter #57 (Serial) is set to DISABLED.
- Drive Parameter #58 (Serial Address) is changed.
- Drive Parameter #30 (Control) is changed.
- Drive Parameter #65 (Program) is changed to RESET 60 or REST 50 (i.e., a factory reset is performed) and Drive Parameter #58 (Serial Address) was not previously set to 30. In this case, serial communications will be terminated immediately.
- Drive Parameter #65 (Program) is changed to RESET 60 or REST 50 (i.e., a factory reset is performed) and Drive Parameter #30 (Control) was not previously set to NORMAL.

NOTE - Drive Stop unrelated to Serial Communication

The drive will also be brought to a stop if changed from LOCAL to REMOTE or from REMOTE to LOCAL.



N2 Points

4 MC3000 N2 Points

The entries in Table 3 are based upon MC3000 Drive Software Version 213-043 Revision 05 (Parameter Version 143). If a later revision of software changed parameter definitions or added parameters it could seriously affect the drive's operation. This will be identified for a given drive by examining Analog Input Point 1 (Parameter Version). If it is not 143, writing to any register on the drive **MUST NOT BE ATTEMPTED** unless your Controller has been setup to support the new configuration.



NOTE

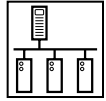
The Change of State (COS) feature as a means of alarm/warning notification on MC3000 Series Drives has not been implemented. Upon being polled, the Analog Input points that can change value will report that a change of state (COS) has occurred. However, since the alarm limits that have been specified are ignored, the alarm and warning flags will never be set. As this feature is not implemented, normal Metasys Alarm/Warning Notification will be defeated. This is generally NOT an issue since none of the Analog Input Points require alarm limits in standard operation.

If, for some reason, notification for alarms and warnings is required, it will be necessary for the operator to perform the following:

- Map the specific object requiring COS to a CS object.
- Define an AD or BD object with the CS object of the required COS point as the "Associated In".
- Assign Alarm Limits to the AD object.
- The AD or BD point will only be scanned at a minimum of 30 seconds
- The normal state of the BO must be updated (written to) by GPL.

Analog/Binary Input points that are mapped in directly that do not support COS will never report a change of state condition. They will report the current value when read but no alarm notification will occur. A read will only occur if a focus window is open or a feature requires the current value.

The MC3000 N2 Points are divided into four types: analog input, binary input, analog output and binary output. Sections 4.2 through 4.5 describe each of these point types and the individual point numbers within each.



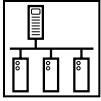
4.1 Metasys N2 Point Map

Table 3: Metasys N2 Point Map for MC3000 Series Drives

Point Type ¹	Point #	Description (Point Name)	Read (R)/ Override (R/O)	Point Units	Decimal Places	MIN Value	MAX Value	Default Value
1	1	Parameter Version	R	--	0	--	--	143 ²
1	2	Software Version	R	--	0	--	--	043 ²
1	3	Software Revision	R	--	0	--	--	05 ²
1	4	Drive Config/Size	R	--	0	0	57	--
1	5	Drive Class	R	--	0	--	--	65
1	6	Total Runtime (RUNTIME HRS)	R	hrs	0	0		--
1	7	Total Runtime (RUNTIME MIN)	R	min	0	0		--
1	8	Operational Status (RUN STATUS)	R	--	0	0	10	--
1	9	Load Percent (LOAD PERCENT)	R	%	0	150	180	180
1	10	Motor Voltage (MOTOR VOLTS)	R	VAC	0			
1	11	Present Fault (FAULT)	R	--	0	0	23	0
1	12	Recorded Fault 1	R	--	0	0	23	0
1	13	Recorded Fault 2	R	--	0	0	23	0
1	14	Recorded Fault 3	R	--	0	0	23	0
1	15	Recorded Fault 4	R	--	0	0	23	0
1	16	Recorded Fault 5	R	--	0	0	23	0
1	17	Recorded Fault 6	R	--	0	0	23	0
1	18	Recorded Fault 7	R	--	0	0	23	0
1	19	Recorded Fault 8	R	--	0	0	23	0
1	20	PID Feedback (PID FEEDBACK)	R	PID	0	Note 3	Note 3	Note 3
1	21	PID Setpoint Command (PID SETPOINT)	R	PID	0	Note 3	Note 3	Note 3
1	22	Actual Speed (ACTUAL FREQ)	R	Hz	2	0	12000	--
2	01	Fault Condition (OK.FAULT)	R	--	0	OK	FLT	OK
3	01	Command Speed (COMMAND SPD)	R/O	Hz	2	0	120.00	20.00
3	02	Keypad Command Speed (CMD KEY SPD)	R/O	Hz	2	0	120.00	20.00
3	03	Normal Acceleration (ACCEL)	R/O	sec	1	*	3600.0	30.0
3	04	Normal Deceleration (DECEL)	R/O	sec	1	*	3600.0	30.0
3	05	Local PID Command	R/O	PID	0	Note 3	Note 3	Note 3
3	06	Control Mode	R/O	--	0			
4	01	History	R/O	--	0	0 (maintain)	1 (clear)	0
4	02	Start/Stop Drive (CMD RUN.STOP)	R/O	--	0	0 (stop)	1 (start)	0
4	03	Speed Control Auto/Manual	R/O	--	0	0 (auto)	1 (manual)	0
4	04	Clear Present Fault (CLEAR FAULT)	R/O	--	0	0	1 (clear)	

NOTES:

- Point Types: 1 = Analog Input; 2 = Binary Input; 3 = Analog Output; 4 = Binary Output
 - Current Value of the parameter version, software version and software revision.
 - Units, MIN/MAX Values: for this point are defined via Drive Parameters #31, 75 and 76 respectively. Refer to notes in sections 4.2 and 4.4.
- * Refer to MC3000 Installation & Operation Manual (M301)

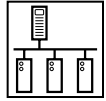


N2 Points

4.2 Analog Input (AI) Point Descriptions

- | <u>Point</u> | <u>Description</u> |
|--------------|---|
| 1-01: | <p>Parameter Version</p> <p>The entries in Table 1 are based upon Parameter Version = 143. If a later revision of software changed parameter definitions or added parameters it could seriously affect the drive's operation. This will be identified for a given drive by examining Analog Input Point 1 (1-01) Parameter Version. If it is not 143, writing to any register on the drive MUST NOT BE ATTEMPTED unless your Controller has been setup to support the new configuration.</p> |
| 1-02: | <p>Software Version</p> <p>This point represents the Software Version for MC3000 Metasys Software in the numerical format "xxx-xxx". The current software version number is 213-043.</p> |
| 1-03: | <p>Software Revision</p> <p>This point represents the drive's software revision level in the numerical format "xx". The current revision status is 05.</p> |
| 1-04: | <p>Drive Configuration</p> <p>This point represents the drive size (Configuration) as listed in the following table:</p> |

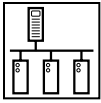
Drive Config	Horsepower	Drive Voltage	Drive Config	Horsepower	Drive Voltage
0	0.25	120 V	29	2.00	590/480 VAC
1	0.25	240/200 VAC	30	3.00	590/480 VAC
2	0.50	240/200 VAC	31	5.00	590/480 VAC
3	1.00	240/200 VAC	32	7.50	590/480 VAC
4	1.50	240/200 VAC	33	10.0	590/480 VAC
5	2.00	240/200 VAC	34	15.0	590/480 VAC
6	3.00	240/200 VAC	35	20.0	590/480 VAC
7	5.00	240/200 VAC	36	25.0	590/480 VAC
8	7.50	240/200 VAC	37	30.0	590/480 VAC
9	10.0	240/200 VAC	38	40.0	590/480 VAC
10	15.0	240/200 VAC	39	50.0	590/480 VAC
11	20.0	240/200 VAC	40	60.0	590/480 VAC
12	25.0	240/200 VAC	41	75.0	590/480 VAC
13	50.0	480/400 VAC	42	100.0	590/480 VAC
14	60.0	480/400 VAC	43	125.0	590/480 VAC
15	1.00	480/400 VAC	44	150.0	590/480 VAC
16	1.50	480/400 VAC	45	200.0	590/480 VAC
17	2.00	480/400 VAC	46	75.0	480/400 VAC
18	3.00	480/400 VAC	47	100.0	480/400 VAC
19	5.00	480/400 VAC	48	125.0	480/400 VAC
20	7.50	480/400 VAC	49	150.0	480/400 VAC
21	10.0	480/400 VAC	50	200.0	480/400 VAC
22	15.0	480/400 VAC	51	30.0	240/200 VAC
23	20.0	480/400 VAC	52	40.0	240/200 VAC
24	25.0	480/400 VAC	53	50.0	240/200 VAC
25	30.0	480/400 VAC	54	60.0	240/200 VAC
26	40.0	480/400 VAC	55	75.0	240/200 VAC
27	1.00	590/480 VAC	56	100.0	240/200 VAC
28	1.50	590/480 VAC	57	Unknown	Unknown



- | <u>Point</u> | <u>Description</u> |
|---------------------|--|
| 1-05: | <p>Drive Class</p> <p>This point represents the MC series drive class = 65 (41h).</p> |
| 1-06: | <p>Total Runtime Hours</p> <p>This point represents the total accumulated time the drive has run in hours. This value can be reset to 0 by entering the password 4425 and restoring factory defaults via parameter 65 (PROGRAM).</p> |
| 1-07: | <p>Total Runtime Minutes</p> <p>This point represents the total accumulated time the drive has run in minutes. This value can be reset to 0 by entering the password 4425 and restoring factory defaults via parameter 65 (PROGRAM).</p> |
| 1-08: | <p>Operational Status</p> <p>This point is for monitoring the actual operating condition of the drive. The value returned is a number between 0 and 10 which corresponds to one of the following operating states:</p> |

Value	Operational State	Value	Operational State
0	FAULT LOCKOUT	6	RUN
1	FAULT	7	ACCEL
2	START PENDING	8	DECEL
3	STOP	9	CURRENT LIMIT
4	DC BRAKE	10	DECEL OVERRIDE
5	RUN AT 0Hz		

- | | |
|-------|--|
| 1-09: | <p>Load %</p> <p>This point represents the drive load as a percentage of full load. The high limit for this point is dictated by Parameter 1 (Current Limit). Depending on the setting of Parameter 0 (Line Volts), the drive is capable of delivering 150% or 180% of its rated output current. This value can be viewed on the local display by pressing the Enter key once.</p> |
| 1-10: | <p>Motor Voltage</p> <p>This point represents the AC voltage that is currently being sent to the motor. This number can be viewed on the local display by pressing the Enter key twice.</p> |



N2 Points

Point

Description

1-11:

Present Fault

This point indicates the type of fault on which the drive is currently tripped. This point returns a value between 0 and 23 which corresponds to one of the following fault conditions:

Value	Fault	Value	Fault
0	NO FAULT	12	POWER SAG
1	OUTPUT FAULT	13	CONTROL FAULT
2	RESERVED	14	LANGUAGE
3	HIGH DC BUS VOLTS	15	EXTERNAL FAULT
4	HIGH DRIVE TEMPERATURE	16	INTERNAL16
5	THERMAL OVERLOAD	17	POWER TRANSIENT
6	RESERVED	18	S/W ERROR #1
7	LOW DC BUS VOLTS	19	S/W ERROR #2
8	RESERVED	20	S/W ERROR #3
9	DC BRAKE ERROR	21	S/W ERROR #4
10	FOLLOWER LOSS	22	S/W ERROR #5
11	DB ERROR	23	GENERAL S/W ERROR

1-12:

Recorded Fault 1

This point represents the most recent fault condition that has occurred according to the same code scheme as for the present fault object. To clear the fault history, refer to Point 4-01 (Clear Fault History)

1-13:

Recorded Fault 2

This point represents the 2nd most recent fault condition that has occurred.

1-14:

Recorded Fault 3

This point represents the 3rd most recent fault condition that has occurred.

1-15:

Recorded Fault 4

This point represents the 4th most recent fault condition that has occurred.

1-16:

Recorded Fault 5

This point represents the 5th most recent fault condition that has occurred.

1-17:

Recorded Fault 6

This point represents the 6th most recent fault condition that has occurred.

1-18:

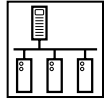
Recorded Fault 7

This point represents the 7th most recent fault condition that has occurred.

1-19:

Recorded Fault 8

This point represents the 8th most recent fault condition that has occurred.



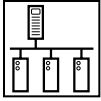
<u>Point</u>	<u>Description</u>
1-20:	<p>PID Feedback</p> <p>This point monitors the current state of the PID Feedback. If the drive is running in Local or Serial Control Mode, the PID Setpoint will be as dictated by Local PID Cmd. If the drive is running in Remote Control Mode, the Setpoint will come from either analog source TB-5A or TB-5B. Refer to the MC3000 Installation and Operation Manual (M301) for more details on PID functionality.</p>
1-21:	<p>Command PID Setpoint</p> <p>This point monitors the current state of the PID Setpoint. If the drive is running in Local or Serial Control Mode, the PID Setpoint will be as dictated by Local PID Cmd. If the drive is running in Remote Control Mode, the Setpoint will come from either analog source TB-5A or TB-5B. Refer to the MC3000 Installation and Operation Manual (M301) for more details on PID functionality.</p>
1-22:	<p>Actual Speed</p> <p>This point indicates the speed (in Hz) at which the drive is currently running.</p>

4.3 Binary Input (BI) Point Descriptions

<u>Point</u>	<u>Description</u>
2-01:	<p>Fault Condition</p> <p>This point indicates whether or not the drive is currently tripped on a fault. This point returns 0 (OK) if the drive is not in a fault condition or 1 (FAULT) if the drive is currently faulted.</p>

4.4 Analog Output (AO) Point Descriptions

<u>Point</u>	<u>Description</u>
3-01:	<p>Command Speed</p> <p>This point represents the speed at which the drive is being commanded to run. It is acquired from the currently selected speed source (preset speeds, speed pot, etc. if set to auto speed control; keypad if set for manual speed control). Overriding this parameter will force the drive to operate at the override speed until released. Until the point is released, the drive will ignore any changes in speed induced by the currently selected speed source. The value of this point is limited by drive Parameters 10 (minimum frequency) and 11 (maximum frequency). Parameter 10 can be set down to 0.00 Hz. Parameter 11 can be set up to 120.00 Hz.</p>
3-02:	<p>Keypad Command Speed</p> <p>This point represents the command speed as dictated by the keypad. This speed is only used if the drive is set for MANUAL speed control. Therefore, overriding this parameter will only have an effect if MANUAL speed control is selected. The value of this point is also limited by Parameters 10 and 11.</p>



N2 Points

Point

Description

3-03:

Normal Acceleration

This point sets the time that it will take for the drive to ramp up the motor from 0.0Hz to the value set in Parameter 18 (Base Frequency). The maximum value for this point is 3600.0 seconds. The minimum value is either 0.1 sec or 0.3 sec depending on the horsepower of the drive. For the actual minimum boundary, refer to the MC3000 Installation and Operation Manual (M301).

When this object is overridden, the override value is stored in a temporary variable and not in the drive's memory. If this parameter is viewed on the drive itself via program mode while it is being overridden, the value that is displayed will not reflect the override value but rather the value that was last stored into the drive's memory via programming mode. Example: if the initial value of Parameter 8 (ACCEL), is 30.0 seconds and this object is overridden to be 15.0 seconds, the serial link will report the 15.0 second value and the drive response will be based on the 15.0 second value but in programming mode, Parameter 8 will still display the original value of 30.0 seconds.

3-04:

Normal Deceleration

This point sets the time that it will take for the drive to ramp down the motor from the value set in Parameter 18 (Base Frequency) to 0.0Hz. The maximum value for this point is 3600.0 seconds. The minimum value is between 0.1 sec and 2.0 sec depending on the voltage rating and horsepower of the drive as well as the presence of a dynamic brake. For the actual minimum boundary, refer to the MC3000 Installation and Operation Manual (M301).

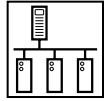
The Normal Deceleration time is only used when Parameter 26 (Stop) is set to RAMP.

When this object is overridden, the override value is stored in a temporary variable and not into the drive's memory. If this parameter is viewed on the drive itself via program mode while it is being overridden, the value that is displayed will not reflect the override value but rather the value that was last stored into the drive's memory via programming mode. Example: if the initial value of Parameter 9 (DECEL) is 30.0 seconds and this object is overridden to be 15.0 seconds, the serial link will report the 15.0 second value and the drive response will be based on the 15.0 second value but in programming mode, Parameter 9 will still display the original value of 30.0 seconds.

3-05:

Local PID Command

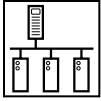
This point indicates the PID Setpoint that is used when the drive is running in LOCAL or SERIAL modes. The PID Setpoint is the number that the drive is attempting to match with the PID Feedback value. Refer to the MC3000 Installation and Operation Manual (M301) for more details on PID functionality.



<u>Point</u>	<u>Description</u>
3-06:	<p>Control Mode</p> <p>This point allows the user to manipulate the control mode in which the drive is running. The drive powers up and will remain in LOCAL Control Mode until the first override or release command is sent to it. The drive will then switch to SERIAL Control Mode. This point can be used to change the control mode back to LOCAL (0) for front panel manipulation. It can also be used to change the control mode to REMOTE to control the drive from the terminal strip. If this point is overridden with REMOTE (1), no overrides or releases will be recognized except for the CONTROL MODE point until the drive is returned to SERIAL control mode. The release of this parameter will return it to the value specified by Parameter 30 (CONTROL).</p>

4.5 Binary Output (BO) Point Descriptions

<u>Point</u>	<u>Description</u>
4-01:	<p>Clear Fault History</p> <p>This history stores the last eight (8) faults that tripped the drive. These are viewable via Analog Input Points 1-12 through 1-19. This history can be cleared by overriding Binary Output Point 1 with a one (1). This will reset each of the eight fault blocks to a no fault status. Once the fault history is cleared, this object will not reset itself to a zero state until another fault is recorded in the history or until serial control is shut down.</p>
4-02:	<p>Start/Stop Drive</p> <p>Allows the drive to be started and stopped through the serial link. The value of this object should follow the current run status of the motor. It will reset itself to a zero state if the drive is stopped, decelerating to a stop or in a fault condition. It will set itself to a set state if the drive is started locally while serial control is disabled.</p>
4-03:	<p>Auto/Manual Select</p> <p>This object controls the speed source from which the drive receives its command speed.</p> <p>AUTO If this point is set to Auto (0), then the drive will get its command speed from the currently selected speed source on the terminal strip (i.e. speed pot, preset speeds 1 - 4, etc. ...) or from the PID Setpoint if PID Mode is enabled.</p> <p>MANUAL If this point is set to Manual (1), then the drive's command speed will come directly from the keypad. This selection is restricted by Parameter 28 (Keypad Programming) which has four settings: AUTO, MANUAL, A/M LOC and A/M SPD.</p> <p>AUTO If parameter 28 is set to AUTO, then the drive can only get its command speed from the source selected on the terminal strip or from the PID setpoint.</p> <p>MANUAL If parameter 28 is set to MANUAL, then the drive can only get its operating speed from the keypad.</p>



N2 Points

Point

Description

4-03:

Auto/Manual Select - Continued

A/M LOC If parameter 28 is set to A/M LOC, then the drive can be set to get its speed from either an automatic speed source or from the keypad. When in either Local or Serial Control Mode, this setting allows the user to change from Auto to Manual or vice versa via the keypad (when in Local) or the serial link (when in Serial).

A/M SPD If parameter 28 is set to A/M SPD, the drive is forced into AUTO mode during a transition from LOCAL to REMOTE or from SERIAL to REMOTE. It forces the drive into MANUAL during the transition from REMOTE to LOCAL control mode. A/M SPD leaves the Auto/Man key active at all times enabling the user to toggle their Auto/Man selection while in REMOTE control mode.

4-04:

Clear Present Fault

If the drive is currently in fault, the fault can be cleared by pressing the STOP key on the keypad. Overriding 4-04 to (1) simulates the pressing of the STOP key via the serial link. 4-04 will reset to (0) whenever the drive enters a fault condition or serial control is shut down.