Quick start guide





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and software support

PowerXL DM1 Series VFD

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Safety

A WARNING! DANGEROUS ELECTRICAL VOLTAGE!

Read this manual thoroughly and make sure you understand the procedures before you attempt to install, set up, operate or carry out any maintenance work on this PowerXL Adjustable Frequency Drive.

Definitions and symbols

WARNING

This symbol indicates high voltage. It calls your attention to items or operations that could be dangerous to you and other persons operating this equipment. Read the message and follow the instructions carefully.



This symbol is the "Safety Alert Symbol." It occurs with either of two signal words: CAUTION or WARNING, as described below.

WARNING

Indicates a potentially hazardous situation which, if not avoided, can result in serious injury or death.

A CAUTION

Indicates a potentially hazardous situation which, if not avoided, can result in minor to moderate injury, or serious damage to the product. The situation described in the CAUTION may, if not avoided, lead to serious results. Important safety measures are described in CAUTION (as well as WARNING).

Hazardous high voltage

WARNING

Motor control equipment and electronic controllers are connected to hazardous line voltages. When servicing drives and electronic controllers, there may be exposed components with housings or protrusions at or above line potential. Extreme care should be taken to protect against shock.

- Stand on an insulating pad and make it a habit to use only one hand when checking components.
- Always work with another person in case an emergency occurs.
- Disconnect power before checking controllers or performing maintenance.
- · Be sure equipment is properly earthed.
- Wear safety glasses whenever working on electronic controllers or rotating machinery.

WARNING

The components in the drive's power section remain energized after the supply voltage has been switched off. After disconnecting the supply, wait at least five minutes before removing the cover to allow the intermediate circuit capacitors to discharge.

Pay attention to hazard warnings!



WARNING

Electric shock hazard—risk of injuries! Carry out wiring work only if the unit is de-energized.

WARNING

Do not perform any modifications on the AC drive when it is connected to mains.

Warnings and cautions

A WARNING

Be sure to ground the unit following the instructions in this manual. Ungrounded units may cause electric shock and/or fire.

WARNING

This equipment should only be installed, adjusted, and serviced by qualified electrical maintenance personnel familiar with the construction and operation of this type of equipment and the hazards involved. Failure to observe this precaution could result in death or severe injury.

WARNING

Components within the drive are live when it is connected to power. Contact with this voltage is extremely dangerous and may cause death or severe injury.

WARNING

Line terminals (L1, L2, L3), motor terminals (U, V, W) and the brake resistor terminals (R+, R-) are live when the drive is connected to power, even if the motor is not running. Contact with this voltage is extremely dangerous and may cause death or severe injury.

EMC warnings and cautions

WARNING

In a residential environment, this product may cause radio interference, in which case supplementary mitigation measures may be required.

WARNING

- This type of PDS is not intended to be used on a low-voltage public network which supplies residential premises.
- Radio frequency interference is expected if used on such a network.

A CAUTION

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

A WARNING

Even though the control I/O terminals are isolated from line voltage, the relay outputs and other I/O terminals may have dangerous voltage present even when the drive is disconnected from power. Contact with this voltage is extremely dangerous and may cause death or severe injury.

WARNING

This equipment has a large capacitive leakage current during operation, which can cause enclosure parts to be above ground potential. Proper grounding, as described in this manual, is required. Failure to observe this precaution could result in death or severe injury.

WARNING

Before applying power to this drive, make sure that the front and cable covers are closed and fastened to prevent exposure to potential electrical fault conditions. Failure to observe this precaution could result in death or severe injury.

A WARNING

An upstream disconnect/protective device must be provided as required by the National Electric Code® (NEC®). Failure to follow this precaution may result in death or severe injury.

A WARNING

This drive can cause a DC current in the protective earthing conductor. Where a residual current-operated protective (RCD) or monitoring (RCM) device is used for protection in case of direct or indirect contact, only an RCD or RCM of Type B is allowed on the supply side of this product.

WARNING

Carry out wiring work only after the drive has been correctly mounted and secured.

WARNING

Before opening the drive covers:

- Disconnect all power to the drive, including external control power that may be present.
- Wait a minimum of five minutes after all the lights on the keypad are off. This allows time for the DC bus capacitors to discharge.

Failure to follow these precautions may cause death or severe injury.

WARNING

The opening of the branch-circuit protective device may be an indication that a fault current has been interrupted. To reduce the risk of fire or electric shock, current-carrying parts and other components of the controller 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.

WARNING

Operation of this equipment requires detailed installation and operation instructions provided in the Installation/Operation manual intended for use with this product. It should be retained with this device at all times. A hard copy of this information may be ordered from literature fulfillment.

WARNING

Before servicing the drive:

- Disconnect all power to the drive, including external control power that may be present.
- Place a "DO NOTTURN ON" label on the disconnect device Lock the disconnect device in the open position.

Failure to follow these instructions will result in death or serious injury.

WARNING

The drive outputs (U, V, W) must not be connected to the input voltage or the utility line power as severe damage to the device may occur and there may be a risk of fire.

WARNING

The heat sink and/or outer enclosure may reach a high temperature.

Pay attention to hazard warnings!



Hot Surface-Risk of Burn. DO NOT TOUCH!

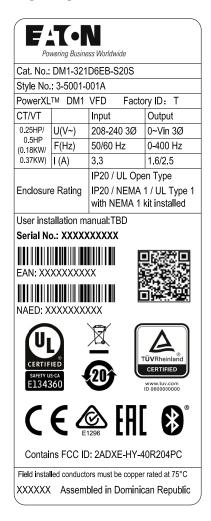
WARNING

In a domestic environment, this product may cause radio interference, in which case supplementary mitigation measures may be required.

1

Step 1 - Ratings Rating label

Figure 1. Housing rating label.



Carton labels (U.S. and Europe)

Figure 2. Carton rating label.

	1D6EB-S20S	
: 3-5001-		
™ DM1	VFD Facto	ry ID: T
	Input	Output
U(V~)	208-240 3Ø	0~Vin 3Ø
F(Hz)	50/60 Hz	0-400 Hz
I (A)	3.3	1.6/2.5
	IP20 / UL Ope	en Type
e Rating		
	with NEMA 1	kit installed
allation m	nanual:TBD	
	7	
UL) RTIFIED		TÜVRheinland CERTIFIED www.tuv.com 10 060000000
	F(Hz) I (A) e Rating allation mode: XXXX	U(V~) 208-240 3Ø F(Hz) 50/60 Hz I (A) 3.3 IP20 / UL Ope e Rating IP20 / NEMA with NEMA 1 allation manual:TBD

Connection options

Table 1. Connection options - main keypad.

Connection method	Port	Upgrade firmware	Upgrade Connects to firmware PC tool	Communication settings				
RS-485	Modbus serial terminals	⊘	⊘	DM1 PR0 I DIN1 16 ST02 17 ST01 18 RY1NO Relay terminals I/O terminals I				
				RS-485 Comm Set: Settable in RS-485 communication parameter group. (Default modbus RTU). Note: If set to BACnet MSTP, PC Tool will not communicate.				
				Slave address: Settable in RS-485 communication parameter group (Default 1).				
				Baud rate: Settable in RS-485 communication parameter group (Default 19,200).				
				Parity: Settable in RS-485 communication parameter group (Default even).				
				Data bits: Not settable, 8 data bit.				
				Stop bits: Not settable, 1 stop bit.				
	Keypad port	⊘	⊘	PINS - GND PIN7 - +24V out PIN6 - Not used PIN5 - Not used PIN5 - Not used PIN5 - Not used				
				Slave address: Not settable, set to modbus ID 18.				
				Baud rate: Not settable, set to 38,400 Kbaud.				
				Parity: Not settable, set to even.				
				Data bits: Not settable, 8 data bit.				
				Stop bits: Not settable, 1 stop bit.				
Ethernet	Ethernet port			PIN4 - GND PIN5 - GND PIN3 - RXP PIN2 - TXN PIN1 - TXP PIN8 - GND PIN8 - GND PIN8 - GND PIN8 - GND				
				IP address mode: Settable in ethernet communication parameter group. (Default DHCP with AutoIP). Note: Most facilities require a static IP. Change the static IP address before changing. After changing this parameter, a reset or power cycle is required.				
				Active IP address: Set depending on IP address assigned static or DHCP.				
				Active subnet mask: Set depending on IP address assigned static or DHCP.				
				Active default gateway: Set depending on IP address assigned static or DHCP.				
				Static IP address: Settable in ethernet communication parameters group. (Default 192.168.1.245).				
				Static subnet mask: Settable in ethernet communication parameters group. (Default 255.255.255.0).				
				Static default gateway: Settable in ethernet communication parameters group. (Default 192.168.1.1).				

Step 2 - PowerXL DM1 connection process to PowerXpert inControl PC tool

To set up a network, it will require a communication DTM supported by the device DTM being connected to. Determine the communication network being used in your system; Eaton currently supports modbus serial and modbus TCP communication protocols for connecting to its devices.

Creating a network

The framework will show the installed communication modules that are installed along with the saved network name.

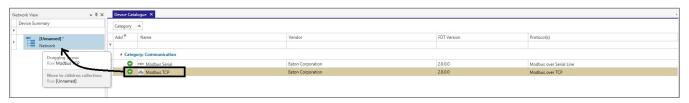
Figure 3. Available communication adapters



Determine what network is being used to connect to the device. To add that network DTM shown in the device catalog there are a few options.

Drag the communication DTM from the Device Catalog to the Network name.

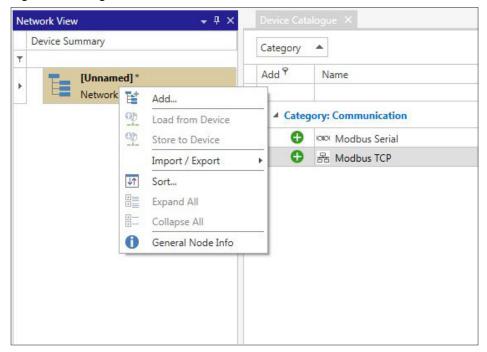
Figure 4. Dragging the communication adapter to create a network.



Press the sign in the device catalog.

Click on the green "+" next to the communication protocol or right click on the Network Name and select Add. Follow the steps to add the desired network.

Figure 5. Adding the desired network.



Note: If the modbus serial DTM is added an additional window will pop up to set communication protocol settings for the communication adapter.

Connecting to the drive

The PowerXL Series DM1 drive can be connected to the Power Xpert inControl configuration tool through either the RS-485 communication terminals A(25) and B(26), or through the keypad port with Eaton's designed USB to RJ45 cable or with the ethernet port located next to the real-time clock battery. Once the drive has physically been connected to the network, both the drives communication parameter and the PC Tool parameters must be configured. Please refer to the PowerXL DM1 communication manual for configuring the modbus MSTP or modbus TCP communication parameters.

△WARNING

Please note that not all communication information for the PowerXL series DM1 drive will be covered in this manual. For additional information regarding the PowerXL DM1 communication abilities, please reference the Communications Manual (MN040051EN).

△WARNING

DO NOT attempt to connect through the keypad port with ethernet communication; it is not for ethernet use. It can be used to connect up via RS-485 with Eaton's communication cable.

Quick connection

Modbus TCP on-board communication details

To connect the PowerXL DM1 drive to the Power Xpert inControl PC Tool using an ethernet connection, please follow the below procedure.

- 1. The static IP address for the DM1 drive defaults to 192.168.001.254. Change the static IP address as needed to follow the site network topology. Example address: 192.168.001.050.
- 2. The ethernet port on the host computer must also be changed as to match the subnet mask IP requirements of the drive (default set to 255.255.255.000). Find the ethernet port which is connected to the network through the computers network control panel menu (administrative rights to computer are required). Change the IP address as the match first (3) octets of the drives IP address, with a unique address in the last IP octet. Example: 192.168.001.001.

Note: Network administrators at the user's location may have different subnet mask requirements or restrictions. Contact local IT for support for IP addressing if needed.

- 3. Open the Power Xpert inControl configuration tool and begin a new project.
- 4. Begin creating the network topology by adding "Modbus TCP" DTM located on the device catalog.
- 5.

- Configure the modbus TCP settings to match that of the drive. The default values loaded into the modbus TCP DTM matches the DM1 default IP address.
- 7. Add a DM1 device DTM to the network by following the same procedure outlined in Step 6. Once added to the network, a prompt will appear requesting an IP address for the device. Enter the same IP address which was set on the device through the keypad in step 1 (Ex: 192.168.001.050), then click "Set".
- 8. Bring the device online by right-clicking the device node, then select "Go Online", or click the "Go Online" button on the top toolbar.
- Double-click the DM1 device node to open the drives Online Configuration screen. The user should now be connected to the drive and have the ability to monitor, configure, and control the device.

Modbus RTU on-board communication details

To connect the drive to the Power Xpert inControl remote configuration and control PC Tool, please follow the below procedure.

- 1. The DM1 drives default slave address for the modbus RTU communication option is "18". It is recommended that the user defines the slave address as to insure a unique address is being assigned to the drive. Change the address as desired by changing parameter P11.2.1 (range available is 1–247 per modbus node).
- 2. Open the Power Xpert inControl configuration tool and begin a new project.
- 3. Begin creating the network topology by adding "Modbus Serial" DTM located on the device catalog.
- 4. Adjust the port setting values for the connected USB-to-serial adaptor by using the Device Manager option through the control panel to match the default values of the drive or to the user's preference. Take note of the COM number assigned to the device as it needs to be assigned in the Power Xpert inControl software.

Note: If the USB-to-serial adaptor port, modbus serial DTM, and DM1 drive are not all configured to the same communication settings the devices will not communicate.

- Assign the modbus serial communications DTM port setting to match the communication port number found in the device manager in Step 4. Adjust all other values to match the drives default values or to the users preference
 - a. Baud rate default: 38400.
 - b. Data bits default: 8 (for modbus TCP specifically).
 - c. Parity default: Even.
 - d. Stop bits default: 1.
- 6. Add a DM1 device DTM.

- 7. Assign the same slave address as in Step 1 to the drives
- 8. This will bring up the Multi-frame Setting screen that allows for sizing the drive. This is typically used in creating an offline parameter file. Bring the device online by right-clicking the device node, and then select "Connect" or click the "Connect" button on the top toolbar. The online parameter window will open when once connected.
- 9. The user should now be connected to the drive and have the ability to monitor, configure, and control the device.

DM1 – Bluetooth connectivity instructions

Introduction

This section contains instructions for configuring DM1/DM1Pro Bluetooth functionality.

Network Diagram

DM1Pro

PC Setup

Insure Bluetooth wireless communication is available on PC/laptop and set to "Enabled".

On Windows10 computer, WIN-X \ Settings \ Devices.

Bluetooth & other devices

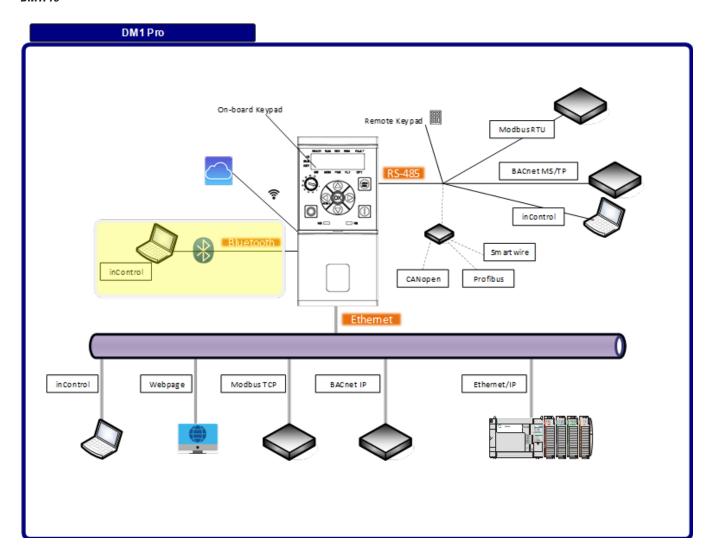


Add Bluetooth or other device

Bluetooth



On

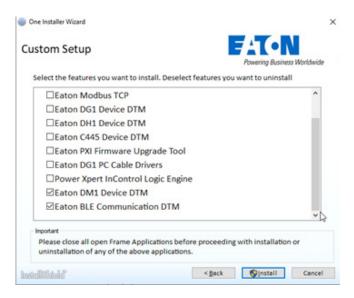


Reference version

Component	Version (or later)
One Installer	2.17.1
Eaton BLE Communication DTM	1.0
PowerXL DM1 DTM	1.0.0.25
PowerXL DM1 bundle	DM1-Pro-V01.03

Power Xpert inControl Installation

Install Power Xpert inControl, DTM for DM1 and BLE Communication DTM using One Installer.

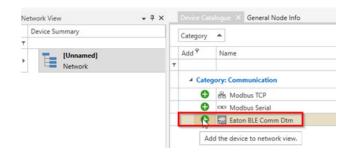


DM1 Bluetooth Parameters

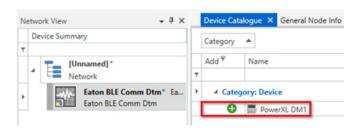
- P11.22 [Blue Tooth Enable] = Enabled
 - (P11.6.1 on keypad)
- P11.48 [Blue Broadcast Mode] = On
 - (P11.6.2 on keypad)

Power Xpert inControl

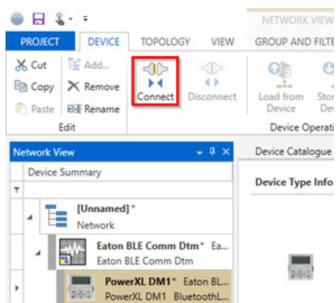
- · Open inControl
- Add Eaton BLE Comm DTM in Network View

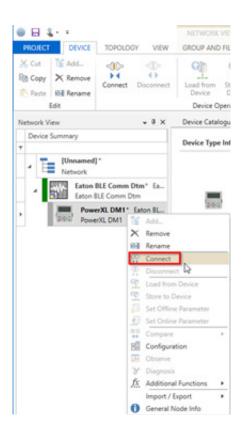


 Select Eaton BLE Communication in Network view and add PowerXL DM1 Device DTM in network view.

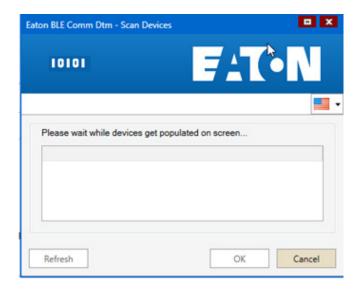


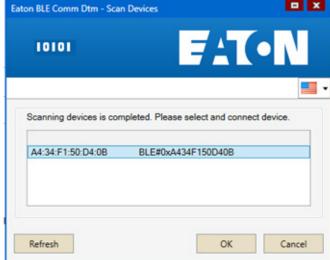
- Connect.
 - · Toolbar or right-click context menu.





- Eaton BLE Comm DTM will go to Online mode.
- Power XL DM1 starts the connection process.
 - Scan dialog will be displayed to see the devices available within range of Bluetooth.



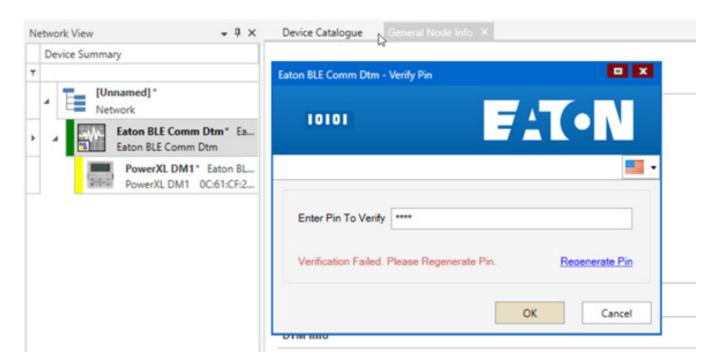


- While scanning is in process, the OK button is disabled.
- Upon completion, the device is selectable and OK is enabled
- If no device detected, attempt a Refresh.
- Note: Scanning will detect only DM1 / DM1 Pro products.
 All others are filtered.
- Four-digit PIN dialog is generated and displayed on local the keypad and remote keypad.
 - Note: It is necessary to have a local or remote keypad to obtain PIN.

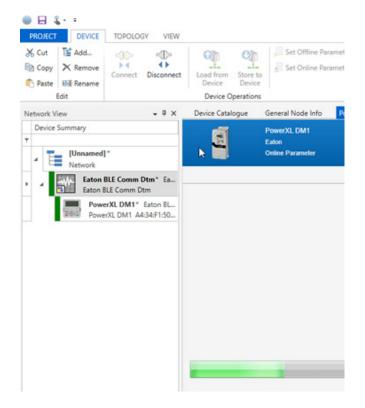




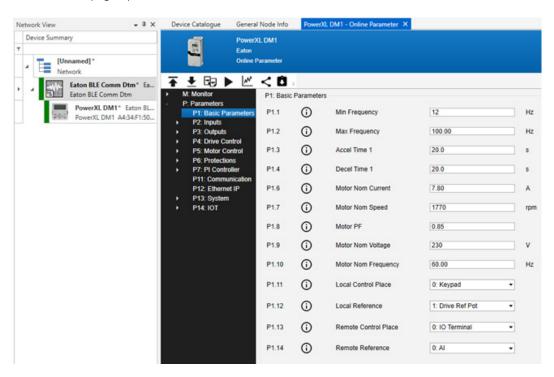
- · Regenerated PIN can be used if the entry period elapses.
- If PIN verification fails after two re-attempts, PowerXL DM1 device DTM will move to Disturbed state.



 If PIN verification succeeds, PowerXL DM1 device DTM instance goes to Online connected state and Online parameters page is loaded.



· Parameters page opens.



- · Why Verify Pin operation is required.
 - Verify Pin operation is used to create pairing between the device and PC. Pairing information is saved by the device as well as the PC. There are different cases when re-pairing needs to be done. They are as follows:
 - 1. Device was never paired with the PC.
 - 2. Device remembers only the last five pairing information.
 - 3. Pairing information is cleared in the device using P11.49 (P11.6.3 on keypad),
 - Note: If pairing is done between the device and PC, and information is available (last five pairs - #2 and pairing info. not cleared - #3) in device, pin verification is not needed.

Additional Help

In the USA please contact the LV Drives Technical Resource Center at 1-800-322-4986 or via email at TRCDrivesTechSupport@Eaton.com.

In Canada please contact the CSC EatonCare Distribution and Control solutions at 1-800-268-3578 or via email at csccanada@eaton.com.

All other supporting documentation is located on the Eaton web site at www.eaton.com/drives.

Device

After inserting the communication DTM, the tool will switch to show device DTMs. Select the device you want to connect to and perform the same sets as used to add communication DTM to add the device. Once the device is added, depending on the communication device selected, a window will pop up to set slave address or IP address of the device (refer to the device specific DTM for an example of setting the device addresses). Once the correct address is set hit the set button.

Offline/online

With the devices added to the Network View, it gives the ability to view an Offline parameter set of the device. By stepping through the multi-frame selection screen, it will size the offline file for the correct drive size or you can connect to the device via the selected communication protocol.

Offline

The offline mode only allows for viewing and setting the parameter without being connect to the device. Once you have the parameters set, you can save this configuration and load it to the drive when you are connected to it. To open an offline file after adding the device to the network, it will open the Multi-frame Settings window, set the drop-downs for the required drive information, and hit set. This will then ask to go through the Quick Start Wizard or open parameters. If you click "Yes" for the Start-up Wizard, it will set through parameter settings; once complete, it will open parameter files. If "No" is selected for the Start-up Wizard, it will close the Multi-frame and then double clicking on the device will open parameter screen.

Figure 6. Selecting the device.

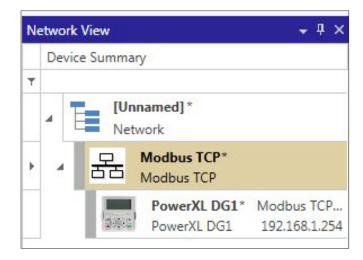


Figure 7. Opening the Parameter screen.



Figure 8. Multi-frame Setting window.



- Drive Voltage would correspond to the voltage rating of the drive in which it is going to be installed.
- Drive Current Rating would correspond to the current rating of the drive in which it is going to be installed.
- Motor/Line Frequency will correspond to the line frequency of the facility in which it is being put.
- Drive Application will select the desired application to be used on the drive depending on the intended use.
- If option cards will be used, select the desired option cards and slots in which they will be inserted.

When Set becomes active, it may be pressed to advance to the Start-up Wizard screen or can press "No" to close the Multi-frame window.

Start-up wizard

The application selected will depend on how many screens will be available in the Start-Up Wizard. The Start-Up Wizard will walk through the most used parameter required to get the drive programmed and running. As the screens come up, by selecting "Next" it will advance you to the next screen, "Back" will take you back to the previous screen, and "Finish" will open up the parameter screen.

Figure 9. Drive setup window.

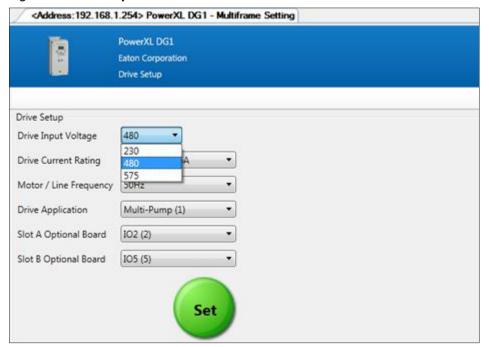
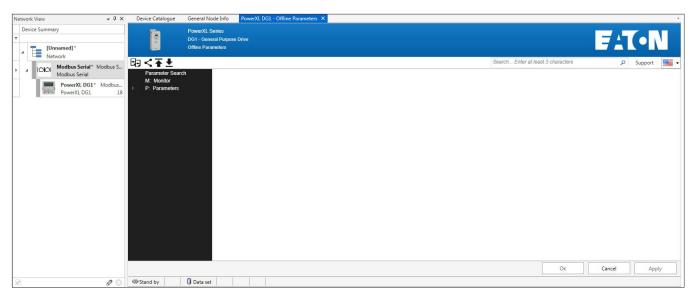


Figure 10. Start-up Wizard screens.



Offline parameter window

The Offline Parameter window gives the ability to compare parameter files, perform a parameter distribution, and Export/Import parameter files that we will discuss in a later section.

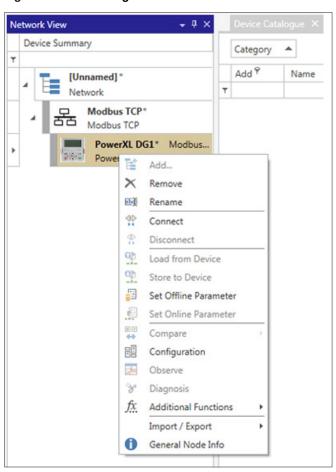
To find a desired parameter or word in a parameter, the Search box allows for a quick way to look for letter order used in a parameter name or by checking the Long description box, it will also look in the parameter descriptions. If further support is needed, the Support button will provide technical support contacts for the Region required. More details on these buttons are described below.

Online

The Online mode is when the tool is connected to the device via the communication protocol. When online, you are able to make changes to the drive and see them change in real time with the drive. It also gives the ability to see fault conditions, monitor device parameters, trend data, and sync real-time clock, compare parameter, device service info, and control the device. To go online with the device, there are a few options.

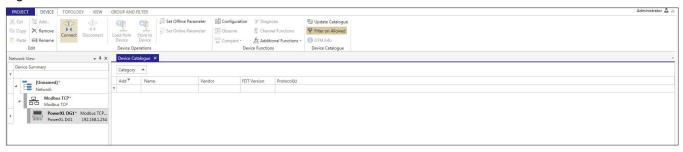
Right click on the device in the Network View and select Connect.

Figure 11. Connecting via the Network View window.



With a device selected in the Network View, click on the Connect button in the ribbon

Figure 12. Connect button in the ribbon.



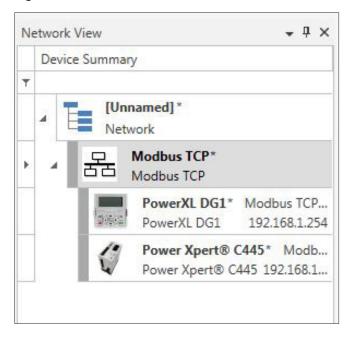
Once connected, the Network tree will show a color bar indicating if the devices connection status:

Green - Online;

Yellow - Communication set issue, check communication settings; and

Grey - Offline.

Figure 13. Network Tree window.



Once connected to the device, you can open the application window by double clicking on the device you would like to view and edit. The tab indicator will show that you are in an online window.

To disconnect from a device, there are the same options as there was to connect to the device with either right clicking on the device and selecting Disconnect or through the ribbon when the device is selected.

Edit DTMs

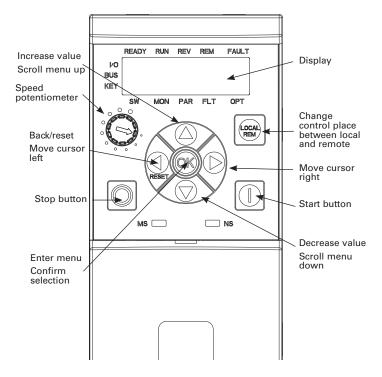
To edit any of the communication or device DTM information, there is a few options, either right click on the device and select configuration or in the Device ribbon select Configuration. Communication DTMs will show communication port settings while Device DTMs will show address settings

Step 3 - Keypad overview

Main keypad

The keypad is the interface between the drive and the user. It features an LCD display, speed potentiometer, and navigation buttons. With the control keypad, it is possible to control the speed of a motor, to supervise the state of the equipment, and to set the frequency converter's parameters (see **Figure 14**).

Figure 14. Main keypad and display.



Main keypad buttons

Buttons description

Table 3. Keypad buttons.

Icon	Button	Description
LOCAL	Local/Remote	Local/Remote: Switches between LOCAL and REMOTE control for start and speed reference. The control locations corresponding to local and remote shall be selected within an application.
	Start	Start: This button operates as motor start button for normal operation when the "Keypad" is selected as the active control source. When Keypad is the reference place after hitting the start button, it will jump directly to the Keypad Ref Screen.
	Stop	 Stop: This button operates as motor stop button for normal operation when the "Keypad" is selected as the control source and keypad stop button is active, or stop button is always enabled regardless of control source. Motor stop from the keypad.
	Up	Up and Down arrows: • Move either up or down a menu list to select the desired menu item. • Editing a parameter bit by bit, while the active digit is scrolled. • Increase/decrease the reference value of the selected parameter. • In parameter page when in read mode, move to the previous or next brother parameter of this parameter.
	Left/Back/Reset	Left arrow: Navigation button, movement to left when editing a parameter digit by digit. Backs up one step.
RESET		 At Main Menu page by hitting Back/Reset takes to Default Page. Back/Reset: This button has three integrated functions. The button operates as backward button during normal mode. In edit mode, it is used as cancel operate. It is also used to reset faults when faults occur.
		 Backs up one step Cancels Modify in edit mode Resets the active faults (all the active faults shall be reset by pressing this button more than 2s in any page) Hold Stop and Back Reset for 5 seconds to return drive to factory default

At Main Menu page by hitting Back/Reset takes to Default Page.

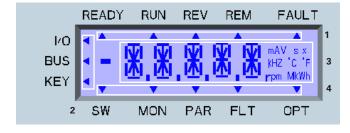
Table 3. Keypad buttons (Cont.).

lcon	Button	Description
	Right	Right arrow:
		Enter parameter group mode.
		Enter parameter mode from group mode.
		 Enter parameter whole edit mode when this parameter can be written.
		Enter parameter bit by bit edit mode from whole edit mode.
		Navigation button, movement to right when editing a parameter bit by bit.
	OK	OK:
		 To clear all the Fault History if pressed for more than 5 s (including 5 s) in any page.
		This button is used in the parameter edit mode to save the parameter setting.
		To confirm the start-up list at the end of the Start-Up Wizard.
		To confirm the comparison item in parameters comparison mode.
		The following is the same with Right key:
		Enter parameter whole edit mode when this parameter can be written.
		Enter parameter group mode.
		Enter parameter mode from group mode.

Main keypad display

The main keypad LCD display indicates the status of the motor and the drive and any faults in motor or drive functions. On the display, the user sees information about the current location in the menu structure and the item displayed.

Figure 15. Main keypad display and labels.



Overview

The display on the main keypad is a customized LCD with four information areas:

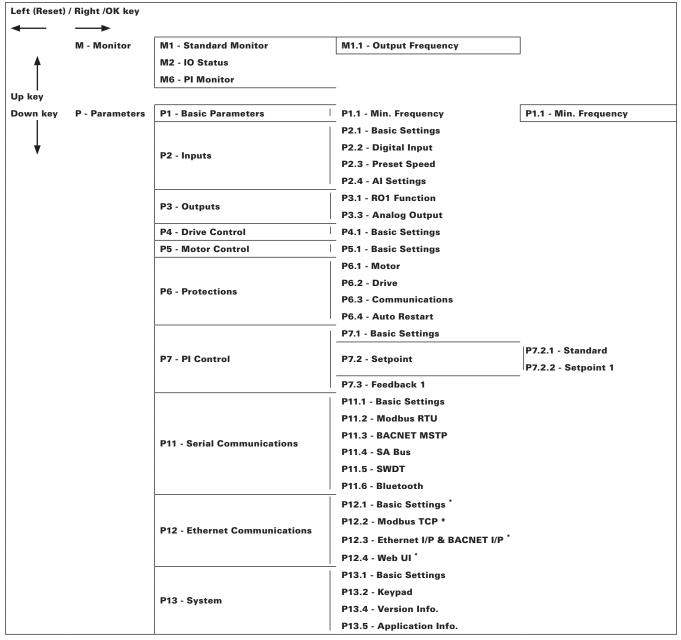
- 1. (**Top line**) The top line is state line and indicates whether the device state is:
 - Ready/NRD; Remote/Local;
 - RUN/STP;
 - REV/FWD;
 - Remote/Local; or
 - Fault (lit)/Warning (flashing).

- 2. (Left line) The left line indicates the control source:
 - IO;
 - BUS; or
 - KEY.
- 3. (Middle line) The middle line is the parameter:
 - · Path;
 - · Value; or
 - Unit.
- (Bottom line) The bottom line is the menu line. It indicates which parameter menu is selected. The choices are:
 - SW: Start-up wizard;
 - MON: Monitor;
 - PAR: Parameter;
 - FLT: Fault; or
 - OPT: Option cards.

Menu navigation - main keypad

This section provides basic instruction on navigating each section in the menu structure from the main keypad.

Figure 16. Main keypad menu navigation.

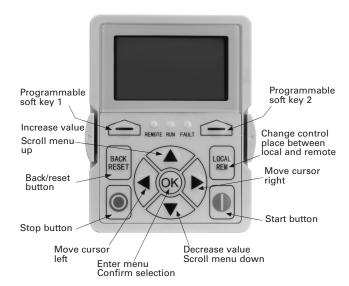


^{* =} DM1 PRO Only.

Remote keypad overview

The remote keypad is another interface between the drive and the user. It features an LCD display, 3 LED lights and 11 buttons. With the control keypad, it is possible to control the speed of a motor, to supervise the state of the equipment, and to set the frequency converter's parameters.

Figure 17. Remote keypad and display.



Remote keypad buttons

Buttons description

Table 4. Remote keypad buttons.

Icon	Button	Description
	Soft key 1, Soft key 2	Soft key 1, soft key 2: Soft keys 1 and 2 have no functionality with the DM1 device.
BACK RESET	Back/Reset	Back/Reset: This button has three integrated functions. The button operates as backward button during normal mode. In edit mode, it is used as cancel operate. It is also used to reset faults when faults occur. Backs up one step. Cancels Modify in edit mode. Resets the active faults (all the active faults shall be reset by pressing this button more than 2 seconds in any page). Hold Stop and Back Reset for 5 seconds to return drive to factory default. At Main Menu page, pressing Back/Reset takes the user to the Default page.
LOCAL	Local/Remote	Local/Remote: Switches between Local and Remote control for start and speed reference. The control locations corresponding to Local and Remote shall be selected within an application.
	Up Down	 Up and down arrows: Move either up or down a menu list to select the desired menu item. Editing a parameter bit by bit, while the active digit is scrolled. Increase/decrease the reference value of the selected parameter. In Parameter Comparison mode, scroll through the parameters of which current value is different from the comparison parameter value. In the Parameter page when in read mode, move to the previous or next brother parameter of this parameter.

Table 4. Remote keypad buttons (Cont.).



Left

Left arrow:

- · Navigation button, movement to left when editing a parameter digit by digit.
- · Backs up one step.
- · At Main Menu page by hitting Back/Reset takes the user to the Default page.



Right

Right arrow:

- · Enter parameter group mode.
- · Enter parameter mode from group mode.
- Enter parameter whole edit mode when this parameter can be written.
- Enter parameter bit by bit edit mode from whole edit mode.
- Navigation button, movement to right when editing a parameter bit by bit.



OK

OK:

- To clear all the Fault History if pressed for more than 5 seconds (including 5 seconds) in any page.
- This button is used in the parameter edit mode to save the parameter setting.
- . To confirm the start-up list at the end of the Start-Up Wizard.
- To confirm the comparison item in parameters comparison mode.

The following is the same with Right key:

- Enter parameter whole edit mode when this parameter can be written.
- Enter parameter group mode.
- · Enter parameter mode from group mode..



Stop

Stop:

This button operates as motor stop button for normal operation when the "Keypad" is selected as the control source and keypad stop button is active, or stop button is always enabled regardless of control source.

• Motor stop from the keypad.



Start

Start:

This button operates as motor start button for normal operation when the "Keypad" is selected as the active control source. When Keypad is the reference place after hitting the start button, it will jump directly to the Keypad Ref Screen.

LED lights

Table 5. LED state indicators.

Indicator	Description
Run	Green Run: Indicates that the VFD is running and controlling the load in Drive or Bypass.
	Blinks when a stop command has been given but the drive is still ramping down.
Fault	Red Fault: Turns on when there is one or more active drive fault(s).
Remote	Yellow Local/Remote: Local: If the local control place is selected, turns off the light.
	Remote: If the remote control place is selected, turns on the light.

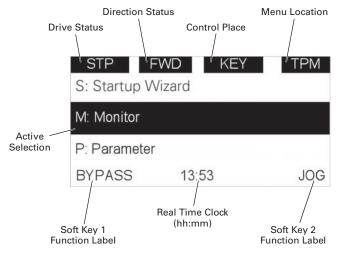
LCD display

The keypad LCD indicates the status of the motor and the drive and any faults in motor or drive functions. On the LCD, the user sees information about the current location in the menu structure and the item displayed.

Overview

Five lines shall be displayed in the screen. General view is as following in Figure 3.

Figure 18. General view of LCD.



The lines definition is as below.

The first line is State line, shows:

- RUN/STP/NRD/FIM/TFM If motor is running, the run state shall display "RUN", otherwise the state display "STP". "RUN" blinks when the stop command is sent but the drive is decelerating. "NRD" is displayed if the drive is not ready or does not have a signal "FIM" is displayed to indicate it is in Fire Mode and the drive is in a Run state. "TFM" is displayed when in the Fire Mode Test Mode and the drive is in a Run State.
- **FWD/REV/JOG** If the motor running direction is clockwise, display "FWD", otherwise display "REV". "Jog" if the drive is in Jog mode the status indication will occur.
- KEY/I/O/BPS/RBP/BUS/OFF If it is in bypass currently, display "BPS"; when run command is given it will got to "RBP" otherwise, if the current control source is I/O terminal, display "I/O". If it is keypad, then display "KEY"; otherwise display "BUS." If HOA enabled and switch to OFF, it shall show OFF.
- PAR/MON/FLT/OPE/QSW/FAV/TPM/MS1/SL1/SL2/SL3/SL4/BUx If the current page is parameter menu, display "PAR". If monitor menu, then display "MON". If fault menu, then display "FLT". If operation menu, then display "OPE". If quick start wizard, then display "QSW". If optional card menu, then display "BOA". If favorite menu, then display "FAV". If main menu, then display "TPM". When doing the Multi-drive Pump and Fan mode, the drive mode will be defined with MS- Master and SL being a slave drive. The 1 through 5 will indicate the number in the series it is. "BUx" indicates the drive being a backup drive when in the redundant drive system.

The second line is Code line, shows the menu code.

The third line is Name line, shows the menu name or parameters name.

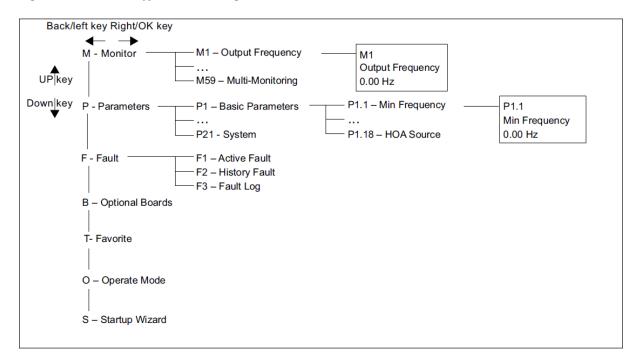
The fourth line is Value line, shows the submenu name or parameters value.

The fifth line is Soft Key line, the functions of Soft Key 1 and Soft Key 2 are changeable, and the real time is in the middle

Menu navigation - remote keypad

This section provides basic instruction on navigating each section in the menu structure from the remote keypad.

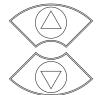
Figure 19. Remote keypad menu navigation.



Step 4 - Start-up

Start-up wizard

In the Start-up Wizard, you will be prompted for essential information needed by the drive so that it can start controlling your process. In the Wizard, you will need the following keypad buttons:



Up/down buttons.

Use these to changes value(s).



OK button.

Confirm selection with this button, and enter into next question.



Left/back/reset button.

If this button was pressed at the first question, the Start-up Wizard will be cancelled.

If this button is pressed in any step on the Start-up Wizard, the Start-up Wizard will be cancelled.

Once you have connected power to your Eaton PowerXL frequency converter, and the Start-up Wizard is enabled, follow these instructions to easily set up your drive.

Table 6. Start-up wizard instructions.

P13.1.7	Parameter lock	PIN			ID 624	
Minimum value:	0	Maximum value:	9999	Default value:	0	
Description:		election can be protected against u will be prompted to enter a passw				
	By default, the password function is not in use. If you want to activate the password, change the value of this parameter to any number between 1 and 9999.					
	To deactivate the	password, reset the parameter va	lue to 0.			
P1.1 ^②	Minimum frequ	ency			ID 101	
Minimum value:	0.00 HZ	Maximum value:	400.00 Hz	Default value:	0.00 Hz	
Description:	frequency has to b	These define the frequency limits of the frequency converter. The maximum value for these parameters is 400 Hz. The minimum frequency has to be below the maximum frequency level. These will limit other frequency parameter settings; preset speeds, jog speed 4 mA fault preset speed, fire mode speed, and brake speed settings.				
P1.2 ^②	Maximum frequ	iency			ID 102	
Minimum value:	0.00 HZ	Maximum value:	400.00 Hz	Default value:	MaxFreqMFG	
	These define the frequency limits of the frequency converter. The maximum value for these parameters is 400 Hz. The minimum frequency has to be below the maximum frequency level. These will limit other frequency parameter settings; preset speeds, jog speed, 4 mA fault preset speed, fire mode speed, and brake speed settings.					
Description:	frequency has to b	be below the maximum frequency		ther frequency parameter setti	ngs; preset speeds, jog speed	
P1.6 ^①	frequency has to b	pe below the maximum frequency speed, fire mode speed, and brake		ther frequency parameter setti	ngs; preset speeds, jog speed	

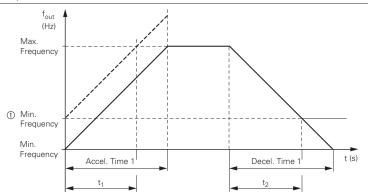
Table 6. Start-up wizard instructions (Cont.). Description: Motor nominal nameplate full load current. Find this value on the rating plate of the motor. Motor Nom. Motor Nom. Voltage Current 0 230/400V 4.0/2.3A 0.75 kW cos φ 0.67 1410 min -1 50 Hz 0 Motor PF Motor Nom. Speed Frequency

P1.7 ^①	Motor nomina	al speed			ID 489
Minimum value:	300 rpm	Maximum value:	20,000 rpm	Default value:	MotorNomSpeedMFG
Description:	Motor nominal r	nameplate base speed. Find this val	ue on the rating plate of	the motor.	
P1.8 ^①	Motor power	factor			ID 490
Minimum value:	0.30	Maximum value:	1.00	Default value:	0.85
Description:	Motor nominal r	nameplate full load power factor. Fi	nd this value on the ratio	ng plate of the motor.	
P1.9 ^①	Motor nomina	al voltage			ID 487
Minimum value:	180 V	Maximum value:	690 V	Default value:	487 V
Description:	Motor nominal r	nameplate base voltage. Find this v	alue on the rating plate	of the motor.	
P1.10 ^①	Motor nomina	al frequency			ID 488
Minimum value:	8.00 Hz	Maximum value:	400.00 Hz	Default value:	MotorNomFreqMFG
Description:	Motor nominal r point (P8.4) to th	nameplate base frequency. Find this ne same value.	s value on the rating plat	e of the motor. This paramete	r sets the field weakening
		4i 4			ID 100
P1.3 ^②	Acceleration	time i			ID 103
	0.10 s	n value:	3000.00 s	Default value:	20 .00 s
P1.3 ² Minimum value: Description:	0.10 s The time require		erate from zero frequenc	y to maximum frequency (P1.2)	20 .00 s
Minimum value:	0.10 s The time require	n value: ed for the output frequency to accele ncy levels, the acceleration time wil	erate from zero frequenc	y to maximum frequency (P1.2)	20 .00 s

Table 6. Start-up wizard instructions (Cont.).

Description:

The time required for the output frequency to decelerate from maximum frequency (P1.2) to zero frequency. When decelerating from different frequency levels, the deceleration time will be a fraction of the total deceleration time.



The values for the acceleration time t_1 and the deceleration time t_2 are calculated as follows: $t_1 = \frac{\text{(Max. Frequency - Min. Frequency)} \times \text{Accel. Time 1}}{\text{Max. Frequency}} t_2 = \frac{\text{(Max. Frequency - Min. Frequency)} \times \text{Decel. Time 1}}{\text{Max. Frequency}}$

P1.13 ^②	Remote control place	ID 135			
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = IO terminal; 1 = Fieldbus; or 3 = Keypad.				
Description:				location: I/O terminals would be fror Il indicate what mode is selected	n the digital hard-wired
P1.14 ^{①②}	Remote reference				ID 137
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Al; 1 = Drive reference pot; 2 = Al joystick; 3 = Motor pot; 4 = Maximum frequency; 5 = Pl control output; 6 = Keypad; or 7 = Fieldbus reference.				
Description:	This parameter determine reference signal	es the reference for remot	e 1 control mode. 1	This value can be fed from an analog	input, keypad, or fieldbus
P13.5.3	Keypad lock PIN				ID 75

Table 6. Start-up wizard instructions (Cont.).

Minimum value:	0	Maximum value:	9999	Default value:	0
Description:	The keypad can be pr	otected against unauthorized	changes with the l	keypad lock function after no keys are	pressed after five minutes.
	When the password function is enabled, the user will be prompted to enter a password before the keypad display parameter or response to key press except up/down/left/right.				
	By default, the password function is not in use. If you want to activate the password, change the value of this parameter to any number between 1 and 9999.				
	To deactivate the pas	sword, reset the parameter va	alue to 0.		
P11.6.1	Blue tooth enable	d			ID 1895
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Options:	0 = Disabled; or 1 = Enable.				
Description:	Blue tooth enable.				

© Parameter value can only be changed after the drive has stopped.
© Parameter value will be set to be default when changing macros.

Now the Start-up Wizard is done. It will not show again at the next power up. If you want to reset it, please select it from the main menu ("Start-up Wizard").

The PID Mini-Wizard is activated in the Quick Setup menu.

Step 5 - Standard application

Introduction

The standard application performs all basic functions of a drive. It allows local and remote control, different speed command sources such as analog input and PID. The standard application allows for basic configuration of fault responses. The standard application supports basic tuning of 3-phase induction motors. The standard application allows programming of digital input 3 and 4 and relay outputs 1 and 2.

Standard application includes functions:

- · Selectable digital input function;
- · Selectable digital output function;
- Output signal filter, scaling, inversion, offset, and range;
- Selectable analog output function;
- · PID control;
- Start source (local/remote control function);
- · Reference source;
- · Flying start;
- · Volts per Hertz control;
- · Real time clock function RTC time display;
- · Drive temperature limit supervision;
- · Output frequency 1 limit supervision;
- · Output frequency 2 limit supervision;
- · Torque limit supervision;
- · Reference frequency limit supervision;
- · Power limit supervision;
- · Analog input limit supervision;
- · Auto restart;
- · Programmable switching frequency;
- · Multi-preset speeds;
- · Emergency stop;
- · Fan control;
- · DC brake;
- · Dynamic brake.

I/O controls

• "Function to terminal" (FTT) programming

The design behind programming of the digital inputs and outs of the DM1 uses "funciton to terminal" programming. It is composed of a terminal, be it a relay output or a digital output, that is assigned a parameter. Within that parameter, it has different functions that can be set.

Control I/O configuration

- Run 240 Vac and 24 Vdc control wiring in separate conduit.
- · Communication wire to be shielded.

Table 7. I/O connection.



External wiring	Terminal	Short name	Name	Default setting	Description
	. 1	DI1	Digital input 1	Run forward	Starts the motor in the forward direction.
	- 2	DI2	Digital input 2	Run reverse	Start the motor in the reverse direction.
<u> </u>	3	DI3	Digital input 3	External fault	Triggers a fault in the drive.
	. 4	DI4	Digital input 4	Fault reset	Resets active faults in the drive.
	. 5	CMA	DI1 to DI4 common	Grounded	Allows for sourced input.
	. 6	Α	RS-485 signal A	_	Fieldbus communication (Modbus RTU, BACNet).
	. 7	В	RS-485 signal B	_	Fieldbus communication (Modbus RTU, BACNet).
	. 8	Al1+ ①	Analog input 1	0 - 10 V	Voltage speed reference (programmable to 4 mA to 20 mA).
H	9	Al1-	Analog input 1 ground	_	Analog input 1 common (ground).
	10	GND	I/O signal ground	_	I/O ground for reference and control.
	-11	A01+	Analog output 1	Output frequency	Shows output frequency to motor 0 - 60 Hz (4 mA to 20 mA).
	12	GND	I/O signal ground	_	I/O ground for reference and control.
	- 13	10 V	10 Vdc reference output	10.3 Vdc +/- 3%	10 Vdc reference voltage.
	- 14	24 V	24 Vdc control output	24 Vdc In/Out	Control voltage input/output (100 mA max.).
	· 15	STO_com	Safe torque common	_	Safe torque Off common.
-	16	ST02	Safe torque Off 2	_	Safe torque Off 2 input.
	· 17	ST01	Safe torque Off 1	_	Safe torque Off 1 input.
*	· 18	R1N0	Relay 1 normally open	Run	Changes state when the drive is in the run state.
¥	· 19	R1CM	Relay 1 common		
	20	R1NC	Relay 1 normally closed		
<u>, </u>	- 21	R2N0	Relay 2 normally open	Fault	Changes state when the drive is in the fault state.
<u>````</u>	- 22	R2CM	Relay 2 common		

Notes: The above wiring demonstrates a SINK configuration. It is important that CMA and CMB are wired to ground. If a SOURCE configuration is desired, wire 24 V to CMA and CMB and close the inputs to ground. When using the +10 V for Al1, it is important to wire Al1—to ground (as shown by dashed line).

① Al1+ and Al2+ support 10K potentiometer.

Standard application—parameters list

On the next pages you will find the lists of parameters within the respective parameter groups. Each parameter section within the table lists:

- Parameter code (location indication on the keypad; shows the operator the present parameter number);.
- · Parameter name;
- ID (number of the parameter);

and where applicable:

- · Minimum value and units;
- · Maximum value and units;
- · Default value and units;
- · Options (when available); and
- Description of the parameter.

Table 8. Monitor.

M1 - standard.	1	1			1
M1.1	Output frequency				ID 1
Minimum value:	Hz	Maximum value:	Hz	Default value:	Hz
Description:	Output frequency (Hz).				
M1.2	Frequency reference	e	,	,	ID 24
Minimum value:	Hz	Maximum value:	Hz	Default value:	Hz
Description:	Reference frequency (I	Hz).			,
M1.3	Motor speed	1	,	,	ID 2
Minimum value:	rpm	Maximum value:	rpm	Default value:	rpm
Description:	Motor output speed (rp	om).			
M1.4	Motor current				ID 3
Minimum value:	А	Maximum value:	А	Default value:	А
Description:	Motor output current F	RMS (Amps).			
M1.5	Motor torque				ID 4
Minimum value:	%	Maximum value:	%	Default value:	%
Description:	Percent motor torque o	alculated from nameplate va	lues and measured i	motor current (%).	
M1.6	Motor power				ID 5
Minimum value:	%	Maximum value:	%	Default value:	%
Description:	Percent motor power o	alculated from nameplate va	lues and measured r	motor current (%).	
M1.7	Motor voltage				ID 6
Minimum value:	V	Maximum value:	V	Default value:	V
Description:	Output ac motor voltag	ge (Vac).			
M1.8	DC-link voltage				ID 7
Minimum value:	V	Maximum value:	V	Default value:	V
Description:	DC bus voltage (Vdc).				
M1.9	Unit temperature	,	,		ID 8
Minimum value:	°C	Maximum value:	°C	Default value:	°C
Description:	Heat sink temperature	(deg C).			

Table	8	Monitor	(Cont.)	i.

M1 - standard (Cont.									
M1.10	Motor temperature				ID 9				
Minimum value:	%	Maximum value:	%	Default value:	%				
Description:		calculated from nameplat		motor current (%)	,,,				
M1.11	Latest fault code	- dalediated from namepiat		Thotor current (70).	ID 28				
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.				
Description:					14.74.				
M1.12	Instant motor power	Last active fault code value. See fault codes for the value shown here.							
Minimum value:	kW	Maximum value:	kW	Default value:	ID 1686 kW				
Description:	Instantaneous motor pov		N V V		K V V				
Doddingtion.	mistantaneous motor pov	vei (KVV).							
M2 - I/O status.									
M2.1	Analog input 1	,	,	,	ID 10				
Minimum value:	Varies	Maximum value:	Varies	Default value:	Varies				
Description:		I value (Vdc or Amps) selec							
M2.2	Keypad pot voltage	- 12.30 (133 37 mips) 00100	and the dipotential.	,	ID 1858				
Minimum value:	V	Maximum value:	V	Default value:	V				
Description:		easured value (Vdc). DM1			•				
M2.3	Analog output	Oddarod Varao (Vao). Bivii	1110 01117.		ID 25				
Minimum value:	Varies	Maximum value:	Varies	Default value:	Varies				
Description:		ed value (Vdc or Amps) sele			Varios				
M2.4	DI1, DI2, DI3		Ctable With parameter		ID 12				
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.				
Description:			IV.A.	Delault value.	IV.A.				
M2.5	Digital input 1/2/3 status	S.		1	ID 13				
Minimum value:	DI4	Maximum value:	NI A	Default value:					
	N.A.	wiaxiiiiuiii value.	N.A.	Delauit value.	N.A.				
Description: M2.8	Digital input 4 status.				ID 557				
	RO1, RO2	Maximum value:	NI A	Defends male an					
Minimum value:	N.A.		N.A.	Default value:	N.A.				
Description:	Relay output 1 and 2 4 st	atus.							
ME Dimenter									
M5 - PI monitor.	Pl oot ==:=t				ID 16				
M5.1 Minimum value:	PI set point	Maximum valua:	Varion	Default value	ID 16				
	Varies	Maximum value:	Varies	Default value:	Varies				
Description:	PI set point in process ur	III.S.			ID 40				
M5.2	PI feedback	Maximum	\/:	Defects	ID 18				
Minimum value:	Varies	Maximum value:	Varies	Default value:	Varies				
Description:	PI feedback level in proc	ess units.							
M5.3	PI error value				ID 20				
Minimum value:	Varies	Maximum value:	Varies	Default value:	Varies				
Description:	PI error in process units.								
M5.4	PI output				ID 22				
Minimum value:	%	Maximum value:	%	Default value:	%				
Description:	PI output.								

Table 8. Monitor (Cont.).

M5.5	PI status				ID 23
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Options:	0 = Stopped; 1 = Running; or 2 = Sleep mode.				
Description:	PI status indication, in	dicates if drive is stopped, ru	nning in PI mode, or	in PI sleep mode.	

M9 - Multi-monitoring.

M9.1	Multi-monitoring	,	'	'	ID 30
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0, 1, 2.
Description:	Displays any three monitor see three lines of monitori editing the value then by g	ng values. Up and down ke	n. The values are s eys can be used to s	electable via the keypad menu. Nelect the row and then hitting the	fulti-monitor page could left arrow key will allow for

Table 9. Operate mode - O.

Code	Parameter	Min.	Max.	Unit	Default	ID	Note
01	Output frequency			Hz		1	
02	Freq. reference			Hz		24	
03	Motor speed			rpm		2	
04	Motor current			А		3	
05	Motor torque			%		4	
06	Motor power			%		5	
07	Motor voltage			V		6	
08	DC-link voltage			V		7	
09	Unit temperature			°C		8	
010	Motor temperature			%		9	
R11 [®]	Keypad reference	Minimum frequency	Maximum frequency	Hz	0.00	141	
R12 [®]	PI keypad setpoint 1	PI process minimum	PI process maximum	Varies	0.00	1307	

 $[\]ensuremath{^{\circ}}$ Parameter value will be set to be default when changing macros.

Table 10. Parameters.

P1 - Basic parameters.					'
P1.1 [©]	Minimum frequ	iency			ID 101
Minimum value:	0.00 Hz	Maximum value:	400.00 Hz	Default value:	0.00 Hz
Description:	Defines the lowes 1 = Fire mode mini 2 = Derag. 3 = MPFC staging 4 = MPFC master 5 = Prime pump fr 6 = Prime pump fr	frequency. fixed frequency. requency.	ll operate. This setting	will limit other frequency parar	neter settings.

Step 5 - Standard application

Table 10. Parameters (Cont.).

P1.2 ^②	Maximum frequency				ID 102
Minimum value:	0.00 Hz	Maximum value:	400.00 Hz	Default value:	MaxFreqMFG
Description:	Defines the highest frequence. 1 = Keypad reference. 3 = Motor potentiometer. 3 = Jog speed. 4 = 2nd stage ramp frequence. 5 = Fire mode minimum files and frequence. 7 = MPFC staging frequence. 8 = MPFC master fixed frequence. 10 = Prime pump frequence. 11 = Preset speed frequence. 12 = Frequency limit value. 13 = Reference limit value. 14 = Speed control_fs2. 15 = Stall frequency limit. 16 = 4 mA fault frequence. 17 = MPFC de-staging frequence. 19 = Pipe fill loss frequence. 20 = Broken pipe frequence.	ency. requency. ncy. equency. y. ncy 2. ncy. e. e y. quency. ety low. loy low.	II operate. This will limit oth	er frequency parameters.	
P1.3 ^②	Accel. time 1				ID 103
Minimum value:	0.10 s	Maximum value:	3,000.00 s	Default value:	20 s
Description:	Defines the time required	for the output frequency	to accelerate from zero frequ	ency to maximum frequency	<i>y</i> .
P1.4 ^②	Decel. time 1				ID 104
Minimum value:	0.10 s	Maximum value:	3,000.00 s	Default value:	20 s
Description:	Defines the time required	for the output frequency	to decelerate from maximum	frequency to zero frequency	у.
P1.6 ^①	Motor nom. current		,	,	ID 486
Minimum value:	DriveNomCurrCT*1/10 A	Maximum value:	DriveNomCurrCT*2 A	Default value:	DriveNomCurrCT A
Description:	Motor nameplate rated f	ull load current. This value	is found on the rating plate	of the motor.	
P1.7 ^①	Motor nom. speed				ID 489
Minimum value:	300 rpm	Maximum value:	20,000 rpm	Default value:	MotorNomSpeedMFG
Description:	Motor nameplate rated s	peed. This value is found	on the rating plate of the mot	or.	
P1.8 ^①	Motor PF				ID 490
Minimum value:	0.30	Maximum value:	1.00	Default value:	0.85
Description:	Motor nameplate rated p	ower factor. This value is	found on the rating plate of t	he motor.	
P1.9 ^①	Motor nom. voltage				ID 487
Minimum value:	180 V	Maximum value:	690 V	Default value:	MotorNomVoltMFG V
Description:	Motor nameplate rated v	oltage. This value is found	on the rating plate of the mo	otor.	
P1.10 ^①	Motor nom. frequenc	ey .			ID 488
Minimum value:	8.00 Hz	Maximum value:	400.00 Hz	Default value:	MotorNomFreqMFG Hz
Description:	Motor nameplate rated f	requency. This value is fou	nd on the rating plate of the	motor.	
P1.11 ^②	Local control place				ID 1695
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = keypad; 1 = IO terminal; or 3 = fieldbus.				
Description:	Defines the signal location Start/Stop buttons on the	on for the start command in e drive. Keypad display wi	n local mode. I/O terminals w Il indicate which mode is sele	vould be from the digital ha ected.	rd-wired inputs or keypad fo

Table 10. Parameters (Cont.).

P1.12 ^{①②}	Local reference				ID 136
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	1
Options:	0 = Al; 1 = drive ref. pot; 4 = maximum frequency; 6 = keypad; or 7 = fieldbus ref.				
Description:	Defines the signal location	n for the speed reference	in local mode.		
P1.13 ^②	Remote control place			'	ID 135
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = IO terminal; 1 = fieldbus; or 3 = keypad.				
Description:	Defines the signal location	n for the start command in	remote mode. I/O	terminals would be from the digital	hard-wired inputs or keynad
	for Start/Stop buttons on				. nara wirod inpato or noypad
P1.14 ^{©②}					ID 137
P1.14 [©]	for Start/Stop buttons on				. ,.
	for Start/Stop buttons on Remote reference	the drive. Keypad display	will indicate which	mode is selected.	ID 137

^① Parameter value can only be changed after the drive has stopped. ^② Parameter value will be set to be default when changing macros.

Table 11. Inputs.

P2.1 - Basic settings.										
P2.1.3 ^{①②}	IO terminal Start/Stop logic				ID 143					
Minimum value:	N.A.	Maximum value:	Maximum value: N.A. Default value:							
Options:	1 = Start - rever 2 = Start - enab	rse: maintained input on start signa ble: maintained input on start signal - Stop pulse: used for three wire op	1 to run forward ar 1 to run forward an	d and a maintained signal on start s nd a maintained signal on start signa d a maintained signal on start signa Il 1 uses a normally open start and	al 2 for reverse. I 2 to enable the drive to run.					
Description:	Defines the functionality for start signal 1 and start signal 2. By default, start signal 1 is DI1 and start signal 2 is DI2.									
	0 = P3 2· DI clo	osed contact = start forward P3 3	· DI closed contact	= start reverse. This would be co	nsidered 2-wire control wit					

either a contact used on the start FWD or start REV commands. When contacts open, the motor stops.

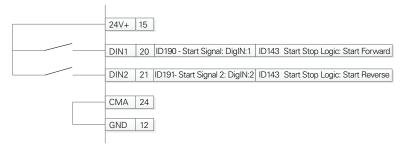
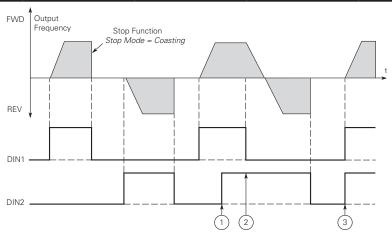


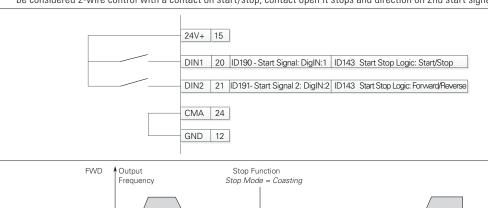
Table 11. Inputs (Cont.).



Notes: ① The first selected direction has the highest priority. ② When the DIN1 contact opens the direction of rotation

(DIN1) and start reverse (DIN2) signals are active simultaneously the start forward signal (DIN1) has priority.

1 = P3.2: DI closed contact = start /open contact = stop P3.3: DI closed contact = reverse / open contact = forward. This would be considered 2-wire control with a contact on start/stop, contact open it stops and direction on 2nd start signal.



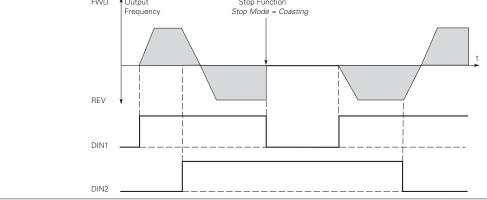
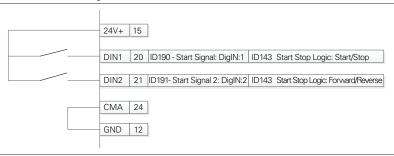


Table 11. Inputs (Cont.).

2 = P3.2: DI closed contact = start/open contact = stop P3.3: DI closed contact = start enabled/open contact = start disabled and drive stopped if running motor direction keeps forward. This would be considered 3-wire control with start signal 2 required to be closed to enable start on start signal 1.



3 = Three-wire connection (pulse control): P3.2: DI changes from open to closed = start pulse P3.3: DI changes from closed to open = stop pulse P3.5: DI closed contact = reverse/open contact = forward. This would be considered 3-wire control with start signal 1 being the start pulse and start signal 2 being the NC stop.



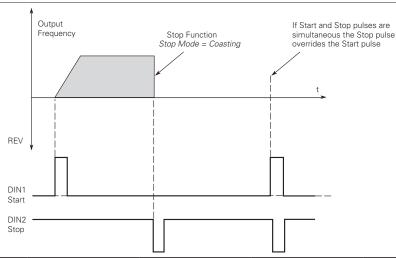


Table 11. Inputs (Cont.).

P2.2 - Digital input.					
P2.2.5 ^②	DI3 function		,	'	ID 1805
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	4
Options:	by P2.1.3. 2 = IO terminal start sign by P2.1.3. 3 = Reverse - when Start 4 = Ext. fault 1 - when 7 = Fault reset - when 8 = Run enable - when 9 = Preset speed B0 - t 10 = Preset speed B1 - 11 = Preset speed B2 - 16 = Accel./decel. time 19 = Remote control - who 22 = Pl controller - who 23 = Pl setpoint select 24 = Motor interlock 1 29 = DC brake active -	gnal 1 - when the control sou gnal 2 - when the control sou art/Stop logic is set to 3 start closed, ext. fault 1 will be ac- closed, all active faults will b closed the drive will allow as the seven preset speeds are sthe seven preset speeds are sthe seven preset speeds are set - when open, accel./decon when closed, the drive will be en closed, the drive will force - when open, parameter setp - when closed, motor will be when closed, DC injection bris	pulse stop pulse, this tivated. e reset. start command and be elected via three bina selected via three bina selected via three bina selected via three bina el. time 1 will be used, e forced to the remote proced to the local cont the reference source oint 1 is active, when enabled to run. aking will be active.	ry inputs, this is least significant ary inputs. ary inputs. ary inputs, this is most significant when closed accel./decel. time 2 control place. rol place. to PI controller output. closed, setpoint 2 is active.	form the action defined t in the reverse direction bit in that binary input.
Description:		hen closed. The Derag. cycle	tor pumps will be init	18TEO.	
P2.2.7 [©]	Defines the function of DI4 function	aigitai input 3.			ID 1807
P2.2.7◎ Minimum value:	N.A.	Maximum value:	N.A.	Default value:	7
	by P2.1.3. 2 = IO terminal start sign by P2.1.3. 3 = Reverse - when Start 4 = Ext. fault 1 - when 7 = Fault reset - when 8 = Run enable - when 9 = Preset speed B0 - t 10 = Preset speed B1 - 11 = Preset speed B2 - 16 = Accel./decel. time 19 = Remote control - where 20 = Local control - where 23 = Pl setpoint select 24 = Motor interlock 1 29 = DC brake active - 10 = North 1	gnal 2 - when the control sou art/Stop logic is set to 3 start closed, ext. fault 1 will be ac closed, all active faults will b closed the drive will allow a the seven preset speeds are s the seven preset speeds are the seven preset speeds are	rce is set to IO terminal pulse stop pulse, this tivated. e reset. start command and be elected via three binal selected via three binal time I will be used, a forced to the remote broad to the local contitude to run. It is active, when enabled to run. aking will be active.	ry inputs, this is least significant ary inputs. ary inputs, this is most significant when closed accel./decel. time 2 control place. rol place. to PI controller output. closed, setpoint 2 is active.	form the action defined t in the reverse direction bit in that binary input.
Description:	Defines the function of	digital input 4.			
P2.3 - Preset speed.					
P2.3.1 ^②	Preset speed 1				ID 105
Minimum value:	0.00 Hz	Maximum value:	MaxFreq Hz	Default value:	5.00 Hz
Description:	Preset speed is selecte	ed with digital inputs using a	binary input.		
P2 3 2 ²	Preset speed 2		,		ID 106

P2.3.1 ²	Preset speed 1				ID 105
Minimum value:	0.00 Hz	Maximum value:	MaxFreq Hz	Default value:	5.00 Hz
Description:	Preset speed is sele	cted with digital inputs using a	binary input.		
P2.3.2 ^②	Preset speed 2	,		'	ID 106
Minimum value:	0.00 Hz	Maximum value:	MaxFreq Hz	Default value:	10.00 Hz
Description:	Preset speed is sele	cted with digital inputs using a	binary input.		
P2.3.3 ^②	Preset speed 3	,	,	'	ID 118
Minimum value:	0.00 Hz	Maximum value:	MaxFreq Hz	Default value:	15.00 Hz
Description:	Preset speed is sele	cted with digital inputs using a	binary input.		

Table 11. Inputs (Cont.).

P2.3.4 ^②	Preset speed 4	'	'	'	ID 119		
Minimum value:	0.00 Hz	Maximum value:	MaxFreq Hz	Default value:	20.00 Hz		
Description:	Preset speed is selecte	ed with digital inputs using a	binary input.				
P2.3.5 ^②	Preset speed 5			'	ID 120		
Minimum value:	0.00 Hz	Maximum value:	MaxFreq Hz	Default value:	25.00 Hz		
Description:	Preset speed is selected with digital inputs using a binary input.						
P2.3.6 ^②	Preset speed 6	'	,	'	ID 121		
Minimum value:	0.00 Hz	Maximum value:	MaxFreq Hz	Default value:	30.00 Hz		
Description:	Preset speed is selecte	ed with digital inputs using a	binary input.				
P2.3.7 ^②	Preset speed 7				ID 122		
Minimum value:	0.00 Hz	Maximum value:	MaxFreq Hz	Default value:	35.00 Hz		
Description:	Preset speed is selected with digital inputs using a binary input.						

P2.4 - Al settings.

P2.4.1	Al mode				ID 222		
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	1		
Options:	0 = 0 - 20 mA; or 1 = 0 - 10 V.						
Description:	Defines the analog inp parameter.	ut mode to current or voltage	the DIP switches o	n control board will need to be set t	to the same mode as this		
	*DM1 PRO CN5 terminals 8 and 9 for current or voltage, also need to set DIP switches SW2 2 and 3 on control board, near the RJ45 port.						
	DIP switches SW2 2 and 3 off for voltage.						
				1 / DM1 Pro, it will require DIP swith supply, the DIP switches SW2 2 of			

		Default	
	SV	V2	
	OFF	ON	
CMA ✓ • GND			CMA⊸⊸GND
Al- ⋖⊙GND	2		Al GND
AI0 ~ 10 V	3		AI0 ~ 10 V

Table 11. Inputs (Cont.).

P2.4.2 ^②	Al signal range				ID 175
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = 0-100%/0-20 m 1 = 20-100%/4-20				
Description:	With this paramete	r, you can select the analog ir	nput 1 signal range.		
	For selection "Cust	omized," see "Al Custom Min'	and "AI Custom Max	", this enables a customized signal	range.
		Al Ref.	Output Frequency		
		Scale Min. Value	Al1 Signal Range = Custon Al1 Signal Range = 0 Al2 = 0 - 100%		
		Al Ref. Scale Max. Value	Al1 Signa Range = Al2 = 20	1 Al2	

4 mA

Custom Min.

20 mA

Al1 Custom Max.

Table 12. Outputs

P3.1 - Digital output.							
P3.1.1 ^②	RO1 function				ID 152		
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	2		
Options:	0 = Not used - no action. 1 = Ready - drive is ready for operation. 2 = Run - drive is running. 3 = Fault - drive is faulted. 4 = Fault invert - drive is not faulted. 5 = Warning - drive has a warning message. 6 = Reverse - drive is outputting reverse phase rotation. 7 = At speed - output frequency has reached the set reference. 8 = Zero frequency - drive output is at zero frequency. 24 = STO fault output - safe torque off input is activated. 26 = Remote control - remote is the control place. 37 = Pl sleep - Pl controller is in a sleep state.						
Description:	Defines the function associated with changing the state of relay output 1.						
P3.1.4 ^②	RO2 function	'			ID 153		
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	3		
Options:	2 = Run - drive is i 3 = Fault - drive is 4 = Fault invert - c 5 = Warning - driv 6 = Reverse - driv 7 = At speed - out 8 = Zero frequenc 24 = STO fault out 26 = Remote cont	s ready for operation. unning. faulted.	reference. y.				
Description:	Defines the functi	on associated with changing the s	tate of relay output 2.		,		

[©] Parameter value can only be changed after the drive has stopped. © Parameter value will be set to be default when changing macros.

Table 12. Outputs (Cont.).

P3.3 - Analog output.								
P3.3.1 ^②	AO mode				ID 227			
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0			
Options:	0 = 0 - 20 mA; or 1 = 0 - 10 V.							
Description:	Defines the analog out	Defines the analog output mode to current or voltage.						
P3.3.2 ^②	AO function				ID 146			
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	1			
Options:	1 = Output frequency (0 - maximum frequency). 2 = Frequency reference (0 - max frequency). 3 = Motor speed rpm (0 - nameplate rpm). 4 = Motor current (0 - nameplate current). 5 = Motor torque (0 - calculated nominal). 6 = Motor power (0 - calculated nominal). 7 = Motor voltage (0 - nameplate voltage.; 8 = DC bus voltage (0 - 1,000 Vdc). 12 = Analog input (0% - 100%).							
Description:	Select the function des	ired to the terminal AO1.						

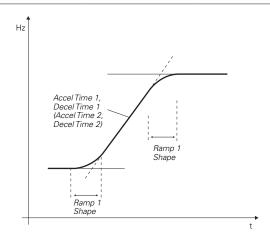
^② Parameter value will be set to be default when changing macros.

Table 13. Drive control.

P4.1.1 [©]	Kevpad reference				ID 141			
	.,,							
Minimum value:	MinFreq	Maximum value:	MaxFreq	Default value:	0.00 Hz			
Description:	Keypad reference value.							
P4.1.3 ^②	Keypad stop				ID 114			
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	1			
Options:		0 = Enabled - keypad operation - In this mode, the keypad stop will only operate when the control source is set to keypad. 1 = Always enabled - In this mode, the stop button will always stop the drive regardless of control mode.						
Description:	Enabled or always enable	ed keypad operation.						
P4.1.4 ^①	Reverse enabled				ID 1679			
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	1			
Options:	0 = Disabled; or 1 = Enabled.							
Description:	Enables or disables the re	everse motor direction.						
P4.1.5	Change phase sequence motor ID 2515							
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0			
Options:	0 = Change disable; or 1 = Change enable.							
Description:	This parameter allows fo	r swapping the motor phas	e output from u, v, w to	0 u, w, v.				
P4.1.6 ^②	Power up local remo	te select			ID 1685			
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0			
Options:	0 = Hold last; 1 = Local control; or 2 = Remote control.							
Description:	Selects what control place	ce the drive will start at aft	er power is applied. T	The default setting will hold the lart in that mode regardless of las	ast state that the drive w			

Table 13. Drive control (Cont.).

P4.1.8 ^②	Start mode				ID 252
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	1 = Flying start fro last operating 2 = Flying start fro	frequency as a starting point.	catch a spinning mo will catch a spinnir	ence value. otor. This setting searches for the one of motor. This setting searches for	, , ,
Description:	Selects the start n	node operation.			
P4.1.9 ^②	Stop mode	'			ID 253
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	1
Options:		er a stop command, the motor coane stop command, the speed of th		trolled by the drive. ted according to the set deceleration	on parameters.
Description:	Selects the stop m	ode operation.			
P4.1.10 ^②	Ramp 1 shape				ID 247
Minimum value:	0.00 s	Maximum value:	10.00 s	Default value:	0.00 s
Description:	gives a linear ramp	shape that causes acceleration	and deceleration to	noothed with these parameters. Se react immediately to the changes in an S-shaped acceleration/decelera	n the reference signal.



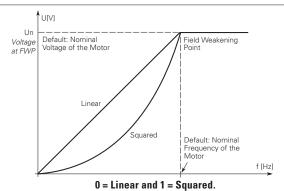
 $^{^{\}scriptsize \textcircled{\tiny 1}}$ Parameter value can only be changed after the drive has stopped. $^{\scriptsize \textcircled{\tiny 2}}$ Parameter value will be set to be default when changing macros.

Table 14. Motor control.

P5.1 - Basic setting	s.				
P5.1.1 ^{①②}	Motor control	mode			ID 287
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	1 = Speed control 2 = Open loop veo identification 3 = PM control 1	ntrol - Output frequency is controll I - Output frequency is controlled b ctor control - Similar to the standar - PM motor control mode 1, used fo - PM motor control mode 2, used fo	ly giving a frequency and speed control mod or SPM (surface mou	reference to it with slip compensa de, higher performance slip calcula inted permanent magnet) and it als	tion requires running a motor so can be used for IPM.
Description:	Selects the motor	r control mode.			

Table 14. Motor control (Cont.).

P5.1.2 ^①	Current limit			ID 107			
Minimum value:	DriveNomCurrCT*1/10 A Maximu	m value: DriveNomCu	rrCT*2 A Default value:	DriveNomCurrCT*3/2 A			
Description:	This parameter determines the maxim Once the motor current hits this level,						
P5.1.3 ^{①②}	V/Hz optimization	'	'	ID 109			
Minimum value:	N.A. Maximu	m value: N.A.	Default value:	0			
Options:	0 = Disable torque boost function. 1 = Enable torque boost function.						
Description:	Automatic torque boost - the voltage and run at low frequencies with high		tically, which assists the motor to pr	oduce sufficient torque to start			
P5.1.4 ^{①②}	V/Hz ratio	·		ID 108			
Minimum value:	N.A. Maximu	m value: N.A.	Default value:	0			
Options:	where the nominal voltage is supp 1 = Squared - the voltage of the moto weakening point where the nomin produces less torque and electron the load is proportional to the squ 2 = Programmable V/Hz curve - the V/ voltage, midpoint and weakening I application. 3 = Linear with flux optimization - the	 0 = Linear - the voltage of the motor changes linearly with the frequency in the constant flux area from 0 Hz to the field weakening poin where the nominal voltage is supplied. A linear V/Hz ratio should be used in constant torque applications. 1 = Squared - the voltage of the motor changes following a squared curve with the frequency in the area from 0 Hz to the field weakening point where the nominal voltage is supplied. The motor runs under magnetized below the field weakening point and produces less torque and electromechanical noise. A squared V/Hz ratio can be used in applications where the torque demand of the load is proportional to the square of the speed. 2 = Programmable V/Hz curve - the V/Hz curve can be programmed with three different points. These points are the 0 frequency voltage, midpoint and weakening point. A programmable V/Hz curve can be used if the other settings do not satisfy the needs of th application. 3 = Linear with flux optimization - the drive starts to search for the minimum motor current in order to save energy. This mode is called Eaton's Active Energy Control which will reduce the voltage and current but still maintain the desired speed. 					
Description:	Selects the V/Hz ratio. 0 = Linear; 1 = Squared; 2 = Programmable; or 3 = Linear + flux optimization.						



P5.1.10 ^②	Switching frequenc	y			ID 2522
Minimum value:	MinSwitchFreq kHz	Maximum value:	MaxSwitchFreq kHz	Default value:	DefaultSwitchFreqCT kHz
Description:	Sets the switching freq	uency for the PWM output v	vaveform.		
P5.1.16 ^{①②}	Identification	'	'		ID 299
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	2 = Identification with r 3 = Identification no run	tator resistor - does not spir run - motor stator resistor is n - motor is supplied with cu nertia - identification for the	completed then the motor is rrent and voltage but at zero	run. This must be comple	eted with unloaded motor.
Description:	parameters to improve will be active then set b	the drive to make an motor starting torque and open loo back to 0 when completed. N ned. If there is an issue witl	op vector control performand When a run command is issu	e. Once set and a run com ued, the message on the ke	mand is given, the operation ypad will indicate "Auto

[©] Parameter value can only be changed after the drive has stopped. © Parameter value will be set to be default when changing macros.

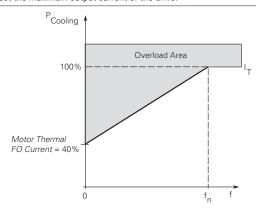
Table 15. Protections.

P6.1 - Motor.					
P6.1.4 ^{①②}	Motor thermal	protection			ID 310
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	2
Options:		ode after fault according to param ode after fault always by coasting			
Description:	calculated motor t		r on values of the dri	stage based off the % of calculate ve and monitoring values as the d of the motor to 0%.	
P6.1.5 ^②	Motor thermal FO current				ID 311
Minimum value:	0.00%	Maximum value:	150.00%	Default value:	100.00%

Description:

The current can be set between 0 - 150.0% x InMotor. This parameter sets the value for thermal current at zero frequency. The default value is set assuming that there is no external fan cooling the motor. If an external fan is used, this parameter can be set to 90% (or even higher).

Note: The value is set as a percentage of the motor nameplate data, P1.6 (nominal current of the motor), not the drive's nominal output current. The motor's nominal current is the current that the motor can withstand in direct on-line use without being overheated. If you change the parameter nominal current of motor, this parameter is automatically restored to the default value. Setting this parameter does not affect the maximum output current of the drive.



P6.2 - Drive.

P6.2.2 ^{①②}	Input phase fault				ID 332			
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	2			
Options:		fault according to paramete fault always by coasting; or nit.						
Description:	The input phase supervision	on ensures that the input ph	ases of the frequency conve	rter have approximately equ	ial current draw.			
P6.2.3 ^{①②}	4 mA input fault				ID 306			
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0			
Options:	0 = No response. 1 = Warning. 2 = Warning, the frequency from 10 seconds back is set as reference. 3 = Warning, the preset frequency P6.2.4 is set as reference. 4 = Fault, stop mode after fault according to parameter stop mode. 5 = Fault, stop mode after fault always by coasting.							
Description:			if the 4 - 20 mA reference si ation can also be programm					

Table 15. Protections (Cont.).

P6.2.4 ^{①②}	4 mA fault freque	ency			ID 331			
Minimum value:	0.00 Hz	Maximum value:	MaxFreq Hz	Default value:	0.00			
Description:	When 4 mA fault hap	pens, the output frequency of	drive goes to this preset	speed when P6.2.3 = 3.				
P6.2.5 ^{①②}	External fault		,	'	ID 307			
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	2			
Options:		after fault according to parame after fault always by coasting.	eter stop mode.					
Description:	A warning or a fault a external fault). The s	action and message is generate status information can also be	ed from the external faul programmed into digital	t signal in the programmable (output relay outputs RO1 and l	digital inputs function select RO2.			
P6.2.11 ^②	STO fault respons	e			ID 2427			
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	2			
Options:	1 = Warning - drive ir	0 = No Action - drive will stop, no indication shown, no reset required, have to cycle start command. 1 = Warning - drive indicate warning/if STO clears drive will run without reset. 2 = Fault - drive will indicate fault/require reset to start again.						
Description:	STO fault response d	efines the function of how the	STO input will be seen o	on the keypad and how the driv	e functions to it.			
P6.2.12 ^①	PI feedback Al los	ss response		,	ID 2401			
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0			
Options:	0 = No action; 1 = Warning; 2 = Fault; or 3 = Warning: preset f	requency (P6.2.13).						
Description:	This parameter defin feedback.	es the function of the PI feedba	ack analog input loss res	ponse. If the AI feedback is lo	st based off the programed A			
P6.2.13 ^{①②}	PI feedback Al los	ss pre-frequency	,	'	ID 2402			
Minimum value:	0.00 Hz	Maximum value:	400.00 Hz	Default value:	0.00 Hz			
Description:	This parameter defin	es the frequency the master w	ould run to if a feedback	is lost and P6.2.12 was set to	option 3.			
P6.2.14 ^②	PI feedback Al los	ss pipe fill			ID 2403			
Minimum value:	0.00 varies	Maximum value:	1000.00 varies	Default value:	0.00 varies			
Description:		in the pump based off the me 1.13 "loss of prime" occurs.	asured level. If the value	e drops below this level for the	time in P6.2.15 and below,			
P6.2.15 ^②	PI feedback Al los	ss pre-frequency			ID 2404			
Minimum value:	0.00 s	Maximum value:	6,000.00 s	Default value:	0.00 s			
Description:		re-frequency timeout - when P for the time set here. After thi						

P6.3 - Communications.

P6.3.1 ^{①②}	Fieldbus fault re	ID 334			
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	2
Options:	0 = No action; 1 = Warning; 2 = Fault; or 3 = Fault, coast.				
Description:					

Step 5 - Standard application

Table 15. Protections (Cont.).

P6.3.2 ^{①②}	OPTcard fault re	esponse		'	ID 335
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	2
Options:	0 = No action; 1 = Warning; 2 = Fault; or 3 = Fault, coast.				
Description:	This sets the respo	cating to the central			

[©] Parameter value can only be changed after the drive has stopped. © Parameter value will be set to be default when changing macros.

Table 16. Pl Controller

P7.1 - Basic settings	s.				
P7.1.1 ^②	PI control gain				ID 1294
Minimum value:	0.00%	Maximum value:	200.00%	Default value:	100.00%
Description:		of the PI Controller. It adjust the s f 10% in the error value causes th			he load. If this value is set to
P7.1.2 ^②	PI control itime	9			ID 1295
Minimum value:	0.00 s	Maximum value:	600.00 s	Default value:	1.00 s

Table 16. Pl Controller (Cont.).

P7.1.3 ^{①②}	PI process unit				ID 1297	
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0	
Options:	0 = %; 1 = 1/min.; 2 = rpm; 3 = ppm; 4 = pps; 5 = I/s; 6 = I/min.; 7 = I/h; 8 = kg/s; 9 = kg/min.; 10 = kg/h; 11 = m3/s; 12 = m3/min.; 13 = m3/h; 14 = m/s; 15 = mbar; 16 = bar; 17 = Pa; 18 = kPa; 19 = mVS; 20 = kW; 21 = Deg. C; 22 = GPM; 23 = gal/s; 24 = gal/min.; 25 = gal/h; 26 = lb/s; 27 = Ib/min.; 28 = lb/h; 29 = CFM; 30 = ft³/s; 31 = ft³/min.; 32 = ft³/h; 33 = ft/s; 34 = in. wg; 35 = ft wg; 36 = PSI; 37 = lb/in.2; 38 = HP; 39 = Deg. F; 40 = PA; 41 = WC; 42 = HG; 43 = ft; 44 = m;					
Description: P7.1.4 ²	Defines the unit type fo				ID 1298	
Minimum value:	-99999.99 varies	Maximum value:	PID1_ProcessUnitMax varies	Default value:	0.00 varies	
Description:	Defines the minimum pr	ocess unit value.				
	PI process unit maximum ID 1300					
P7.1.5 ^②	PI process unit max					
P7.1.5 [©] Minimum value:			99999 99 varies	Default value:	100 00 varies	
	PID1_ProcessUnitMin	Maximum value:	99999.99 varies	Default value:	100.00 varies	
Minimum value: Description:		Maximum value:	99999.99 varies	Default value:	100.00 varies	
Minimum value:	PID1_ProcessUnitMin Defines the maximum p PI error inversion	Maximum value:		Default value:	ID 1303	
Minimum value: Description: P7.1.6 [©]	PID1_ProcessUnitMin Defines the maximum p PI error inversion N.A. 0 = Normal - if feedback	Maximum value: rocess unit value.	N.A.			

[©] Parameter value can only be changed after the drive has stopped. © Parameter value will be set to be default when changing macros.

Table 17. Setpoint.

P7.2.1 - Standard.							
P7.2.1.1 ^②	PI keypad setpoint 1				ID 1307		
Minimum value:	PID1_ProcessUnitMin	Maximum value:	PID1_ProcessUnitMax	Default value:	0.00 varies		
Description:	Keypad PI reference valu	ie set point 1.					
P7.2.1.3 ^②	PI wake-up action				ID 2466		
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0		
Options:							
Description:	This parameter defines t	he wake-up function action	١.				

P7.2.2 - Setpoint 1.

P7.2.2.1 ^①	PI setpoint 1 source	9			ID 1312
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	1
Options:	0 = Not used; 1 = PI keypad setpoint; 2 = PI keypad setpoint; 3 = AI; 4 = Drive reference pot; 5 = FB process data inp; 6 = FB process data inp; 8 = FB process data inp; 9 = FB process data inp; 10 = FB process data in; 11 = FB process data in; 12 = FB process data in; 13 = FB PS process data in; 14 = FB PS process data in; 15 = FB process data in; 16 = FB PS process data in; 17 = FB PS process data in; 18 = FB PS process data in; 19 = FB PS process data in; 10 = FB PS process data in; 11 = FB PS process data in; 12 = FB PS process data in; 13 = FB PS process data in; 14 = FB PS process data in; 15 = FB PS process data in; 16 = FB PS process data in; 17 = FB PS process data in; 18 = FB PS process data in; 19 = FB PS process data in; 10 = FB PS process data in; 11 = FB PS process data in; 12 = FB PS process data in; 13 = FB PS process data in; 14 = FB PS process data in; 15 = FB PS process data in; 16 = FB PS process data in; 17 = FB PS process data in; 18 = FB PS process data in; 19 = FB PS process data in; 10 = FB PS process data in; 11 = FB PS process data in; 12 = FB PS process data in; 13 = FB PS process data in; 14 = FB PS process data in; 15 = FB PS process data in; 16 = FB PS process data in; 17 = FB PS process data in; 18 = FB PS process data in; 19 = FB PS process data in; 10 = FB PS process data in; 11 = FB PS process data in; 12 = FB PS process data in; 13 = FB PS process data in; 14 = FB PS process data in; 15 = FB PS process data in; 16 = FB PS process data in; 17 = FB PS process data in; 18 = FB PS process data in; 19 = FB PS process data in; 10 = FB PS process data in; 11 = FB PS process data in; 12 = FB PS process data in; 13 = FB PS process data in; 14 = FB PS process data in; 15 = FB PS process data in; 16 = FB PS process data in; 17 = FB PS process data in; 18 = FB PS process data in; 19 = FB PS process data in; 10 = FB PS process data in; 10 = FB PS process data in; 11 = FB PS process data in; 12 = FB PS process data in; 13 = FB PS process data in; 14 = FB PS process data in; 15 = FB PS proc	2; ; ut 1; ut 2; ut 3; ut 4; ut 5; put 6; put 7; put 8;			
Description:	Defines source of the s fieldbus message.	etpoint value the drive uses.	This can either be an inte	rnal preset value, keypad se	tpoint, analog signal, or
P7.2.2.2 ^①	PI setpoint 1 sleep	enable			ID 1315
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Disabled; or 1 = Enabled.				
Description:		le the output when the frequency rises above the wake-u		p frequency for the sleep de	ay time. The output
P7.2.2.3 ^②	PI setpoint 1 sleep	delay		'	ID 1317
Minimum value:	0.00 s	Maximum value:	3,000.00 s	Default value:	0.00 s
Description:				evel for this amount of time a going into the sleep function	nd then the drives output wil to save motor run time.
P7.2.2.4 ^②	PI setpoint 1 wake-	up level			ID 1318
Minimum value:	-99999.99 varies	Maximum value:	99999.99 varies	Default value:	0.00 varies
Description:		e PI feedback value to go ab scaled based off the PI unit		ut to be re enabled. This valu	ue is based of the % of
P7.2.2.5 ^②	PI setpoint 1 boost				ID 1320
Minimum value:	-2.00 varies	Maximum value:	2.00 varies	Default value:	1.00 varies
Description:	The setnoint can be bo	osted via a multiplier value.			

Table 17. Setpoint (Cont.).

P7.2.2.6 ^②	PI setpoint 1 sleep l		ID 2450				
Minimum value:	PID1_ProcessUnitMin H	Z Maximum value:	PID1_ProcessUnitMax Hz	Default value:	0.00 Hz		
Description:		ch the unit value is used to e drive into the sleep mode.		ode. When the unit drops	s below this level for the sleep		
P7.2.2.7 ^②	SP1 sleep mode ove	ID 1842					
Minimum value:	0.00 varies	Maximum value:	10.00 varies	Default value:	0.00 varies		
Description:	cycle" fault. One cycle is defined wh	en the drive transfers from	o mode. If multiple times don normal mode to sleep mode. and clear "pump over cycle" f	·	drive would trip on "pump over		
P7.2.2.8 ^②	SP1 sleep mode ma	kimum cycle time			ID 1843		
Minimum value:	0.00 s	Maximum value:	3,600.00 s	Default value:	300.00 s		
Description:	Defines the maximum ti	Defines the maximum time for sleep over cycle checking.					

① Parameter value can only be changed after the drive has stopped. ② Parameter value will be set to be default when changing macros.

Table 18. Feedback.

P7.3.2 - Feedback 1.							
P7.3.2.1 ^①	PI feedback 1 s	source		'	ID 1332		
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	2 varies		
Options:	0 = Not used; 1 = Al; 2 = Drive referenc 3 = FB process da; 11 = FB PI feedbac	ta input 1; or					
Description:	Defines where fee	edback signal is being fed into the	drive, via analog or	fieldbus data value.			

^① Parameter value can only be changed after the drive has stopped.

Table 19. Serial communication.

P11.1 - Basic settings.								
P11.1.1 ^①	Serial communication	ID 586						
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0			
Options:	0 = Modbus RTU; 1 = BACnet MSTP; or 2 = SWD.							
Description:	This parameter defines t	This parameter defines the communication protocol for RS-485.						

P11.2 - Modbus RTU.

P11.2.1 ^①	Slave address				ID 587
Minimum value:	1.00 varies	Maximum value:	247.00 varies	Default value:	1.00 varies
Description:	This parameter def	ines the slave address for RS-48	35 communication.		

Table 19. Serial communication (Cont.).

P11.2.2 ^①	Baud rate				ID 584
/linimum value:	N.A.	Maximum value:	N.A.	Default value:	1
Options:	0 = 9,600; 1 = 19,200; 2 = 38,400; 3 = 57,600; or 4 = 115,200				
escription:	This parameter defines of	communication speed for RS	-485 communication.		
P11.2.3 ^①	Parity type	,			ID 585
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	2
Options:	0 = None; 1 = Odd; or 2 = Even.				
Description:	This parameter defines p	parity type for RS-485 comm	nunication.		
P11.2.4	Modbus RTU protoco	ol status		'	ID 588
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Options:	0 = Initial; 1 = Stopped; 2 = Operational; or 3 = Faulted.				
Description:	This parameter shows th	ne protocol status for RS-48	5 communication.		
P11.2.5	Communication time	eout modbus RTU			ID 593
Vlinimum value:	0.00 ms	Maximum value:	60,000.00 ms	Default value:	10,000.00 ms
Description:	Selects the time to wait	before a communication fa	ult occurs over modbus R	TU if a message is not receive	ed.
	Selects the time to wait Modbus RTU fault re		ult occurs over modbus R	TU if a message is not receive	ID 2516
P11.2.6 Minimum value:	Modbus RTU fault re	sponse Maximum value:	N.A.	Default value:	ID 2516
Description: P11.2.6 Minimum value: Options: Description: P11.3 - BACnet RTU	N.A. 0 - Only in fieldbus controcommunications; if not 1 - In all control modes. Defines the fieldbus faul	sponse Maximum value: ol mode. When fieldbus is at in fieldbus control, place	N.A. the control place and fiel will not fault. s setting, if communication	<u> </u>	ID 2516 0 will fault on loss of
P11.2.6 Winimum value: Options: Description:	N.A. 0 - Only in fieldbus controcommunications; if not 1 - In all control modes. Defines the fieldbus faul	Maximum value: ol mode. When fieldbus is to tin fieldbus control, place No matter the control place.	N.A. the control place and fiel will not fault. s setting, if communication	Default value: Idbus fault is active, the drive	ID 2516 0 will fault on loss of
P11.2.6 Winimum value: Options: Description: P11.3 - BACnet RTU	N.A. 0 - Only in fieldbus contr communications; if no 1 - In all control modes. Defines the fieldbus faul	Maximum value: ol mode. When fieldbus is to tin fieldbus control, place No matter the control place.	N.A. the control place and fiel will not fault. s setting, if communication	Default value: Idbus fault is active, the drive	ID 2516 0 will fault on loss of ase will occur.
P11.2.6 Minimum value: Options: Description: P11.3 - BACnet RTU	N.A. 0 - Only in fieldbus controcommunications; if note that I all control modes. Defines the fieldbus faul MSTP. MSTP baud rate	Maximum value: ol mode. When fieldbus is it in fieldbus control, place No matter the control place t condition for modbus RTU	N.A. the control place and fiel will not fault. e setting, if communication communication.	Default value: Idbus fault is active, the drive on is lost, fieldbus fault respon	ID 2516 0 will fault on loss of use will occur.
P11.2.6 Winimum value: Options: P11.3 - BACnet RTU P11.3.1 Winimum value: Options:	N.A. 0 - Only in fieldbus controumunications; if not 1 - In all control modes. Defines the fieldbus faul MSTP. MSTP baud rate N.A. 0 = 9,600; 1 = 19,200; 2 = 38,400; 3 = 76,800; or 4 = 115,200.	Maximum value: ol mode. When fieldbus is it in fieldbus control, place No matter the control place t condition for modbus RTU	N.A. the control place and fiel will not fault. e setting, if communicatio communication. N.A.	Default value: Idbus fault is active, the drive on is lost, fieldbus fault respor Default value:	ID 2516 0 will fault on loss of use will occur.
P11.2.6 Winimum value: Options: Description: P11.3 - BACnet RTU P11.3.1 Winimum value: Options: Description:	N.A. 0 - Only in fieldbus controumunications; if not 1 - In all control modes. Defines the fieldbus faul MSTP. MSTP baud rate N.A. 0 = 9,600; 1 = 19,200; 2 = 38,400; 3 = 76,800; or 4 = 115,200.	Maximum value: ol mode. When fieldbus is of in fieldbus control, place No matter the control place t condition for modbus RTU Maximum value:	N.A. the control place and fiel will not fault. e setting, if communicatio communication. N.A.	Default value: Idbus fault is active, the drive on is lost, fieldbus fault respor Default value:	ID 2516 0 will fault on loss of use will occur.
P11.2.6 Winimum value: Options: P11.3 - BACnet RTU P11.3.1 Winimum value: Options: Options: Options:	Modbus RTU fault re N.A. 0 - Only in fieldbus contr communications; if no 1 - In all control modes. Defines the fieldbus faul MSTP. MSTP baud rate N.A. 0 = 9,600; 1 = 19,200; 2 = 38,400; 3 = 76,800; or 4 = 115,200. This parameter defines t	Maximum value: ol mode. When fieldbus is of in fieldbus control, place No matter the control place t condition for modbus RTU Maximum value:	N.A. the control place and fiel will not fault. e setting, if communicatio communication. N.A.	Default value: Idbus fault is active, the drive on is lost, fieldbus fault respor Default value:	ID 2516 0 will fault on loss of one will occur. ID 594
P11.2.6 Winimum value: Options: Description: P11.3 - BACnet RTU P11.3.1 Winimum value:	N.A. 0 - Only in fieldbus controumunications; if not 1 - In all control modes. Defines the fieldbus faul MSTP. MSTP baud rate N.A. 0 = 9,600; 1 = 19,200; 2 = 38,400; 3 = 76,800; or 4 = 115,200. This parameter defines to the standard standards.	Maximum value: ol mode. When fieldbus is st in fieldbus control, place No matter the control place t condition for modbus RTU Maximum value: he communication speed for se	N.A. the control place and fiel will not fault. e setting, if communicatio communication. N.A.	Default value: Idbus fault is active, the drive on is lost, fieldbus fault respon Default value:	ID 2516 0 will fault on loss of ase will occur. ID 594 2
P11.2.6 Winimum value: Options: Description: P11.3 - BACnet RTU P11.3.1 Winimum value: Options: Description: P11.3.2 Winimum value:	N.A. 0 - Only in fieldbus controumunications; if not 1 - In all control modes. Defines the fieldbus faul MSTP. MSTP baud rate N.A. 0 = 9,600; 1 = 19,200; 2 = 38,400; 3 = 76,800; or 4 = 115,200. This parameter defines to the standard standards.	Maximum value: ol mode. When fieldbus is so in fieldbus control, place No matter the control place t condition for modbus RTU Maximum value: he communication speed for so Maximum value: ess of the drive on the BACr	N.A. the control place and fiel will not fault. e setting, if communicatio communication. N.A.	Default value: Idbus fault is active, the drive on is lost, fieldbus fault respon Default value:	ID 2516 0 will fault on loss of ase will occur. ID 594 2
P11.2.6 Winimum value: Options: Description: P11.3 - BACnet RTU P11.3.1 Winimum value: Options: Description: P11.3.2 Winimum value: Description:	Modbus RTU fault re N.A. 0 - Only in fieldbus contr communications; if no 1 - In all control modes. Defines the fieldbus faul MSTP. MSTP baud rate N.A. 0 = 9,600; 1 = 19,200; 2 = 38,400; 3 = 76,800; or 4 = 115,200. This parameter defines t MSTP device address 0 Defines the device address	Maximum value: ol mode. When fieldbus is so in fieldbus control, place No matter the control place t condition for modbus RTU Maximum value: he communication speed for so Maximum value: ess of the drive on the BACr	N.A. the control place and fiel will not fault. e setting, if communicatio communication. N.A.	Default value: Idbus fault is active, the drive on is lost, fieldbus fault respon Default value:	ID 2516 0 will fault on loss of ase will occur. ID 594 2 ID 595
P11.2.6 Winimum value: Options: Description: P11.3 - BACnet RTU P11.3.1 Winimum value: Options: Description: P11.3.2 Winimum value: Description: P11.3.3	N.A. 0 - Only in fieldbus contromunications; if not 1 - In all control modes. Defines the fieldbus faul MSTP. MSTP baud rate N.A. 0 = 9,600; 1 = 19,200; 2 = 38,400; 3 = 76,800; or 4 = 115,200. This parameter defines to the many defines the device address. 0 Defines the device address. 0 MSTP instance number 10.	Maximum value: ol mode. When fieldbus is so the infieldbus control, place No matter the control place to condition for modbus RTU Maximum value: Maximum value: ess of the drive on the BACrepter Maximum value:	N.A. the control place and fiel will not fault. e setting, if communication N.A. r RS-485 communication 127 tet MSTP network. 4,194,302	Default value: Idbus fault is active, the drive on is lost, fieldbus fault respon Default value: Default value:	ID 2516 0 will fault on loss of ase will occur. ID 594 2 ID 595 1
P11.2.6 Winimum value: Options: Description: P11.3 - BACnet RTU P11.3.1 Winimum value: Options: Description: P11.3.2 Winimum value: Description: P11.3.3 Winimum value: P11.3.3	N.A. 0 - Only in fieldbus contromunications; if not 1 - In all control modes. Defines the fieldbus faul MSTP. MSTP baud rate N.A. 0 = 9,600; 1 = 19,200; 2 = 38,400; 3 = 76,800; or 4 = 115,200. This parameter defines to the many defines the device address. 0 Defines the device address. 0 MSTP instance number 10.	Maximum value: ol mode. When fieldbus is so the fieldbus control, place No matter the control place the condition for modbus RTU Maximum value: Maximum value: ess of the drive on the BAC of the d	N.A. the control place and fiel will not fault. e setting, if communication N.A. r RS-485 communication 127 tet MSTP network. 4,194,302	Default value: Idbus fault is active, the drive on is lost, fieldbus fault respon Default value: Default value:	ID 2516 0 will fault on loss of ase will occur. ID 594 2 ID 595 1

Table 19. Serial communication (Cont.).

P11.3.5	MSTP protocol status				ID 599
Minimum value:	N.A. Ma	ximum value:	N.A.	Default value:	N.A.
Options:	0 = Stopped; 1 = Operational; or 2 = Faulted.				
Description:	This parameter shows the proto	col status for BACn	et MSTP communicat	ion.	
P11.3.6	MSTP fault code				ID 600
Minimum value:	N.A. Ma	ximum value:	N.A.	Default value:	N.A.
Options:	0 = None; 1 = Sole master; 2 = Duplicate MAC ID; or 3 = Baud rate fault.				
Description:	This parameter shows the proto	col status for BACn	et MSTP communicat	ion.	
P11.3.7	MSTP fault response				ID 2526
Minimum value:	N.A. Ma	ximum value:	N.A.	Default value:	0
Options:	communications. If not in fi	eldbus control, place	e will not fault.	fieldbus fault is active, the drive vication is lost, fieldbus fault respo	
Description:	Defines the fieldbus fault condi	tion for BACnet MS	ΓP communication.		
P11.3.8	MSTP maximum master				ID 1537
Minimum value:	1 Ma	ximum value:	127	Default value:	127
Description:	Defines the maximum number o	f masters that can e	establish connections	with the drive.	
	SA hus davica address				ID 1726
P11.4.1 ^①	SA bus device address				ID 1726
P11.4.1 ^① Minimum value:	204 Ma	ximum value:	254	Default value:	ID 1726 204
P11.4.1 [©] Winimum value: Description:	204 Ma This parameter is used to set th				204
P11.4.1 [©] Minimum value: Description: P11.4.2 [©]	204 Ma This parameter is used to set th SA bus baud rate	e SA bus address at	which the drive will	be located on instance node.	204 ID 1727
P11.4.1 [©] Minimum value: Description: P11.4.2 [©] Minimum value:	204 Ma This parameter is used to set the SA bus baud rate N.A. Ma				204
P11.4 - SA bus. P11.4.1 [©] Minimum value: Description: P11.4.2 [©] Minimum value: Options:	204 Ma This parameter is used to set th SA bus baud rate	e SA bus address at	which the drive will	be located on instance node.	204 ID 1727
P11.4.1 [©] Minimum value: Description: P11.4.2 [©] Minimum value: Options:	204 Ma This parameter is used to set th SA bus baud rate N.A. Ma 0 = 9,600; 1 = 19,200; 2 = 38,000; 3 = 57,600; or	e SA bus address at ximum value:	which the drive will N.A.	be located on instance node. Default value:	204 ID 1727
P11.4.1 [©] Minimum value: Description: P11.4.2 [©] Minimum value: Options:	204 Ma This parameter is used to set the SA bus baud rate N.A. Ma $0 = 9,600;$ $1 = 19,200;$ $2 = 38,000;$ $3 = 57,600;$ or $4 = 115,200.$	e SA bus address at ximum value:	which the drive will N.A.	be located on instance node. Default value:	204 ID 1727
P11.4.1 [©] Minimum value: Description: P11.4.2 [©] Minimum value: Options: Description: P11.4.3 [©]	204 Ma This parameter is used to set the SA bus baud rate N.A. Ma 0 = 9,600; 1 = 19,200; 2 = 38,000; 3 = 57,600; or 4 = 115,200. This parameter defines community of the same and the s	e SA bus address at ximum value:	which the drive will N.A.	be located on instance node. Default value:	204 ID 1727 2
P11.4.1 [©] Minimum value: Description: P11.4.2 [©] Minimum value: Options: Description: P11.4.3 [©] Minimum value:	204 Ma This parameter is used to set the SA bus baud rate N.A. Ma 0 = 9,600; 1 = 19,200; 2 = 38,000; 3 = 57,600; or 4 = 115,200. This parameter defines community and a set of the set o	e SA bus address at ximum value: nication speed for SA ximum value:	N.A. A bus communication 4,194,302	be located on instance node. Default value:	204 ID 1727 2
P11.4.1 [©] Minimum value: Description: P11.4.2 [©] Minimum value: Options: Description: P11.4.3 [©] Minimum value: Description:	204 Ma This parameter is used to set the SA bus baud rate N.A. Ma 0 = 9,600; 1 = 19,200; 2 = 38,000; 3 = 57,600; or 4 = 115,200. This parameter defines communus SA instance number 0 Ma	e SA bus address at ximum value: nication speed for SA ximum value: the drive on the SA	N.A. A bus communication 4,194,302	be located on instance node. Default value:	204 ID 1727 2
P11.4.1 [©] Minimum value: Description: P11.4.2 [©] Minimum value: Options: Description: P11.4.3 [©] Minimum value: Description: P11.4.4	This parameter is used to set the SA bus baud rate N.A. Ma 0 = 9,600; 1 = 19,200; 2 = 38,000; 3 = 57,600; or 4 = 115,200. This parameter defines communate of the set of the	e SA bus address at ximum value: nication speed for SA ximum value: the drive on the SA	N.A. A bus communication 4,194,302	be located on instance node. Default value:	204 ID 1727 2 ID 1728 0
P11.4.1 [©] Minimum value: Description: P11.4.2 [©] Minimum value: Options: Description: P11.4.3 [©] Minimum value: Description: P11.4.4 Minimum value:	This parameter is used to set the SA bus baud rate N.A. Ma 0 = 9,600; 1 = 19,200; 2 = 38,000; 3 = 57,600; or 4 = 115,200. This parameter defines communate of the set of the	e SA bus address at ximum value: nication speed for SA ximum value: the drive on the SA tt ximum value:	N.A. A bus communication 4,194,302 bus network.	Default value: Default value:	204 ID 1727 2 ID 1728 0 ID 1730
P11.4.1 [©] Minimum value: Description: P11.4.2 [©] Minimum value: Options: Description: P11.4.3 [©] Minimum value: Description: P11.4.4 Minimum value: Description:	This parameter is used to set the SA bus baud rate N.A. Ma 0 = 9,600; 1 = 19,200; 2 = 38,000; 3 = 57,600; or 4 = 115,200. This parameter defines communication timeout 0 Ma	e SA bus address at ximum value: nication speed for SA ximum value: the drive on the SA tt ximum value:	N.A. A bus communication 4,194,302 bus network.	Default value: Default value:	204 ID 1727 2 ID 1728 0 ID 1730
P11.4.1 [©] Minimum value: Description: P11.4.2 [©] Minimum value:	This parameter is used to set the SA bus baud rate N.A. Ma 0 = 9,600; 1 = 19,200; 2 = 38,000; 3 = 57,600; or 4 = 115,200. This parameter defines communate of SA instance number 0 Ma Defines the instance number of SA communication timeous of SA communication timeous of SA bus protocol status	e SA bus address at ximum value: nication speed for SA ximum value: the drive on the SA tt ximum value:	N.A. A bus communication 4,194,302 bus network.	Default value: Default value:	204 ID 1727 2 ID 1728 0 ID 1730 10,000
P11.4.1 [©] Minimum value: Description: P11.4.2 [©] Minimum value: Options: Description: P11.4.3 [©] Minimum value: Description: P11.4.4 Minimum value: Description: P11.4.5	This parameter is used to set the SA bus baud rate N.A. Ma 0 = 9,600; 1 = 19,200; 2 = 38,000; 3 = 57,600; or 4 = 115,200. This parameter defines communate of the set of the	e SA bus address at ximum value: iication speed for SA ximum value: the drive on the SA ximum value: a communication fa	N.A. A bus communication 4,194,302 bus network. 60,000 ult occurs over SA bu	Default value: Default value: Default value: s if a message is not received.	204 ID 1727 2 ID 1728 0 ID 1730 10,000

Table 19. Serial communication (Cont.).

P11.4.6	SA bus fault response				ID 1732
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	communications. If not i	n fieldbus control, place	will not fault.	fieldbus fault is active. The drive	
Description:	Defines the fieldbus fault co	ndition for SA bus comm	nunication.		
				,	
P11.5 - SWD.					
P11.5.1	Parameter access				ID 2630
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	1
Options:	0 = No permission to read/w 1 = Acyclic read/write are al	rite on acyclic channel. lowed on Profibus.			
Description:	PNU927 which specifies the	operation priority of pa	rameters for acyclic	communication.	
P11.5.2 ^①	Parameter data access				ID 2631
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	4
Options:	0 = Local control; 1 = Fieldbus; 2 = Mixed interface; 4 = NET, local on fault; or 5 = Dual mode.				
Description:	PNU928 which specifies the	control priority of the d	evice for cyclic comm	nunication.	
P11.5.3	Fault situation counter				ID 2632
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Description:	PNU952 which specifies the Only write of 0 is allowed, th (parameter 944) are erased.		er (actual fault situat	ion and all other fault situations) a	and the fault message coun
P11.5.4	Board status		,		ID 2609
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
	Status of the board.				
Description:	B0-DCOM communication fa B1-Board HW fault B2-I01 24 volt overload fault B3-Profibus communication B4-fieldbus fault.				
	B0-DCOM communication fa B1-Board HW fault B2-I01 24 volt overload fault B3-Profibus communication				ID 2610
P11.5.5	B0-DCOM communication fa B1-Board HW fault B2-I01 24 volt overload fault B3-Profibus communication B4-fieldbus fault.		N.A.	Default value:	ID 2610 N.A.
P11.5.5 Minimum value:	B0-DCOM communication fa B1-Board HW fault B2-I01 24 volt overload fault B3-Profibus communication B4-fieldbus fault.	fault. Maximum value:		Default value:	
P11.5.5 Minimum value: Description:	B0-DCOM communication fa B1-Board HW fault B2-I01 24 volt overload fault B3-Profibus communication i B4-fieldbus fault. Firmware version N.A.	fault. Maximum value:		Default value:	
P11.5.5 Minimum value: Description: P11.5.6 Minimum value:	B0-DCOM communication fa B1-Board HW fault B2-I01 24 volt overload fault B3-Profibus communication B4-fieldbus fault. Firmware version N.A. This parameter provides the Protocol status	fault. Maximum value:		Default value: Default value:	N.A.
P11.5.5 Minimum value: Description: P11.5.6	B0-DCOM communication fa B1-Board HW fault B2-I01 24 volt overload fault B3-Profibus communication B4-fieldbus fault. Firmware version N.A. This parameter provides the Protocol status	fault. Maximum value: firmware version of the	SWD.		N.A. ID 2612
P11.5.5 Minimum value: Description: P11.5.6 Minimum value:	B0-DCOM communication fa B1-Board HW fault B2-I01 24 volt overload fault B3-Profibus communication is B4-fieldbus fault. Firmware version N.A. This parameter provides the Protocol status N.A. 0 = Not configured; 1 = Operational; or	fault. Maximum value: firmware version of the Maximum value:	SWD.		N.A. ID 2612
P11.5.5 Minimum value: Description: P11.5.6 Minimum value: Options:	B0-DCOM communication fa B1-Board HW fault B2-I01 24 volt overload fault B3-Profibus communication B4-fieldbus fault. Firmware version N.A. This parameter provides the Protocol status N.A. 0 = Not configured; 1 = Operational; or 2 = Diagnostics.	fault. Maximum value: firmware version of the Maximum value:	SWD.		N.A. ID 2612
P11.5.5 Minimum value: Description: P11.5.6 Minimum value: Options: Description:	B0-DCOM communication fa B1-Board HW fault B2-I01 24 volt overload fault B3-Profibus communication B4-fieldbus fault. Firmware version N.A. This parameter provides the Protocol status N.A. 0 = Not configured; 1 = Operational; or 2 = Diagnostics.	fault. Maximum value: firmware version of the Maximum value:	SWD.		N.A. ID 2612
P11.5.5 Minimum value: Description: P11.5.6 Minimum value: Options: Description:	B0-DCOM communication fa B1-Board HW fault B2-I01 24 volt overload fault B3-Profibus communication B4-fieldbus fault. Firmware version N.A. This parameter provides the Protocol status N.A. 0 = Not configured; 1 = Operational; or 2 = Diagnostics. This parameter specifies the	fault. Maximum value: firmware version of the Maximum value:	SWD.		N.A. ID 2612 0
P11.5.5 Minimum value: Description: P11.5.6 Minimum value: Options: Description: P11.6 - Bluetooth. P11.6.1	B0-DCOM communication fa B1-Board HW fault B2-I01 24 volt overload fault B3-Profibus communication B4-fieldbus fault. Firmware version N.A. This parameter provides the Protocol status N.A. 0 = Not configured; 1 = Operational; or 2 = Diagnostics. This parameter specifies the	fault. Maximum value: firmware version of the Maximum value: protocol status for SW	N.A. D card.	Default value:	N.A. ID 2612 0

Table 19. Serial communication (Cont.).

P11.6.2 ^②	Bluetooth broadcast	mode			ID 2920
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Off; or 1 = On.				
Description:	Bluetooth broadcast mod	de.			
P11.6.3	Bluetooth pairing res	set	'	,	ID 2935
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Options:	0 = Not reset; or 1 = Reset.				
Description:	Bluetooth pairing reset.				

Table 20. Ethernet communication.

P12.1 - Basic setting	js.				
P12.1.1 ^①	IP address mode				ID 1500
Minimum value:	N.A. Ma	aximum value:	N.A.	Default value:	0
Options:	0 = Static IP; or 1 = DHCP with AutoIP.				
Description:	This parameter defined the IP a	address configuratior	n mode for EIP/modbus 1	ГСР.	
P12.1.2	Active IP address			'	ID 1507
Minimum value:	N.A. Ma	aximum value:	N.A.	Default value:	N.A.
Description:	Reads the current active IP add	dress.			
P12.1.3	Active subnet mask		'	'	ID 1509
Minimum value:	N.A. Ma	aximum value:	N.A.	Default value:	N.A.
Description:	Reads the current active subne	et mask.			
P12.1.4	Active default gateway				ID 1511
Minimum value:	N.A. Ma	aximum value:	N.A.	Default value:	N.A.
Description:	Reads the current active defau	Ilt gateway.			
P12.1.5	MAC address				ID 1513
Minimum value:	N.A. Ma	aximum value:	N.A.	Default value:	N.A.
Description:	Reads the current MAC addres	SS.			
P12.1.6 ^①	Static IP address			'	ID 1501
Minimum value:	N.A. Ma	aximum value:	N.A.	Default value:	192.168.1.254
Description:	Defines the static IP address.				
P12.1.7 ^①	Static subnet mask				ID 1503
Minimum value:	N.A. Ma	aximum value:	N.A.	Default value:	255.255.255.0
Description:	Defines the static subnet mask	ζ.			
P12.1.8 ^①	Static default gateway				ID 1505
Minimum value:	N.A. Ma	aximum value:	N.A.	Default value:	192.168.1.1
Description:	Defines the static default gate	way.			
P12.1.9	Ethernet communication	timeout			ID 611
Minimum value:	0.00 ms M a	aximum value:	60,000 ms	Default value:	10,000 ms
Description:	Selects the time it waits before	e a communication fa	ault occurs over etherne	t.	

[©] Parameter value can only be changed after the drive has stopped. © Parameter value will be set to be default when changing macros.

P12.2 - Trusted IP fil	ter (DM1 PRO only).				
P12.2.1	Trusted IP white list				ID 68
Vinimum value:	N.A.	Maximum value:	N.A.	Default value:	192.168.1.255 0.0.0. (0.0.0.0
Description:	Defines the IP addresses	in the white list. A setting	g of 192.168.1.255 enables	all connections on the local	subnet.
212.2.2	Trusted IP filter enab	le			ID 76
Viinimum value:	N.A.	Maximum value:	N.A.	Default value:	1
Options:	0 = Disabled; or 1 = Enabled.				
Description:	Enables IP white listing.	Devices not in the white li	st will not be able to estab	lish communications with th	e drive.
P12.3 - Modbus TCP	(DM1 PRO only).		,		,
P12.3.1 ^①	Modbus TCP enable	,		,	ID 1942
Vinimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Disable; or 1 = Enable.				
Description:	Enables modbus TCP com	munications, must be enab	oled to connect to Power X	pert inControl.	
P12.3.2	Modbus TCP connect	ion limit			ID 609
Viinimum value:	N.A.	Maximum value:	N.A.	Default value:	5
Description:	Maximum number of conr	nections allowed to the dri	ve.		
12.3.3	Modbus TCP unit idea	ntifier number			ID 610
/linimum value:	N.A.	Maximum value:	N.A.	Default value:	1
Description:	Unit identifier unit value f	or modbus TCP.			
P12.3.4	Modbus TCP protoco	status			ID 612
Viinimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Options:	0 = Stopped; 1 = Operational; or 2 = Faulted.				
Description:	This parameter shows the	protocol status for modb	us TCP communication.		
P12.3.5	Modbus TCP fault res	ponse			ID 2517
/linimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	communications. If no	ot in fieldbus control, place	e will not fault.	bus fault is active, the drive is lost, fieldbus fault respo	
Description:	Defines the fieldbus fault	condition for modbus TCP	communication.		
P12.4 - Ethernet IP (DM1 PRO only).				
P12.4.1 ^①	Ethernet based proto	col select			ID 1997
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Disabled; or 2 = BACnet IP.				
Description:	Selects the active commu	nication protocol on the e	thernet I/P port.		
P12.4.2	Ethernet IP protocol	status			ID 608
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Options:	0 = Off; 1 = Operational; or				
	2 = Faulted.				

Table 20. Ethernet communication (Cont.).

P12.4.3	Ethernet IP fa	ult response			ID 2518
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	communicati	ons. If not in fieldbus control, place	e will not fault.	and Fieldbus fault is active, the drive nunication is lost, fieldbus fault respo	
Description:	Defines the field	lbus fault condition for ethernet IP (communication.		

P12.5.1 ^①	BACnet IP UDP por	rt number			ID 1733
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	47,808
Options:	47808 = BACO; 47809 = BAC1; 47810 = BAC2; 47811 = BAC3; 47812 = BAC4; 47813 = BAC5; 47814 = BAC6; 47815 = BAC7; 47816 = BAC8; 47817 = BAC9; 47819 = BACB; 47820 = BACC; 47821 = BACD; 47821 = BACD; 47821 = BACD; 47822 = BACE; or 47823 = BACF.				
Description:	Defines the BACnet UI	OP port number.			
P12.5.2 ^①	BACnet IP foreign	devise			ID 1734
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Disabled; or 1 = Enabled.				
Description:	Enables BACNET IP for	reign device configuration.			
P12.5.3 ^①	BACnet IP BBMD II	•	'	,	ID 1735
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0.0.0.0
Description:	Displays the BACnet B	BMD IP address.			
P12.5.4 ^①	BACnet IP UDP por	rt			ID 1737
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	47,808
Options:	47808 = BAC0; 47809 = BAC1; 47810 = BAC2; 47811 = BAC3; 47813 = BAC5; 47814 = BAC6; 47815 = BAC7; 47816 = BAC8; 47817 = BAC9; 47818 = BACA; 47819 = BACB; 47820 = BACC; 47821 = BACD; 47821 = BACD; 47822 = BACE; or 47823 = BACF.				
Description:	Displays the BACnet B	BMD UDP port number.			
P12.5.5 ^①	BACnet IP registra	tion interval			ID 1738
Minimum value:	0.00	Maximum value:	65,535	Default value:	10
Description:	Defines the registratio	n interval			

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Table 20. Ethernet communication (Cont.).

P12.5.6	BACnet IP com	nunication timeout			ID 1739
Minimum value:	0.00	Maximum value:	60,000	Default value:	0
Description:	Selects the time it	waits before a communication fa	ault occurs over BACn	et IP.	
P12.5.7	BACnet IP proto	ocol status			ID 1740
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Stopped; 1 = Operational; or 2 = Faulted.				
Description:	This parameter sho	ows the protocol status for BACn	et IP communication.		
P12.5.8	BACnet IP fault	behavior			ID 1741
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	communication	s. If not in fieldbus control, place	e will not fault.	Fieldbus fault is active, the drive cation is lost, fieldbus fault respo	
Description:	Defines the fieldbu	ıs fault condition for BACnet IP co	ommunication.		
P12.5.9 ^①	BACnet IP insta	nce number			ID 1742
Minimum value:	0.00	Maximum value:	4,194,302	Default value:	0
Description:	D: 1 11 DAG	et instance number.			

P12.6 - Web UI (DM1 PRO only).

P12.6.1	Web UI protocol s	tatus			ID 2915
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Options:	0 = Off; 1 = Operational; or 2 = Faulted.				
Description:	This parameter shows	s the protocol status for web s	erver communicatio	n.	
P12.6.2	Web UI fault respo	onse			ID 2916
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	communications.	If not in fieldbus control, place	e will not fault.	d fieldbus fault is active, the drive nication is lost, fieldbus fault respo	
Description:	Defines the fieldbus f	ault condition for web server	communication.		
P12.6.3	Web UI communic	ation timeout			ID 2919
Minimum value:	30.000 ms	Maximum value:	60,000 ms	Default value:	60.000 ms

[©] Parameter value can only be changed after the drive has stopped.

Table 21. System.

	s.		,	ID 340
P13.1.1	Language			
Minimum value:	N.A. Maximum value:	N.A.	Default value:	0
Options:	0 = English; 1 = English; or 2 = English.			
Description:	This parameter offers the ability to control the f available language is English only.	equency converter thro	ugh the keypad in the language of	your choice. Currently
P13.1.2 ^①	Application			ID 142
Minimum value:	N.A. Maximum value:	N.A.	Default value:	N.A.
Options:	0 = Standard;; 1 = Pump; 2 = Fan; or 3 = Multi-purpose.			
Description:	This parameter sets the active application if mu	tiple applications have	been loaded.	
P13.1.3 ^①	Parameter sets			ID 619
Minimum value:	N.A. Maximum value:	N.A.	Default value:	N.A.
Options:	0 = No; 1 = Reload defaults; 2 = Reload set 1; 3 = Reload set 2; 4 = Store set 1;			
	5 = Store set 2; 6 = Reset; or 7 = Reload defaults VM.			
Description:	6 = Reset; or	default parameter value	es, and to store and load two custo	mized parameter sets.
<u> </u>	6 = Reset; or 7 = Reload defaults VM.	default parameter value	es, and to store and load two custo	mized parameter sets.
P13.1.4	6 = Reset; or 7 = Reload defaults VM. This parameter allows you to reload the factory	default parameter value N.A.	es, and to store and load two custo Default value:	· ·
P13.1.4 Minimum value:	6 = Reset; or 7 = Reload defaults VM. This parameter allows you to reload the factory Up to keypad	·	· · · · · · · · · · · · · · · · · · ·	ID 620
P13.1.4 Minimum value: Options:	6 = Reset; or 7 = Reload defaults VM. This parameter allows you to reload the factory Up to keypad N.A. Maximum value: 0 = No; or	N.A.	· · · · · · · · · · · · · · · · · · ·	ID 620
P13.1.4 Minimum value: Options: Description:	6 = Reset; or 7 = Reload defaults VM. This parameter allows you to reload the factory Up to keypad N.A. Maximum value: 0 = No; or 1 = Yes (all parameters).	N.A.	· · · · · · · · · · · · · · · · · · ·	ID 620
P13.1.4 Minimum value: Options: Description: P13.1.5	6 = Reset; or 7 = Reload defaults VM. This parameter allows you to reload the factory Up to keypad N.A. Maximum value: 0 = No; or 1 = Yes (all parameters). This function uploads all existing parameter grounds.	N.A.	· · · · · · · · · · · · · · · · · · ·	ID 620 N.A.
Description: P13.1.4 Minimum value: Options: Description: P13.1.5 Minimum value: Options:	6 = Reset; or 7 = Reload defaults VM. This parameter allows you to reload the factory Up to keypad N.A. Maximum value: 0 = No; or 1 = Yes (all parameters). This function uploads all existing parameter groupown from keypad	N.A. Ips to the keypad.	Default value:	ID 620 N.A.
P13.1.4 Minimum value: Options: Description: P13.1.5 Minimum value: Options:	6 = Reset; or 7 = Reload defaults VM. This parameter allows you to reload the factory Up to keypad N.A. Maximum value: 0 = No; or 1 = Yes (all parameters). This function uploads all existing parameter group Down from keypad N.A. Maximum value: 0 = No; 1 = All parameters; 2 = All, no motor; or	N.A. Ips to the keypad. N.A.	Default value: Default value:	ID 620 N.A.
P13.1.4 Minimum value: Options: Description: P13.1.5 Minimum value: Options: Description:	6 = Reset; or 7 = Reload defaults VM. This parameter allows you to reload the factory Up to keypad N.A. Maximum value: 0 = No; or 1 = Yes (all parameters). This function uploads all existing parameter ground from keypad N.A. Maximum value: 0 = No; 1 = All parameters; 2 = All, no motor; or 3 = Application parameters.	N.A. Ips to the keypad. N.A.	Default value: Default value:	ID 620 N.A.
P13.1.4 Minimum value: Options: Description: P13.1.5 Minimum value: Options: Description:	6 = Reset; or 7 = Reload defaults VM. This parameter allows you to reload the factory Up to keypad N.A. Maximum value: 0 = No; or 1 = Yes (all parameters). This function uploads all existing parameter gro Down from keypad N.A. Maximum value: 0 = No; 1 = All parameters; 2 = All, no motor; or 3 = Application parameters. This function downloads one or all parameter gro	N.A. Ips to the keypad. N.A.	Default value: Default value:	ID 620 N.A. ID 621 N.A.
P13.1.4 Minimum value: Options: Description: P13.1.5 Minimum value: Options:	6 = Reset; or 7 = Reload defaults VM. This parameter allows you to reload the factory Up to keypad N.A. Maximum value: 0 = No; or 1 = Yes (all parameters). This function uploads all existing parameter gro Down from keypad N.A. Maximum value: 0 = No; 1 = All parameters; 2 = All, no motor; or 3 = Application parameters. This function downloads one or all parameter gro	N.A. N.A. N.A. N.A. Dups from the keypad to 9,999	Default value: Default value: Default value: state of the drive.	ID 620 N.A. ID 621 N.A. ID 624 0 en the password function
P13.1.4 Minimum value: Options: Description: P13.1.5 Minimum value: Options: Description: P13.1.7 Minimum value:	6 = Reset; or 7 = Reload defaults VM. This parameter allows you to reload the factory Up to keypad N.A. Maximum value: 0 = No; or 1 = Yes (all parameters). This function uploads all existing parameter ground in the parameter ground in the parameters; 2 = All, no motor; or 3 = Application parameters. This function downloads one or all parameter ground in the	N.A. N.A. N.A. N.A. Dups from the keypad to 9,999 ast unauthorized change ssword before applications.	Default value: Default value: the drive. Default value: s with the password function. Whon changes, parameter value change	ID 620 N.A. ID 621 N.A. ID 624 0 een the password function ges, or password changes.

Step 5 - Standard application

Table 21. System (Cont.).

	Keypad parameter	rlock			ID 625
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Change enable; or 1 = Change disable.	r			
Description:		he user to prohibit changes to to edit a parameter value.	the parameters. If the p	parameter lock is activated, the	text "locked" will appear or
	Note: This function d	oes not prevent unauthorized o	editing of parameter valu	Jes.	
P13.1.9	Start-up Wizard				ID 626
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Enabled. 1 = Disabled.				
Description:	the application desire completion, it allows always enabled for th	ed and then advances paramete the user to go to the main mer ne initial power up of the DM1 use it to be active on start-up.	ers through the start-up nu or default page and th PRO. By setting this par	nable", the Start-up Wizard proparameter list/Application Min is parameter is set to "Disable ameter to "Disable" without grop Wizard after completion, or o	i wizard in keypad. After d". The Start-up Wizard is bing through the Start-up
P13.2 - Keypad.					
P13.2.4	Timeout time		'	'	ID 629
Minimum value:	1 s	Maximum value:	65.535 s.	Default value:	30 s
Description:	The timeout time set	ting defines the time after whi	ch the keypad display re	turns to the Default Page.	
	Note: If the default p	age value is 0, the timeout tim	e setting has no effect.		
P13.2.5	Contrast adjust	-	-	,	ID 630
Minimum value:	5	Maximum value:	18	Default value:	12
Description:	If the remote keypad	display is not clear, you can ad	just the keypad contrast	with this parameter.	
P13.2.6	Backlight time				ID 631
Minimum value:	1 min.		05.505 '		
viiiiiiuiii vaiue.	1 111111.	Maximum value:	65,535 min.	Default value:	10 min.
		mines how long the backlight s	<u></u>		10 min.
Description:			<u></u>		10 min.
Description: P13.2.7 Minimum value:	This parameter deter		<u></u>		
Description: P13.2.7	This parameter determined Fan control N.A. 0 = Continuous - fan r 1 = Temperature - bas 60°C (140°F). The minute after receiving the "Temperature". 2 = Run follow - after	Maximum value: Tuns continuously, sed on the temperature of the e fan receives a stop command e stop command or switching of power up, the fan is stopped to	N.A. unit. The fan is switched when the heat sink tem on the power, as well as until the run command is	t.	ID 632 2 eat sink temperature reaches The fan runs for about a "Continuous" to uously. This is mainly made
Description: P13.2.7 Minimum value:	This parameter determined by the second by t	Maximum value: Tuns continuously, sed on the temperature of the e fan receives a stop command e stop command or switching of power up, the fan is stopped to	N.A. unit. The fan is switcher when the heat sink tem on the power, as well as until the run command is fans to load charging res	t. Default value: d on automatically when the he perature falls to 55°C (131°F). after changing the value from given and then fan runs contin	ID 632 2 eat sink temperature reaches The fan runs for about a "Continuous" to uously. This is mainly made
Description: P13.2.7 Minimum value: Options:	This parameter determined by the second by t	Maximum value: Tuns continuously. sed on the temperature of the e fan receives a stop command e stop command or switching of power up, the fan is stopped up systems to prevent cooling.	N.A. unit. The fan is switcher when the heat sink tem on the power, as well as until the run command is fans to load charging res	t. Default value: d on automatically when the he perature falls to 55°C (131°F). after changing the value from given and then fan runs contin	ID 632 2 eat sink temperature reaches The fan runs for about a "Continuous" to uously. This is mainly made
Description: P13.2.7 Winimum value: Options:	This parameter determined Fan control N.A. 0 = Continuous - fan r 1 = Temperature - bas 60°C (140°F). The minute after receiving the "Temperature". 2 = Run follow - after for common DC-b This function allows y	Maximum value: Tuns continuously. sed on the temperature of the e fan receives a stop command e stop command or switching of power up, the fan is stopped up systems to prevent cooling.	N.A. unit. The fan is switcher when the heat sink tem on the power, as well as until the run command is fans to load charging res	t. Default value: d on automatically when the he perature falls to 55°C (131°F). after changing the value from given and then fan runs contin	ID 632 2 eat sink temperature reaches The fan runs for about a "Continuous" to uously. This is mainly made
Description: P13.2.7 Winimum value: Options: Description:	This parameter determined Fan control N.A. 0 = Continuous - fan r 1 = Temperature - bas 60°C (140°F). The minute after receiving the "Temperature". 2 = Run follow - after for common DC-b This function allows y	Maximum value: Tuns continuously, sed on the temperature of the e fan receives a stop command e stop command or switching of the substitution of the switching	N.A. unit. The fan is switcher when the heat sink tem on the power, as well as until the run command is fans to load charging res	t. Default value: d on automatically when the he perature falls to 55°C (131°F). after changing the value from given and then fan runs contin	ID 632 2 eat sink temperature reaches The fan runs for about a "Continuous" to uously. This is mainly made

P13.4.1	Keypad softwa	are version				
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.	
Description:	Keypad firmware version.					
	Motor control software version					
P13.4.2	Motor control	software version			ID 642	
P13.4.2 Minimum value:	N.A.	software version Maximum value:	N.A.	Default value:	N.A.	

Table 21. System (Cont.).

P13.4.3	Application software version						
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.		
Description:	MCU/application software version.						
P13.4.4	Software bund	dle version			ID 1714		
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.		
Description:	Software bundle	version.					

P13.5 - Application information

P13.5.1	Serial number				ID 648
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Description:	Product serial number.				
P13.5.2	Multi-monitor set				ID 627
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Change enable; or 1 = Change disable.				
Description:		display three actual monitor itored with other values.	ed values at the same time	e. This parameter determine	es if the operator is allowed to
P13.5.3	Keypad lock PIN	'			ID 75
Minimum value:	0	Maximum value:	9,999	Default value:	0
Description:	When the password fu	ected against unauthorized onction is enabled, the user wexcept up/down/left/right.			
	By default, the passwo between 1 and 9,999.	rd function is not in use. If y	ou want to activate the pas	ssword, change the value of	this parameter to any number
	T	word, reset the parameter va	lue to 0.		
	to deactivate the passi	word, reset the parameter va			
P13.5.4	Drive application na	•			ID 2922

 $^{^{\}scriptsize \textcircled{\tiny 1}}$ Parameter value can only be changed after the drive has stopped.

Step 6 - Faults and warning codes

Under this menu, you can find active faults, history faults, and fault codes.

Table 22. Active faults.

Menu	Function	Note
Active faults	When a fault/faults appear(s), the display with the name and fault time of the fault will be pop. Press DETAIL to see the fault data.	The fault remains active until it is cleared with the Reset button push for 2s) or with a reset signal from the I/O terminal or fieldbus.
	The active faults submenu shows the list of faults. Select the fault and push DETAIL to see the fault data.	The memory of active faults can store the maximum of 10 faults in the order of appearance.

Table 23. History faults.

Table 201 Thetery Taures					
Menu	Function	Note			
History faults	10 latest faults are stored in the fault history. Select the fault and push DETAIL to see the fault data.	The history fault will be stored until it is cleared with the OK button (push for 5 s).			
		The memory of active faults can store the maximum of 10 faults in the order of appearance.			

Fault codes and descriptions

Configurable 1 = The fault type of this fault is configurable, fault type can be configured as: 0 = No action; 1 = Warning; 2 = Fault; 3 = Fault, Coast.

Fault code	Fault name/ description	Fault type	Default configuration	Possible cause	Remedy
1	Over current	Fault		AC drive has detected too high a current (>4*IH) in the motor cable: • Sudden heavy load increase; • Short circuit in motor cables; • Unsuitable motor.	Check loading. Check motor. Check cables and connections. Make identification run. Check ramp times.
2	Over voltage	Fault		The DC-link voltage has exceeded the limits defined: Too short a deceleration time; Brake chopper is disabled; High overvoltage spikes in supply; Start/stop sequence too fast.	 Make deceleration time longer. Use brake chopper or brake resistor (available as options). Activate overvoltage controller. Check input voltage.
3	Earth fault	Fault	Configurable	Current measurement has detected that the sum of motor phase current is not zero: • Insulation failure in cables or motor.	Check motor cables and motor.
9	Under voltage	Fault	Configurable	DC link voltage is under the voltage limits defined: • Most probable cause: Too low a supply voltage; • AC drive internal fault; • Defect input fuse; • External charge switch not closed. Note: This fault is activated only if the drive is in the Run state.	 In case of temporary supply voltage break reset the fault and restart the AC drive. Check the supply voltage. If it is adequate, an internal failure has occurred. Contact the distributor near you.
10	Input phase superv	No action	Configurable	Input line phase is missing.	Check supply voltage, fuses, and cable.
11	Output phase superv	Fault	Configurable	Current measurement has detected that there is no current in one motor phase.	Check motor cable and motor.
13	Drive under temp	Warning	Configurable	Too low temperature measured in power. Unit's heat sink or board. Heat sink temperature is under -10°C.	
14	Drive over temp	Fault		Too high temperature measured in power. Unit's heat sink or board. Heat sink temperature is over 90°C.	Check the correct amount and flow of cooling air. Check the heat sink for dust. Check the ambient temperature. Make sure that the switching frequency is not too high in relation to ambient temperature and motor load.
15	Motor stalled	No action	Configurable	Motor is stalled.	Check motor and load.

Fault code	Fault name/ description	Fault type	Default configuration	Possible cause	Remedy
16	Motor over load	No action	Configurable	Motor is too hot, based on either the drive's estimate or on temperature feedback.	Decrease motor load. If no motor overload exists, check the temperature model parameters.
17	Motor under load	No action	Configurable	Condition defined by parameter underload protection, underload Fnom torque, underload F0 torque, valid longer than the time defined by underload time limit.	Check load.
18	IP address conflict	Warning	Configurable	IP setting issue.	Check settings for IP address. Verify no duplicates are on the network.
19	Power board EEPROM fault	Fault		Power board EEPROM fault, memory lost in EEPROM.	Cycle power to drive. Try updating software. If issue continues, contact distributor near you.
20	Control board EEPROM fault (MCU EEPROM fault)	Fault		EEPROM data error in EEPROM memory.	Cycle power to drive. Try updating software. If issue continues, contact a distributor near you.
21	S-flash fault	Warning		Serial flash error; serial flash memory failed.	Cycle power to drive. Try updating software. If issue continues, contact a distributor near you.
22	Speed deviation	Fault		Estimated speed is greater than 115% of maximum frequency. Or current loop is oscillating.	Check motor parameters and run identification. Adjust the Observer Kp.
23	STO circuit fault	Fault		STO switch is broken; STO circuit failure.	Check STO switch and STO circuit. If issue continues, contact a distributor near you.
25	MCU watchdog fault	Fault		Watchdog register overflows in MCU.	Cycle power to drive. Try updating software. If issue continues, contact a distributor near you.
26	Start-up prevent	Fault		The time when interlock signal activates is over setting time.	Stop drive and resend start command.
37	Device change	Warning		Power board or option card change.	Alarm will reset.
38	Device added	Warning		Power board or option board added.	Device is ready for use. Old parameter settings will be used.
39	Device removed	Fault		Optional board removed from slot; or power board removed from control board.	Device no longer available in drive.
40	Device unknown	Fault		Unknown device connected (power board/option board).	Check EEPROM connection. Check board connection on slot A/B. Power cycle to drive
41	IGBT over temp	Fault		IGBT temperature is too high.	Check output loading.Check motor size.
	AL 4 A	NI di	0 5 11		Decrease switching frequency.
50	AI < 4 mA (4 to 20 mA)	No action	Configurable	Loss in analog input signal, dropped below 4 mA.	Verify analog input current reference value on either Al1 or Al2, check cabling.
51	External fault	Fault	Configurable	Digital input is activated for external fault input.	Check digital input settings and verify input level, could be an external device causing fault.
52	Keypad comm. Fault	Fault	Configurable	The connection between the control keypad and frequency converter is broken, and the local reference is keypad reference or the local control place is keypad, and the keypad communication fault protection is not "NO action"	Check keypad connection and possible keypad cable.
54	Option card fault	Fault	Configurable	Defective option card or option card slot.	Check right option card and option card slot connections. Check board status on keypad for exact cause of fault. Contact distributor nearest you.
57	Motor ID fault	Fault		The motor parameters identification running was not completed successfully.	Check motor size. Verify the input and output wiring is connected properly.
58	Current measure fault	Fault		Current measurement is out of range.	Restart the drive again. Should the fault re-occur, contact the distributor nearest to you.
66	Safety torque off	Fault	Configurable	STO triggered; STO input is open.	Reset STO trigger and verify wiring. Reset fault after input is enabled.
67	Current limit	Warning		The output current has reached the current limit value.	Check the load.

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Step 6 - Faults and warning codes

Fault code	Fault name/ description	Fault type	Default configuration	Possible cause	Remedy
68	Over voltage control	Warning		The DC link voltage has reached its voltage limit value.	Check the input voltage. Set the acceleration/deceleration time longer.
70	System fault	Fault		MCU sending wrong parameters to DSP.	Restart the drive again. Should the fault re-occur, contact the distributor nearest to you.
80	Fieldbus fault	Fault	Configurable	BACnet IP fieldbus fault.	Check the fieldbus communication wiring. Verify drive parameters are set correctly. Check BACnet master programming to verify proper addressing.
81	Fieldbus fault	Fault	Configurable	SA bus fieldbus fault.	Check the fieldbus communication wiring on A/B terminal. Verify drive parameters are set correctly. Check SA bus master programming to verify proper addressing.
83	Fieldbus fault	Fault	Configurable	(1) DCI_ubRTUBacNetFaultBehavior parameter's value is 0, loss of communication with modbus RTU, and the fieldbus reference is the remote reference or the fieldbus control place is the remote control place ,and the fault protection is not "NO action";	Check RS485 communication wiring. Verify drive parameters are set correctly. Check master programming to verify proper addressing.
				(2) DCI_ubRTUBacNetFaultBehavior parameter's value is 1, loss of communication with modbus RTU.	
84	Fieldbus fault	Fault	Configurable	(1) DCI_ubTCPFaultBehavior parameter's value is 0, loss of communication with modbus TCP, and the fieldbus reference is the remote reference or the fieldbus control place is the remote control place ,and the fault protection is not "NO action";(Check ethernet communication wiring. Verify drive parameter are set correctly. Check master programming to verify proper addressing.
				2)DCI_ubTCPFaultBehavior parameter's value is 1, loss of communication with modbus TCP.	
85	Fieldbus fault	Fault	Configurable	Loss of communication with BACnet, and the fieldbus reference is the remote reference OR the fieldbus control place is the remote control place, and the fault protection is not "NO action".	Check RS485 communication wiring. Verify drive parameters are set correctly. Check BACnet master configuration programming to verify proper addressing.
86	Fieldbus fault	Fault	Configurable	Loss of communication with ethernet IP, and the fieldbus reference is the remote reference OR the fieldbus control place is the remote control place, and the fault protection is not "NO action".	Check ethernet communication wiring. Verify drive parameters are set correctly. Check EIP master configuration programming to verify proper addressing.
87	Fieldbus fault	Fault	Configurable	Loss of communication with Profibus/Canopen/Devicenet master on Slot A, and the fieldbus reference is the remote reference OR the fieldbus control place is the remote control place, and the fault protection is not "NO action".	Profibus/Canopen/Devicenet communication wiring. Verify drive parameters are set correctly. Check Profibus/Canopen/Devicenet master configuration programming to verify proper addressing.
90	Drive under temp. (Cold weather	Warning		Cold weather mode is not enabled, and unit temperature is less than -10°C. Cold weather mode is enabled and Under Temp Fault Override	If unit temp -20 ~ -10°C, start motor in cold weather mode. If unit temp <-20°C, warm up unit above
	drive under temp.)			 is not set, unit temperature is less than -30°C. Cold weather mode is enabled and Under Temp Fault Override is not set, unit temperature is -20 ~ -30°C. The temp <-20°C when cold weather start time out. 	-20°C for proper operation using cold weather mode. If still < -20°C when cold weather mode time out, try higher output voltage in cold weather mode.
92	External fault (External fault 2)	Fault	Configurable	Digital input is activated for external fault input.	Check digital input settings and verify input level, could be an external device causing fault.
93	External fault (External fault 3)	Fault	Configurable	Digital input is activated for external fault input.	Check digital input settings and verify input level, could be an external device causing fault.
97	Pipe fill loss (Prime loss)	No action	Configurable	 In single drive control mode of MPFC, include FC, interlock enable, and all interlock signals lost. In single drive control mode of MPFC, not include FC, interlock enable, and interlock 1 lost. In multi drive network mode of MPFC, interlock enable, and interlock 1 lost. 	Check digital inputs for interlock.

Fault code	Fault name/ description	Fault type	Default configuration	Possible cause	Remedy
98	PI feedback AI loss	No action	Configurable	The feedback function has a relationship with feedback 1/2 and the feedback 1/2 source has relationship with Al. The Al signal range is 1 (20-100%/2-10 V/4-20m A). The Al value is out of range (Al mode: 0–20 mA, Al < 4 mA or Al > 20 mA, Al mode: 0–10 V, Al < 2 V or Al > 10 V) of PID1 feedback.	Check the AI of PI1 feedback, the AI value whether is out of range or not, the AI range shall be 2~10 V (AI mode is 0~10 V) or 4~20 mA (AI mode is 0~20 mA).
100	Fieldbus fault (Fieldbus SMDT fault)	Fault	Configurable	Smart wire sus fieldbus fault.	Check SmartWire DT card.
101	Option card fault	Fault	Configurable	SMDT board hardware fault.	Check SmartWire DT card.
102	External fault (External fault from SWD)	Fault	Configurable	External fault from SWD.	Check SmartWire DT card.
111	Profibus firmware incompatible	Warning		Profibus card firmware is not compatible with MCB firmware.	Check the Profibus card firmware revision.
113	CANOpen firmware incompatible	Warning		CANOpen card firmware is not compatible with MCB firmware.	Check the CANOpen firmware revision.
114	SWD firmware incompatible	Warning		SWD card firmware is not compatible with MCB firmware.	Check the SWD card firmware revision.
115	Fieldbus fault	Fault	Configurable	FieldBus EIP idle fault	Check ethernet IP master programming to verify proper addressing and ensure idle communication bit is not set.
117	Pump over cycle	Warning		During a period, the times which the drive sleeps and wakes up exceed a user configurable value.	Check the reason that drive is not stable. Check why the drive sleeps and wakes up frequently.
118	Broken pipe	Warning	Configurable	PID feedback is less than broken pipe level and the drive output frequency is more than broke pipe frequency for delay time.	
125	Freq. limit supv. (Freq. limit)	No action		The output frequency exceeds the range of frequency supervision limit.	Check the output frequency and check the setting of frequency supervision limit.
126	Torque limit supv. (Torque limit)	No action		The motor torque exceeds the range of torque supervision limit.	Check the motor torque and check the setting of torque supervision limit.
127	Ref. limit supv. (Ref. limit)	No action		The frequency reference exceeds the range of freq. reference supervision limit.	Check the frequency reference and check the setting of frequency reference supervision limit.
128	Power limit supv. (Power limit)	No action		The motor power exceeds the range of power supervision limit.	Check the motor power and check the setting of power supervision limit.
129	Temp. limit supv. (Temp. limit)	No action		The unit temperature exceeds the range of temperature supervision limit.	Check the unit temperature and check the setting of temperature supervision limit.
130	Al limit supv. (Al limit)	No action		The Al value exceeds the range of Al supervision limit.	Check the AI value and check the setting of AI supervision limit.
131	Motor current supv. (Motor current limit)	No action		The motor current exceeds the range of current supervision limit	Check the motor current and check the setting of current supervision limit.
132	PI superv.	No action		The PI1 feedback exceeds the range of PI1 supervision limit.	Check the PI1 feedback and check the setting of PI1 supervision limit.
133	Fieldbus fault (Fieldbus web Ul fault)	Fault	Configurable	FieldBus web UI fault.	Check the web connection with RJ45 connector. Verify drive parameters are set correctly. Check the web UI tool to know if there is proper request going to drive or not.

Step 6 - Faults and	I warning codes
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Notes:

Notes:

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