User Manual

Allen-Bradley

Using the 20-HIM-A6 HIM with the LiquiFlo 2.0 AC Drive

20-HIM-A6 Firmware Revision Number 2.001 or Later

Additional Resources

The PowerFlex 20-HIM-A6/-C6S HIM (Human Interface Module) User Manual, publication 20HIM-UM001, contains additional information about the HIM.

Getting Started

The term 'HIM' (Human Interface Module), as in the 20-HIM-A6 HIM, replaces the term 'OIM' (Operator Interface Module) throughout this document.

The 20-HIM-A6 HIM is a keypad/display that enables you to program, monitor, and control the drive.

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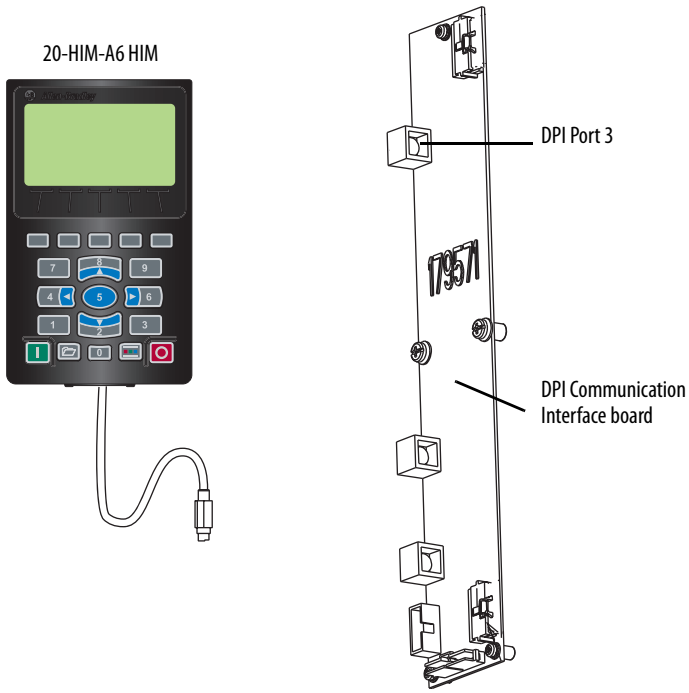
Installing and Removing the HIM

A cable, catalog number 20-HIM-H10, must be used to convert the HIM for hand-held use. The maximum cable length is 9.7 m (32 ft) using extender cables.

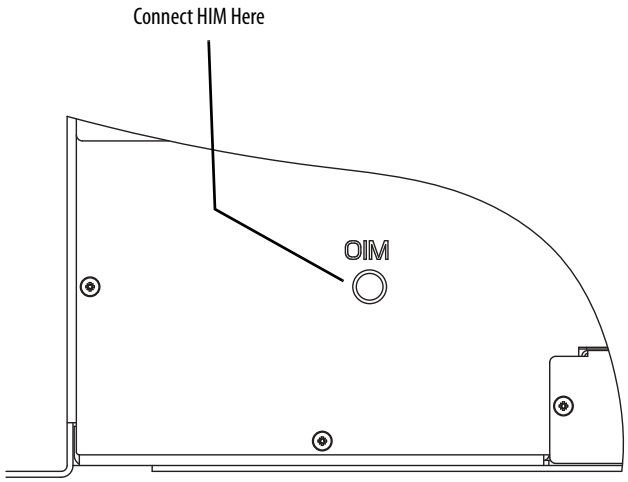
To **install** the HIM on a **Frame 3** Power Module, connect the HIM to DPI port 3 on the DPI Communication Interface board until it clicks into place. See Figure 1.

Figure 1 - Installing and Removing the Local HIM (Frame 3)



To **install** the HIM on a **Frame 4** Power Module, connect the HIM to the HIM adapter on the lower right corner of the power module. See Figure 2.

Figure 2 - Installing and Removing the Local HIM (Frame 4)



To **remove** the HIM, pull back on the HIM cable connector to release the HIM from the DPI Communication Interface board.

Removing the HIM While the Drive is Powered

If the HIM **is the selected control source**, removing the HIM while the drive is powered will cause a drive fault.

If the HIM is not the selected control source, but **is the reference source**, removing the HIM while the drive is powered will result in a zero reference value. When the HIM is replaced, the drive will ramp to the reference level supplied by the HIM.

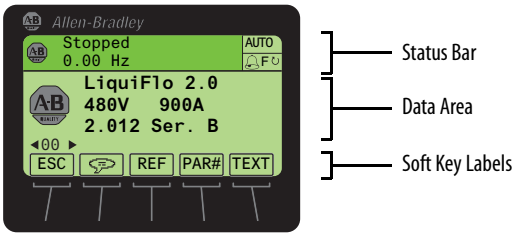
ATTENTION: Removing and replacing the HIM while the drive is running may cause an abrupt speed change if the HIM is the selected reference source, but is not the selected control source. The drive will ramp to the reference level provided by the HIM at the rate specified in Accel Time 1 (140), Accel Time 2 (141), Decel Time 1 (142), and Decel Time 2 (142). Be aware that an abrupt speed change may occur depending upon the new reference level and the rate specified in these parameters. Failure to observe this precaution could result in bodily harm.

If the HIM is not the selected control source or reference source, removing the HIM while the drive is powered will have no effect on drive operation.

Display Description

The basic HIM screen is divided into three display zones (Figure 3). Each display zone is described below in its respective subsection.

Figure 3 - HIM Display Zones



Status Bar

The Status Bar provides operating status information about the Host Drive.

Figure 4 - Status Bar on the Display Screen

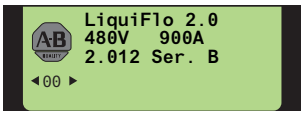
Element		Meaning
	Host Icon	A small image of the connected Host Drive.
Stopped	Status Text	Indicates current Host Drive operating status. Text flashes when a fault is present.
0.00 Hz	Feedback	Indicates drive output feedback (for example, Hz, RPM, amps, etc.)

Element		Meaning
AUTO / MAN	Mode Indication	Indicates Auto or Manual HIM status.
🔔	Alarm Indication	Bell icon indicates that an alarm is present.
F↻ R↺	Rotation Indication	Indicates Forward or Reverse direction of Host Drive operation.
DLX (not shown)	DeviceLogix Indication	Indicates when the Host Drive DeviceLogix feature is enabled.

Data Area

The Data Area displays the data or function presently being acted upon.

Figure 5 - Data Area on the Display Screen

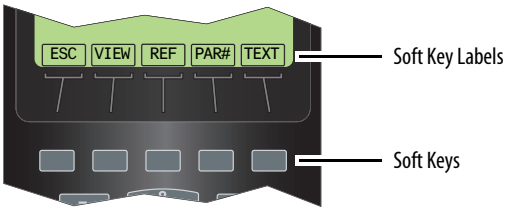


Element		Meaning
	Host or Device Icon	Image of the Host Drive or image of the device connected to the port selected.
◀ 00 ▶	Port Selection	Indicates selected port. Use the 4 ◂ or ▸ 6 navigation keys to select a port.
Host Drive	User-Definable Text	Top line of text in the Data Area can be edited by the user.

Soft Key Labels

The Soft Key Labels identify the present function of a corresponding Soft Key on the Key Pad. Different screens may show different Soft Key Labels.

Figure 6 - Soft Key Labels Example on the Display Screen



Label	Name	Function
.	Decimal Point	Adds decimal point to the right-most position of a numeric value.
←	Backspace	Deletes the character to the left of the cursor.
+ / -	Sign	Changes the sign of a parameter value.
#	Number	Selects the Direct Numeric Entry Method to change drive parameter associations.
🗩	Language	Directly accesses the Select Language To Use screen.
▲	Scroll Up	• Scrolls up through display lines. • Increases a value.
▼	Scroll Down	• Scrolls down through display lines. • Decreases a value.

Label	Name	Function
◀	Scroll Left	Scrolls left through display lines.
▶	Scroll Right	Scrolls right through display lines.
ACK	Acknowledge	Acknowledges the fault or alarm on the pop-up screen, stops the backlight from flashing, and keeps the pop-up screen active.
ALL	All	• Clears all faults, alarms or events when a pop-up box appears from a queue screen. • Restores all Host or Port device parameters to factory defaults.
CLR	Clear	• Deletes an entire text string. • Displays the Select Action pop-up box used to clear the selected fault, alarm or event, or the entire fault, alarm or event queue.
DEL	Delete	Deletes a highlighted character.
EDIT	Edit	• Accesses a displayed parameter to edit. • Accesses the Edit Process Display screen.
END	End	• Displays the end (least recent) fault, alarm or event in a queue • Scrolls to the end line of data on the Device Version information screen.
ENTER	Enter	• Displays the next level of a selected menu item. • Enters new values. • Performs the intended action.
ESC	Escape	• Cancels port verification conflict pop-up box during procedure to resolve a conflict. • Cancels the existing screen and returns to the previous screen. • Cancels an entry. • Cancels pop-up Fault Display screen. • Displays the time zone groups list screen (only when the Date/Time Set Edit Mode screen is shown).
EXP	Exponent	Allows data entry using scientific notation for 32-bit REAL (floating point) values.
FIX	Fix	Fixes “Changed” or “Requires Configuration” port verification conflicts upon power up.
INFO	Information	• Shows additional information about a selected port verification conflict upon power up. • Shows additional information about Set Default actions.
INS	Insert	Inserts a space to the left of a highlighted character.
LINK	Link	Displays a Link Edit pop-up box to link parameters.
LOWER	Lower	Displays the lower 16 bits (bits 0…15) of a 32-bit Bit-type parameter.
MOST	Most	Restores most Host or Port device parameters to factory defaults.
PAR#	Parameter Number	Navigates directly to a parameter.
PGDN	Page Down	Scrolls down to the next page of data lines on the Device Version information screen.
PGUP	Page Up	Scrolls up to the previous page of data lines on the Device Version information screen.
REF	Reference	Enters the speed reference for the Host Drive.
RESET	Reset	Resets the Process screen’s displayed process variables to the factory default process variables shown on page 12.
TEXT	Text	Edits user-definable text for the device selected.
TOP	Top	• Displays the top (most recent) fault, alarm or event in a queue. • Scrolls to the top line of data on the Device Version information screen.
UPPER	Upper	Displays the upper 16 bits (bits 16…31) of a 32-bit Bit-type parameter.
VIEW	View	• Toggles between select screens and views. • Displays the time stamp screen from a fault, alarm or event queue screen.
ZONES	Zones	Displays the Select Time Zone screen.

Folder Screens

The drive and each connected peripheral has its own set of Folder screens:

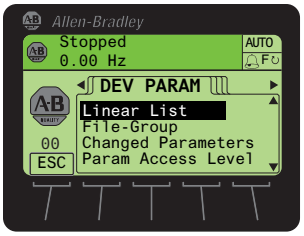
Folder Screen	Description
PORTS	Displays a list of Host Drive ports to which peripherals are connected. The Host Drive is always Port 00. An icon appears for the device occupying the selected port.
DEV PARAM	Displays a list of available methods to access the device's parameters.
HOST PARAM (1)	Displays a list of available methods to access the Host Drive parameters.
DIAGNOSTIC	Displays a list of available diagnostic information items for the device.
MEMORY	Displays a list of available memory storage items for the device.
PROPERTIES	Displays a list of available user-defined convenience functions for the device.
START UP	Displays a list of available Host Drive start up routines. This folder is not applicable for peripheral devices and is not shown.

(1) The HOST PARAM folder screen is only available for PowerFlex 750-Series peripherals that support use of Host Drive parameters (for example, the 20-750-DNET DeviceNet communication Option Card).

To display the last-viewed Folder screen, press the (Folders) key. The Folder screen Data Area displays these items:

- Selected device and port number
- Host drive and peripheral folders

Figure 7 - Example Folder Screen (Device Parameters)



Folder Screen Soft Key

Label	Name	Function
ESC	Escape	Reverts back to the Status or Process Display screen.

Folder Screen Navigation/Number Keys

Key	Name	Function	Screen Element
2	2/Down Arrow	Scrolls down through the folder items.	▼
4	4/Left Arrow	Scrolls to the previous folder.	◀
5	5/Enter	Displays the next level screen for a selected folder item.	Not applicable
6	6/Right Arrow	Scrolls to the next folder.	▶
8	8/Up Arrow	Scrolls up through the folder items.	▲

Powering Up and Adjusting the HIM

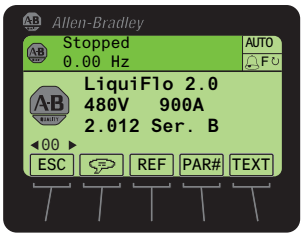
The first time the HIM is powered up, you are prompted to select a language for display text.

Adjusting Display Contrast

The contrast of the HIM display can be adjusted for optimal viewing by performing the following steps.

1. Access the Status screen, which is displayed on HIM power up.

Figure 8 - Status Screen



2. Use the 4 ◄ or ► 6 key to scroll to the port to which the HIM is connected.

Port	Location
01	HIM cradle on the front of the drive.
02	DPI port at the bottom of the drive.
03	Splitter cable port when the cable is plugged into the DPI port at the bottom of the drive.

3. Press the key to display its last-viewed folder.
4. Use the 4 ◄ or ► 6 key to scroll to the PROPERTIES folder.
5. Use the 2 ▼ or 8 ▲ key to select Adjust Contrast.
6. Press the 5 (Enter) key to display the Set LCD Contrast edit pop-up box.
7. Use the ▲ or ▼ 'soft key' to adjust contrast to the desired setting.
8. Press the ESC 'soft key' to set the contrast and exit the screen.

Resetting the Display

To return all the options for the display to factory-default values, select 'Set Defaults' under the MEMORY folder.

Selecting a Device in the System

The HIM can access and display data from any active drive or peripheral device on the network. The drive (Port 0) is the default device selected.

To select a device, use the 4 ◄ or ► 6 key when on the Status screen, or select the device under the PORTS folder. The options listed depend on what is connected to the network.

The name and DPI port number of the device being accessed is shown on the HIM display.

Using the HIM to Program the Drive

The HIM enables you to view and adjust parameters in the drive or in peripheral devices connected to the drive. The parameters available for viewing or adjustment depend on the device selected. See Selecting a Device in the System above for information about selecting a device.

The method of viewing and adjusting parameters is the same regardless of the device selected.

Viewing and Adjusting Parameters

See the 'Parameter Descriptions' chapter in the LiquiFlo drive User Manual for information on how the parameters are organized in the drive.

Selecting File-Group-Parameter or Linear List View

The HIM displays Host Drive parameters by File-Group-Parameter view or by Linear List.

TIP Not all peripheral devices support viewing parameters in a File-Group-Parameter view.

To change viewing between File-Group-Parameter and Linear List, perform the following steps.

1. Access the Status screen (see Figure 8).
2. Use the 4 ◄ or ► 6 key to scroll to the Port of the device whose parameters you want to access (for example, Port 00 for the Host Drive).
3. Press the folder key to display its last-viewed folder.
4. Use the 4 ◄ or ► 6 key to scroll to the DEV PARAM or HOST PARAM folder.
5. Use the 2 ▼ or 8 ▲ key to select **Linear List** or **File-Group**.
6. Press the 5 (Enter) key to display the last-viewed or first parameter in the Linear List, or the last-viewed or first parameter in the first Group.

Direct Parameter Access

1. Access the Status screen (see Figure 8).
2. Use the 4 or 6 key to scroll to the Port of the device whose parameters you want to access (for example, Port 00 for the Host Drive).
3. Press the PAR# 'soft key' to display the Jump to Param # entry pop-up box.

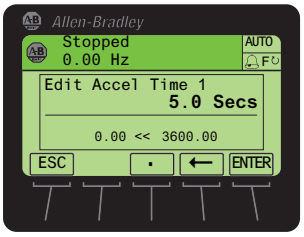
   TIP Some devices have two sets of parameters (Device and Host parameters). In this case, a pop-up box will appear to enable you to first choose the parameter set in which the parameter is that you want to directly access.

4. Use the numeric keys to enter the desired parameter number, or use the ▲ or ▼ 'soft key' to scroll to the desired parameter number.

   TIP Pressing and holding the ▲ or ▼ 'soft key' for 1 second or longer provides continuous scrolling until the key is released.

5. Press the ENTER 'soft key' to display the parameter.
6. Press the EDIT 'soft key' (for editable parameters only) to display the Edit Parameter pop-up box.

Figure 9 - Example Edit Parameter Pop-Up Box



7. Use the numeric keys, decimal 'soft key', and ← 'soft key' to edit the parameter.

   TIP When the decimal 'soft key' is pressed while editing a numeric value, this key temporarily changes to an EXP 'soft key' to allow exponential entry.

8. Press the ENTER 'soft key' to enter the new parameter value and return to the parameter screen.

Alternate Linear List Access

1. Access the Status screen (see Figure 8).
2. Use the 4 or 6 key to scroll to the Port of the device whose parameters you want to access (for example, Port 00 for the Host Drive).
3. Press the key to display its last-viewed folder.
4. Use the 4 or 6 key to scroll to the PARAMETER folder.

5. Use the 2 or 8 key to select Linear List.
6. Press the 5 (Enter) key to display either the device's last-viewed parameter or the first parameter in the linear list.
7. Use the 2 or 8 key to scroll to the desired parameter.
8. Press the EDIT 'soft key' (for editable parameters only) to display the Edit Parameter pop-up box (Figure 9).
9. Use the numeric keys, decimal 'soft key', and ← 'soft key' to edit the parameter.

   TIP When the decimal 'soft key' is pressed while editing a numeric value, this key temporarily changes to an EXP 'soft key' to allow exponential entry.

10. Press the ENTER 'soft key' to enter the new parameter value and return to the parameter screen.

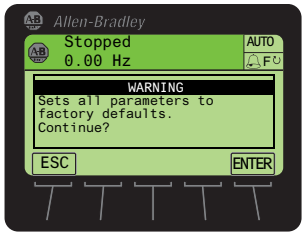
Restoring Parameters to Factory-default Values

To restore all parameters to their factory-default values, perform the following steps.

TIP Parameter values are retained through a line dip or power shutdown.

1. Access the Status screen (see Figure 8).
2. Use the 4 or 6 key to scroll to the Port of the device whose parameters you want to set to factory defaults (for example, Port 00 for the Host Drive or the respective port number for one of the drive's connected peripherals).
3. Press the folder key to display its last-viewed folder.
4. Use the 4 or 6 key to scroll to the MEMORY folder.
5. Use the 2 or 8 key to select Set Defaults.
6. Press the 5 (Enter) key to display the Set Defaults pop-up box.

Figure 10 - Set Defaults Pop-Up Box



7. Press the ENTER 'soft key' to affirm and set all device parameter values to factory defaults—or press the ESC 'soft key' to cancel.

Loading and Saving User Device Sets

Drive configuration, called user sets, can be saved and recalled for use at any time. Up to three user sets can be saved in the LiquiFlo drive.

- To **save** the current drive configuration, select **Save to Device User Set** under the 'Device User Sets' option of the MEMORY folder.
- To **recall**, or **load**, a user set, select **Load from Device User Set** under the 'Device User Sets' option of the MEMORY folder.

To identify which user set is active, select **Show Active Device User Set** under the 'Device User Sets' option of the MEMORY folder. The name of the last user set to be loaded into the drive is displayed. **Active Set** means factory defaults have been restored.

Monitoring the Drive Using the Process Display Screen on the HIM

The Process Display screen (Figure 11) enables you to monitor up to three process variables. You can select the display, parameter, scale, and text for each process variable being displayed.

The ESC 'soft key' toggles between the Status screen and the Process Display screen. In addition, the Process Display screen becomes active if no keys have been pressed before the display timeout period expires. The timeout period is set using HIM parameter 7 (User Dspy Time).

Displaying and Changing the HIM Reference

You can display the reference value that the HIM is sending to the drive by pressing the REF 'soft key'. The HIM reference can be used for the speed reference.

To change the displayed reference, use the numeric keys along with the decimal 'soft key' for the decimal.

TIP Changing the value of the HIM reference does not affect the value of any other port reference.

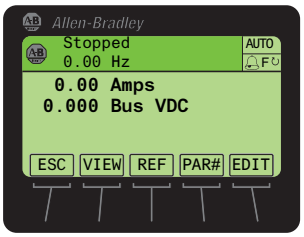
The value of the HIM reference is saved through a power cycle if drive parameter 192 (Save OIM Ref) is set to save at power down.

Customizing the Process Display Screen

Selecting Multi-Line or Single-Line View

By default, the Process Display screen shows a multi-line view of the drive process variables shown below.

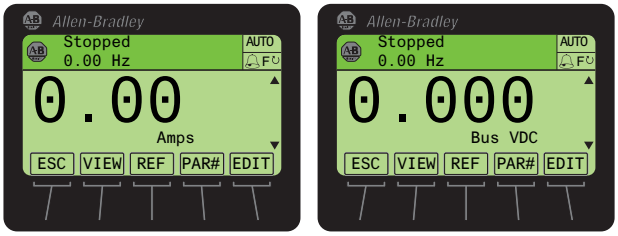
Figure 11 - Multi-Line View Process Display Screen



Displayed (Default) Process Variables	
Screen Text	**Description**
Amps	Output Amps
Bus DC	DC Bus Volts

1. Press the ESC 'soft key' until the Process Display screen appears.
2. To change the multi-line view Process Display screen to show each of the process variables in a larger single-line view, press the VIEW 'soft key'.
3. Use the  or  key to scroll to each single-line view Process Display screen.

Figure 12 - Single-Line View Process Screen Examples



4. To return to the multi-line view Process Display screen, press the VIEW 'soft key' again.

Changing Displayed Items, Adding a Scale Factor or Customizing Text

You can further customize the Process Display screen by doing the following:

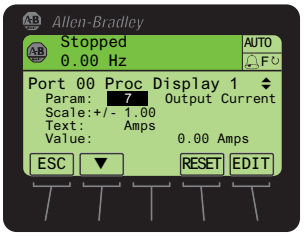
- Changing a displayed parameter to a different parameter.
- Applying a scale factor to the displayed parameter.
- Customizing text for the displayed parameter.

To do any or all of the above, perform the following steps.

1. With either the multi-line view process display screen (Figure 11) or the single-line view process display screen (Figure 12) displayed, use the  or  key to select the process variable you want to change.
2. Press the EDIT 'soft key'.

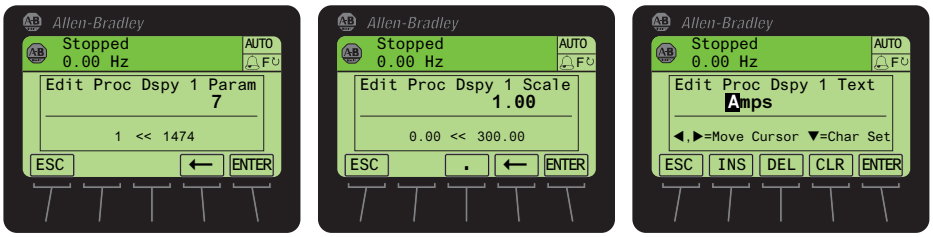
For example, suppose you want to change the first process variable. In this case, the Process Display 1 Edit screen is shown.

Figure 13 - Example Process Display 1 Edit Screen



3. Use the ▼ 'soft key' to select what you want to change (parameter, scale, or text) for the process variable.
4. Press the EDIT 'soft key' to display its respective edit pop-up box (see examples below).

Figure 14 - Example Process Display Edit Pop-Up Boxes



5. For parameter or scale editing, use the numeric keys and available 'soft keys'. Then press the ENTER 'soft key' to enter and save the item.

   For text editing, use the numeric keys, available 'soft keys', and the 5 key to enter each character. Then press the ENTER 'soft key' to enter and save the complete text string.

Controlling the Drive From the HIM

The HIM can be used to control these drive functions:

- Start (Run)
- Stop
- Clear Faults

Starting the Drive

When start from the HIM is enabled using the drive parameters 276 (Logic Mask) and 277 (Start Mask), pressing the | key issues a start command to the drive.

Stopping the Drive

Pressing the ○ key issues a stop command to the drive.

IMPORTANT Stop commands from any attached HIM are always enabled.

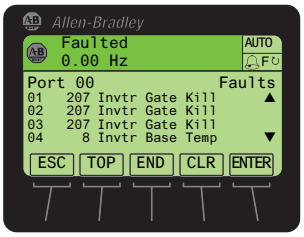
Viewing/Clearing Drive Faults or Alarms

To view and clear drive faults or alarms, perform the following steps.

1. Access the Status screen (see Figure 8).
2. If Port 00 (Host Drive) is not shown above the ESC 'soft key', use the 4 or 6 key to scroll to Port 00.
3. Press the key to display its last-viewed folder.
4. Use the 4 or 6 key to scroll to the DIAGNOSTIC folder.
5. Use the 2 or 8 key to select **Faults** or **Alarms**.
6. Press the 5 (Enter) key to display the numbered fault/alarm queue.

   Faults/alarms are listed from the most recent (line 01) to occur to the least recent. The fault/alarm number and name are shown at the right.

   Figure 15 - Example Drive Fault Queue Screen



7. Use the 2 or 8 key or the following 'soft keys' to navigate within the fault/alarm queue:

Soft Key	Function
ENTER	Displays the Time Stamp pop-up box for the fault/alarm. Use the 2 or 8 key to scroll to all parameters related to the displayed fault/alarm (if supported by device).
TOP	Displays the first (most recent) fault/alarm in the queue.
END	Displays the last (least recent) fault/alarm in the queue.

8. To clear faults/alarms, press the CLR 'soft key'.

   In the Select Action pop-up box, select the appropriate action using the 2 or 8 key and press the 5 (Enter) key to clear the active fault/alarm or clear fault/alarm queue. To cancel the pop-up box, press the ESC 'soft key' or select **Cancel** from the list and press the 5 (Enter) key.

Using the Start-up Routines

ATTENTION: Only qualified electrical personnel familiar with the construction and operation of this equipment and the hazards involved should install, adjust, operate, or service this equipment. Read and understand this section in its entirety before proceeding. Failure to observe this precaution could result in severe bodily injury or loss of life.

ATTENTION: Incorrect values for some of the parameters in the start-up routines can cause the drive to operate improperly. Verify that the values of these parameters are appropriate for your application. Failure to observe this precaution could result in bodily injury.

For standard applications, the start-up routines on the HIM enable you to configure the most commonly used parameters through a series of steps. This helps you set up the drive as quickly as possible.

For advanced applications, you may need to adjust additional parameters in the parameter list using either the HIM or VS Utilities software.

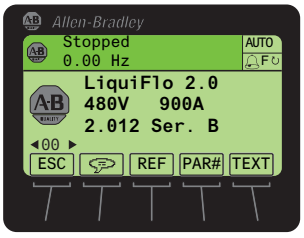
Preparing for Startup

Before performing the start-up routine, you must:

- Be qualified to configure the drive and be familiar with the operation of AC drives.
- Be familiar with the operation of the HIM.
- Have completed all hardware installation.
- Properly connect the drive to the motor.

Running the Start-up Routines

1. Access the Status screen, which is displayed on HIM power up.



2. If Port 00 (LiquiFlo 2.0) is not shown above the ESC soft key, use the 4 or 6 key to scroll to Port 00.
3. Press the folder key to display its last-viewed folder.
4. Use the 4 or 6 key to scroll to scroll to the START UP folder.
5. Use the 2 or 8 key to select **Begin Start Up**.
6. Press the ENTER 'soft key' to acknowledge LiquiFlo Start-up.

7. Complete the steps in order of listing:
   a. Input Voltage
   b. Motor Dat/Ramp
   c. Motor Tests
   d. Speed Limits
   e. Speed Control
   f. Strt/Stop/I/O
   g. Done/Exit

   The Start-up routine automates the process of entering values of selected parameters by taking you to the next parameter after you accept a parameter value. As each item in the list is completed, you are automatically advanced to the next step.

IMPORTANT	Parameter values are saved as they are changed. Pressing the ABORT 'soft key' does not undo the changes to the Start-up routine.

Exiting Before Completing the Start-up Routines

To exit the Start-up routines, press the ABORT 'soft key'. When you select **Begin Start Up** from the START UP folder menu again, you are prompted to either continue or restart the Start-up routines. If you select **Continue**, you are returned to the point at which you exited.

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