**Introduction**

The HMI (Human Machine Interface), a touch screen for the MCC (Motor Control Center), is a tool for the user to configure, monitor, and manipulate the VFD (Variable Frequency Drives) for the motors involved with your car wash. This document will explain how to run the drives in manual mode, change the parameters that tell the motor how quickly to speed up or slow down, and a whole host of other options. While the information contained herein is intended for the user to make changes to the system, it is not intended to tell the user how to set up the VFDs for optimal performance.

When reading through this document, please keep in mind that your VFD has been customized for your MCC and tunnel configuration. You may have more or less types of the motor\VFD configurations than depicted here. To navigate through the various screens, just tap on the button or menu tab. Some of the screens will require the use of a slider bar. Press on the bar while dragging it up or down to scroll. If an alphanumeric input is needed, a virtual keyboard will appear on the screen. Using your finger or a stylus is completely acceptable for working on the HMI.

**IMPORTANT:** Please do not use hard or sharp objects like the tip of a pen which could permanently scratch the screen.

The idle screen of the HMI is known as the main screen. It is not necessary to log in to use the HMI as a monitoring device. As long as the MCC is powered on, you can access this screen. If the screen is dim, just touch the screen to activate it.

![Main Screen](image)

*Figure 1. Main Screen*

On the Main screen, you can find the available types of motor\VFD configurations for your tunnel. See Figure 1:
- Electric Drive
- Pump
- Hydraulic
- Blower
- View VFD Snapshot
- Manual Override
Monitor, Configure, and Review Logs for the Electric Drives

1. On the Main Screen, tap the Electric Drive button to select.

   The Electric Drive screen appears and the first device in the Electric Drive list is shown by default. In this example, it is Mitter 1.

   ![Electric Drive Screen](image)

   Figure 2. Electric Drive Screen

2. Tap the arrow for the Electric Drive menu, and select one of the electric motors from the list.

   The screen will display the following VFD Management links for the selected drive:

   - **Configure** - setup the drive
   - **Logs** - review the logs for the drive
   - **Status** - view the status screen for the drive

   ![Electric Drive Selection and Motor Status](image)

   Figure 3. Electric Drive Selection and Motor Status

The Motor Stats will allow the user to gain a perspective on the efficiency of the motor. The use of gear boxes and control over the motor speed will increase its efficiency, and as a result, lower the operating cost for that motor. During the initial configuration of the motor in the VFD, the person responsible for the installation will enter in the Rated or Full Load Amps (FLA) for the motor in the configuration tab (explained later). This value will appear in the Motor Stats.

While the motor is running, the VFD will measure the current draw of the motor in Amps and will display that value in the Motor Stats. The HMI software will then calculate the percentage of the maximum current load allowable and will use that value to determine the percentage of savings. The savings is a reflection of the VFD's control of the motor versus running the motor at full speed without VFD control as depicted in Figure 3.
The VFD, when initially configured, will have the maximum RPM for the motor as part of its parameters. The VFD will monitor the current RPM of the motor and will calculate the percentage or the rated RPM and display it as shown in Figure 4.

**Figure 4. Monitor RPM**

**Performance Column**

Since not all devices in a specific category will be performing the same functions, the Performance column on the screen will depict information based upon the motor\VFD role in the tunnel.

**Examples:** The Hydraulic conveyor motor\VFD will reflect the number of cars going through the system per hour. The pump performance displays a Target PSI. Depending upon the RPM versus pressure, this may indicate a logged nozzle or a break in a hose. A few examples are shown below:

**Figure 5. Performance Screen Examples**
VFD Management

Motor Nameplate Setup
1. On the Main screen, click the Configure button.

   **NOTE:** This screen can be accessed without logging in to the HMI; however, in order to make changes or enter the initial configuration values, an override password is required. The override password can only be obtained by contacting ICS Support @ 1-800-246-3469.

2. View the parameters or enter new figures if you are adding a new motor for the first time.

   ![Configuration Screen](image)

   ![Motor Label example](image)

Drive Setup
The Drive Setup parameters are relatively universal among motor\VFD configurations.

<table>
<thead>
<tr>
<th>Button</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current Limit</td>
<td>Type the maximum allowable current draw for the motor. This value will cause the VFD to shut off the motor to protect it if the current exceeds the current Limit value. A rise in current can result as a strain on the motor from either of the following: the device getting jammed or a mechanical issue that does not allow the motor to spin freely.</td>
</tr>
<tr>
<td>Low Speed and High Speed</td>
<td>The settings will limit the range that the VFD can attempt the motor to spin at. This value is in Hz. Typically the maximum speed for the motor is going to be 60Hz. This setting will have the motor spinning at its maximum RPM. Other settings in the VFD will dictate what frequency the drive will output to the motor.</td>
</tr>
<tr>
<td>Acceleration and Deceleration Ramps</td>
<td>In this same box are the settings for. As the name implies, these two fields will dictate how long in seconds the VFD will take to either get the motor up to speed or bring it to a stop. While it may seem attractive to start and stop the motor as quickly as possible, some discretion is needed so that the motor\VFD does not fault out from the increased current needed to start and stop the motor.</td>
</tr>
<tr>
<td>WBC Fault Action</td>
<td>This field will determine how the WBC will act in the event of a motor\VFD fault. The options are to do nothing or panic stop the line. In a panic stop condition, the whole line will shut off and go to a safe condition.</td>
</tr>
</tbody>
</table>
Configuration Block

The configuration block is specific to the function of the motor/VFD. A few examples are shown below:

![Figure 8. Configuration Screen Examples](image)

Logs

1. On the Main HMI Screen in the VFD Management section, click the **Logs** button.
   
   A log of activity appears for the user to review in regards to the VFD.
   
   **NOTE:** The log is an advanced diagnostic feature that would require a moderate level of VFD expertise to understand and effectively use.

2. Tap the **Close** button to exit the Logs screen.

![Figure 9. Logs Screen](image)
1. On the Idle or Login HMI screen, click the **Status** button in the VFD Management section.

   A Drive Status screen gives a red or green light for the drive status in various categories.

   □ **NOTE:** A condition showing as red is not necessarily a bad thing or a fault. It is simply a status of a given parameter.

   ![Drive Status Screen]

   **Figure 10. Drive Status Screen**

2. Tap to select the **View Last Fault** button, view the status of the last fault on the drive.

   ![View Last Fault Screen]

   **Figure 11. View Last Fault Screen**

3. On the View Last Fault screen, the last fault will be referenced at the top of the screen along with a description of the fault. When calling support, provide the information from this portion of the screen for initial troubleshooting purposes. The other parameters or displays will give the user either a value or a status of the screen at the instant the fault was reported by the drive. This information may be requested by support in order to follow through with the troubleshooting process.
4. Tap the **Close** button to exit either of the two previous screens.
5. When on the VFD Management screen, tap the **Back to Main Screen** button.

### View VFD Snapshot

1. On the Main Screen, click the **View VFD Snapshot** button.

   A screen appears showing the name, the IP Address, and the current status of each VFD. If the status is highlighted in green, the VFD is in a fault-free, warning-free condition where it is running or where it can run.

   **WARNING:** A red highlight means that a condition exists and the VFD cannot run. A truncated description of the fault will be displayed.

   ![View VFD Snapshot](image)

   **Figure 12. View Last Fault Screen**

### Manual Override

In order to perform manual operations of the VFD HMI software, you need to log in.

Click the Manual Override button on the Main Screen of the HMI. See Figure 1.

The Override Code appears and in order to log in, you will need to type the Username and the Password.

**NOTE:** The override password can only be obtained by contacting ICS Support @ 1-800-246-3469.

![Manual Override](image)

**Figure 13. Override Log In**
After you log in successfully, you will be able to view the drives and settings.

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Settings On / Off Auto/ Manual

Motor Off, Auto Mode

Motor On, Auto Mode

Motor Off, Manual Mode

Motor On, Manual Mode

As switches change to On/Off and Auto/Manual modes, they will register Waiting, Starting or Stopping.
1. From the device, click the **Settings** button.
2. In the **Set Point** box, type in a new number if necessary.
3. In the **Relay Direction** box, select a direction from the list if necessary.

**Mitter**

![HMI Mitter](image)

**Figure 15. HMI Mitter**

4. The set point values in the HMI correspond to the values in the Tunnel Master® WBC relay page. The Set Point Value and Direction can be set.

![Tunnel Master® WBC Relay Settings](image)

**Figure 16. Tunnel Master® wbc Relay Settings**
Figure 17. Tunnel Master® wbc Relay Settings Set Point

![Relay Configuration Table](image-url)
Hydraulic

![Hydraulic Settings](image)

Figure 18. HMI Settings for Hydraulic

Pumps

![Pumps Settings](image)

Figure 19. HMI Pumps

Blowers

![Blowers Settings](image)

Figure 20. HMI Blowers

**NOTE:** When returning from manual to auto mode, the tunnel must be clear of cars as well as the scan arch gate.
YOUR BEST CHOICE
for car wash success.

MISSION STATEMENT:
It is our passion to leverage our experience as car wash operators, our position as a Market Leader, and our ability to incorporate advanced technology into Visionary products, which enables our Customers to differentiate their operations, achieve a distinct competitive advantage, and maximize their earnings.