

Control Techniques, Americas



# Unidrive M400 Multiplex

## Pump Software HMI User Guide

Part Number: APP-M4MPHMI-01

Issue Number: 2

A large, green, 3D geometric graphic that resembles a stylized, multi-faceted cube or a series of overlapping planes. It is positioned at the bottom of the page, spanning most of the width. The number "2016" is printed in black on one of the visible faces.

2016



## SAFETY INFORMATION

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Persons supervising and performing the electrical installation or maintenance of a Drive and/or an external Option Unit must be suitably qualified and competent in these duties. They should be given the opportunity to study and if necessary to discuss this User Guide before work is started.

The voltages present in the Drive and external Option Units are capable of inflicting a severe electric shock and may be lethal. The Stop function of the Drive does not remove dangerous voltages from the terminals of the Drive and external Option Unit. Mains supplies should be removed before any servicing work is performed.

The installation instructions should be adhered to. Any questions or doubt should be referred to the supplier of the equipment. It is the responsibility of the owner or user to ensure that the installation of the Drive and external Option Unit, and the way in which they are operated and maintained complies with the requirements of the Health and Safety at Work Act in the United Kingdom and applicable legislation and regulations and codes of practice in the UK or elsewhere.

The Drive software may incorporate an optional Auto-start facility. In order to prevent the risk of injury to personnel working on or near the motor or its driven equipment and to prevent potential damage to equipment, users and operators, all necessary precautions must be taken if operating the Drive in this mode.

The Stop and Start inputs of the Drive should not be relied upon to ensure safety of personnel. If a safety hazard could exist from unexpected starting of the Drive, an interlock should be installed to prevent the motor being inadvertently started.

## GENERAL INFORMATION

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The manufacturer accepts no liability for any consequences resulting from inappropriate, negligent or incorrect installation or adjustment of the optional operating parameters of the equipment or from mismatching the Drive with the motor.

The contents of this User Guide are believed to be correct at the time of printing. In the interests of a commitment to a policy of continuous development and improvement, the manufacturer reserves the right to change the specification of the product or its performance, or the contents of the User Guide, without notice.

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<b>Issue Code</b>	2

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# 1 INTRODUCTION

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## 1.1 Who Should Read This Manual?

This manual is intended to assist the engineer in commissioning the application software, and should be read in conjunction with the documentation that is supplied with the drive and other associated hardware. The safety systems that are required to prevent risk of injury to persons operating or maintaining the machine are not discussed in this manual. The engineer must be familiar with and able to implement required safety systems. This manual assumes that the engineer is familiar with relevant Control Techniques products and understands the requirements for the application, and should be used alongside the *Unidrive M400 User Guide* for more information as well as the *M400 Multiplex User Guide* for specific solution functionality.

If you do not feel confident of the above, then you should contact your local Nidec Industrial Automation/Control Techniques drive centre or distributor to obtain service / advice.

## 1.2 Document & Parameter References

Referenced document part numbers can be found in Section 1.3 of this user guide.

All parameter references for the Unidrive M400 in this user guide will include the parameter name, location in Menu 0 (if applicable), and drive menu location. The format will appear as follows:

*Parameter Name (Pr 0.Parameter/DriveMenu.Parameter).*

For example,

*Motor Rated Frequency (Pr 0.005/5.006)*

### 1.3 Document References

The following part numbers can be used to order/access documents that have been referenced throughout this user guide.

Manual Description	Control Techniques Part Number
Unidrive M400 User Guide	0478-0044-XX
Unidrive M400 Parameter Reference Guide	Web Download
SI Ethernet User Guide	0478-0137-XX
Unidrive M400 Multiplex User Guide	APP-M4MP-XX
CTVUE-306A User Guide	Web Download

The *Unidrive M400 Parameter Reference Guide* and *CTUVE-306A User Guide* can be found and downloaded at [www.controltechniques.com](http://www.controltechniques.com).

## 2 HMI INSTALLATION AND NETWORK CONFIGURATION

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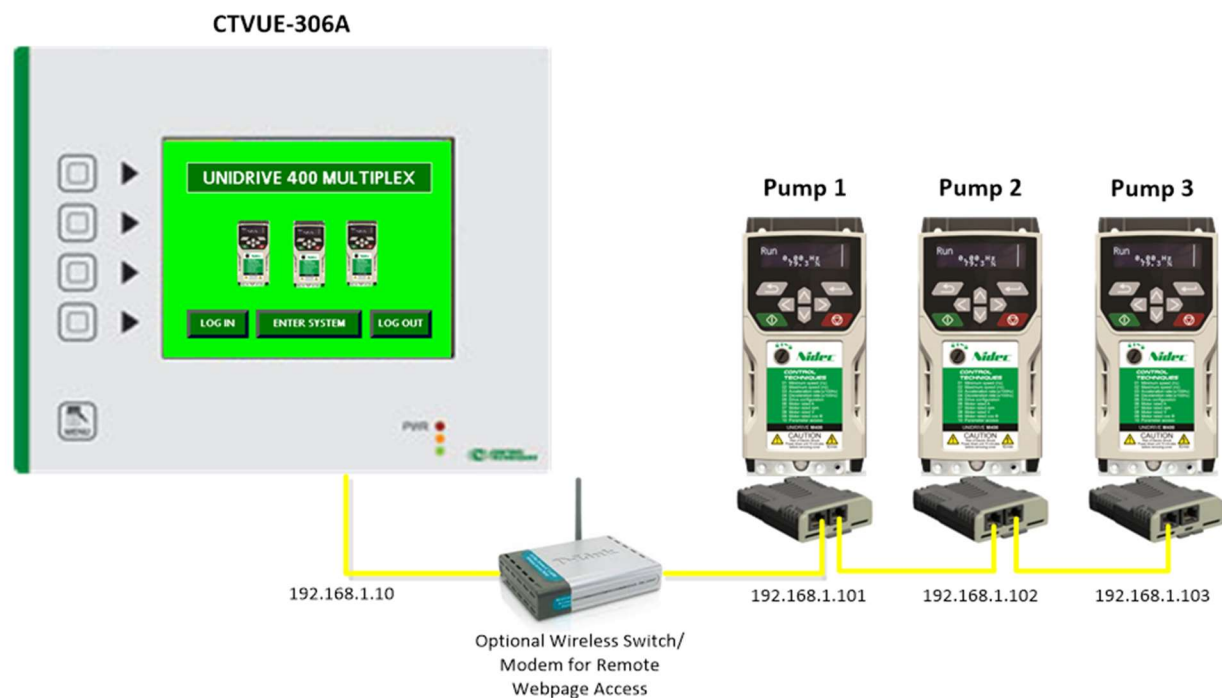
### 2.1 General Notes

The M400 Multiplex HMI has been created to work with the M400 Multiplex Solution on the Unidrive M400 with 1, 2, or 3 pump drives connected on the network. The HMI software was created for use specifically with the CTVUE-306A running on a Modbus TCP/IP Ethernet network. This software package should be installed by the factory before delivery, and if your CTVUE-306A does not have the HMI software installed please contact your local sales or technical support representative. Note that the HMI described in this manual is not necessary to run the M400 Multiplex Pump solution, but does add an easier level of user interface.

For electrical and/or hardware installation questions and recommendations, please reference the *CTUVE-306A User Guide* which can be found at [www.controltechniques.com](http://www.controltechniques.com).

## 2.2 Network Configuration

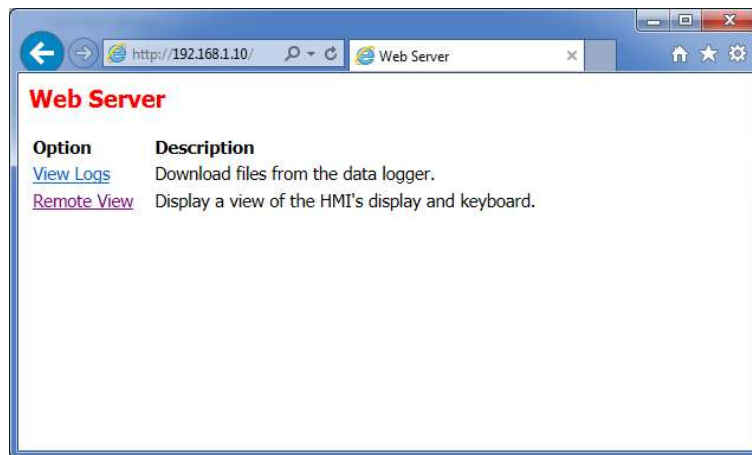
The CTVUE-306A with the M400 Multiplex HMI Software is constructed to be compatible with the network settings configured on the M400 Multiplex Pump SI-Ethernet modules. The IP Address of the HMI is 192.168.1.10, with the SI Ethernet Modules configured at 192.168.1.101, 192.168.1.102, and 192.168.1.103 for pumps 1, 2, and 3, respectively (see diagram below).



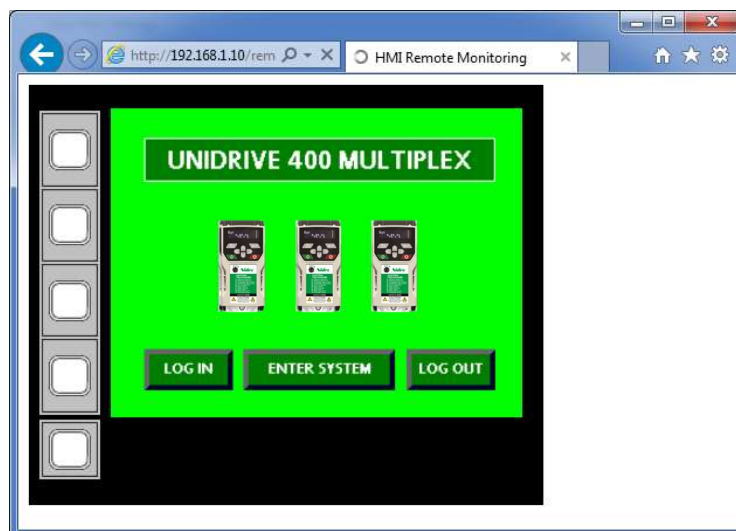
Typically, the HMI will be wired directly to the left hand Ethernet port on the SI-Ethernet Module in Pump 1 of the system, but it can also be wired through an intermediate switch to allow additional access to the network by other devices. Please use good networking practices such as shielded Ethernet cabling and appropriate network isolation when adding the HMI to the system.

## 2.3 Web Server Remote Access

The CTVUE-306A has an enabled and configured web server to allow remote access and control to the HMI from a local wired or wireless Ethernet network. With an internet enabled device (PC, Tablet, etc), the HMI screens can be accessed and manipulated remotely by using an appropriate web browser such as Internet Explorer. With a connected device on the same network subnet (192.168.1.XXX) that does not conflict with any of the existing network devices, the HMI can be accessed by addressing the HMI IP Address (192.168.1.10) through the selected web browser. Upon successful access to the HMI through the web browser, the following options are presented to the user:



From this page, select the link for “Remote View” to gain access to the HMI screens, which will bring the user to the active HMI screen.



From this view, the HMI functions can be accessed with the PC selection device (mouse, touchscreen, etc.). Additionally, the hard keys of the HMI are also available along the left side of the screen.



## 3 MULTIPLEX STATUS AND CONTROL SCREENS

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### 3.1 Splash Screen

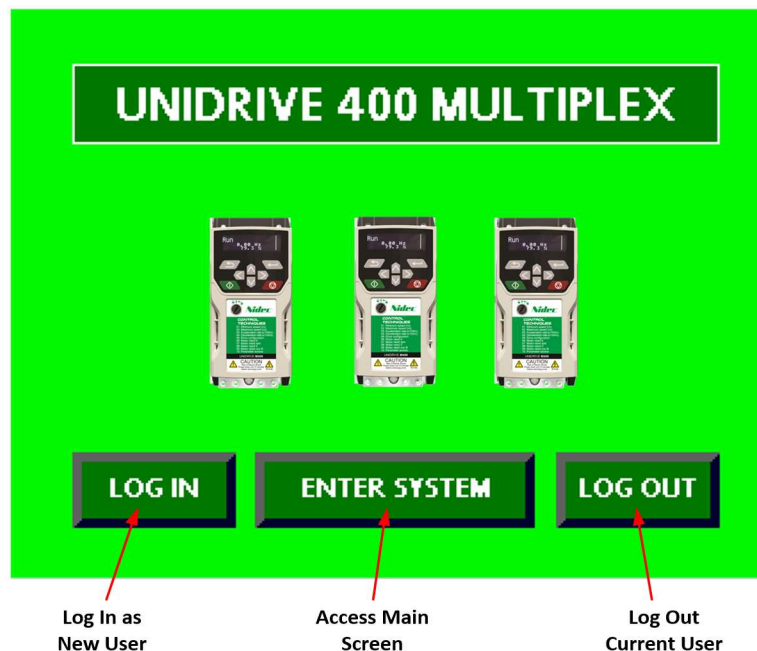
When the M400 Multiplex HMI initially powers on, the user will encounter the Splash Screen of the HMI. This will allow the user to log in as a system administrator, log out from the system administrator, and enter the main system control screen. The Splash Screen can be accessed at any time by selecting the “MENU” hard key in the lower left hand corner of the screen.

The rights of the system administrator allow the user to alter the M400 Multiplex settings, instead of only being able to view the status from the Main System Screen. In order to log in as the system administrator, use the following credentials:

**User Name:**     **admin**

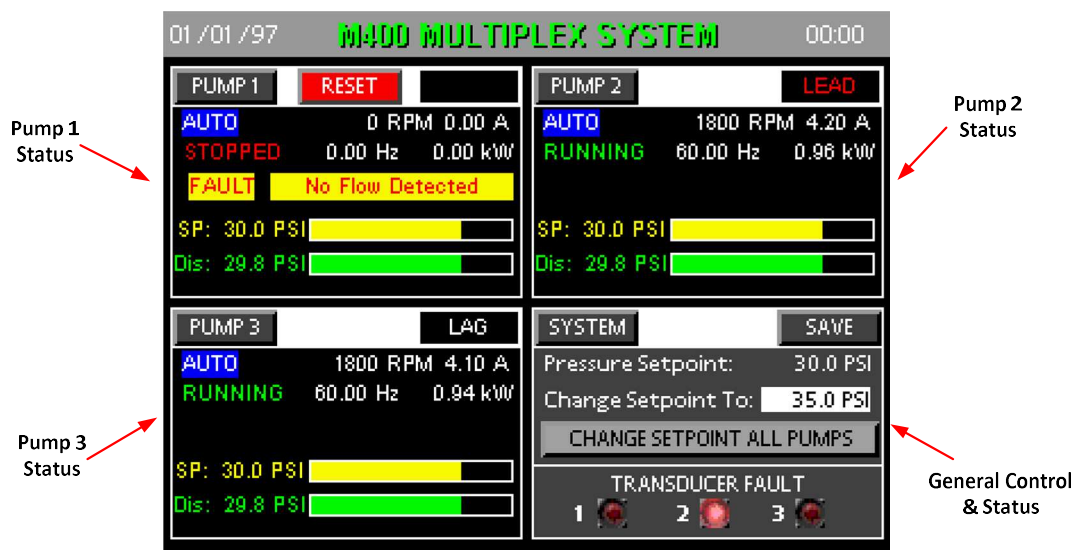
**Password:**     **pump**

By default and following any power cycle, the system starts in guest mode for read only access to most system parameters.



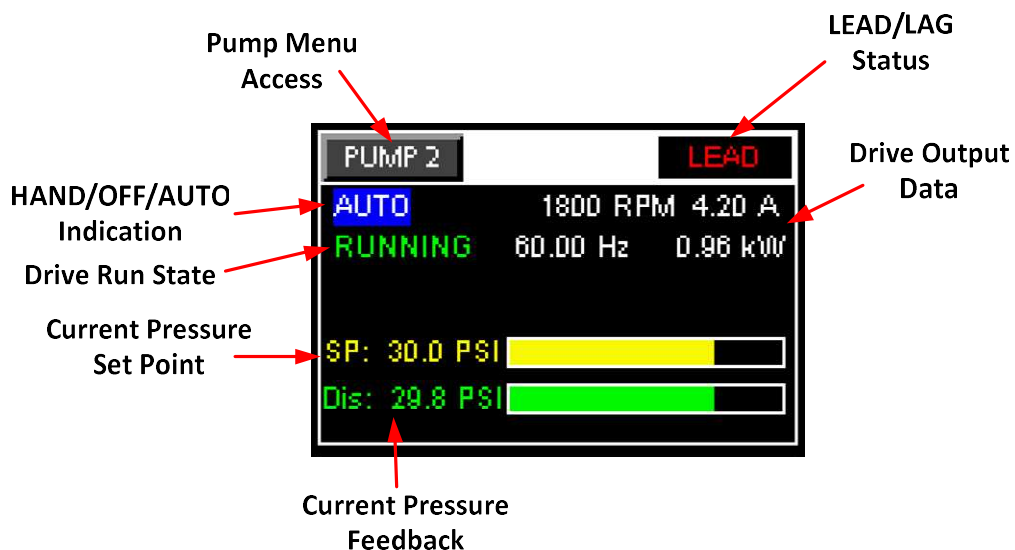
## 3.2 Main System Screen

Upon entering the Main System Screen, the user can view the status of all pumps on system, access pump specific settings, access general system settings, as well as control the system pressure set point. Each pump on the system will occupy a specific quadrant of the screen, where Pump 1 is in the upper left, Pump 2 is in the upper right, and Pump 3 is in the lower left. The lower right quadrant is reserved for general system control and status. If the system uses less than 3 pumps, the absent pump status quadrant will not appear, so only the pumps connected on system will be present. If the system is configured for more than 1 pump (see Section 3.3 “System Settings Screen”) and a pump is no longer on the Ethernet network, the quadrant where that specific pump control and status should appear will display that the pump is offline.



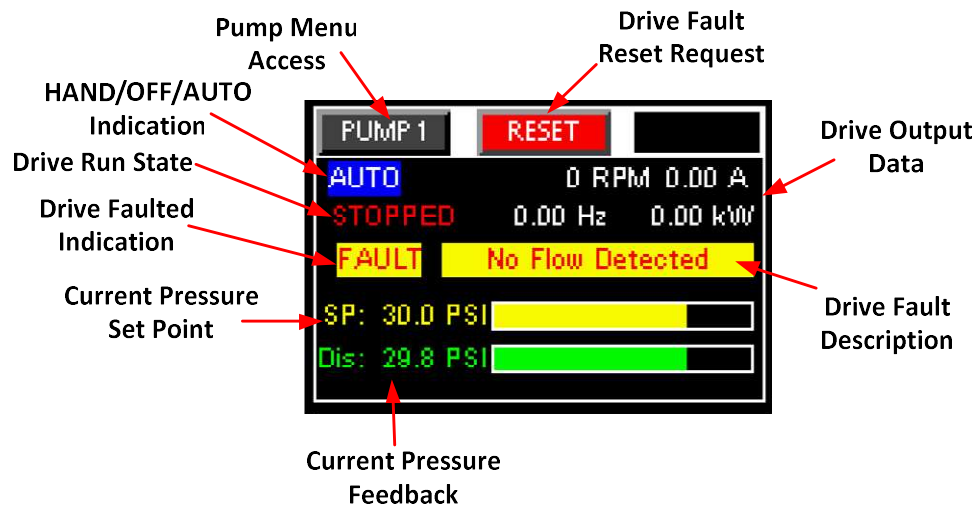
Each pump quadrant displays several elements of information, as well as gives access to the specific settings for that pump and drive. In the case that a drive is healthy and on the network, the following information will be available:

1. **HAND/OFF/AUTO Indication:** Displays the hardware or HMI selection of HAND/OFF/AUTO that is currently active for this pump.
2. **Drive Run State:** Displays the current run state of the drive as “STOPPED” or “RUNNING”. This state is tied to *Drive Active* (Pr 10.002).
3. **Current Pressure Set Point:** Displays the *Main Pressure Set Point* (Pr 0.032/30.030) for the pump.
4. **Current Pressure Feedback:** Displays the *System Pressure Feedback* (Pr 0.059/30.009) for the system.
5. **Lead/Lag Status:** Displays whether the drive is acting as the lead drive, a lag drive, or is running in simplex mode.
6. **Drive Output Data:** Displays the *Motor RPM* (Pr 5.004), the drive *Current Magnitude* (Pr 4.001), the *Output Frequency* (5.001) and the drive *Output Power* (5.003).
7. **Pump Menu Access:** Allows access to pump configuration parameters for specific pump as outlined in Section 4 of this manual.



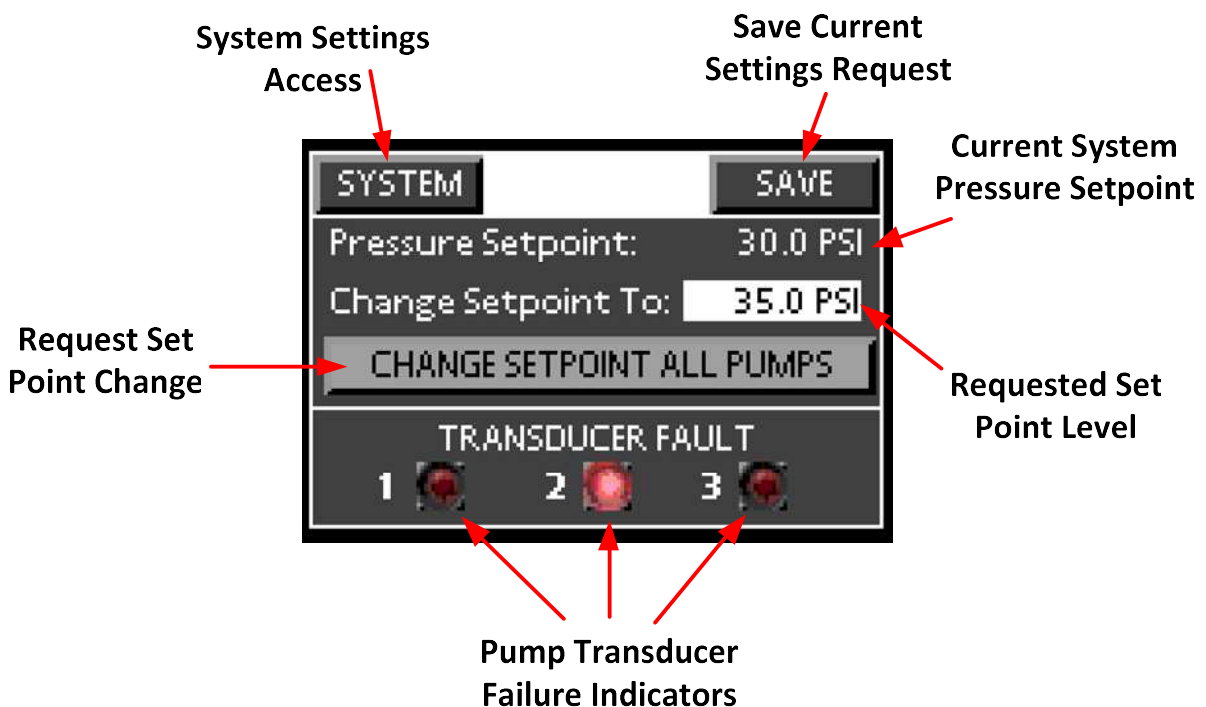
In the case that a specific pump becomes faulted, it will display all of the above statuses in addition to other trip related information:

1. **Drive Fault Reset Request:** When a drive fault or trip occurs, a red “RESET” button will appear in the upper section of the quadrant. Pressing this button will reset the active trip and place the drive back into a ready condition if the trip does not persist. The trip may clear itself as determined by the Auto-Reset function configured in Section 4.3 of this manual.
2. **Drive Faulted Indication:** When a drive fault or trip occurs, the word “FAULT” will appear in red with a yellow background on the left side of the pump quadrant.
3. **Drive Fault Description:** When a drive fault or trip occurs, a short description of the fault will appear in the middle of the quadrant while the fault is active.



In the lower right hand quadrant of the Main System Screen is a general control and status pane. This pane includes the following information:

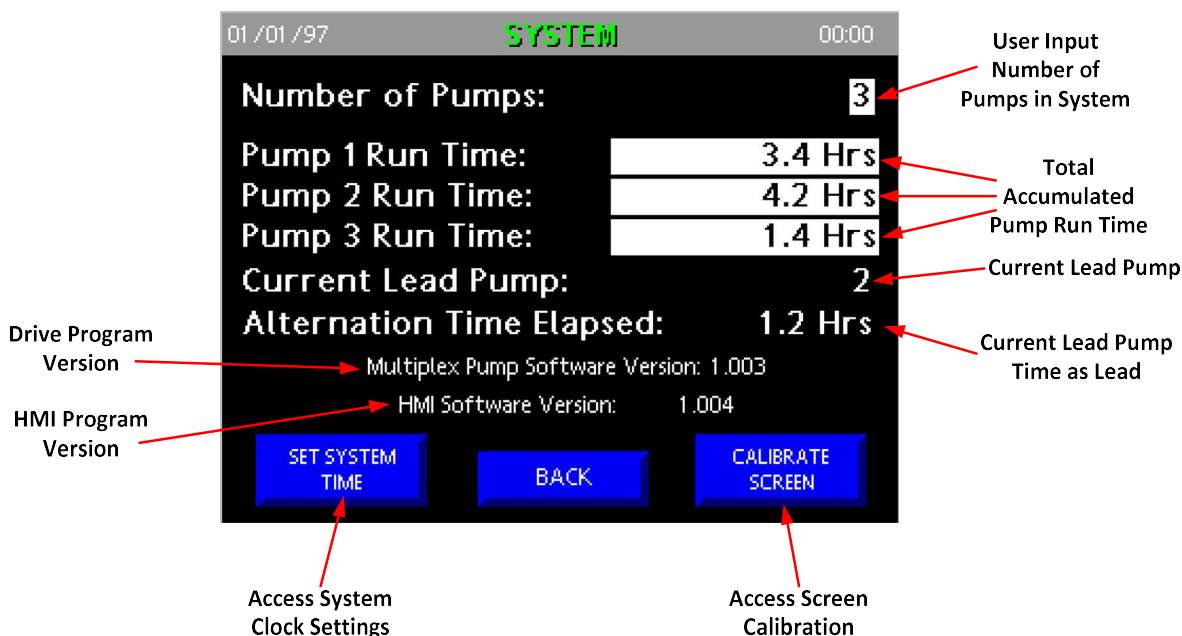
1. **System Settings Access:** Accesses the system settings screen as outline in Section 3.3.
2. **Save Current Settings Request:** Saves current system configuration settings (for all pumps) to drive memory. This should be selected any time that a favorable pump or drive configuration change has been made before power cycling the system.
3. **Current System Pressure Setpoint:** Displays the current pressure set point of the lead drive on the system.
4. **Requested Set Point Level:** User input field to change the pressure set point of all pumps on the system. This will be transferred to the Main Pressure Set Point (Pr 0.032/30.030) for all pumps in the system when “CHANGE SETPOINT ALL PUMPS” is pressed.
5. **Request Set Point Change:** When this button is pressed, it transfers the “Requested Set Point Level” into the Main Pressure Set Point (Pr 0.032/30.030) for all pumps on the system.
6. **Pump Transducer Failure Indicators:** If a pressure transducer becomes disconnected or fails, the corresponding transducer fault LED will illuminate here. These statuses are directly tied to *Analogue 1 Current Loop Loss* (Pr 7.028/0.026 on each drive). Remember, an M400 Multiplex system only requires a single transducer to be connected to function.



### 3.3 System Settings Screen

The System Settings screen contains a variety of information related to general system control and status, and can be accessed through the “SYSTEM” button on the Main System Screen. Most of the information here is related to pump run time and alternation time, and includes the following:

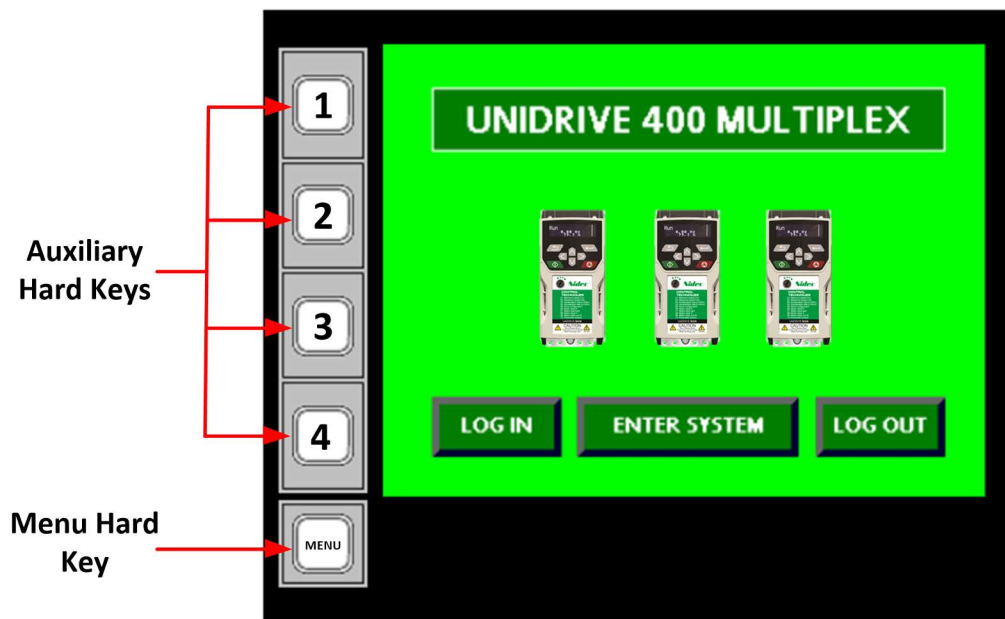
1. **Number of Pumps:** This field is designated for the user to indicate the number of pumps on the system. In addition to the Ethernet network automatically detecting the number of drives present on the network, selecting the correct number of pumps here will allow the HMI to display only information necessary for the number of pumps selected. If the number of pumps configured here is more than the number of pumps detected on the network, the quadrant on the Main System Screen displaying the missing pump will show “PUMP # OFFLINE”.
2. **Pump Run Time:** These fields indicate the total amount of historical run time for each respective pump. These are read only from the HMI, so if a pump is ever replaced these values can be reset by writing a value of 0 to *Total Pump Run Time* (Pr 30.001/0.011) for the respective pump from the drive keypad.
3. **Current Lead Pump:** Identifies the current lead pump on the system.
4. **Alternation Time Elapsed:** Displays how long the current lead pump has been the lead pump on the system during this alternation sequence.
5. **Multiplex Pump Software Version:** Displays version and revision of the M400 Multiplex Pump software.
6. **HMI Software Version:** Displays version and revision of the M400 Multiplex Pump HMI software.
7. **Set System Time:** Used to access HMI time settings.
8. **Calibrate Screen:** Used to access HMI screen calibration.



### 3.4 HMI Hard Key Functions

The M400 Multiplex HMI software automatically configures the hard keys on the bezel of the HMI for quick access to commonly used screens on the HMI. The links for the four auxiliary hard keys and the hard menu key are described below:

1. **Auxiliary Hard Key #1:** Directly accesses Pump #1 Pump Menu Screen.
2. **Auxiliary Hard Key #2:** Directly accesses Pump #2 Pump Menu Screen.
3. **Auxiliary Hard Key #3:** Directly accesses Pump #3 Pump Menu Screen.
4. **Auxiliary Hard Key #4:** Directly accesses Main System Screen.
5. **Menu Hard Key:** Directly accesses Splash Screen for user credential control.

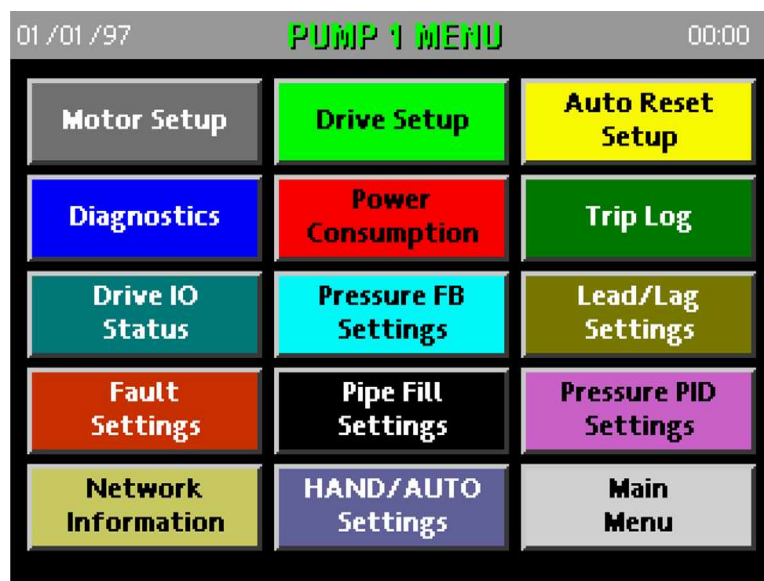


## 4 PUMP MENU SCREENS

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For each pump displayed on the Main System Screen, a corresponding Pump Menu Screen can be accessed by selecting the “PUMP (#)” button on the main screen in the appropriate pump quadrant pane, or from the auxiliary hard keys described in Section 3.4. From the Pump Menu Screen, all necessary drive and multiplex system parameters can be accessed and configured by functional grouping. In the Pump Menu Screen, there are 14 separate categories of settings that can be accessed by pressing the related button. It will be helpful to use the *M400 Multiplex User Guide* and the *Unidrive M400 User Guide* alongside this section for specific parameter explanations. For purposes here, Pump 1 Menu Screen will be illustrated, but this functionality is replicated for Pump 2 and Pump 3 as well.

Note that unless the user is logged in as the system administrator as outline in Section 3.1 of this user guide, from this screen the user will only be able to access Diagnostics, Power Consumption, Trip Log, Drive IO Status, Network Information, and HAND/AUTO Settings.

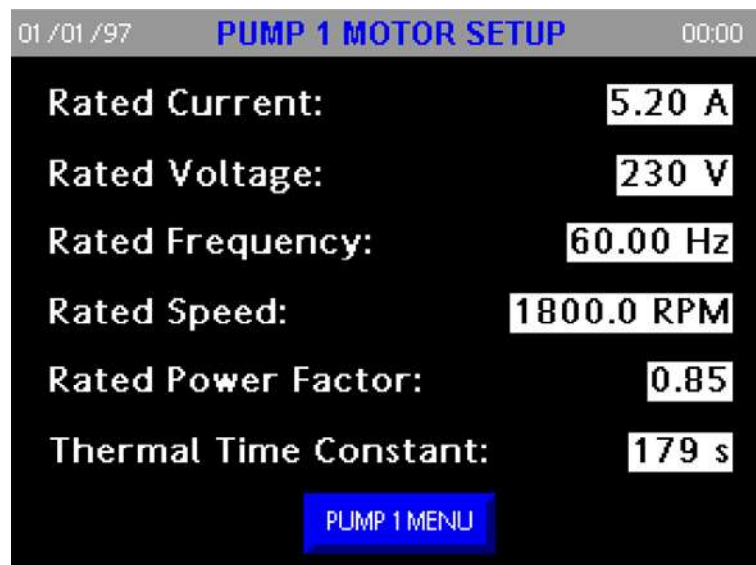




## 4.1 Motor Setup

The Motor Setup Screen is designed to allow the user to set the necessary information related to the motor that is attached to the pump. See the *M400 Multiplex User Guide* for information on auto tuning after these settings are completed. The following settings are available on this screen:

1. **Rated Current:** *Motor Rated Current* (Pr 5.007/0.006).
2. **Rated Voltage:** *Motor Rated Voltage* (Pr 5.009/0.008).
3. **Rated Frequency:** *Motor Rated Frequency* (Pr 5.006/0.005).
4. **Rated Speed:** *Motor Rated RPM* (Pr 5.008/0.007).
5. **Rated Power Factor:** *Motor Power Factor* (Pr 5.010/0.009).
6. **Thermal Time Constant:** *Motor Thermal Time Constant 1* (Pr 4.015).



The screenshot displays the 'PUMP 1 MOTOR SETUP' screen. At the top, there is a status bar with '01 / 01 / 97' on the left, 'PUMP 1 MOTOR SETUP' in the center, and '00:00' on the right. The main area lists six motor parameters, each with a label and a value in a white box. At the bottom, there is a blue button labeled 'PUMP 1 MENU'.

Parameter	Value
Rated Current:	5.20 A
Rated Voltage:	230 V
Rated Frequency:	60.00 Hz
Rated Speed:	1800.0 RPM
Rated Power Factor:	0.85
Thermal Time Constant:	179 s

PUMP 1 MENU

## 4.2 Drive Setup

The Drive Setup Screen allows the user to set minimum and maximum frequencies, as well as ramp rates. The following settings are available from this screen and the following advanced screen:

1. **Min Frequency:** *Minimum Reference Clamp* (Pr 1.007/0.001).
2. **Max Frequency:** *Maximum Reference Clamp* (Pr 1.006/0.002).
3. **Acceleration Rate:** *Acceleration Rate 1* (Pr 2.011/0.003).
4. **Deceleration Rate:** *Deceleration Rate 1* (Pr 2.021/0.004).

01 / 01 / 97 PUMP 1 DRIVE SETUP 00:00

Min Frequency: 30.00 Hz

Max Frequency: 60.00 Hz

Acceleration Rate: 5.0 s/100Hz

Deceleration Rate: 10.0 s/100Hz

ADVANCED PUMP 1 MENU

5. **Volts Mode:** *Control Mode* (Pr 5.014/0.031).
6. **Voltage Boost:** *Low Frequency Voltage Boost* (Pr 5.015).
7. **Current Limit:** *Symmetrical Current Limit* (Pr 4.007/0.030).
8. **Slip Compensation:** *Slip Compensation Level* (Pr 5.027)
9. **Dynamic V to F:** *Dynamic V to F Select / Flux Optimization Select* (Pr 5.013/0.020).

01 / 01 / 97 PUMP 1 ADVANCED DRIVE SETUP 00:00

Volts Mode: Stator Check on Run

Voltage Boost: 10.0 %

Current Limit: 150.0 %

Slip Compensation: 0.0 %

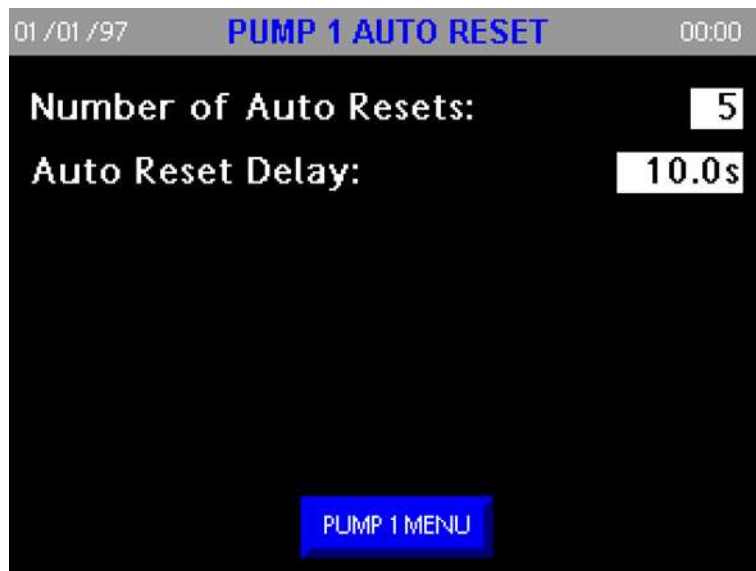
Dynamic V To F: ENABLED

BACK PUMP 1 MENU

### 4.3 Auto Reset Setup

The Auto Reset Setup Screen allows the user to configure how the drive will auto-respond to a trip. This is useful for common trips as it will keep operators from having to come to the drive in the event of a nuisance trip. The following settings are available on this screen:

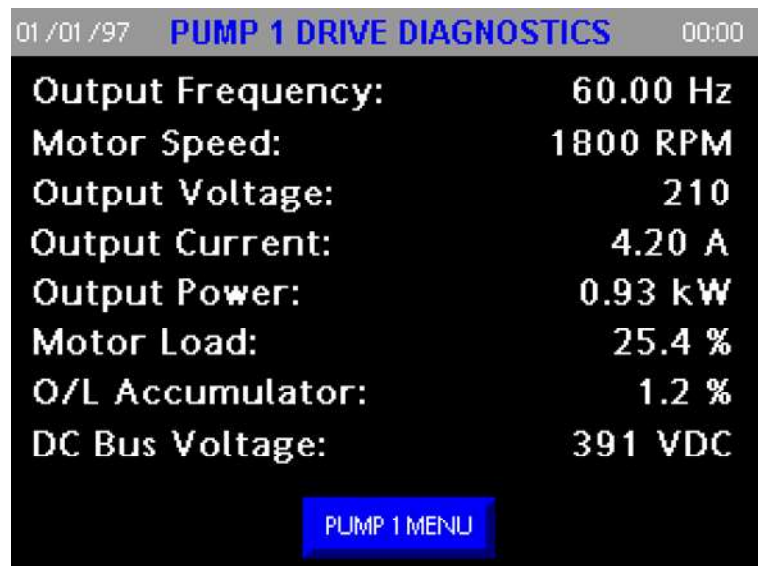
1. **Number of Auto Resets:** *Number of Auto-Reset Attempts* (Pr 10.034/0.033).
2. **Auto Reset Delay:** *Auto-Reset Delay* (Pr 10.035/0.034).



## 4.4 Diagnostics

The Drive Diagnostics Screen offers read access to a number of active drive and motor properties that are helpful when diagnosing a system. Some of these are available on the Main System Screen, but have been copied to here as well. The following statuses are available on this screen:

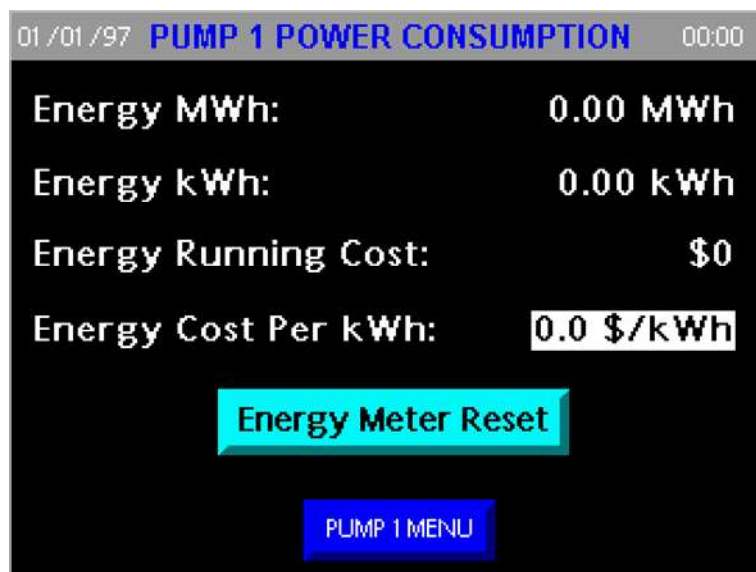
1. **Output Frequency:** *Output Frequency* (Pr 5.001/0.057).
2. **Motor Speed:** *Motor RPM* (Pr 5.004).
3. **Output Voltage:** *Output Voltage* (Pr 5.002).
4. **Output Current:** *Current Magnitude* (Pr 4.001/0.058).
5. **Output Power:** *Output Power* (Pr 5.003).
6. **Motor Load:** *Percentage Load* (Pr 4.020).
7. **O/L Accumulator:** *Motor Protection Accumulator* (Pr 4.019).
8. **DC Bus Voltage:** *D.C. Link Voltage* (Pr 5.005).



## 4.5 Power Consumption

The Power Consumption screen gives the user the ability to track the cost of the power consumed over time for each individual pump. The user should input to local cost of electricity per kWh and change it as the local utility company makes pricing changes. This uses the functions for power tracking in Menu 6 on the drive to calculate the running cost. The following settings and statuses are available on this screen:

1. **Energy MWh:** *Energy Meter: MWh* (Pr 6.025).
2. **Energy kWh:** *Energy Meter: kWh* (Pr 6.026).
3. **Energy Running Cost:** *Running Cost* (Pr 6.028).
4. **Energy Cost Per kWh:** *Energy Cost Per kWh* (Pr 6.027).
5. **Energy Meter Reset:** *Reset Energy Meter* (Pr 6.024).



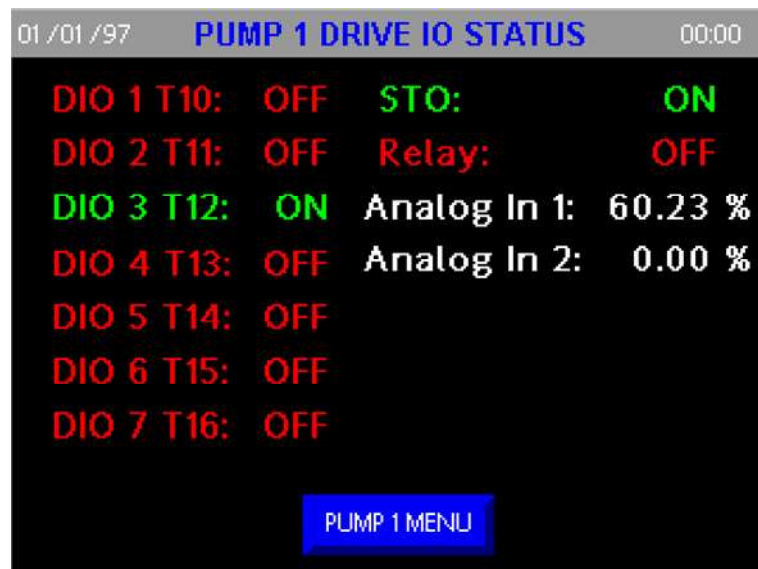
## 4.6 Trip Log

The Trip Log Screen displays the 10 most recent pump/drive faults with time stamps taken from the HMI running clock. These should be used for historical diagnostics on the system, and cannot be cleared.

01 / 01 / 97	PUMP 1 FAULT LOG	00:00
Fault 1:	No Faults	12:00 AM 01 -01 -97
Fault 2:	No Faults	12:00 AM 01 -01 -97
Fault 3:	No Faults	12:00 AM 01 -01 -97
Fault 4:	No Faults	12:00 AM 01 -01 -97
Fault 5:	No Faults	12:00 AM 01 -01 -97
Fault 6:	No Faults	12:00 AM 01 -01 -97
Fault 7:	No Faults	12:00 AM 01 -01 -97
Fault 8:	No Faults	12:00 AM 01 -01 -97
Fault 9:	No Faults	12:00 AM 01 -01 -97
Fault 10:	No Faults	12:00 AM 01 -01 -97
PUMP 1 MENU		

## 4.7 Drive IO Status

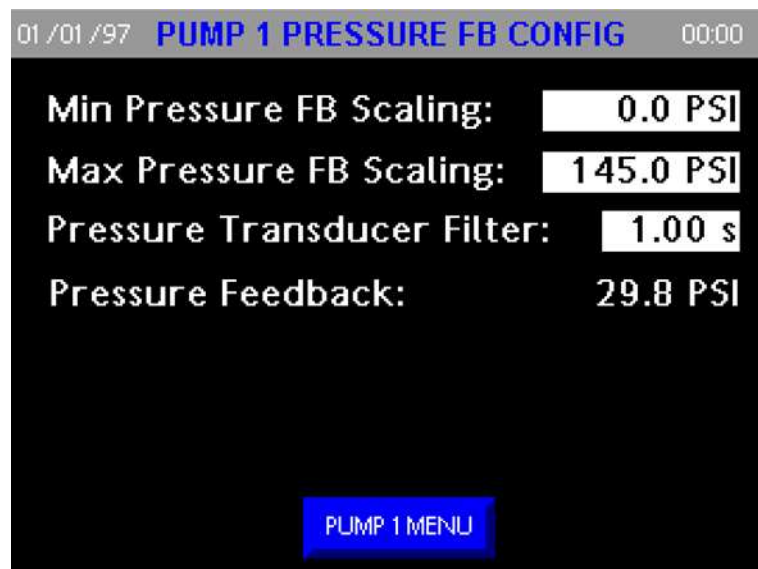
The Drive IO Status Screen offers the user direct status access to the drive IO terminals. This includes all digital inputs and outputs defined by IO names and terminal number (e.g. DIO 3 T12 is Digital Input/Output 3, Terminal 12). Additionally, this shows the status of the STO input, the relay output, and the 2 channels of analogue inputs by % of input level. This is helpful when troubleshooting hardware HAND/OFF/AUTO switches, the flow switch, or the pressure transducer.



## 4.8 Pressure Feedback Settings

The Pressure Feedback Settings Screen allows the user to actively scale and filter the level of the 4-20mA pressure transducer connected to analogue input 1. The following settings and statuses are available on this screen:

1. **Min Pressure FB Scaling:** *Minimum Pressure Feedback Scaling* (Pr 30.022/0.013).
2. **Max Pressure FB Scaling:** *Maximum Pressure Feedback Scaling* (Pr 30.023/0.014).
3. **Pressure Transducer Filter:** *Pressure Transducer Filter* (Pr 12.015/0.017).
4. **Pressure Feedback:** *System Pressure Feedback* (Pr 30.009/0.059).



The screenshot shows a screen titled "PUMP 1 PRESSURE FB CONFIG" with a date/time display "01 / 01 / 97" and "00:00". The screen displays four settings, each with a label and a value in a white box:

- Min Pressure FB Scaling: 0.0 PSI
- Max Pressure FB Scaling: 145.0 PSI
- Pressure Transducer Filter: 1.00 s
- Pressure Feedback: 29.8 PSI

At the bottom center, there is a blue button labeled "PUMP 1 MENU".



## 4.9 Lead/Lag Settings

The Lead Lag Settings Screen allows the user to manipulate the multiplexing sequencing properties of the system when the selected drive is the lead drive. Typically, these settings will need to be entered as the same value in all drives on the system, please see the *M400 Multiplex User Guide* for more information on the following settings available on this screen:

1. **Wake Setpoint:** *Low Pressure (Wake) Setpoint* (Pr 30.013/0.018).
2. **Start Delay Time:** *Start Delay Time* (Pr 30.059/0.019).
3. **Sleep Frequency:** *Minimum Sleep Frequency* (Pr 30.051/0.021).
4. **Sleep Delay Time:** *Sleep Start Time* (Pr 30.052/0.022).
5. **Add Lag Frequency:** *Add Lag Frequency* (Pr 30.002/0.042).
6. **Add Lag Time:** *Add Lag Timer Time* (Pr 30.004/0.043).
7. **Remove Lag Time:** *Remove Lag Timer Time* (Pr 30.005/0.044).
8. **Alternation Time:** *Alternation Time* (Pr 30.006/0.045).

The screenshot shows a control interface for 'PUMP 1 LEAD/LAG CONFIG'. At the top, it displays the date '01 / 01 / 97', the title 'PUMP 1 LEAD/LAG CONFIG', and a timer '00:00'. Below the title, there are eight settings, each with a label and a value in a white box:

- Wake Setpoint: 25.0 PSI
- Start Delay Time: 3.0 s
- Sleep Frequency: 45.00 Hz
- Sleep Delay Time: 3.0 s
- Add Lag Frequency: 59.00 Hz
- Add Lag Time: 3 s
- Remove Lag Time: 3 s
- Alternation Time: 24.0 Hrs

At the bottom center, there is a blue button labeled 'PUMP 1 MENU'.

## 4.10 Fault Settings

The Fault Settings Screen offers the user the ability to configure how the system will respond to various pump related faults such as Transducer Loss, Over Pressure, Network Loss, No Flow, and Dry Well under normal operation. The 2 screens allocated below for fault responses contain the following settings:

1. **Sys Transducer Loss:** *Transducer Loss Action* (Pr 30.017/0.015).
2. **Transducer Loss Speed:** *Transducer Loss Speed Setting* (Pr 1.027/0.016).
3. **Over Pressure Level:** *Over Pressure Trip Level* (Pr 30.021/0.027).
4. **Network Loss Response:** *Network Loss Response* (Pr 30.065/0.056).

01/01/97 PUMP 1 FAULT RESPONSE 00:00

Sys Transducer Loss: Set User Trip 81

Transducer Loss Speed: 50.00 Hz

Over Pressure Level: 45.0 PSI

Network Loss Reponse: Set User Trip 83

NEXT

PUMP 1 MENU

5. **Dry Well Load Level:** *Speed/Load Low Load Point* (Pr 30.063/0.046).
6. **Dry Well Response:** *Dry Well Mode Selection* (Pr 30.018/0.047).
7. **Dry Well Detect Delay:** *Dry Well Detection Delay* (Pr 30.062/0.048).
8. **Dry Well Freq Decrement:** *Low Suction Frequency Decrement* (Pr 30.064/0.049).
9. **No Flow Detect Delay:** *No Flow Delay* (Pr 30.053/0.053).

01/01/97 PUMP 1 FAULT RESPONSE 00:00

Dry Well Load Level: 40.0 %

Dry Well Response: Set User Trip 84

Dry Well Detect Delay: 7.0 s

Dry Well Freq Decrement: 10.0 Hz

No Flow Detect Delay: 5.0 s

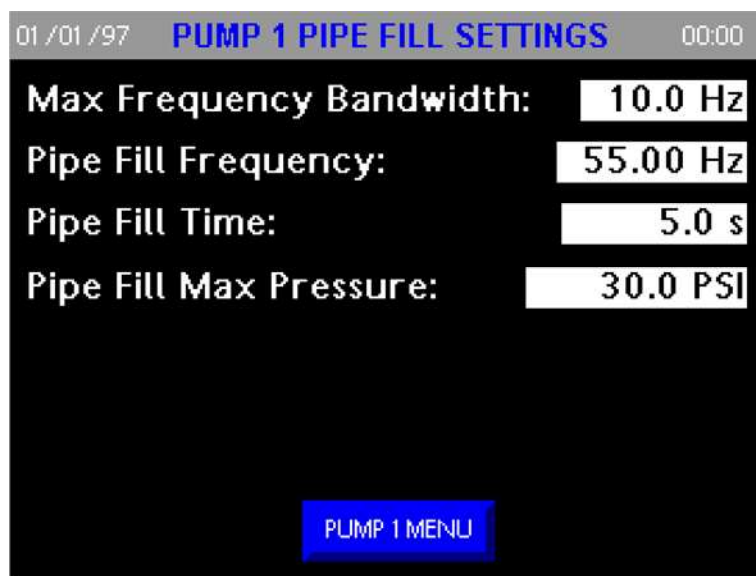
BACK

PUMP 1 MENU

## 4.11 Pipe Fill Settings

The Pipe Fill Settings Screen allows the user to configure the pipe fill operation that is performed after an instance that all pumps are turned off. This screen includes the following user settings:

1. **Max Frequency Bandwidth:** *Max Frequency Band Width* (Pr 30.057/0.028).
2. **Pipe Fill Frequency:** *Pipe Fill Speed Setting* (Pr 1.026/0.035).
3. **Pipe Fill Time:** *Pipe Fill Time* (Pr 30.061/0.036).
4. **Pip Fill Max Pressure:** *Pipe Fill Max Pressure* (Pr 30.029/0.037).



## 4.12 Pressure PID Settings

The Pressure PID Settings page allows the user to adjust the PID response when correcting for pressure errors in the system via the drive PID controller in Menu 14. This screen provides the following user settings:

1. **Pump (#) Pressure Setpoint:** *Pressure Main Setpoint* (Pr 30.030/0.032). Note that this value is the pressure setpoint that the system will try to achieve when this pump is the lead pump on the system. This value is changed in all pumps when it is changed from the Main System Screen. If the value is changed here, it is only changed for this pump.
2. **PID Proportional Gain:** *Kp Proportional Gain* (Pr 14.010/0.038).
3. **PID Integral Gain:** *Ki Integral Time* (Pr 14.011/0.039).
4. **PID Derivative Gain:** *Kd Differential Rate* (Pr 14.012/0.040).

01 / 01 / 97      **PUMP 1 SETPOINT & PID**      00:00

Pump 1 Pressure Setpoint:	30.0 PSI
PID Proportional Gain:	2.000
PID Integral Gain:	1.000
PID Derivative Gain:	0.000

PUMP 1 MENU

## 4.13 Network Information

The Network Information Screen allows the user to look at the information that the local pump is putting out on the drive to drive Ethernet network. Many of these values are bit packed or are scaled for the network, so please reference the *M400 Multiplex User Guide* for more information relating to these values for each respective drive.

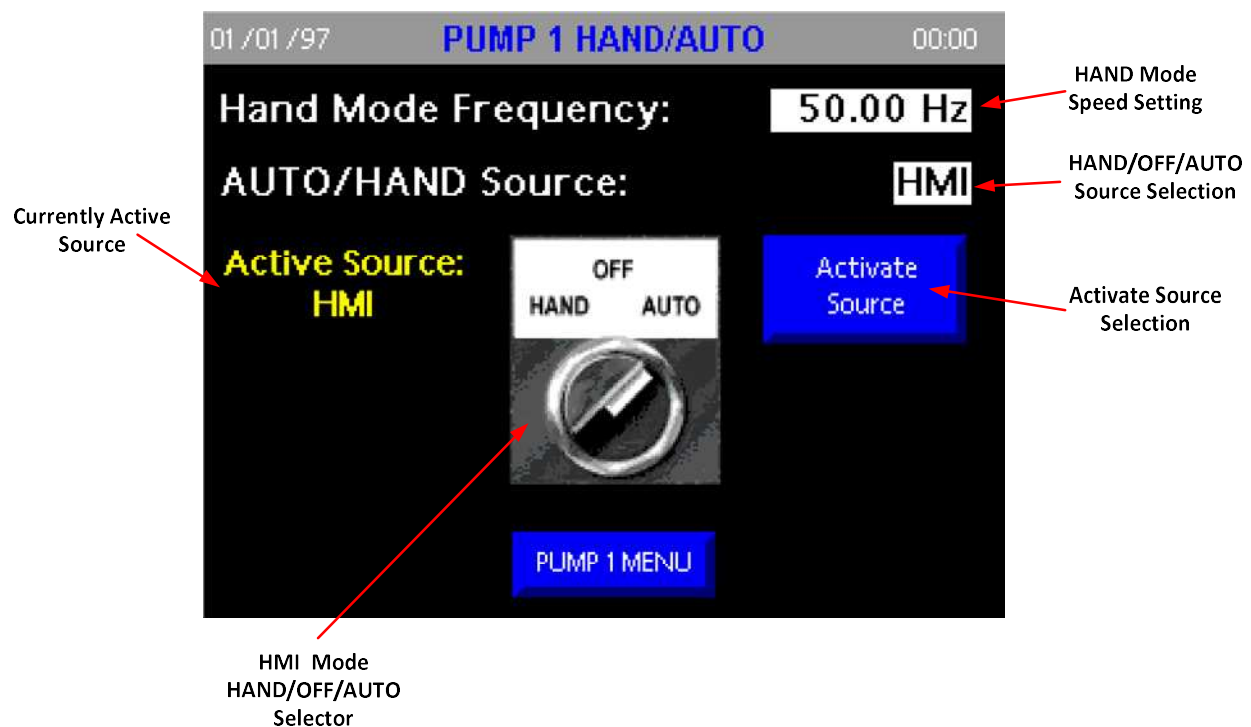
01 / 01 / 97	<b>PUMP 1 NETWORK DATA</b>	00:00
Node ID:	1	
Application Status Word:	81	
PID Output Speed:	345	
Run Control Word:	2	
Lead Pump ID:	2	
Raw Pressure FB:	3124	
<div>PUMP 1 MENU</div>		

## 4.14 HAND/AUTO Settings

The HAND/AUTO settings page provides the user the ability to operate the HAND/OFF/AUTO selector from either the front of the electrical panel at the hard-wired switch, or from the HMI, which provides complete remote control of the system. By default, the system runs HAND/OFF/AUTO operations from the hardware points on the drive, so for HMI operation the change in control must be made here.

In order to make a change for the source of HAND/OFF/AUTO control, perform the following steps:

1. From **AUTO/HAND Source**, select the desired source of the HAND/OFF/AUTO control. This is either “HMI” or “HARDWARE”.
2. After this selection, press the **Activate Source** button to activate the new source, and the system will immediately read from the selected source.
3. The **Active Source** will show the currently selected source for HAND/OFF/AUTO. If the selected source is “HMI”, a 3 position selector switch will appear on the screen to control HAND/OFF/AUTO (as shown below). If the active source is “HARDWARE”, this selector switch will be hidden.
4. If the system is in HAND mode from either source, **Hand Mode Frequency** will adjust the frequency of the pump. This writes directly to the value in *HAND Mode Speed* (Pr 1.023/0.023).



## 5 USER NOTES

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