Signal 1 System Health Instructions

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- Control Panel

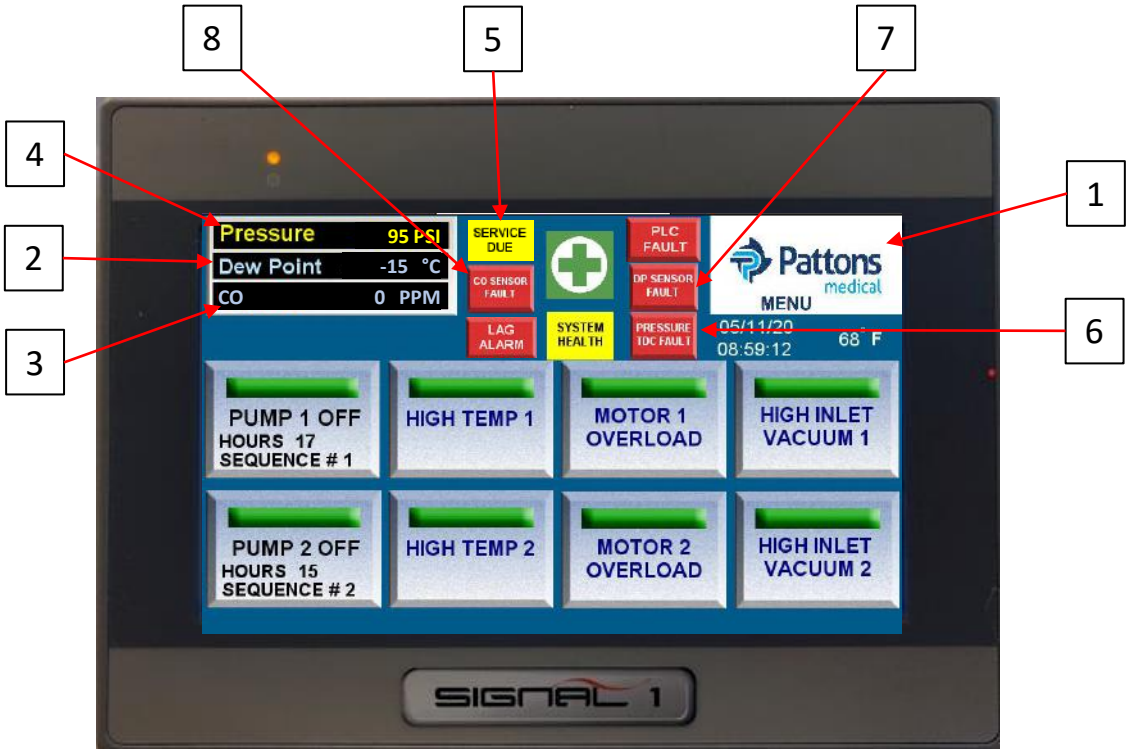
1. Display Screen - Displays the systems operating screens.
2. LED's – Yellow: Power is correctly supplied to the HMI Screen
3. HOA Selector Switch – Motor control switch, Hand – Off – Auto
4. Alarm Horn – Sounds when an alarm condition occurs
5. Alarm Reset/Horn Silence – Pushbutton to silence alarm and reset visual alarm on Signal 1 screen after alarm condition is corrected
6. Dryer Control Selector Switch (Air) – Manual Purge – Off – Demand Purge
   Purge Control Selector Switch (Vacuum) – Hand – Off – Auto Purge
7. External Operator – To control circuit breaker disconnect

- ## Main Display Screen

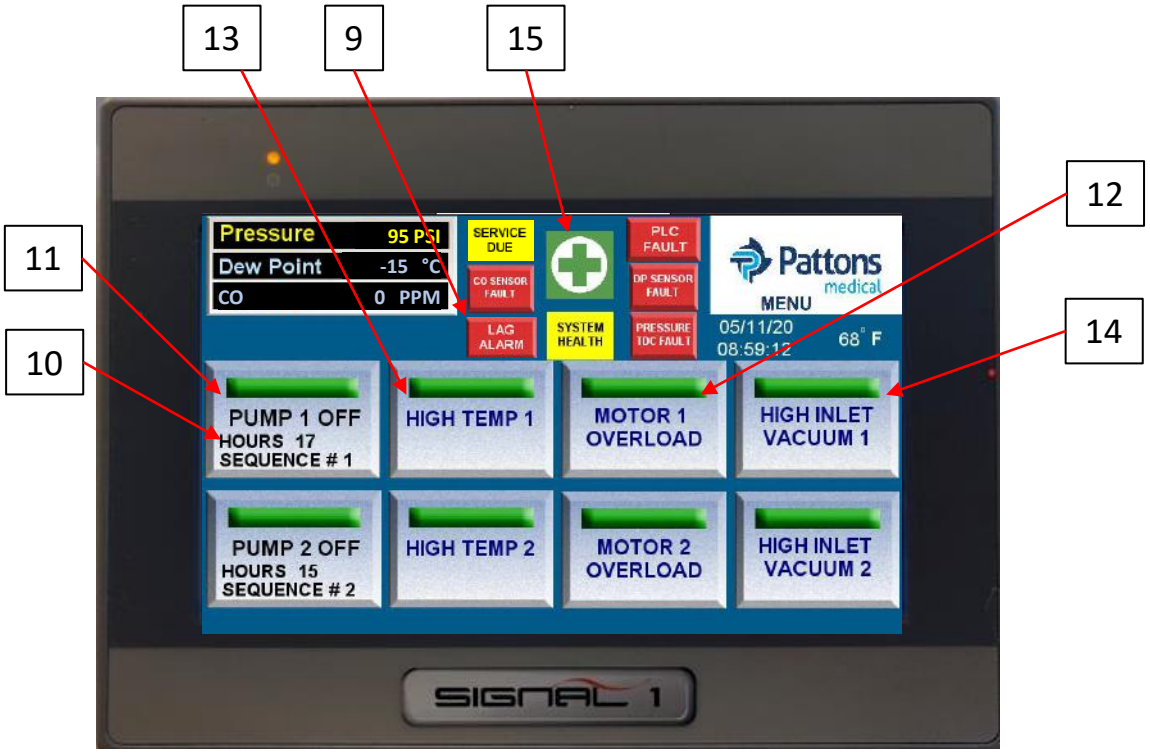
At startup, you may get this screen. Touch the logo to proceed to the main screen.

The main screen for systems will monitor and display the status of the system.
AIR: Receiver pressure, Dewpoint, CO, run sequence, hours, and current status of each module.
VACUUM: Receiver vacuum, run sequence, hours, and current status of each module.
Alarms for pressure/vacuum transducer fault, dewpoint sensor fault, CO sensor fault, PLC fault, System Health warning, LAG Alarm, and service due also blink on this screen when activated.
Module alarms for high temperature, overload, and inlet vacuum (scroll only) will also blink when Activated. Touching the icon of any alarm will take you to an informative screen.
The Menu screen in the upper right corner will allow you to navigate through multiple screens.

1. **MENU**: Displays menu screen which allows the operator to access the System Health status, operating history, service requirements, trends, troubleshooting information, pressure/vacuum settings, and system data information.
2. **DEWPOINT (DP)**: Displays the current dew point reading at the units discharge point. If the dew point reading is higher than 2°C, a high dew point alarm will occur. The dew point indicatory will flash RED and the horn will sound. Pressing the RESET button on the control panel front will silence the alarm. Touching the indicator while flashing red will open a troubleshooting window. The dew point indicator will continue to flash red until the dew point falls below 2°C. At this point, the dew point alarm will reset.
3. **CARBON MONOXIDE (CO)**: Displays the current CO reading at the units discharge point. If the CO reading is higher than 10 ppm, a high CO alarm will occur. The CO indicator will flash RED and the horn will sound. Pressing the RESET button on the control panel front will silence the alarm. Touching the indicator while flashing will open a troubleshooting window. The CO indictator will continue to flash red until the CO falls below 10 ppm. At this point, the CO alarm will reset.
4. **PRESSURE (PSI)**: Displays the current pressure inside the receiver. Can change to BAR.
5. **SERVICE DUE**: Service intervals and types of service are pre-programmed into the Signal 1. The button will flash YELLOW when service is due. Pressing the “Service Due” button when flashing will display the system or module 1 schedule screen. The item requiring service will be flashing RED. If a module requires service, check module service screens.
6. **PRESSURE/VACUUM TDC FAULT**: Indicator will flash RED and horn will sound if the transducer fails. Pressing the flashing red indicator will open the troubleshooting window.
7. **DP SENSOR FAULT**: Indicator will flash RED and horn will sound if the transducer fails. Pressing the flashing red indicator will open the troubleshooting window.
8. **CO SENSOR FAULT**: Indicator will flash RED and horn will sound if the transducer fails. Pressing the flashing red indicator will open the troubleshooting window.



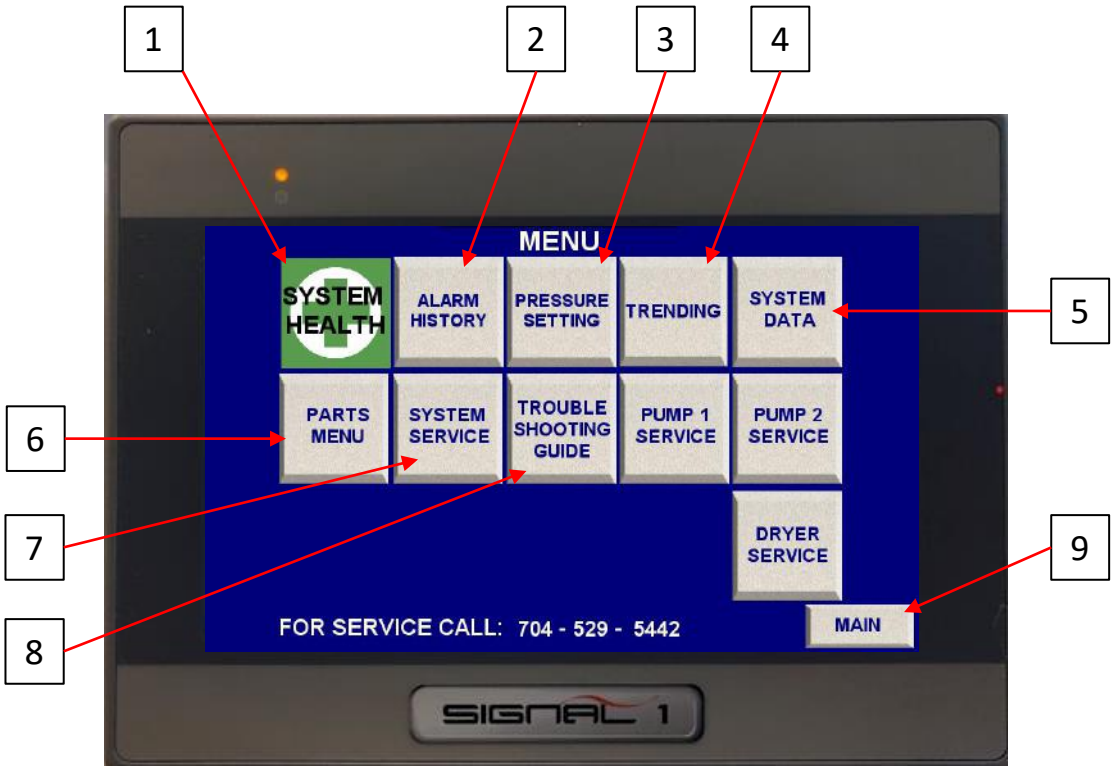
9. **LAG ALARM**: Indicator will flash RED and horn will sound when the last available module comes on. Press the RESET button to silence the alarm. If the condition is corrected, both the alarm and indicator will turn off. If the alarm condition remains, the indicating light on the Signal 1 will remain on. Pressing the flashing red indicator will open the troubleshooting window. Once the lag condition is corrected, press the reset button to turn off the indicator.
10. **UNIT RUN HOURS**: Displays total run hours for each module.
11. **HAND-OFF-AUTO**: Displays status of each module. The green "HAND" displays when running and the HOA selector switch is in the HAND setting. The green "AUTO" displays when is running and the HOA selector is in the AUTO position. The "OFF" indictor is displayed when the HOA selector is in OFF position or module is not powered.
12. **MOTOR OVERLOAD**: Display will flash RED and sound an alarm when the overload switch is tripped in the control panel. The module in question will not re-start until the RESET button on the starter inside the control cabinet is reset. Press the reset button on the front panel to silence the horn. Touching the indicator while flashing will open a troubleshooting window. The indicator on the Signal 1 will remain on until the motor starter is reset.
13. **HIGH TEMP**: Display will flash RED and sound an alarm when the module is shut down due to a high discharge air temperature. Press the reset button on the front panel to silence/clear the alarm. The alarm cannot be cleared until the temperature drops below the preset value. Touching the indicator while flashing will open a troubleshooting window. The indicator on the Signal 1 will remain on until the motor starter is reset.
14. **INLET FAULT** (Scroll only): Display will flash RED if the compressor inlet is restricted. Inlet Fault will also cause a Failed to Start alarm. Pressing the RESET button will silence the horn and clear the alarm. If the problem is not resolve, it will occur again.
15. **SYSTEM HEALTH**: The GREEN PLUS is the icon and will always take you directly to the System Health screen. The yellow button when on will also take you to the same screen. This screen provides and overview of the system and links to all trending screens.



• MENU Screen

The menu screen provides a central gateway to access many additional screens of the Signal1.

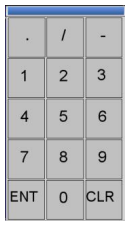
1. **SYSTEM HEALTH**: This button takes you to the SYSTEM HEALTH screen that provides an overview of the system and links to all trending screens.
2. **ALARM HISTORY**: Will open a new window listing all the alarm conditions that have occurred as well as routine maintenance alerts and warnings. The list shows date and time of the incident, type of incident, and when the incident was corrected/cleared. Alarms shown on this screen have a permanent record.
3. **PRESSURE/VACUUM SETTING**: Shows current settings of the pressure or vacuum and a button to return to factory default settings.
4. **TRENDING**: Goes directly to the SYSTEM HEALTH screen.
5. **SYSTEM DATA**: Provides all the system information required when scheduling maintenance or purchasing spare parts from Patton Medical.
6. **PARTS MENU**: Provides a list of basic service parts for the system.
7. **SYSTEM SERVICE**: Takes you to the System Service screen. Other service screens also take you directly to the individual module service screen or dryer service screen.
8. **TROUBLESHOOTING GUIDE**: Takes you to the troubleshooting screen which has links to the individual troubleshooting guide pages.
9. **MAIN**: Can be found on most screens. Takes you back to the main screen.

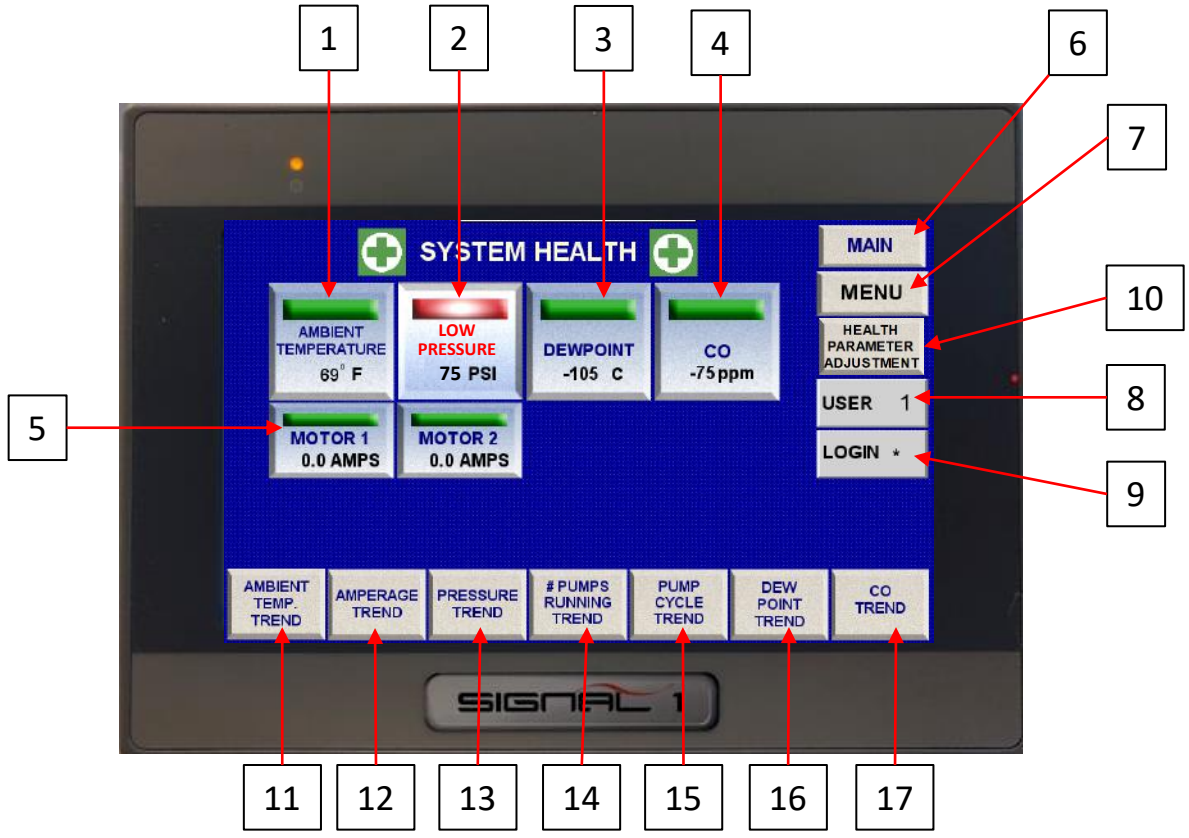


• SYSTEM HEALTH (and Trending) Screen

The System Health screen provides an overall snapshot of the system status and allow warning alarms to be set to provide notification that an alarm is pending.

1. **AMBIENT TEMPERATURE**: Provides temperature of room and notifies when above 105°F.
2. **PRESSURE/VACUUM**: Provides current reading and notifies at a predefined setpoint.
3. **DEWPOINT**: Displays current dewpoint and notifies at a predefined setpoint.
4. **CO**: Displays current CO reading and notifies at a predefined setpoint.
5. **MOTOR**: Displays output current when running. Does not show when run by VFD.
6. **MAIN**: Returns user to main screen.
7. **MENU**: Returns user to menu screen.
8. **USER**: Allows user to change System Health setpoints (1 then ENT).
9. **LOGIN**: All login so user can change System Health setpoints (307 then ENT).
10. **HEALTH PARAMETER ADJUSTMENT**: Hidden button to adjust System Health setpoints.
11. **AMBIENT TEMP TREND**: Goes to screen with ambient temperature charted.
12. **AMPERAGE TREND**: Goes to screen with amps charted for modules 1 & 2 with links to additional modules if available.
13. **PRESSURE/VACUUM TREND**: Goes to screen with pressure/vacuum charted.
14. **# PUMPS RUNNING TREND**: Goes to screen that displays the number of modules running at a defined interval.
15. **PUMP CYCLE TREND**: Trend screen of each module showing on and off cycles. Modules 1-5 shown on first page with link to another page to see 6-8 if applicable.
16. **DEW POINT TREND**: Link to trend screen of dew point showing the charted readings.
17. **CO TREND**: Link to trend screen of CO showing the charted readings.

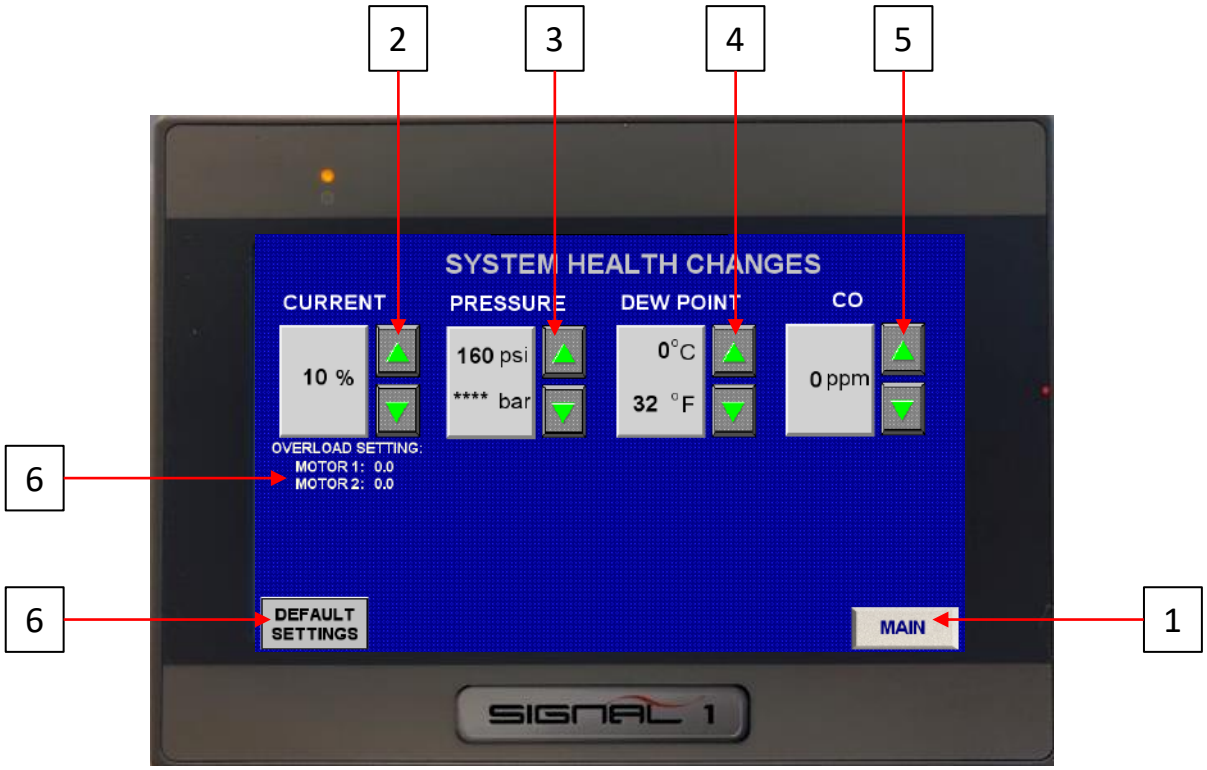




HEALTH PARAMETER ADJUSTMENT Screen

The System Health parameter adjustment screen allow the operator to make adjustments for the warning to alarm. Since these are only warnings, they are not controlled by NFPA 99.

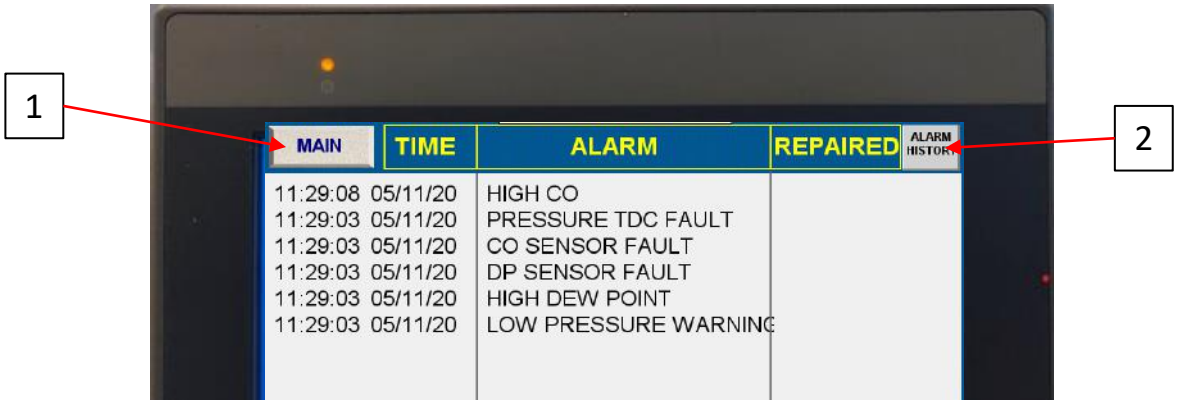
1. **MAIN**: Returns user to main screen.
2. **CURRENT**: Provides adjustment to the percentage above FLA allowed before a warning.
3. **PRESSURE/VACUUM**: Provides adjustment to the pressure/vacuum before a warning is sent.
4. **DEWPOINT** (air only): Provides adjustment to when a dewpoint warning will alarm.
5. **CO** (air only): Provides adjustment to when a CO warning will alarm.
6. **DEFAULT SETTINGS**: Returns above settings to the Pattons Medical default value.
7. **OVERLOAD SETTING**: Shows the actual setting of the overload for each motor.



- ## ALARM HISTORY Screen

The Alarm History screen provides an overview off the last alarms that have been logged. It provides the time and date the alarm triggered, the type of alarm, and the time the alarm was repaired or cleared.

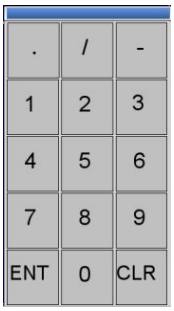
1. **MAIN**: Takes you back to the main screen.
2. **HISTORY**: Takes you to the Alarm History page.
3. **ARROWS**: Allows you to scroll thru days of alarms.
4. **DOWNLOAD TO USB**: Allows you to download all alarms to a USB memory device.

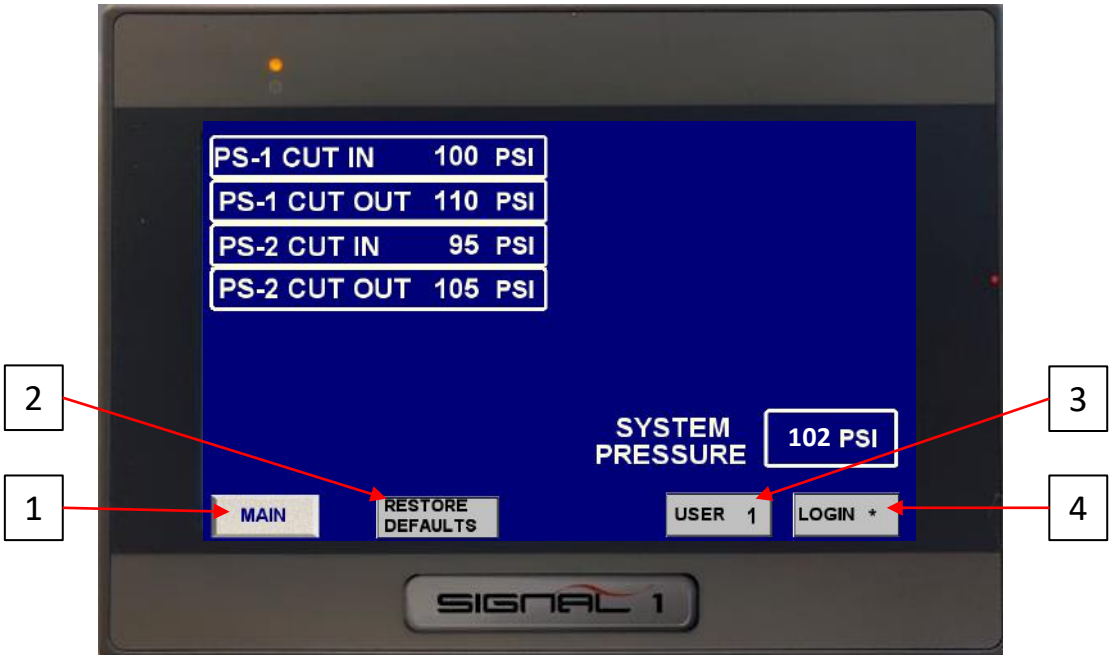


• PRESSURE/VACUUM SETTING Screen

The Pressure or Vacuum Setting screen allows you to customize the settings for the system. It also allows you to return these values back to the default values.

1. **MAIN**: Takes you back to the main screen.
2. **RESTORE DEFAULTS**: Returns pressure/vacuum settings to factory default. The USER and LOGIN must be entered to activate the button.
3. **USER**: Enter to be able to restore defaults (2 then ENT)
4. **LOGIN**: Enter to be able to restore defaults (327 then ENT)

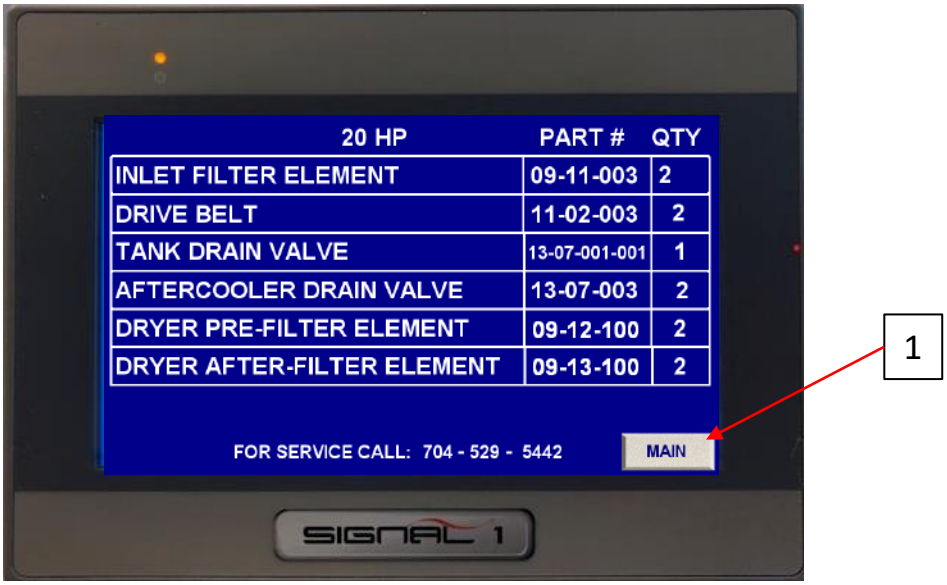




• PARTS Screen

The Parts menu provides a list of common service item part numbers to the equipment.

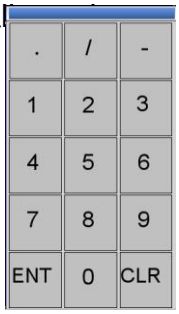
1. **MAIN**: Takes you back to the main screen.

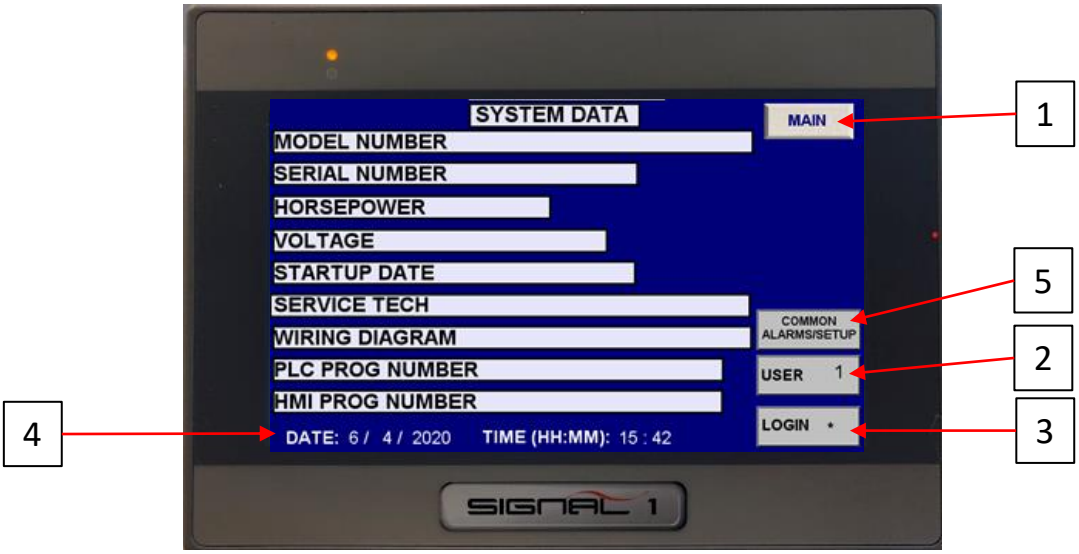


• SYSTEM DATA Screen

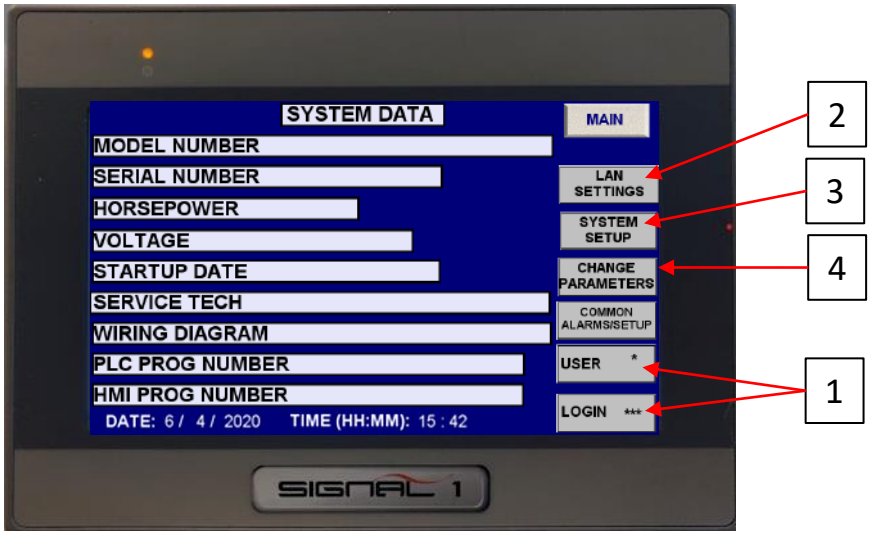
The System Data screen provides key information about the system that is helpful to the service person and/or when calling for support.

1. **MAIN**: Takes you back to the main screen.
2. **USER**: Enter to be able to restore defaults (2 then ENT)
3. **LOGIN**: Enter to be able to make changes/access more menus (327 then ENT)
4. **DATE and TIME**: After login, touch the #'s and a pop-up screen will appear to change
5. **COMMON ALARMS/SETUP**: This button takes you to a screen that allows selection of what conditions/alarms will activate the common alarm signal. This screen also al user to select units and turn OFF horns for System Health warnings.





5. **HIDDEN SERVICE BUTTONS**: These buttons are for service and setup of the controller.
    1. **ACCESS**: USER: 4; LOGIN: 396
    2. **LAN SETTINGS**: To change the IP addresses for PLC interface and MODBUS data.
    3. **SYSTEM SETUP**: For initial setup of HMI.
    4. **CHANGE PARAMETERS**: To adjust the service intervals; change DP units; change date and time



• COMMON ALARM Screen

The common alarm screen allows the operator to select which alarms will trigger the common alarm output signal. When lighted, the alarm is activated to trigger the common alarm output.
*NOTE: Alarms are dependent on type of system. Not all alarms may be present on all systems.

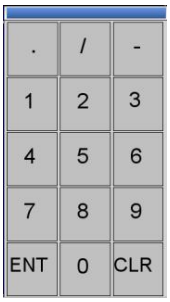
1. **MAIN**: Takes you back to the main screen.
2. **LAG ALARM**: Alarms when the pump in reserve turns on. There is a separate alarm as well.
3. **HIGH TEMP**: Alarms when the high temperature switches close (discharge-air; exhaust-vac)
4. **MOTOR OVERLOAD**: Alarms when the overload relay trips. Must manually reset.
5. **PUMP FAILED TO RUN**: Alarms when the module does not start. Find reason and repair.
6. **HIGH INLET FAULT** (scroll only): Alarms when a vacuum is sensed at the inlet. The isolation valve is closed or something is blocking the intake. Equipment protection fault.
7. **HIGH DEW POINT**: Alarms when high dewpoint sensed. There is a separate alarm as well.
8. **DP SENSOR RECAL**: Service alarm for when recalibration is due on the dewpoint sensor.
9. **DRYER FILTERS DUE**: Service alarm when particulate filters reach defined time limit.
10. **DRYER DESICCANT DUE**: Service alarm when desiccant reaches defined time limit.
11. **SYSTEM HEALTH**: Sends alarm signal when any system health reaches defined setting.
12. **INLET FILTER DUE**: Service alarm when inlet filters reach defined time limit.
13. **CHECK BELT TENSION**: Service alarm when belt reaches defined time limit.
14. **500 HR TIP SEAL WARNING**: Service alarm to notify the scroll pump is nearing rebuilt time.
15. **TIP SEAL REPLACE DUE**: Service alarm to notify the scroll pump needs to be rebuilt based on a defined time limit.
16. **HIGH CO**: Alarms when high CO is sensed. There is a separate alarm as well.
17. **CO SENSOR RECAL**: Service alarm for when recalibration is due on the CO sensor.
18. **SYSTEM UNITS**: Allows the user to change the units for temperature and pressure readings.
19. **SYSTEM HEALTH HORN SETUP**: Allows the user to turn off horn alarms for system health faults.

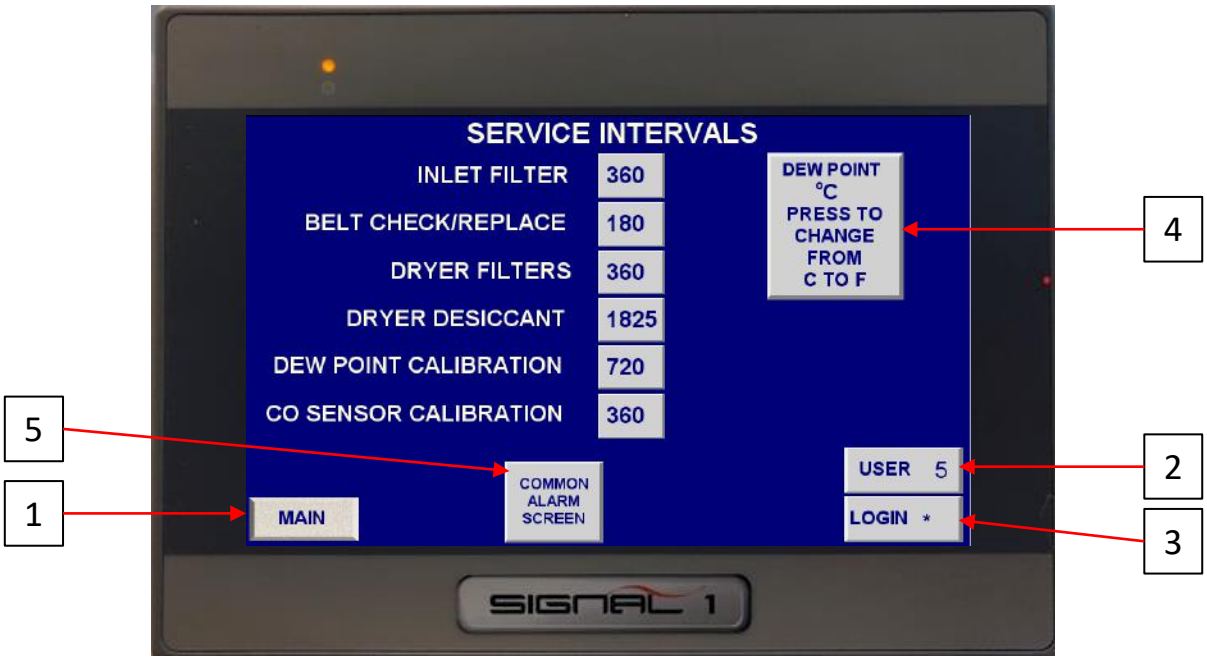
For standard vacuum systems, the RUN TIME selection is also available to select on this screen.

• SERVICE INTERVALS (Change Parameters) Screen

The Service Intervals screen allows the operator to adjust the standard service times of serviceable items. The current setting is shown in the boxes beside the description.

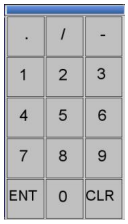
1. **MAIN**: Takes you back to the main screen.
2. **USER**: Allows user to login and adjust settings on the screen (4 then ENT)
3. **LOGIN**: Allows user to login and adjust settings on the screen (396 then ENT)
4. **DEW POINT CHANGE C to F** (air only): Allows user to change dewpoint display between °C and °F.
5. **COMMON ALARM SCREEN**: Take user to common alarm screen.
6. **INLET FILTER**: Standard replacement is 1/year.
7. **BELT CHECK/REPLACE** (air only): Standard check is every 6 months.
8. **DRYER FILTERS** (air only): Standard replacement is every 5 years.
9. **DRYER DESICCANT** (air only): Standard replacement is 1/year.
10. **DEWPOINT CALIBRATION** (air only): Standard calibration is every 2 years.
11. **CO SENSOR CALIBRATION** (air only): Standard calibration is 1/year.
12. **OIL AND FILTER** (vacuum only): Standard replacement is shown (varies based on type of vacuum).



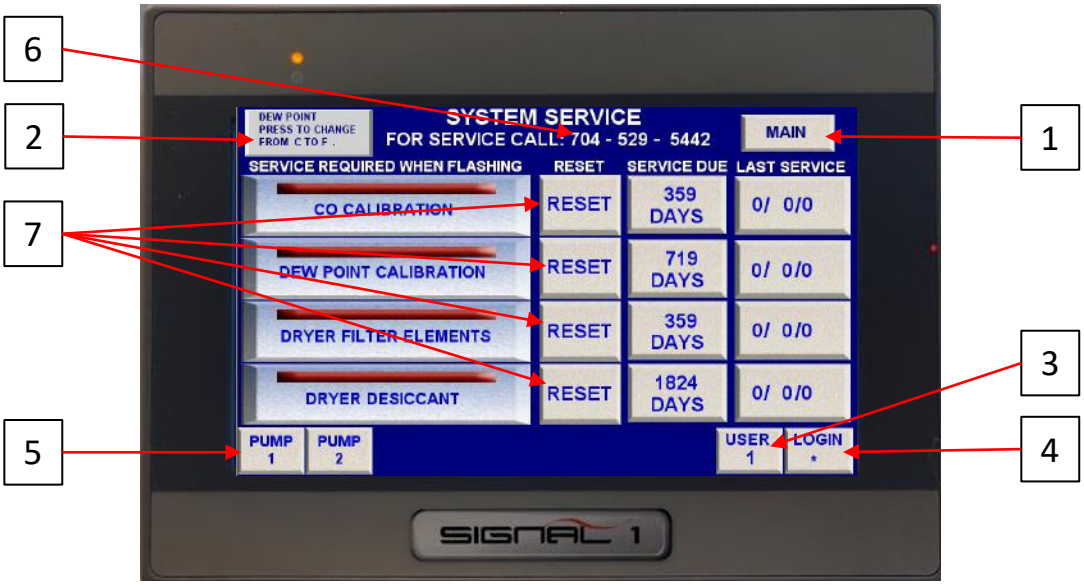


• SERVICE Screen

The Service screen provides information on when the service function was last performed and how many days or hours until service is due again. When service is due, the tag on the left will flash as notification and the Service Due button will be illuminated on the main page.



1. **MAIN**: Takes you back to the main screen.
2. **DEWPOINT C to F**: Allows user to change units for the dewpoint reading.
3. **USER**: Allows user to reset service time (4 then ENT)
4. **LOGIN**: Allows user to reset service time (396 then ENT)
5. **PUMP *X***: Opens the service screen for a particular module.
6. **Phone # Change**: When logged in, the phone # can be touched and changed per section.
7. **RESET**: Records the date of reset and resets the hours/days until next service.



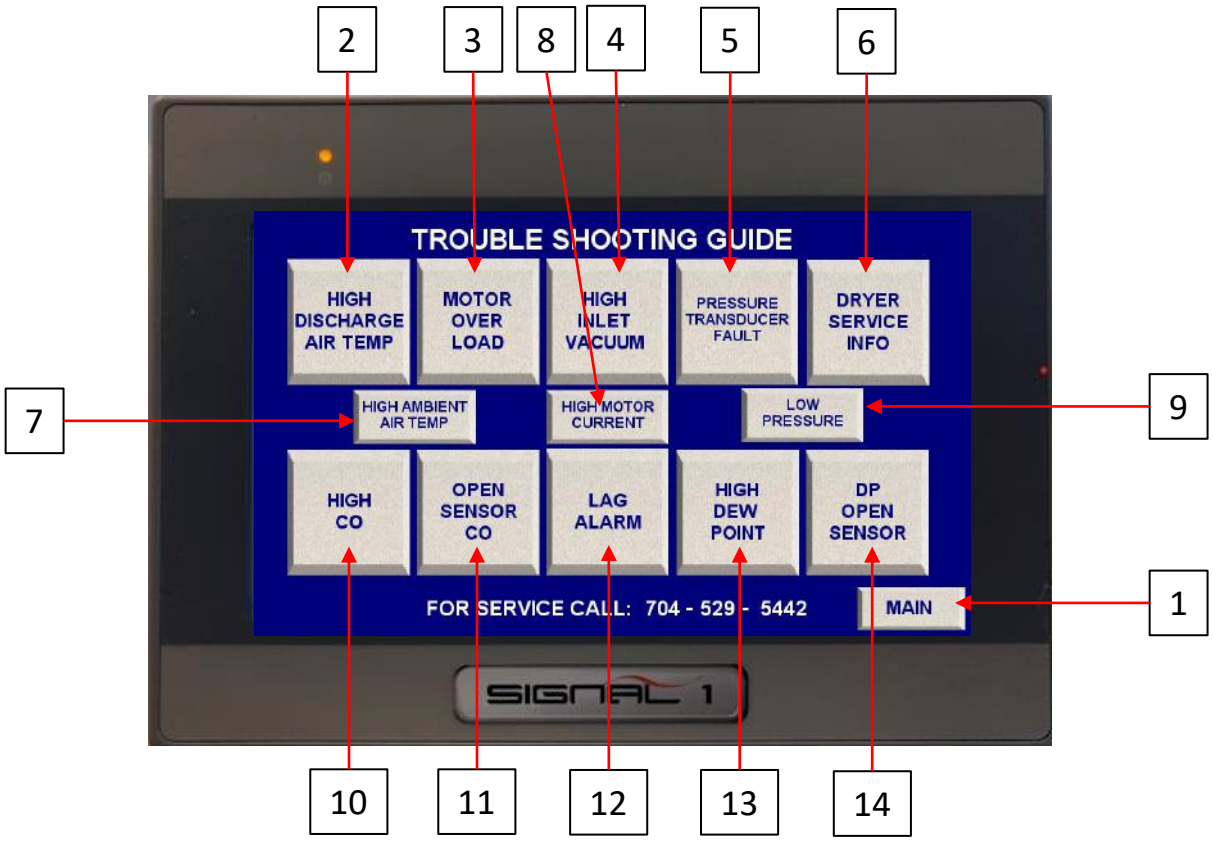
• RESET SCREEN (same layout for all service resets)

The reset screen allow the operator to reset the service performed. When selecting YES, the date will be recorded and displayed and the service due timer will be reset to the set value. Selecting NO will exit the screen and nothing is recorded.

• TROUBLESHOOTING Screen

The Pressure or Vacuum Setting screen allows you to customize the settings for the system. It also allows you to return these values back to the default values.

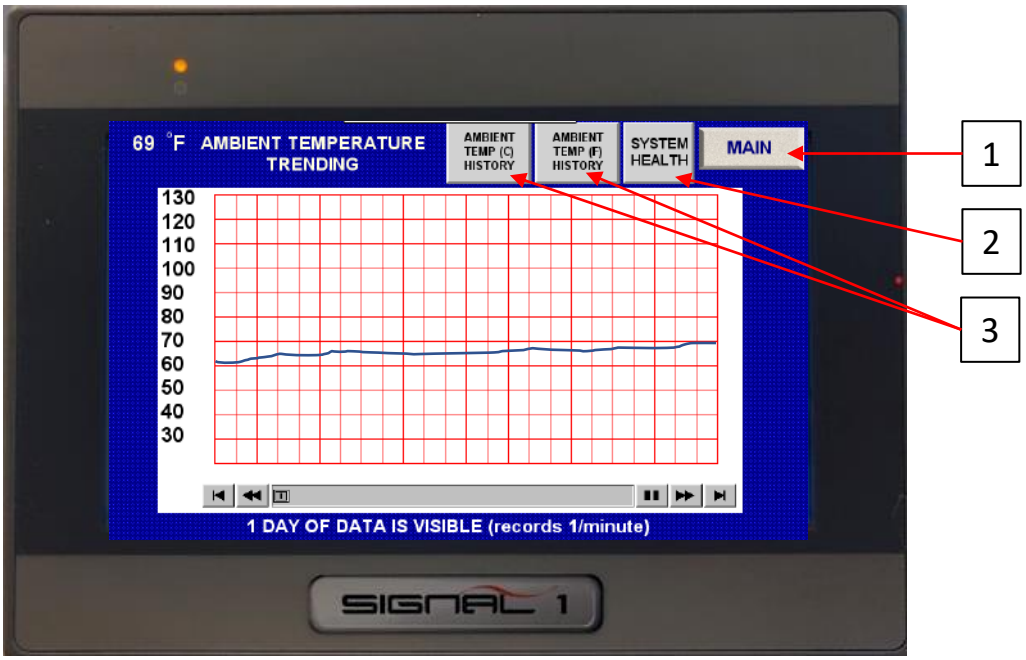
1. **MAIN**: Takes you back to the main screen.
2. **HIGH DISCHARGE AIR TEMP**: Opens a pop-up window with possible reasons for alarm.
3. **MOTOR OVERLOAD**: Opens a pop-up window with possible reasons for alarm.
4. **HIGH INLET VACUUM** *(scroll only)*: Opens a pop-up window with possible reasons for alarm.
5. **PRESSURE TRANSDUCER FAULT**: Opens a pop-up window with possible reasons for fault.
6. **DRYER SERVICE INFO** *(air only)*: Opens a pop-up window with possible reasons for alarm.
7. **HIGH AMBIENT AIR TEMP**: Opens a pop-up window with possible reasons for alarm.
8. **HIGH MOTOR CURRENT**: Opens a pop-up window with possible reasons for alarm.
9. **LOW PRESSURE**: Opens a pop-up window with possible reasons for alarm.
10. **HIGH CO**: Opens a pop-up window with possible reasons for alarm.
11. **CO OPEN SENSOR**: Opens a pop-up window with possible reasons for fault.
12. **LAG ALARM**: Opens a pop-up window with possible reasons for alarm.
13. **HIGH DEW POINT**: Opens a pop-up window with possible reasons for alarm.
14. **DP OPEN SENSOR**: Opens a pop-up window with possible reasons for fault.

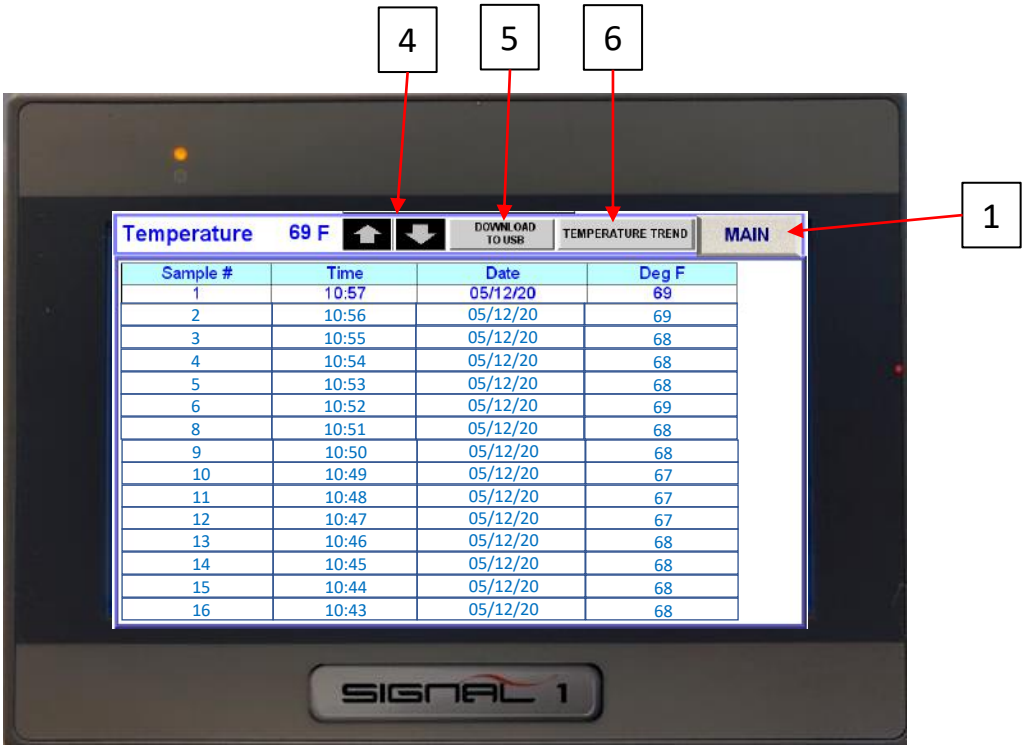


AMBIENT TEMPERATURE TREND Screen

The ambient temp trend screen and data screens allow the operator to see the temperature history to assist in correlating to any problems or issues that have been seen.

1. **MAIN**: Takes you back to the main screen.
2. **SYSTEM HEALTH**: Takes you back to the system health screen.
3. **AMBIENT TEMP (F) or (C) HISTORY**: Opens screen with readings in °F or °C for export.
4. **"ARROWS"**: Allows scrolling thru readings.
5. **DOWNLOAD TO USB**: Allows user to export data readings to USB drive.
6. **TEMPERATURE TREND**: Takes user back to Temperature trending graph page.



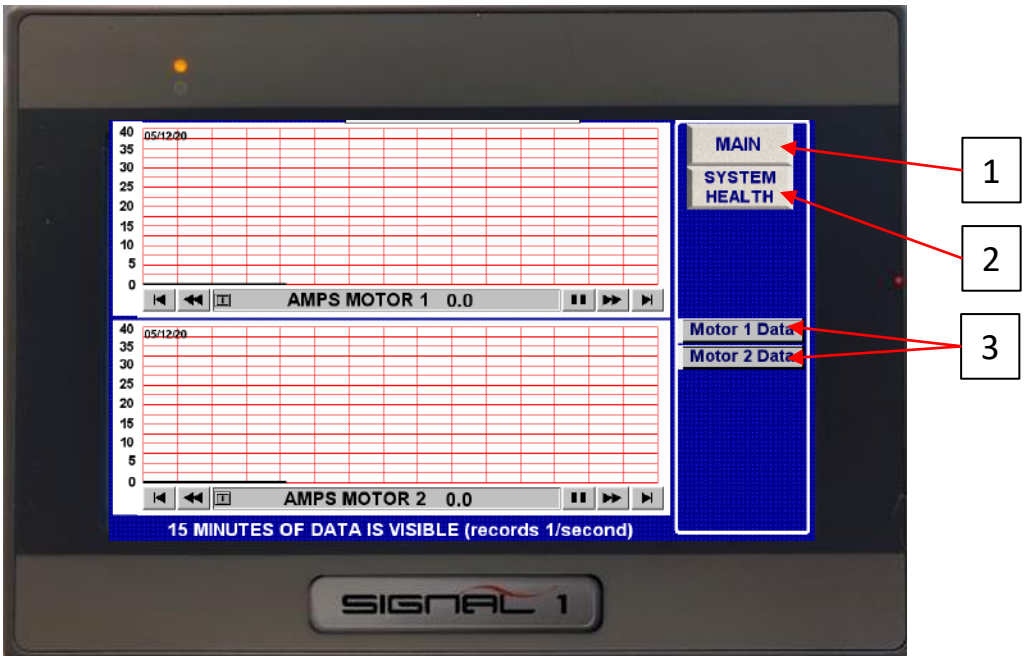


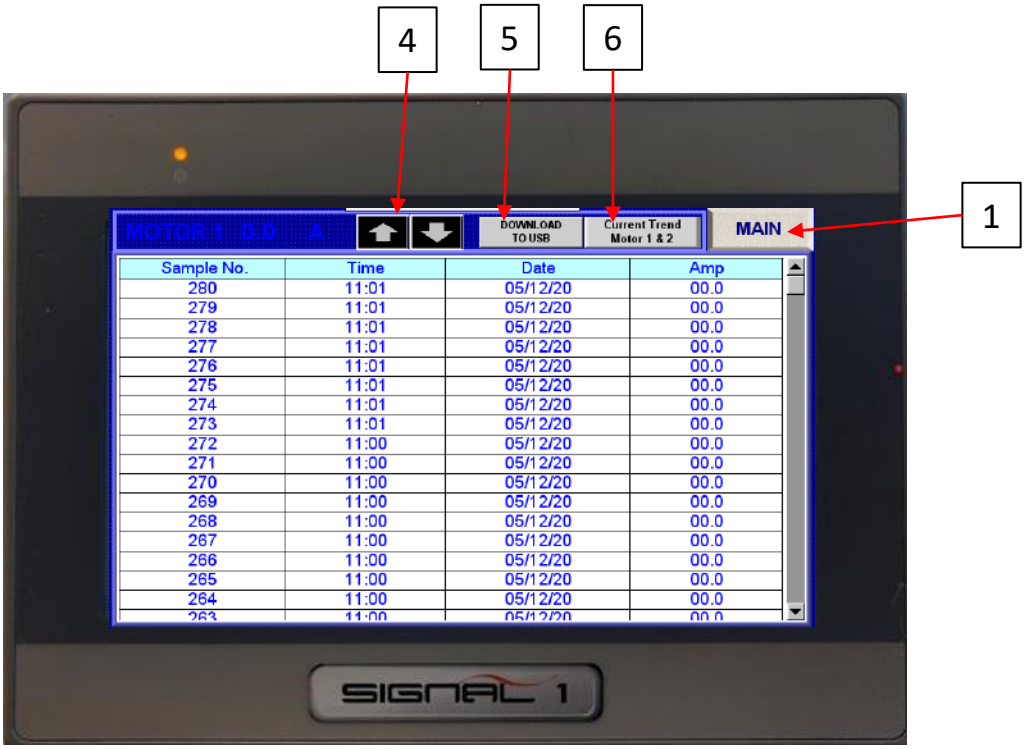
Sample #	Time	Date	Deg F
1	10:57	05/12/20	69
2	10:56	05/12/20	69
3	10:55	05/12/20	68
4	10:54	05/12/20	68
5	10:53	05/12/20	68
6	10:52	05/12/20	69
8	10:51	05/12/20	68
9	10:50	05/12/20	68
10	10:49	05/12/20	67
11	10:48	05/12/20	67
12	10:47	05/12/20	67
13	10:46	05/12/20	68
14	10:45	05/12/20	68
15	10:44	05/12/20	68
16	10:43	05/12/20	68

- # AMPERAGE TREND Screen

The amperage trend screen allows the operator to see the graph and data points of the amps being drawn by each motor to see if there is a trend that may foreshadow a problem.

1. **MAIN**: Takes you back to the main screen.
2. **SYSTEM HEALTH**: Takes you back to the system health screen.
3. **MOTOR X DATA**: Opens screen with amp readings for that motor for export.
4. **"ARROWS"**: Allows scrolling thru readings.
5. **DOWNLOAD TO USB**: Allows user to export data readings to USB drive.
6. **CURRENT TREND**: Takes user back to Amperage trending graph page.

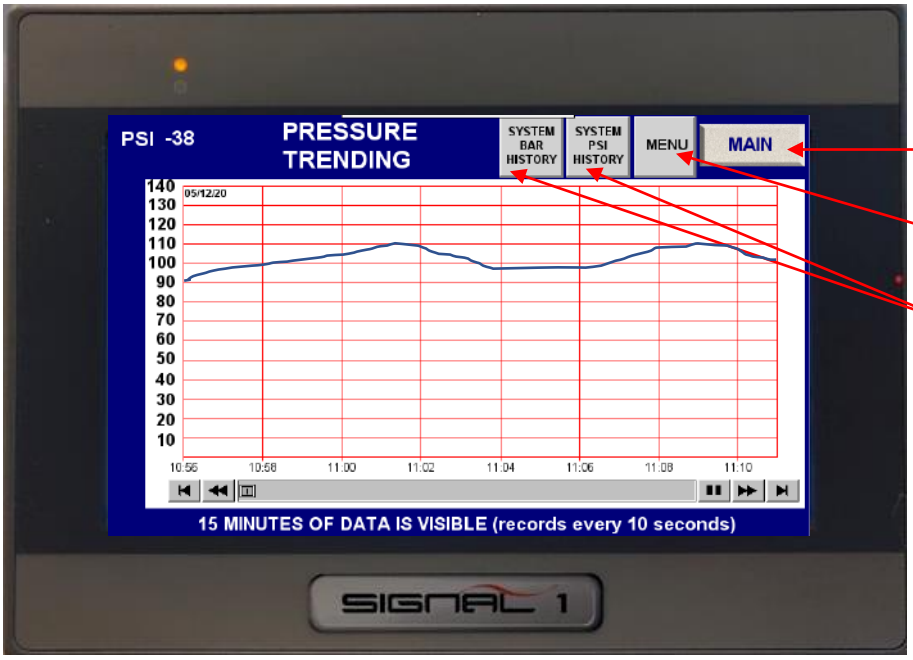


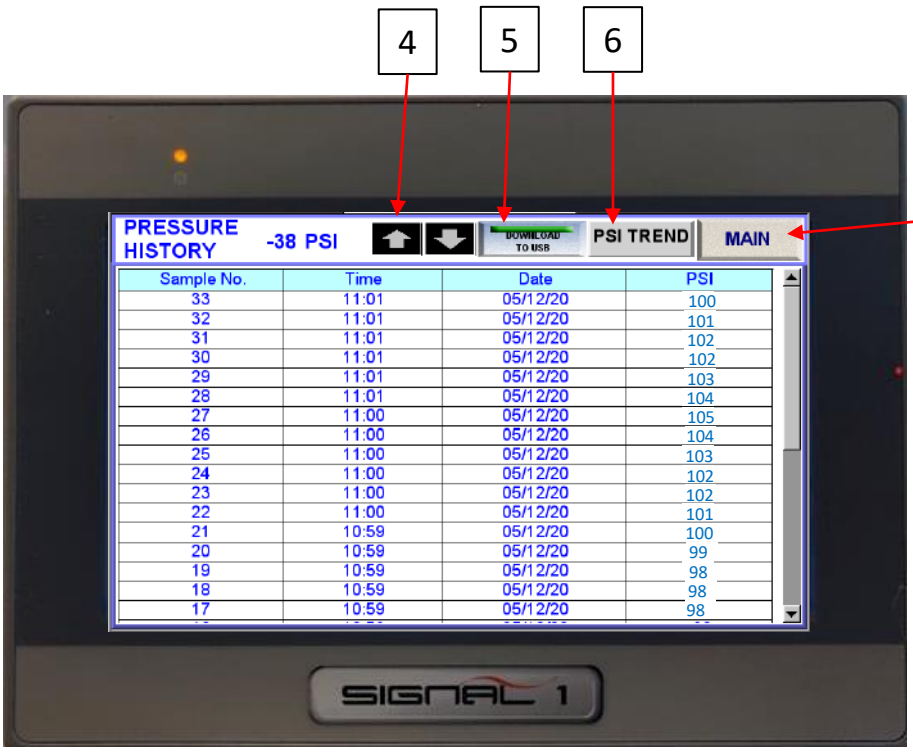


- # PRESSURE TREND Screen

The pressure trend screen allows the operator to view the graph and data points for the pressure history and export the data if needed.

1. **MAIN**: Takes you back to the main screen.
2. **MENU**: Takes you back to the menu screen.
3. **SYSTEM PSI or BAR HISTORY**: Opens screen with readings for that motor for export.
4. **"ARROWS"**: Allows scrolling thru readings.
5. **DOWNLOAD TO USB**: Allows user to export data readings to USB drive.
6. **PSI TREND**: Takes user back to PSI trending graph page.

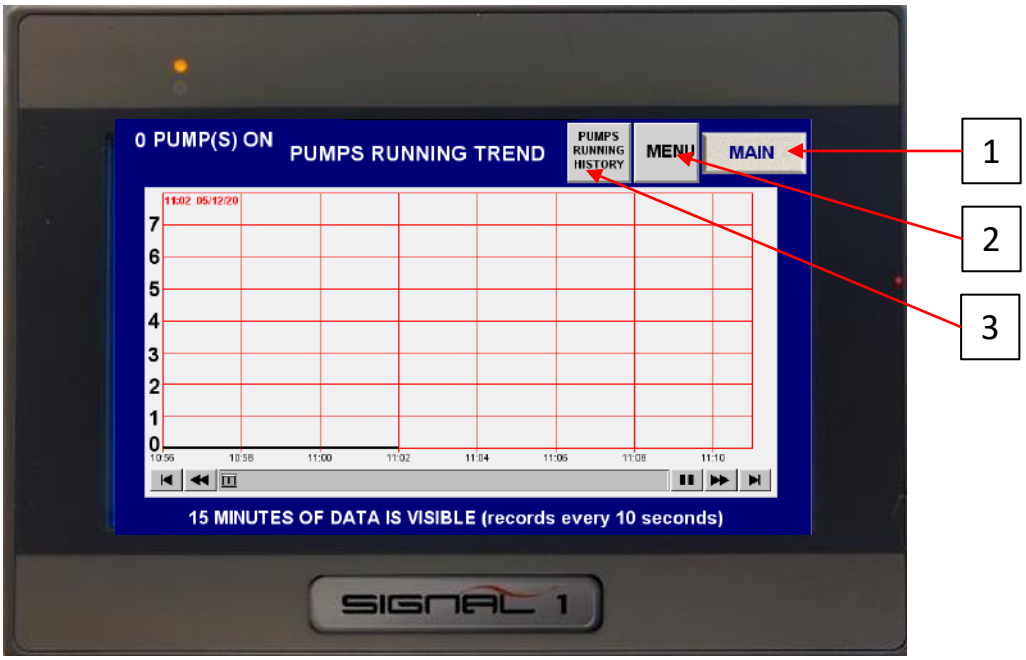


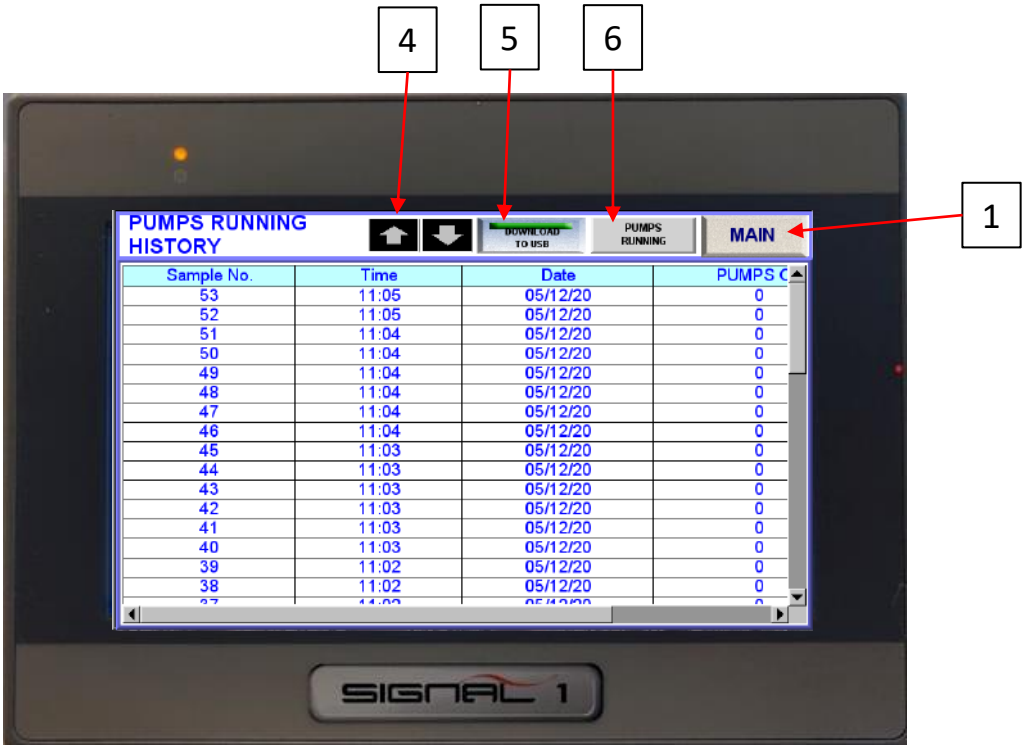


- # PUMPS RUNNING TREND Screen

The pumps running trend screen allows the operator to see how many pumps are running is graph and data point form and export the data if needed.

1. **MAIN**: Takes you back to the main screen.
2. **MENU**: Takes you back to the menu screen.
3. **PUMPS RUNNING HISTORY**: Opens screen with readings for export.
4. **"ARROWS"**: Allows scrolling thru readings.
5. **DOWNLOAD TO USB**: Allows user to export data readings to USB drive.
6. **PUMPS RUNNING**: Takes user back to Pumps running trending graph page.

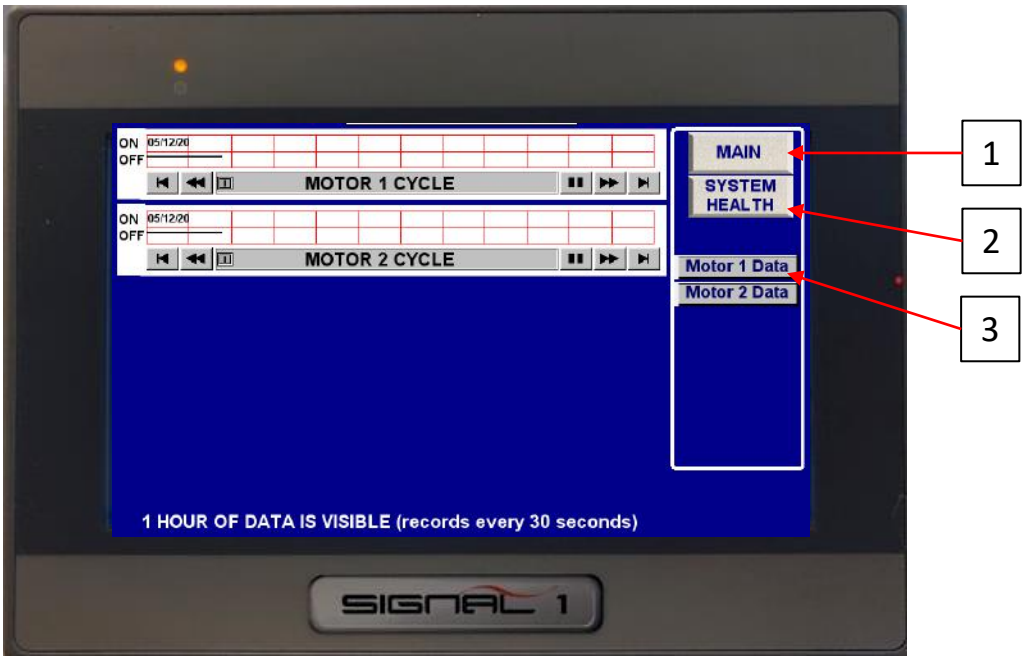


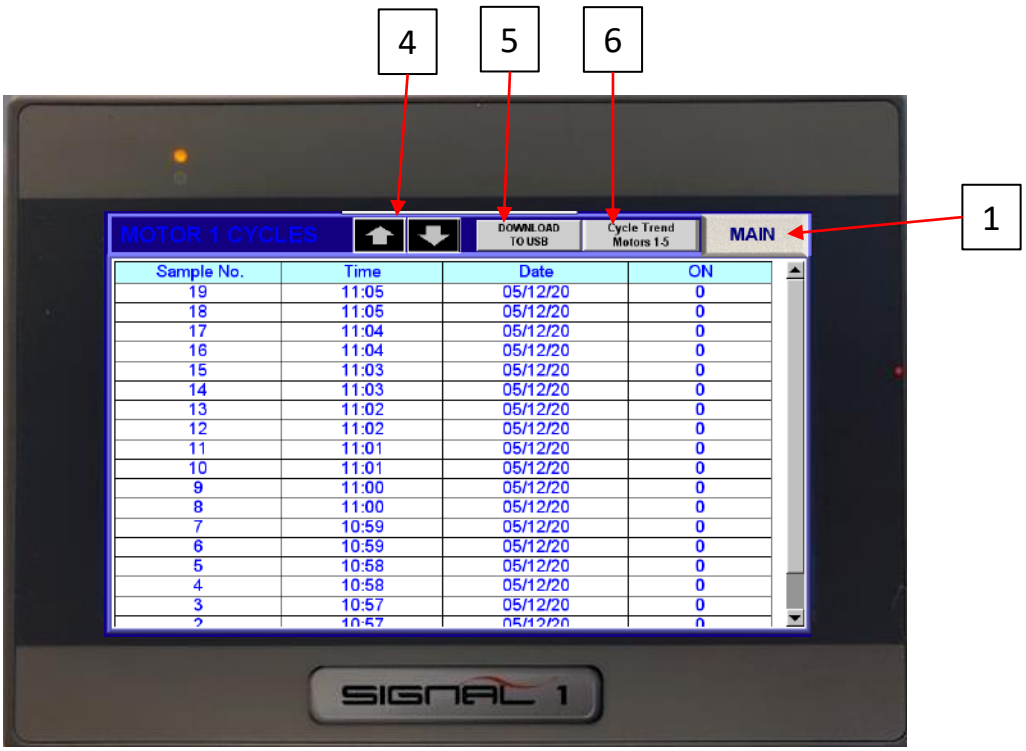


- # PUMP CYCLE TREND Screen

The pumps cycle trend screen allows the operator to see when a pump is running and get graph and data points and export the data if needed.

1. **MAIN**: Takes you back to the main screen.
2. **SYSTEM HEALTH**: Takes you back to the System Health screen.
3. **MOTOR *X* DATA**: Takes you to screen with data points for individual pumps.
4. **"ARROWS"**: Allows scrolling thru readings.
5. **DOWNLOAD TO USB**: Allows user to export data readings to USB drive.
6. **CYCLE TREND**: Takes user back to Cycle trending graph page.

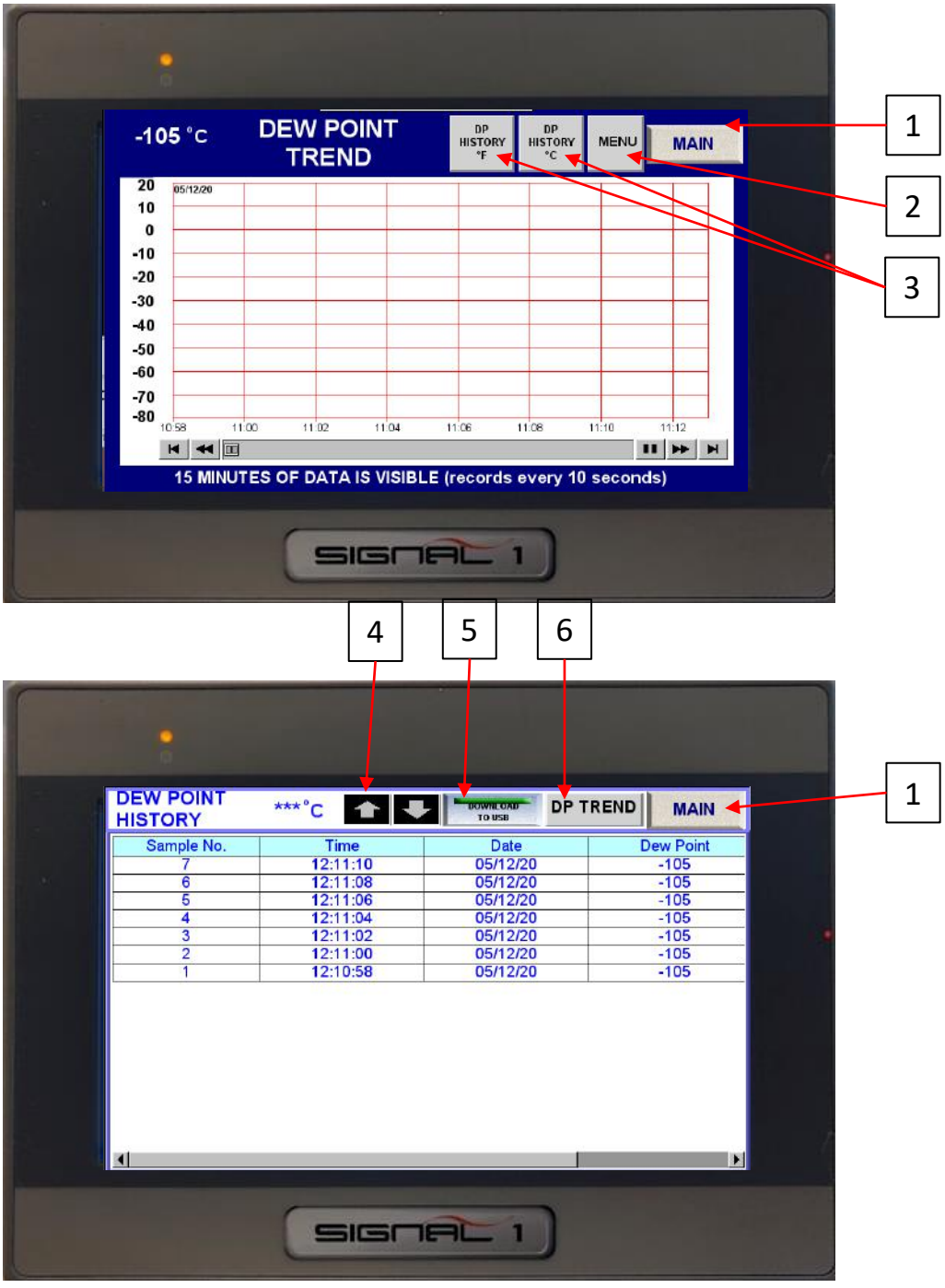




- # DEW POINT TREND Screen (air only)

The dew point trend screen allows the operator to see the dew point and get graph and data points and export the data if needed.

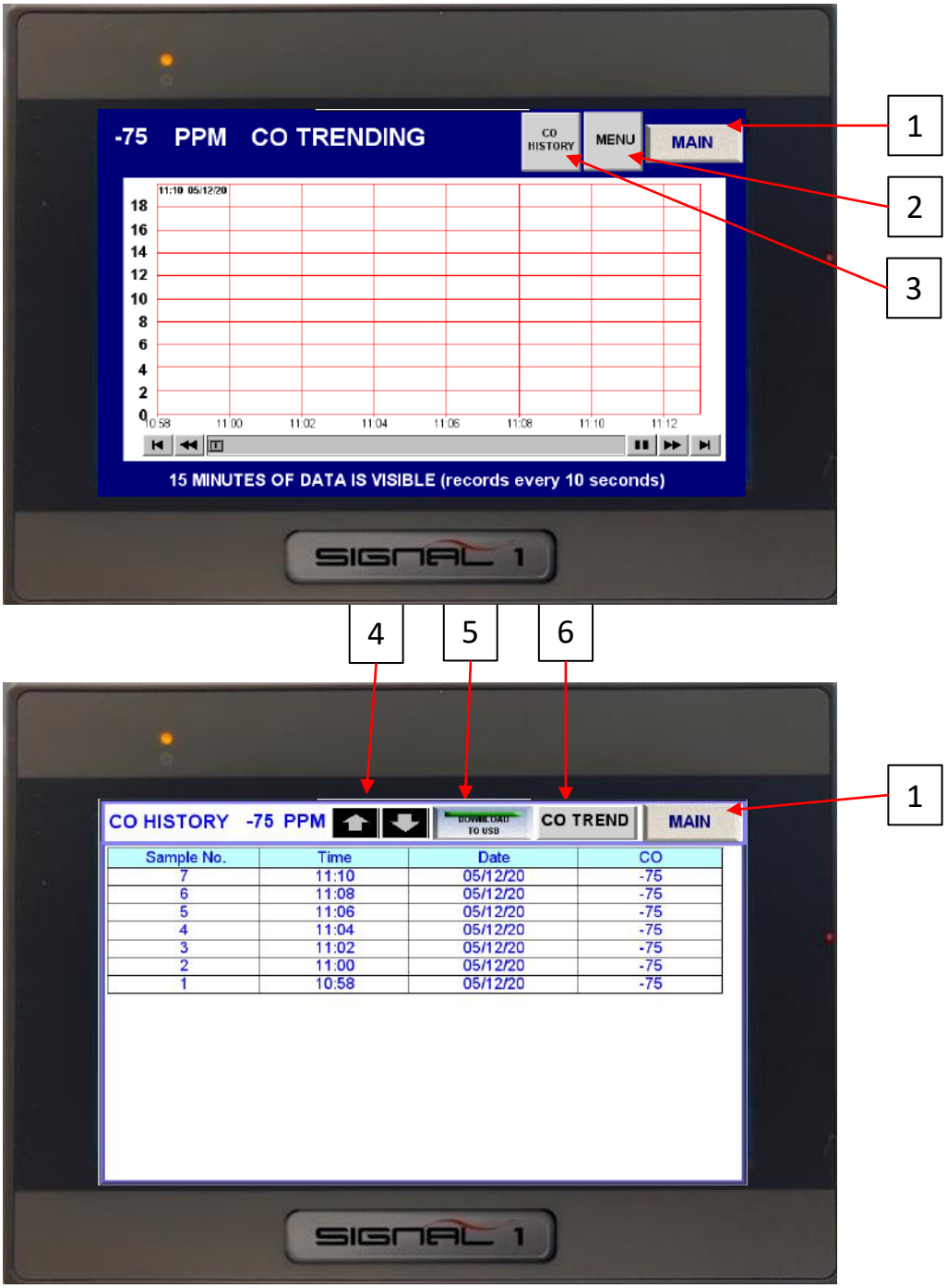
1. **MAIN**: Takes you back to the main screen.
2. **MENU**: Takes you back to the menu screen.
3. **DP HISTORY °F or °C**: Takes you to screen with data points for dewpoint in °F or °C.
4. **"ARROWS"**: Allows scrolling thru readings.
5. **DOWNLOAD TO USB**: Allows user to export data readings to USB drive.
6. **DP TREND**: Takes user back to Cycle trending graph page.



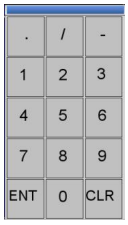
- ## CO TREND Screen (air only)

The dew point trend screen allows the operator to see the dew point and get graph and data points and export the data if needed.

1. **MAIN**: Takes you back to the main screen.
2. **MENU**: Takes you back to the menu screen.
3. **CO HISTORY**: Takes you to screen with data points for CO.
4. **"ARROWS"**: Allows scrolling thru readings.
5. **DOWNLOAD TO USB**: Allows user to export data readings to USB drive.
6. **CO TREND**: Takes user back to Cycle trending graph page.

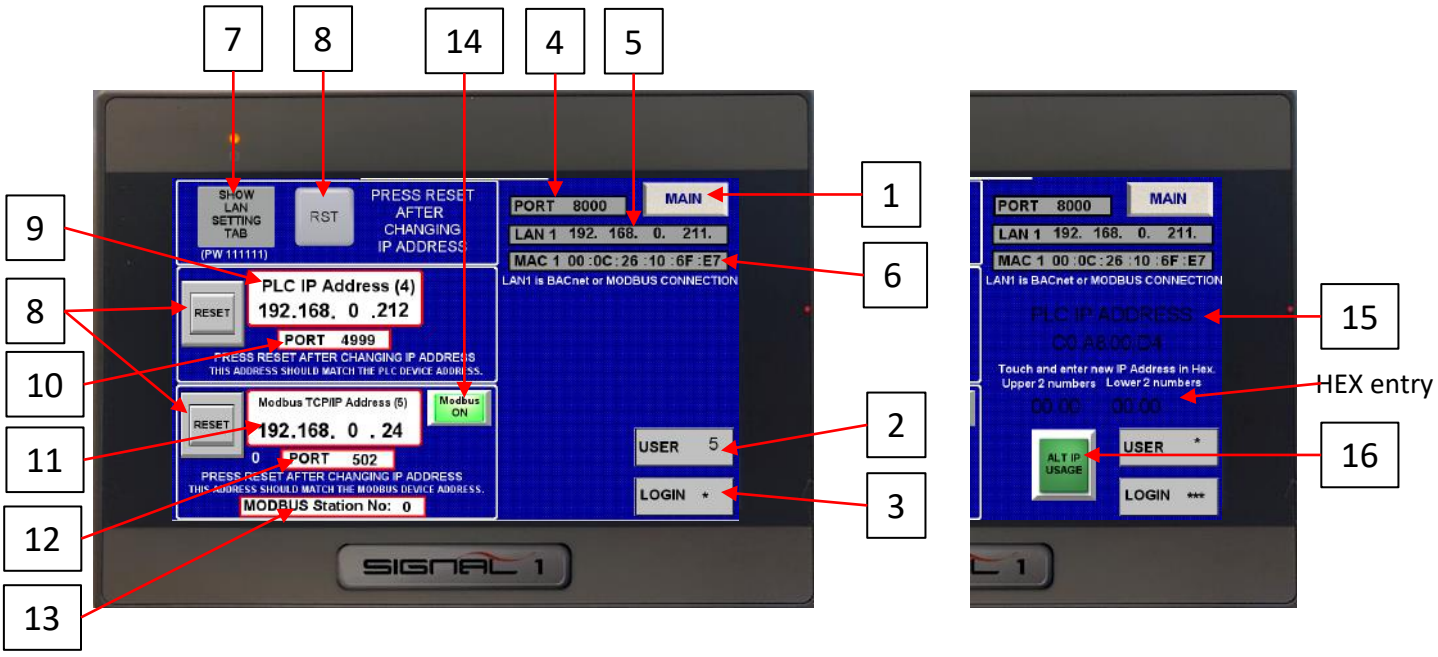


• LAN SETTINGS screen



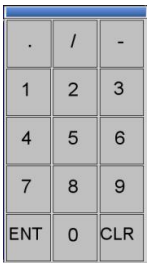
The LAN settings screen allows the operator to change the IP address of the HMI, PLC, and output MODBUS. Additional network parameters can also be changed.

1. **MAIN**: Takes you back to the main screen.
2. **USER**: Allows operator to log in to make changes (4 then ENT).
3. **LOGIN**: Allows operator to log in to make changes (396 then ENT).
4. **PORT**: Allows operator to change the port number of the HMI. Consult IT before changing.
5. **LAN 1**: IP address of the HMI. Consult IT before changing.
6. **MAC 1**: MAC address of HMI. Consult IT before changing.
7. **SHOW LAN SETTING TAB**: This brings up HMI login screen. Adjustments to IP address, time, date, and other HMI settings can be made thru this login.
8. **RESET**: Press after in block after changing the IP address of the HMI, PLC, or Modbus.
9. **PLC IP ADDRESS**: Address where HMI is looking for PLC.
10. **PLC PORT**: Port location of PLC IP Address.
11. **MODBUS IP ADDRESS**: Address where HMI is sending MODBUS packets.
12. **MODBUS PORT**: Port location where Modbus packets are being sent.
13. **MODBUS STATION No**: Station number of Modbus device.
14. **MODBUS OFF**: Turns off Modbus output.
15. **PLC IP ADDRESS**: This function requires a special login. Contact Pattons Medical.
    - Top address it he current PLC IP address
    - Lower address is the new address to be saved. New address must be enter in HEX.
        - i.e.: If IP address needs to be 192.168.1.20, the you would enter 1st block: C0A8 and 2nd block: 0114
16. **ALT IP USAGE**: Select this button to make the new PLC IP address active in the PLC. Then the PLC and HMI must be rebooted.



HMI SETTING TAB

The HMI Setting tab allow the operator to make changes to HMI parameters. The 2 most common changes are 1) IP address and 2) date and time. There are several others too.



1. Go to **MENU** screen
2. Select **SYSTEM DATA** tab
3. Enter **USER 4**, then ENT
4. Enter **LOGIN 396**, then ENT
5. Select **CHANGE PARAMETERS** button
6. Enter USER 4; LOGIN 396
7. Select **SHOW HMI SETTING TAB**
8. A pop-up **KEYBOARD** will appear, then a **PASSWORD** pop-up screen.
9. Once PASSWORD screen appears, enter **111111** for password and hit OK (may auto exit)
10. **SYSTEM SETTINGS** pop-up screen will appear.
11. At this point, changes can be made to any system setting. Select **APPLY** to save. Select OK or CANCEL to exit.