

Keith Industrial Group, Inc.

www.kigsales.com 978-514-3800

ViewMate System Control & Monitoring

DESIGNED SPECIFICALLY FOR KIG COOLING TOWER SYSTEMS & PUMP TANK STATIONS

The KIG ViewMate Series control and monitoring instrument puts you in control of your central cooling tower system or chilled water pump tank system. The ViewMate control is tailor made for KIG Systems and functions as the evaporative cooling tower and chilled water systems control and monitoring instrument.

VIEWMATE SYSTEM CONTROLLER

- Monitors & controls up to 3 process pumps, controls up to 3 tower/evaporator pumps & 3 cooling tower fan outputs to match the cooling capacity to the cooling load.
- Setup is intuitive & the graphic display provides complete system status at a glance.
- Water pressure "to process" and "to the cooling tower or chiller" are monitored by included pressure transducers & displayed digitally on the ViewMate display.
- Connect to VNC to mirror the display and controls on a connected PC.
- Intelligent, customizable water level control for up to two tanks is provided & illustrated graphically on the ViewMate display.
- Alarm outputs for low process water pressure, high process water temperature & low tank level are standard on the ViewMate system control.
- Fault conditions & temperature history are logged & available for review directly from the display.

The following pages are sample screen shots of the upgraded View Mate system for Pump Tank Systems. Details subject to change with updated revisions.



PUMPS AND FANS OPERATORS:

Select Fan or Pump available in the main screen to go to pumps and fans operator as shown in Figure 1.

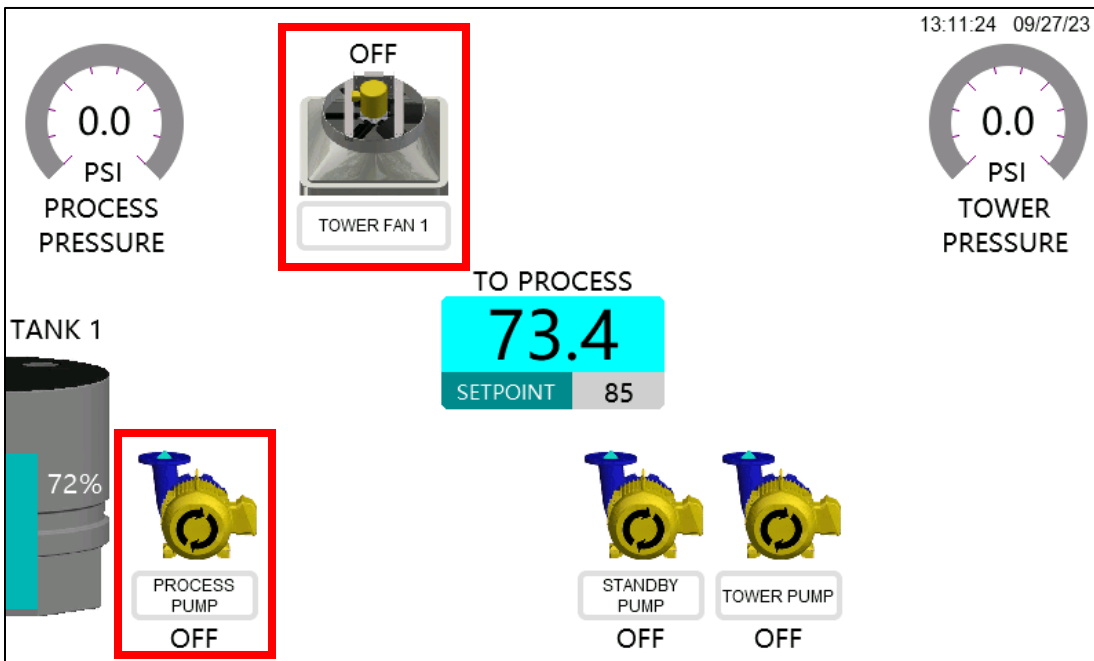


Figure 1: Main Screen display

Pumps and Fans Operators will only display Pumps and Fans that have been enabled from the settings menu.

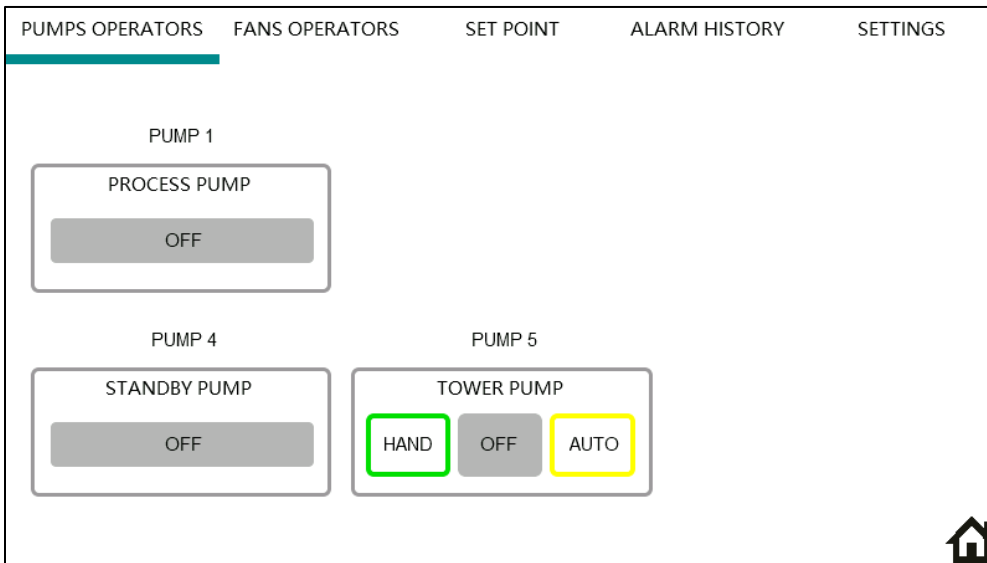


Figure 2: Pump Operators window

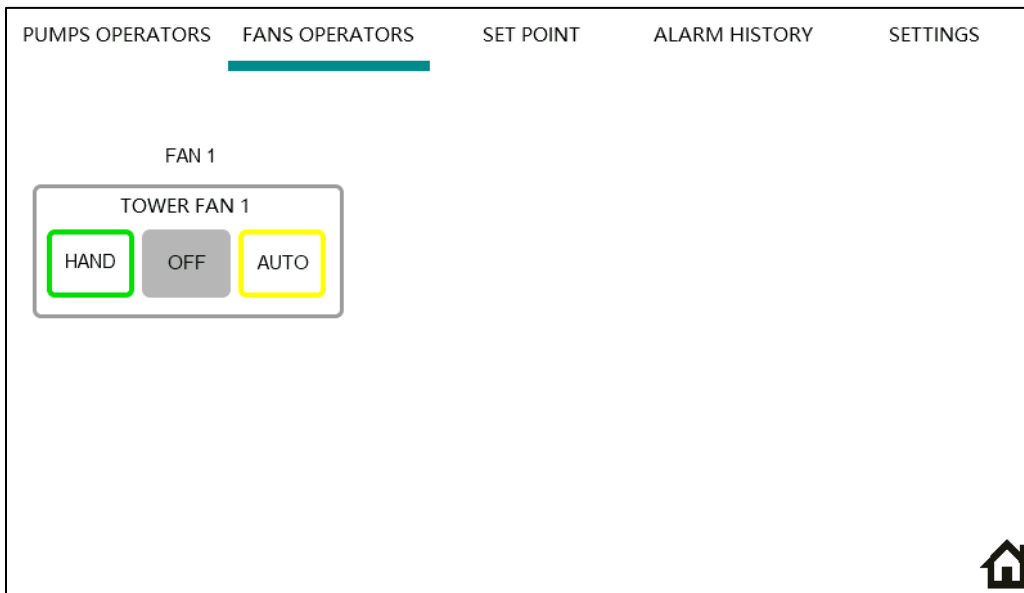


Figure 3: Fan Operators window

WATER PRESSURE MONITORING:

Select either one of the pressure displays in order to see “Water Pressure Monitoring” screen.

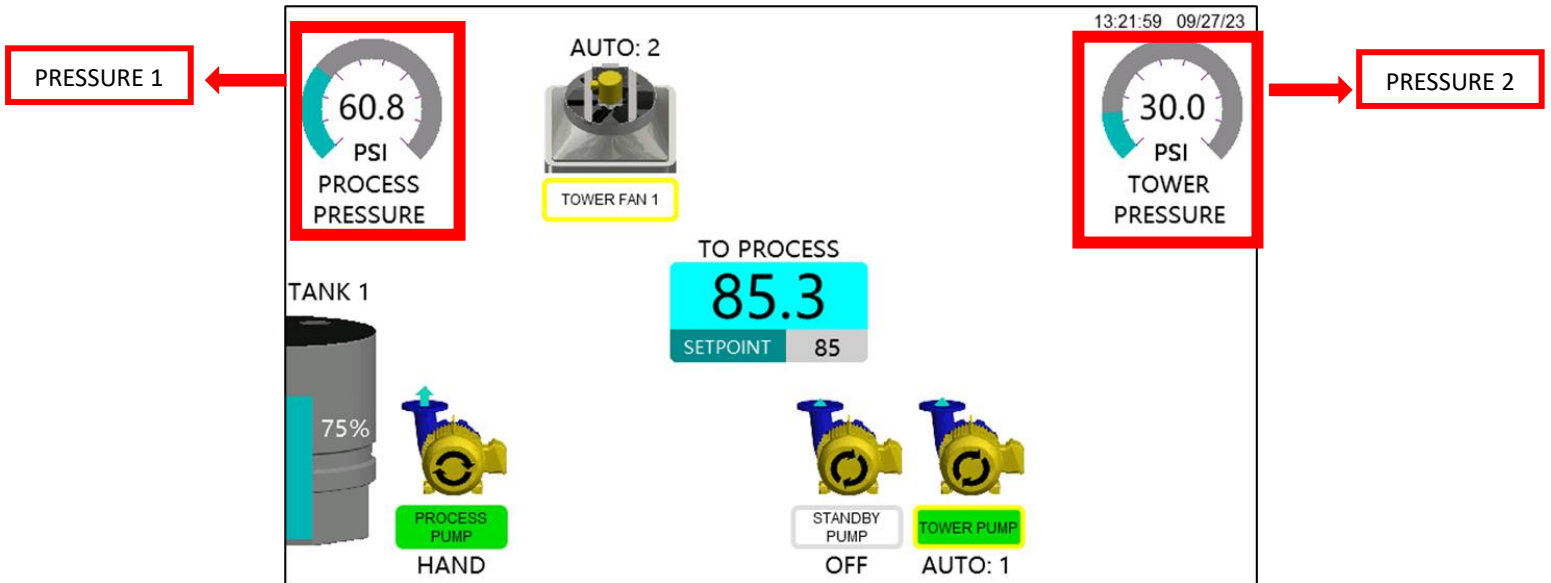


Figure 4: Main screen with Pressure 1 and 2 display with their custom naming to Process Pressure and Tower Pressure

You can view and re-naming all 4 pressures in “Water Pressure Monitoring” window shown in **Figure 5**, but **only Pressure 1 and Pressure 2** will be display on the main screen.

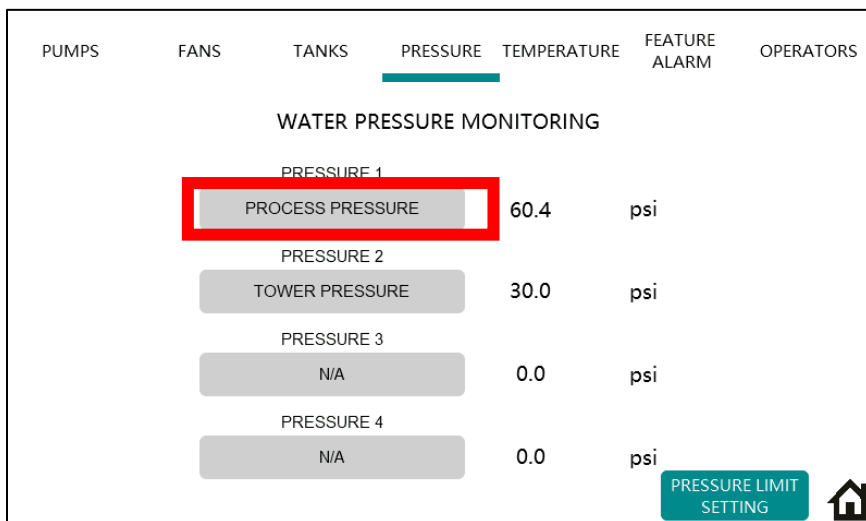


Figure 5: Water Pressure Monitoring window

In order to re-naming pressure, you will need to select on the grey box under “PRESSURE 1” – “PRESSURE 4”

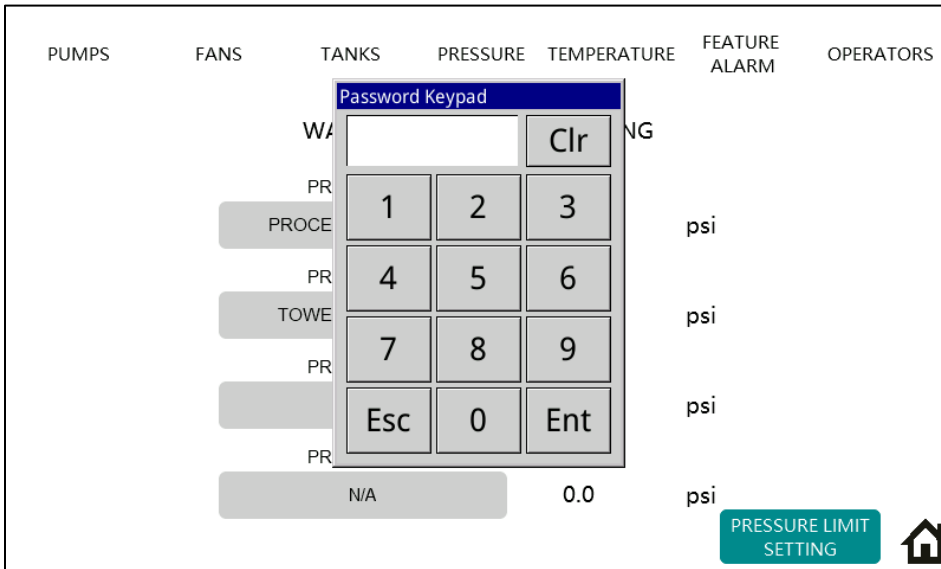


Figure 6: Password Keypad Pop Up window

If this is your initial set up password Keypad will pop up, you will need to type in a 4-digit password (**1999**) then select “**Ent**” in order for the keyboard to show up as shown in **Figure 7**.

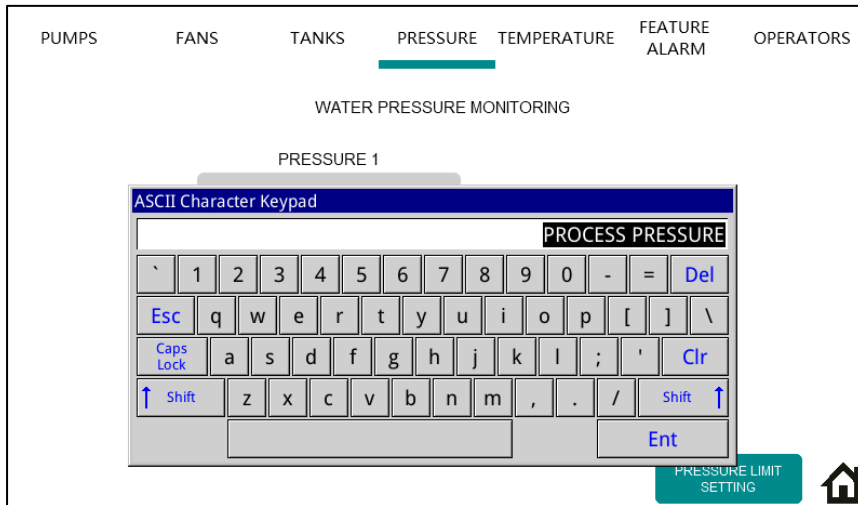


Figure 7: Pop Up Keyboard for custom naming

WATER TEMPERATURE MONITORING:

You can access “Water Temperature Monitoring” Window by selecting “**TEMPERATURE**” tap in setting menu show in **Figure 8**, or select Temperature shown on the main window -> Temperature Monitoring shown in **Figure 9**.

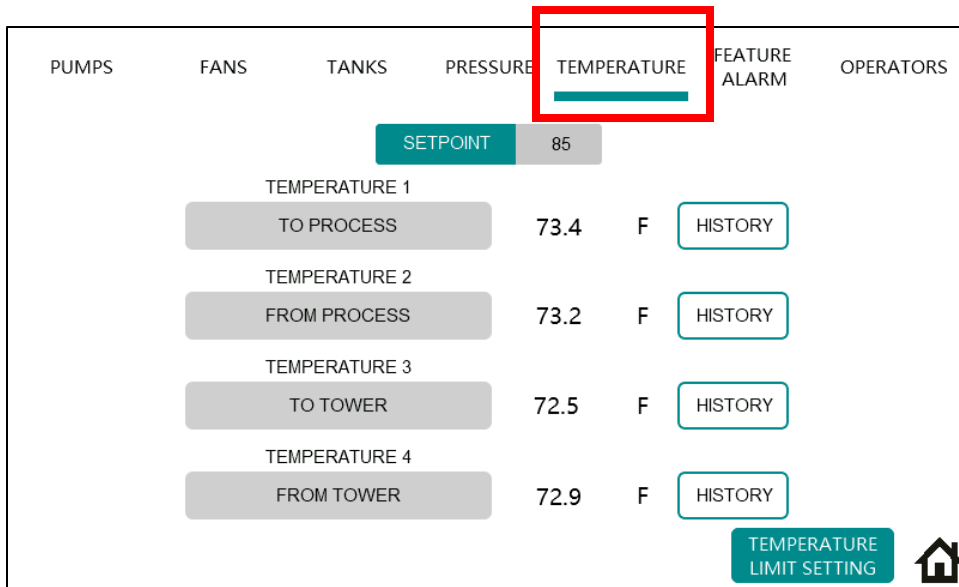


Figure 8: Accessing Water Temperature Monitoring window by selecting “TEMPERATURE” tab.

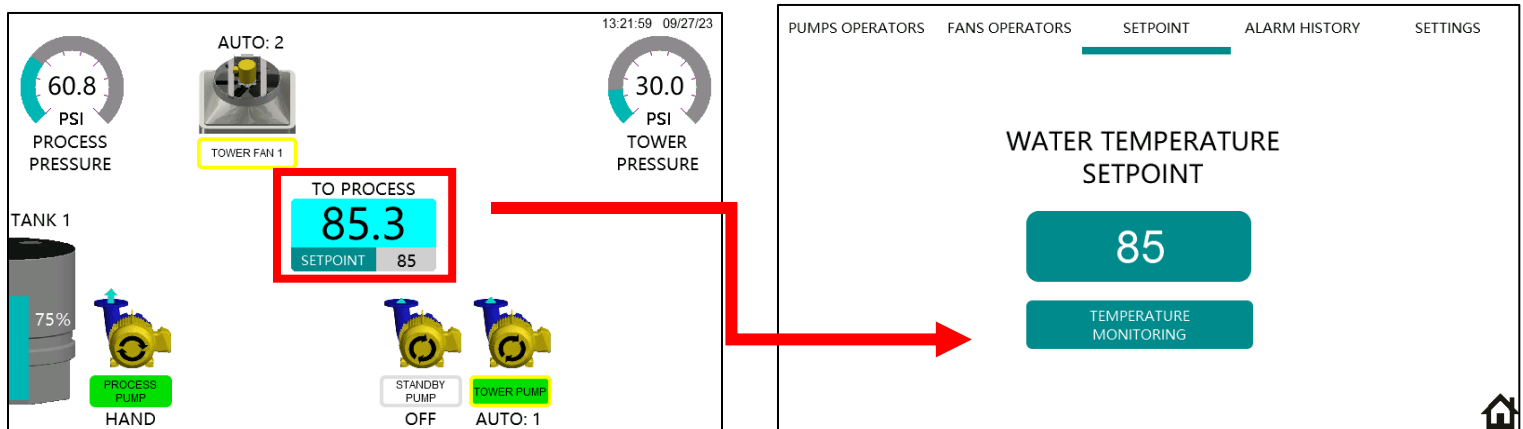


Figure 9: Accessing Water Temperature Monitoring window by selecting around Temperature Display on the main menu then select “TEMPERATURE MONITORING”

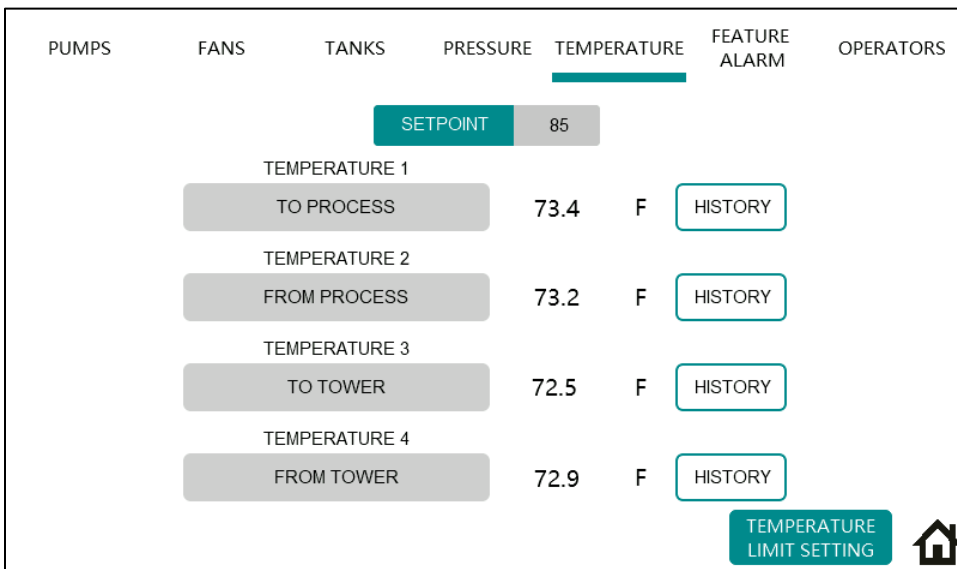


Figure 10: Water Temperature Monitoring Menu

You will be able to customize each Temperature 1 – Temperature 4 name but **only TEMPERATURE 1** will be shown on the main display.

By selecting “HISTORY” you will be able to access temperature history data

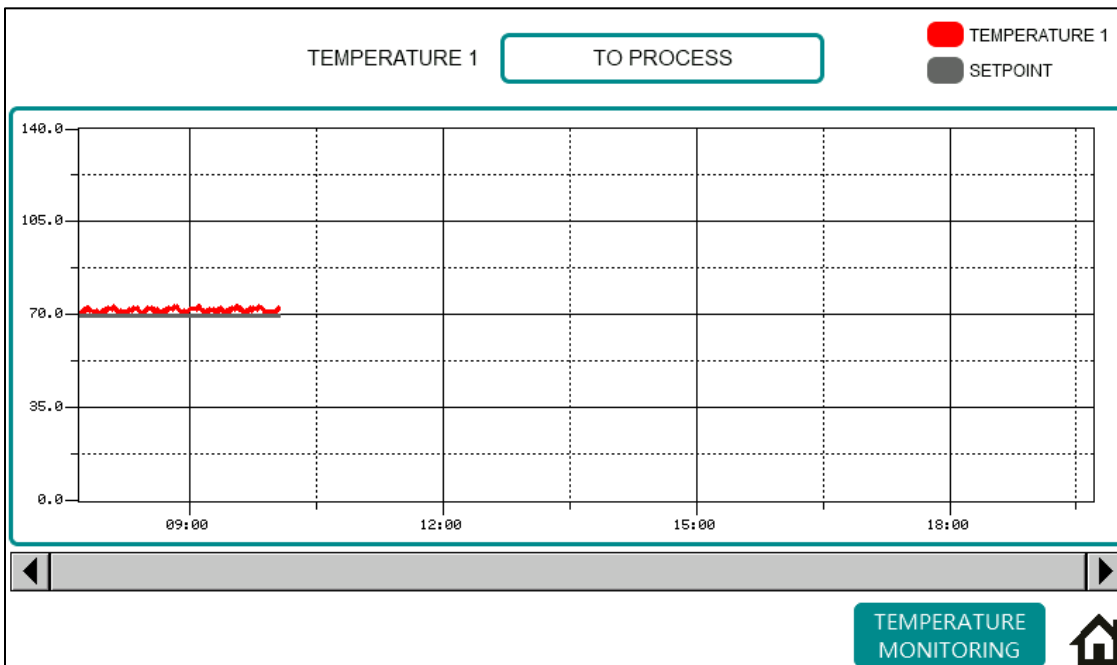


Figure 10a: Temperature 1 history data

TANK SETTINGS:

To access Tank Setting for Tank 1 and Tank 2, you will need to select the tank display on the main screen as shown in **Figure 11**.

Note: If TANK 1 and TANK 2 are both enabled you can go directly into each tank setting by clicking on either tank display.

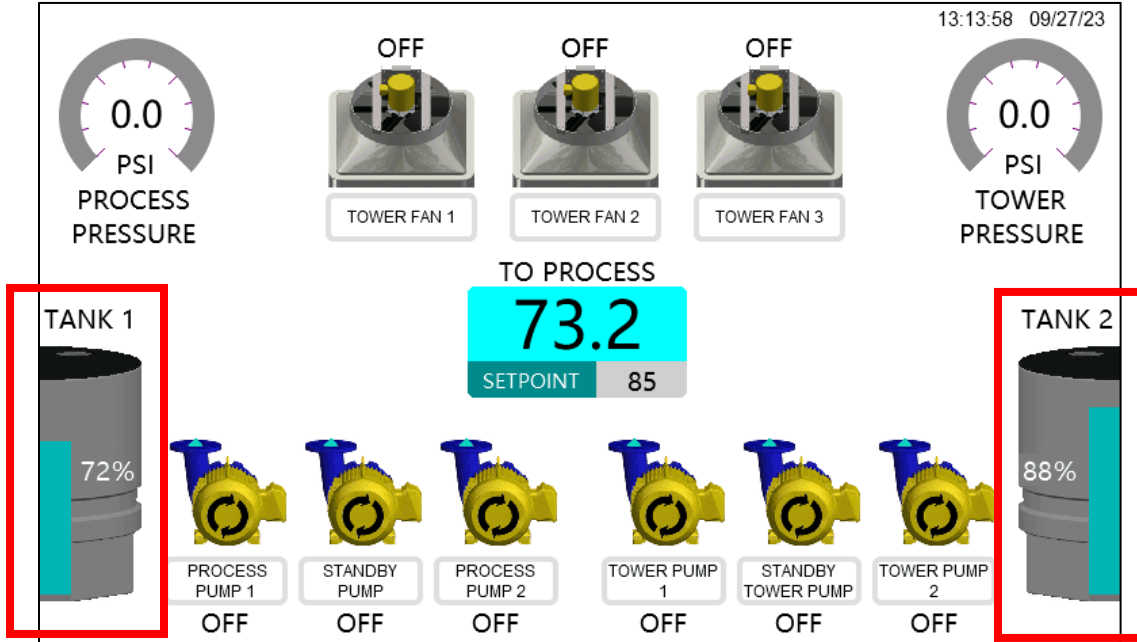


Figure 11: TANK 1 and TANK 2 display on the main screen with all pumps and fans available

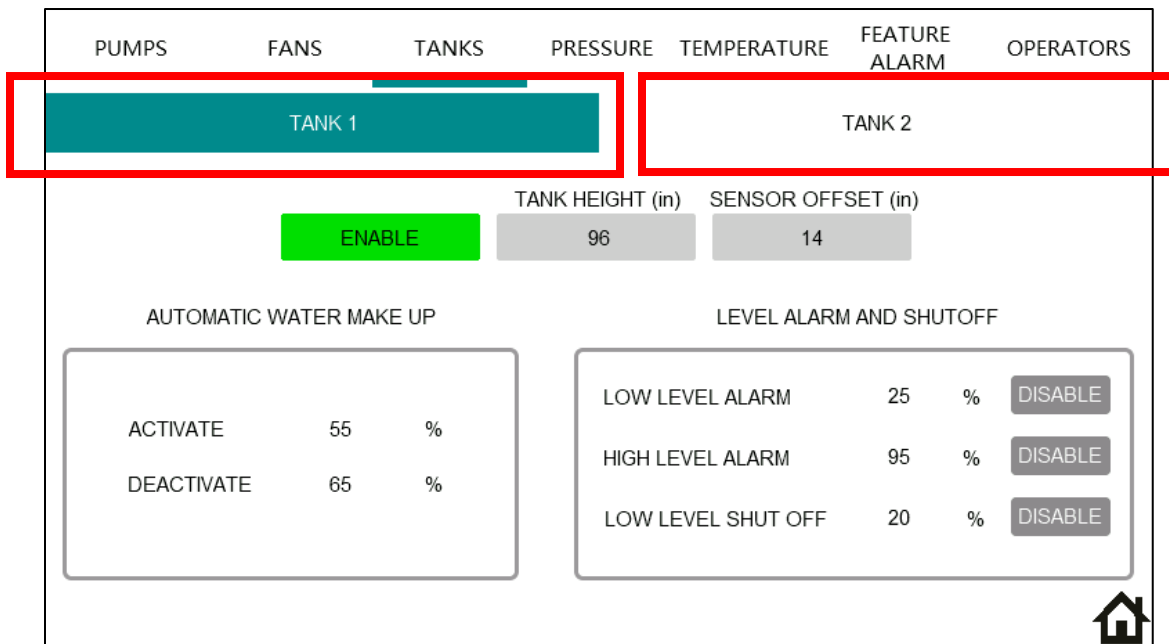


Figure 12: TANK 1 and TANK 2 Setting window

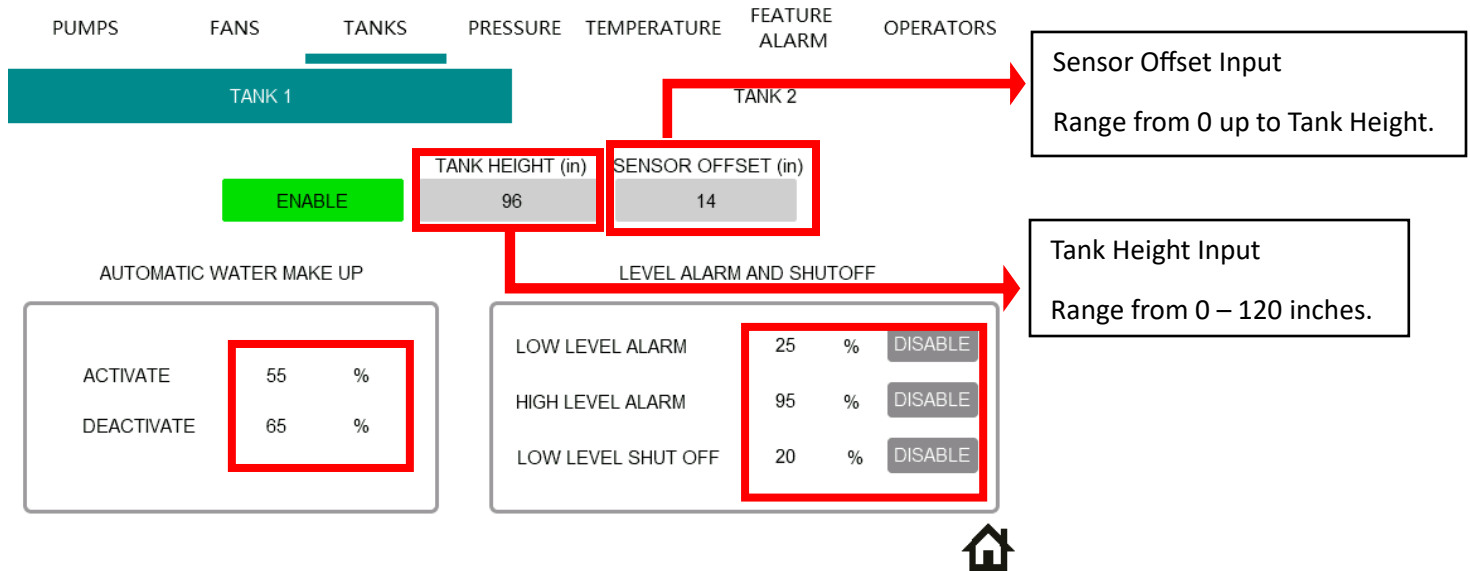


Figure 13: Tank setting window for tank height input, Automatic water make up setting, low level and high level alarm, and low level shut off.

Automatic Water Make Up Setting:

DEACTIVATE level will need to be higher than **ACTIVATE** level, you will need to put in **ACTIVATE** level in percentage (%) first.

*This function will not work unless you type in the **TANK HEIGHT** (0 – 100 inches) on the top of screen.

Level Alarm and Shut Off:

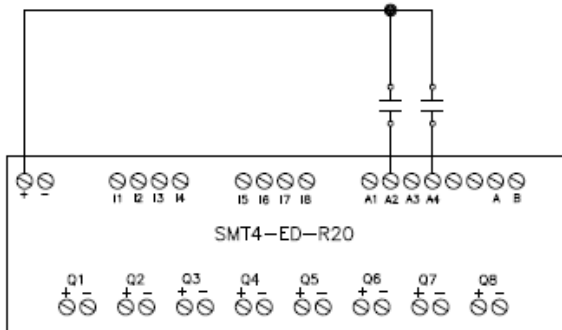
LOW LEVEL SHUT OFF (%) must be less than LOW LEVEL ALARM (%) setting, or this function will not work properly.

LOW LEVEL ALARM, HIGH LEVEL ALARM and LOW LEVEL SHUT OFF can be enable and disable at any time.

FEATURE ALARM:

You can access alarm from setting menu windows by selecting “FEATURE ALARM” tab show in **Figure 14**.

Feature alarms are available by connecting normally open contact in line with SMT-4ED-R20 terminal A2 (Feature alarm 1) to common 24V; and terminal A4 (Feature alarm 2) to common 24V. See wiring diagram below for example.



Feature alarm function can be enable/disable anytime, click on “FEATURE ALARM 1” or “FEATURE ALARM 2” to enable or disable an alarm

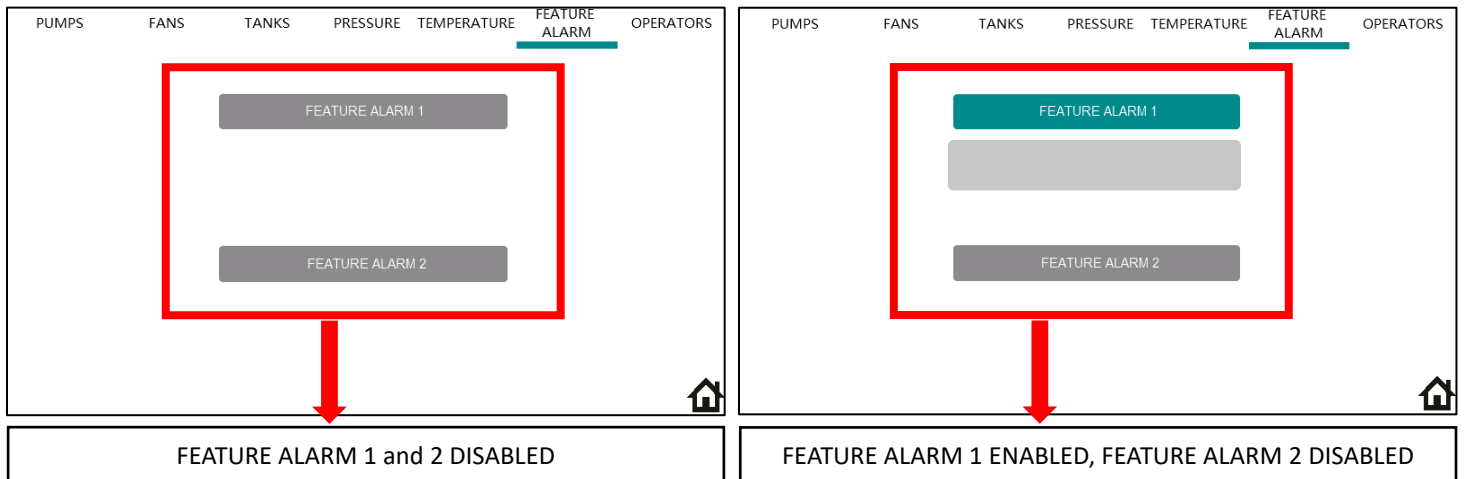


Figure 14: Feature Alarm window

Feature alarm name is customizable by clicking on the grey box under “FEATURE ALARM 1” or “FEATURE ALARM 2” once enabled.

WATER TEMPERATURE SETPOINT:

Water temperature setpoint can be adjusted in 2 different places (see **Figure15** and **Figure 16**).

Water temperature setpoint range is from 0-99 F

1. From main screen by selecting water temperature display

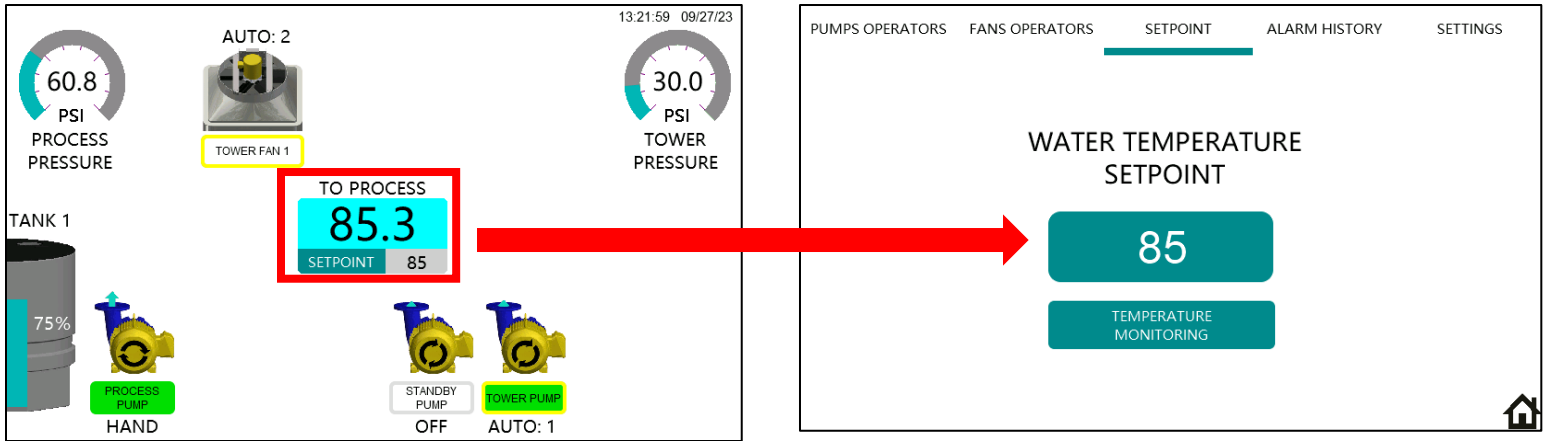


Figure 15: Accessing water temperature setpoint from main screen.

2. From setting menu under “TEMPERATURE” tap

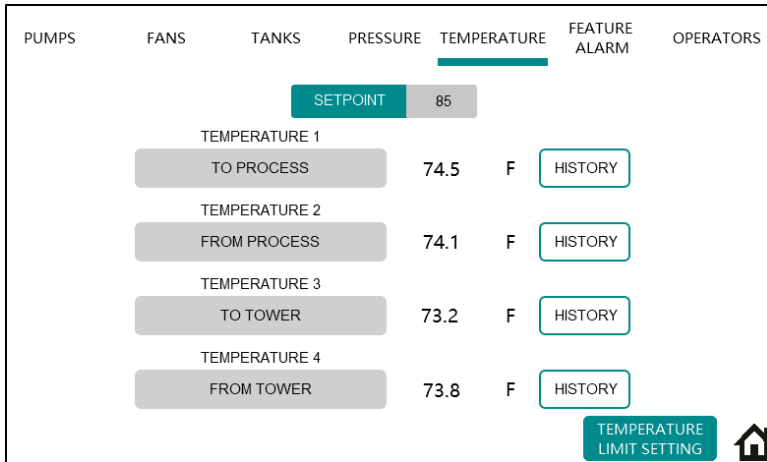


Figure 16: Water temperature setpoint adjustable under “TEMPERATURE” tab.

QUICK COOL FEATURE:

You can access QUICK COOL feature by navigate to Setting Menu then select “FANS”

When pumps and fans are set up in different stages, it usually takes about 90 seconds between each stages, quick cool feature will reduced the staging time to 5 seconds.

On the bottom of “FANS” setting window (**Figure 17**) you will be able to ENABLE and DISABLE the QUICK COOL feature.

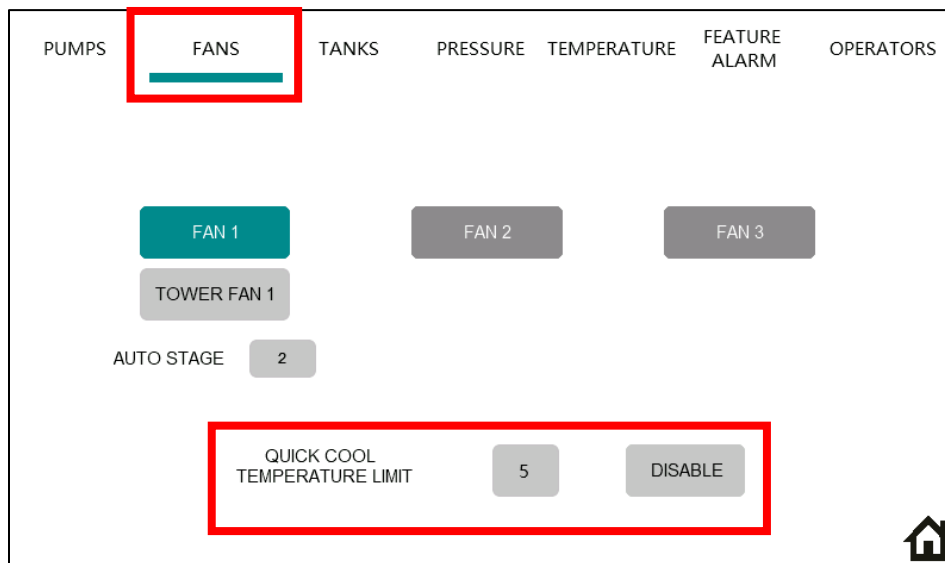


Figure 17: QUICK COOL Feature available under “FANS” setting window.

QUICK COOL TEMPERATURE LIMIT is a deviation from your adjusted setpoint. If your setpoint is at 70 F and quick cool temperature limit is 5 F the quick cool function will start once the reading water temperature is 75 F and above.

PUMPS and FANS STATUS:

1. If pumps or fans have a yellow border with white background inside the border, this identify that it is in **AUTO mode and currently waiting to be staging**.
2. If pumps or fans have a yellow border around the pumps or fans name this means that it is in **AUTO mode**, green background inside the border identify that **pumps or fan is now running**.
3. If pumps or fans have a solid green border with green background this means that it is in **HAND mode** and the pumps or fans are running.
4. If pumps or fans have a grey border around their name this means that the pumps or fans are currently **OFF**.

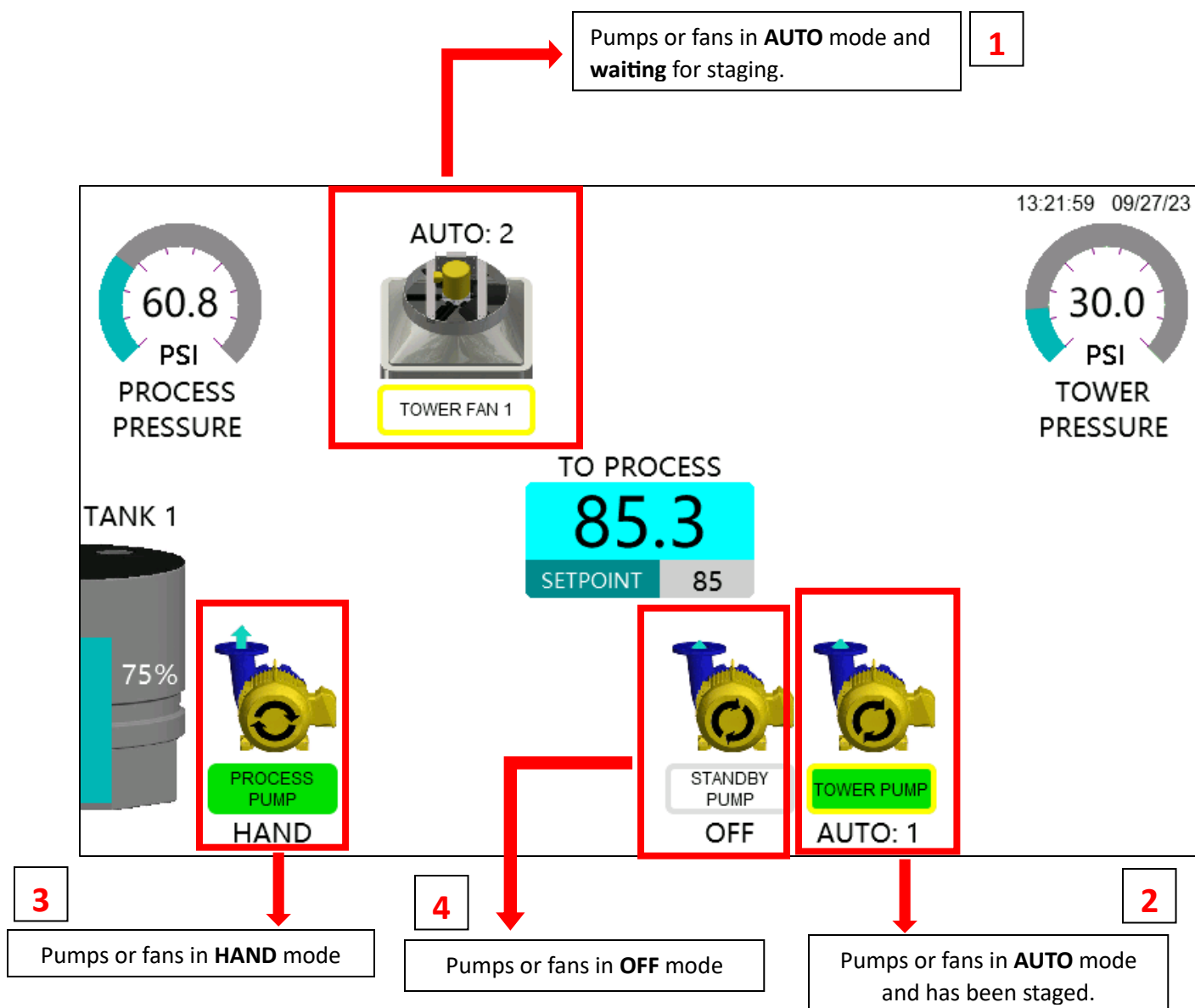


Figure 18: Main display with pumps and fans status explanation

ALARM:

The system come with 2 types of alarm

1. FAULT alarm:

When there is an error that caused the system to shut down and/or pumps and fans to shut down, this type of alarm can be enable and disable; but you cannot enable or disable motor overload alarm.

Figure 19 and Table 1 shown example of fault alarm and the list of error that will cause fault alarm.

2. WARNING alarm:

The system will stay running while there is a warning alarm, no pumps or fans is turning off unless it is a MASTER START OFF and EMERGENCY STOP warning.

Figure 20 and Table 2 shown example of warning alarm and the list of error that will cause warning alarm.

3. ALERT alarm:

If Master switch is off or Emergency button is engaged, you will received an alert on the screen.

See **Figure 20A**

When the **“SILENCE”** button is push, the alarm will stop sounding and the alarm window will be closed.

When the **“ALARM HISTORY”** button is push, the alarm will stop sounding and the Alarm History screen will pop up

If the error still exists, you will see yellow running tab on the top of the screen with the alarm message until the error is fixed. See an example in **Figure 21**

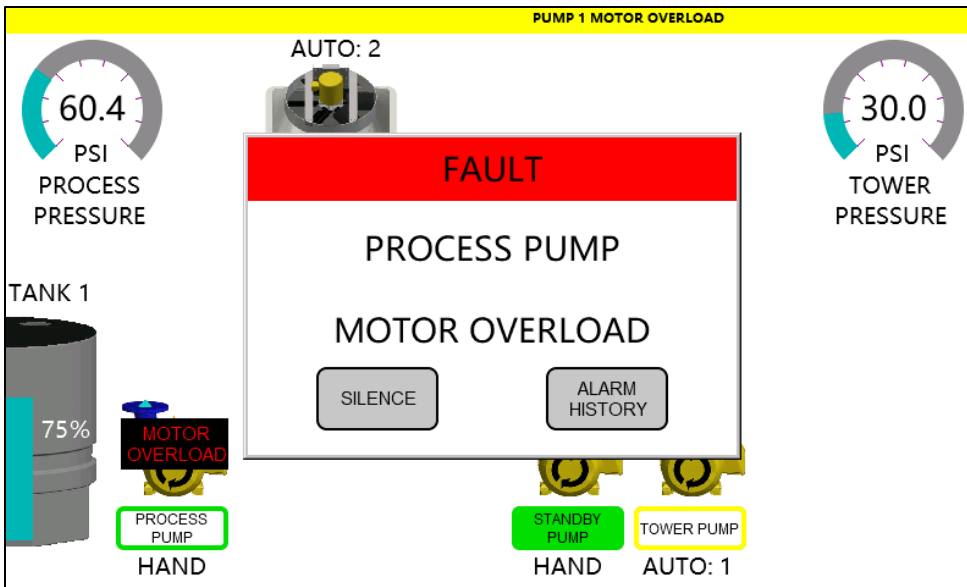


Figure 19: Alarm display with FAULT window

FAULT ALARM	DESCRIPTION
HIGH TEMPERATURE SHUT OFF	If function is enabled , system is shut off when water temperature goes above high temperature shut off limit setting.
PUMPS MOTOR OVERLOAD	Specific pump is shut off when motor overload detected
FANS MOTOR OVERLOAD	Specific fan is shut off when motor overload detected
TANK 1 LOW LEVEL SHUT OFF	If function is enabled , system is shut off when water level in tank 1 go below low level shut off limit.
TANK 2 LOW LEVEL SHUT OFF	If function is enabled , system is shut off when water level in tank 2 go below low level shut off limit.

Table 1: Lists of errors that will cause fault alarm

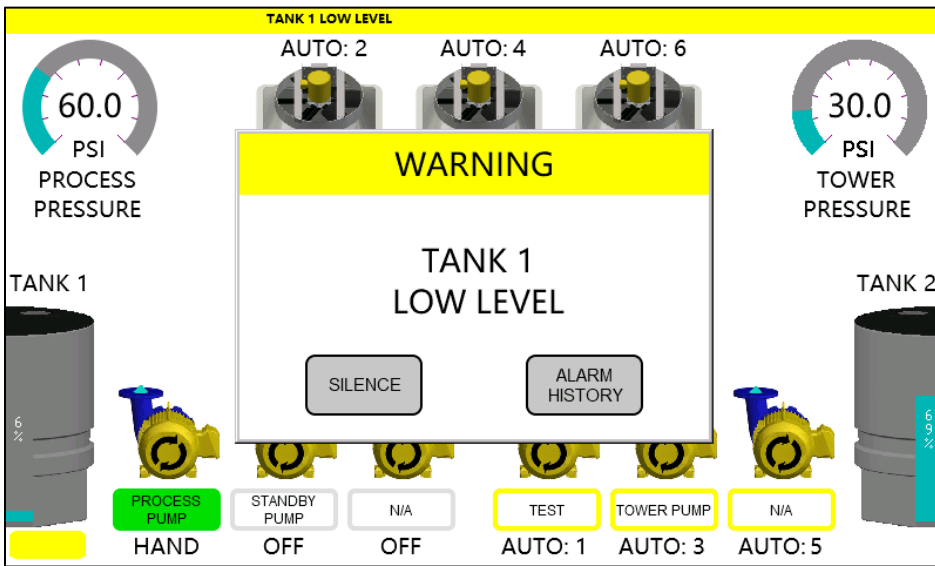


Figure 20: Alarm display with WARNING window

FAULT ALARM	DESCRIPTION
LOW PROCESS PRESSURE 1	Process pressure 1 is lower than low process pressure 1 setpoint
LOW PROCESS PRESSURE 2	Process pressure 2 is lower than low process pressure 2 setpoint
LOW TEMPERATURE	Process water temperature is lower than low temperature limit
HIGH TEMPERATURE	Process water temperature is higher than high temperature limit
TANK 1 LOW LEVEL	Tank 1 water level is lower than low level limit setting
TANK 1 HIGH LEVEL	Tank 1 water level is higher than high level limit setting
TANK 2 LOW LEVEL	Tank 2 water level is lower than low level limit setting
TANK 2 HIGH LEVEL	Tank 2 water level is higher than high level limit setting
FEATURE ALARM 1	Optional alarm
FEATURE ALARM 2	Optional alarm

Table 2: Lists of errors that will cause warning alarm

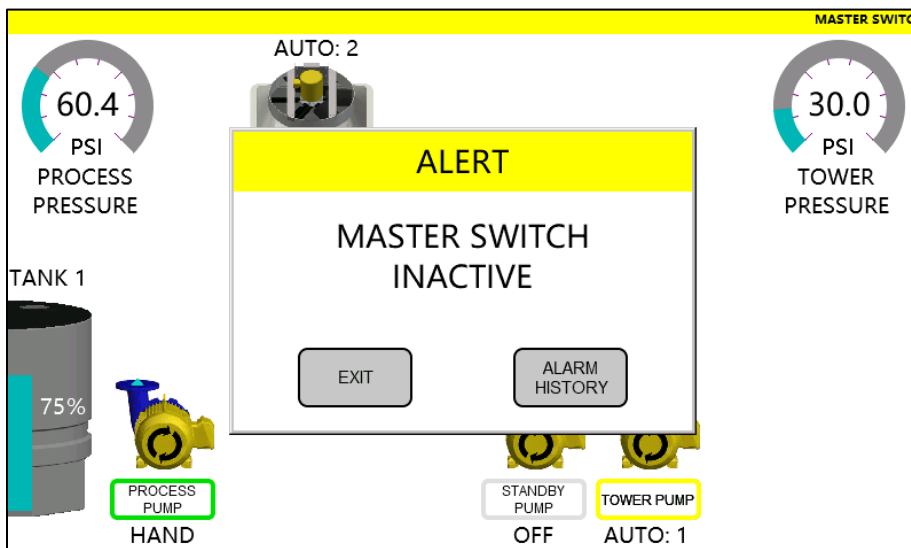


Figure 20A: Alart notification while master switch is inactive

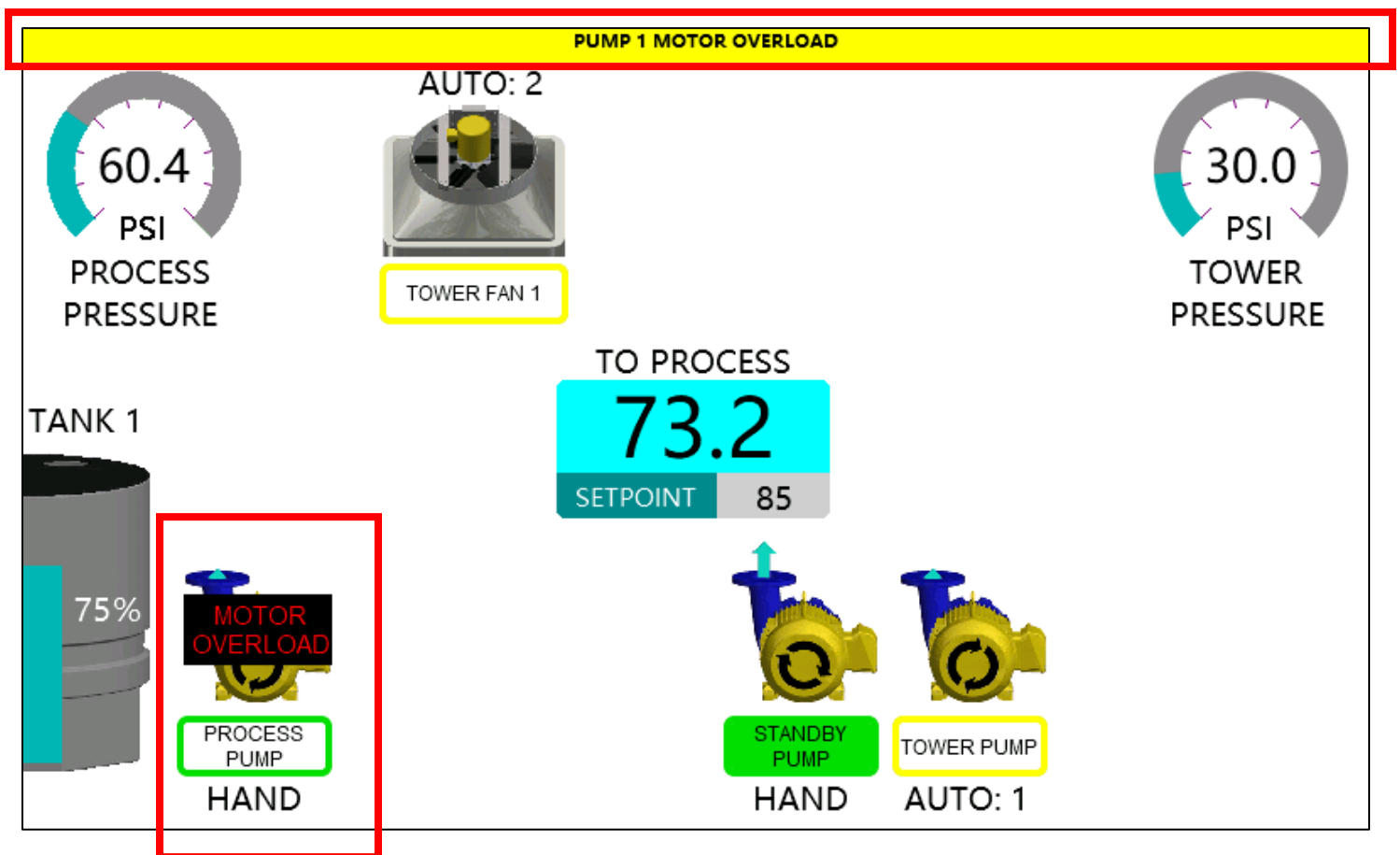


Figure 21: Main display with an example of motor overload error with alarm display running on the top of the screen

HIDDEN BUTTON IN FEATURE ALARM WINDOW:

In “FEATURE ALARM” window, there is 3 hidden button available with password log in access for operation below:

1. Restart HMI: This will restart HMI incase of communication to PLC error or HMI is not operating normally
2. Panel Setup Menu see **Figure 25**
3. Operation Log : You will be able to see if there is changes have been made to your previous set up

In order to access functions mentioned, you will need to click on the empty space highlighted in **Figure 24**, a password keypad will pop up for you to sign in. Once done you will click on the empty space again to access the hidden button function.

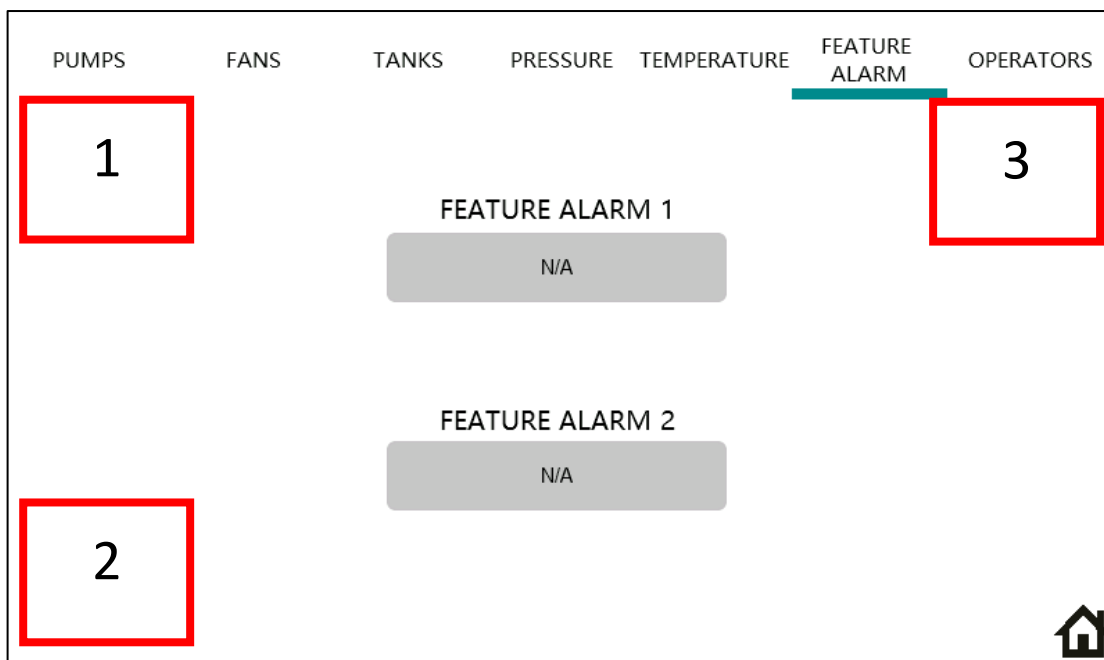


Figure 24: Feature alarm screen with hidden functions button highlighted.

Notes: Password for Panel Setup Menu and Operation Log is **1977**

PANEL SETUP FOR COMMUNICATION WITH PLC:

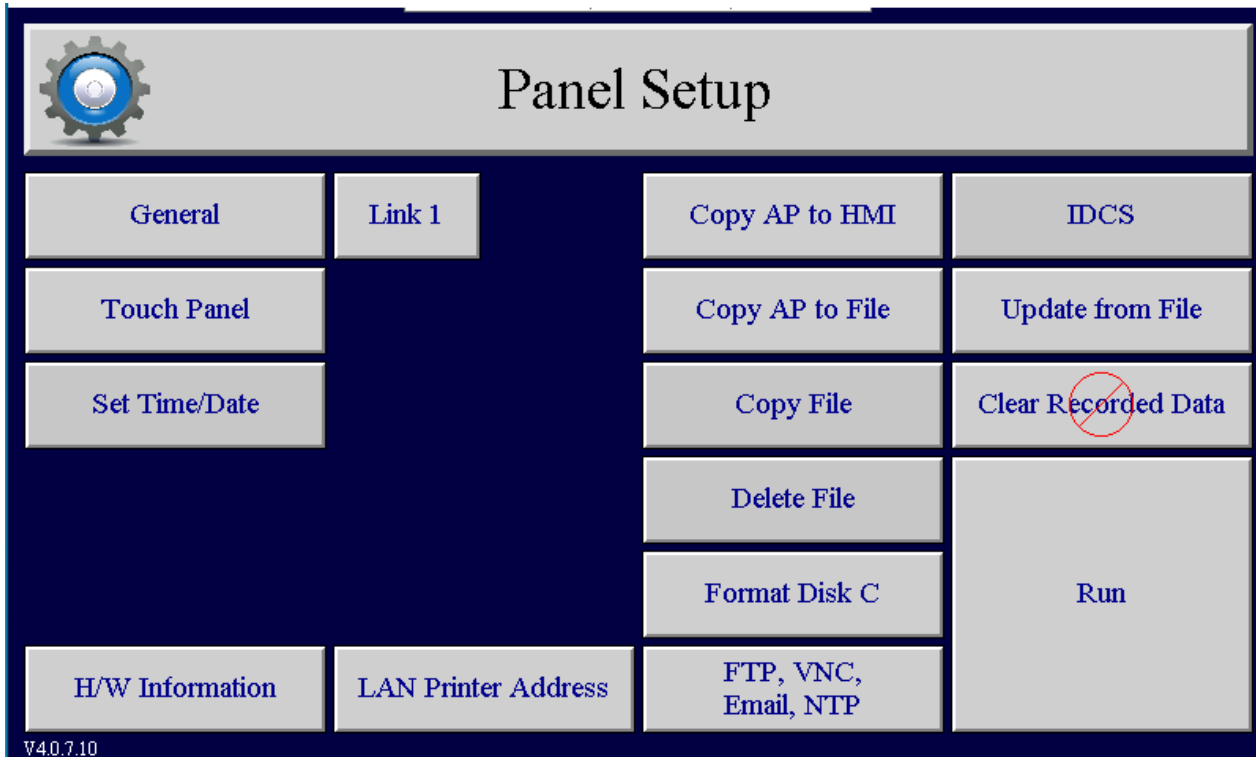


Figure 25: Panel Set up screen.

In case of communication between HMI and PLC device issue select “Link 1” then make sure that Communications setting is “True” and the IP Address matches with the IP Address from PLC.

Once done, select “OK” then select “Run” to return to main screen.

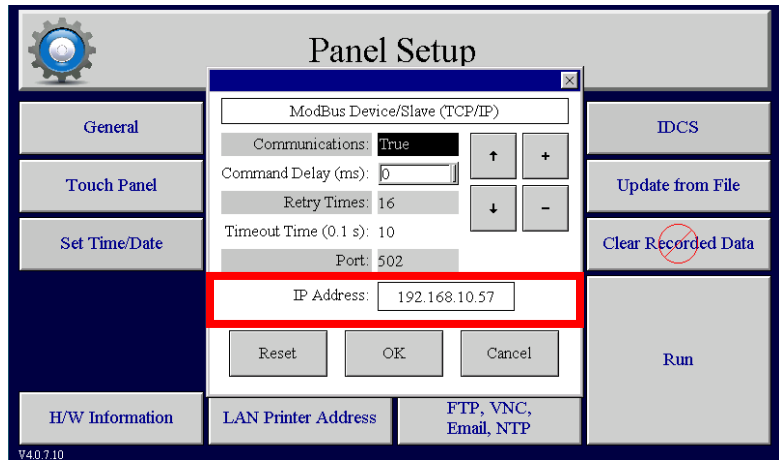
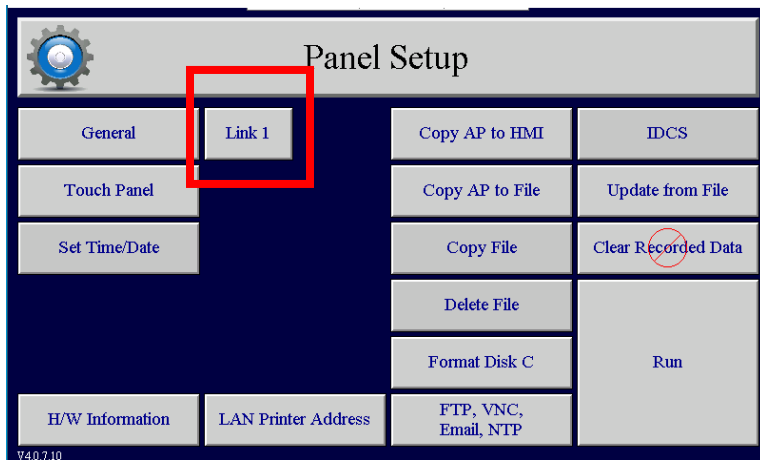


Figure 26: Configuring communication to PLC device

PANEL SETUP FOR REMOTE COMMUNICATION:

The IP Address and Ethernet Port setting for the HMI is in “General.”

You can change the IP Address of the HMI as well as other communications settings here.

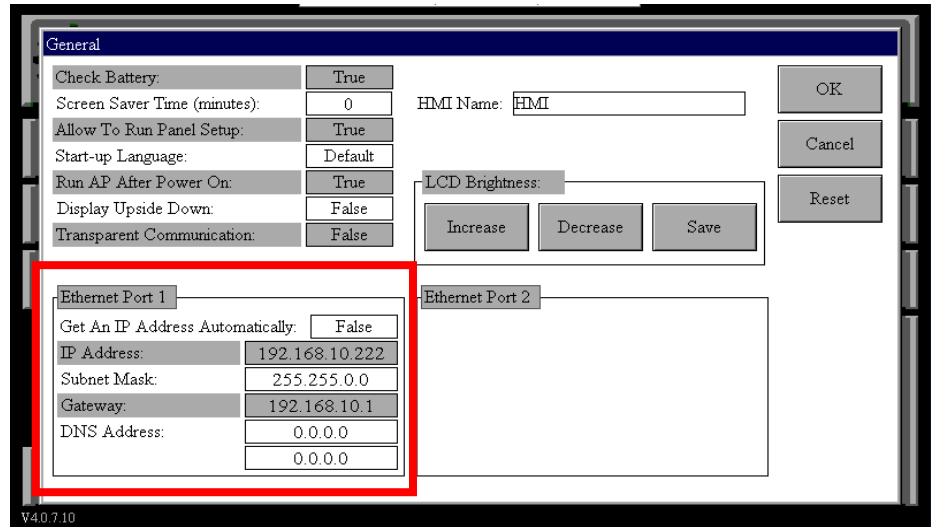
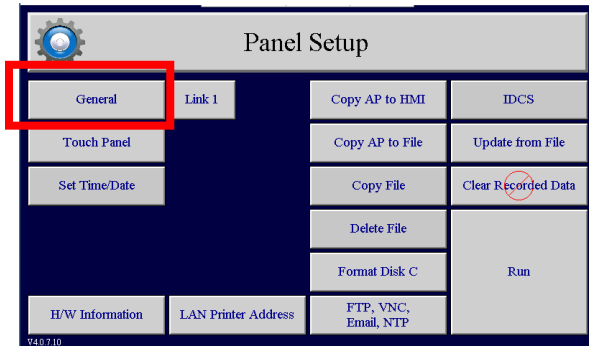


Figure 27: Configuration for HMI Ethernet Port

PUMPS AND FANS SET UP MENU:

If you would like to enable or disable any pumps or fans, click on the pumps or fans available on the main screen then select "SETTINGS." On the top right corner of the screen

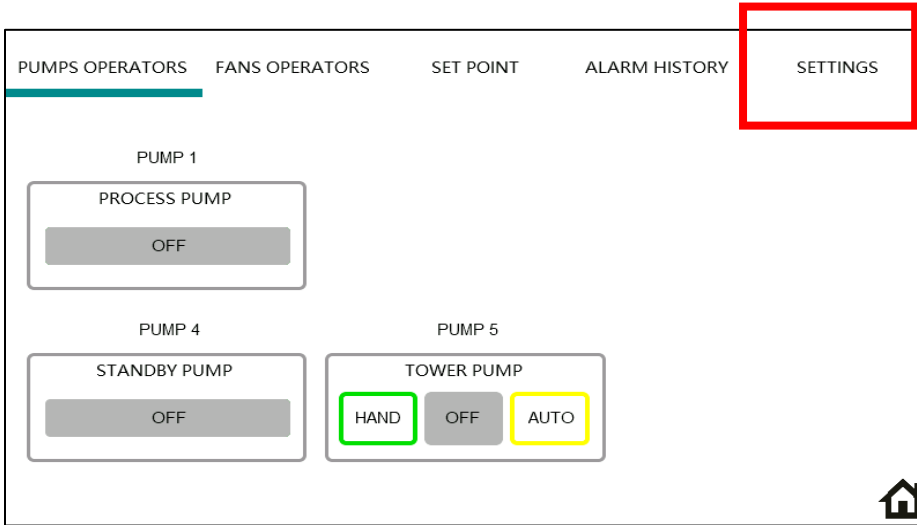


Figure 28: Pumps operators window

Select "PUMPS" or "FANS" tab on the top of the screen to access pumps or fans setting menu, In pumps setting menu you will be able to see PROCESS PUMP and STAGE PUMP tab as shown in **Figure 29**.

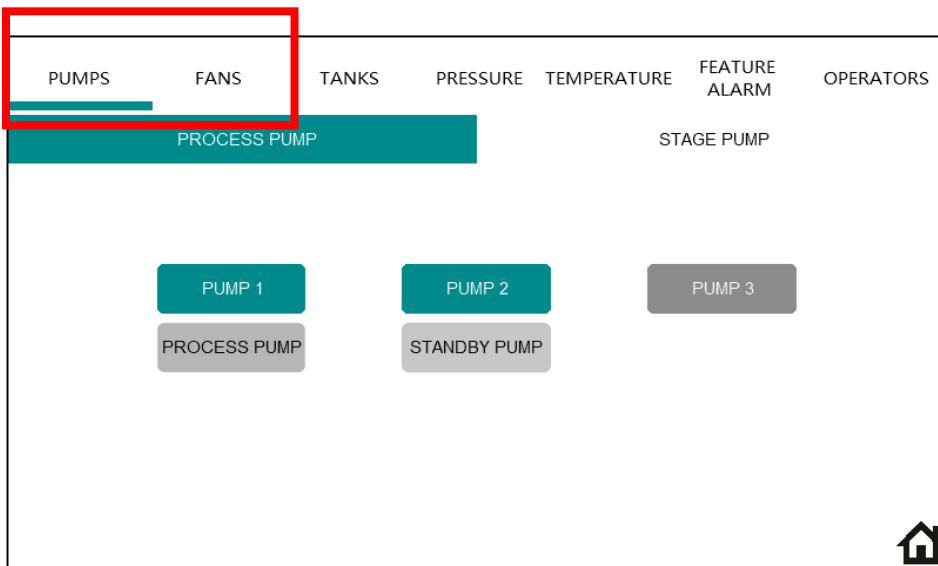


Figure 29: Process Pump setting menu window

Select each pump or fan button in order to enable or disable each pump and or fan. If pumps or fans are enabled, you will be able to see a grey box show up under each pump and or fans button. You can select on the grey box to name and rename each pump or fan. See **Figure 30**.

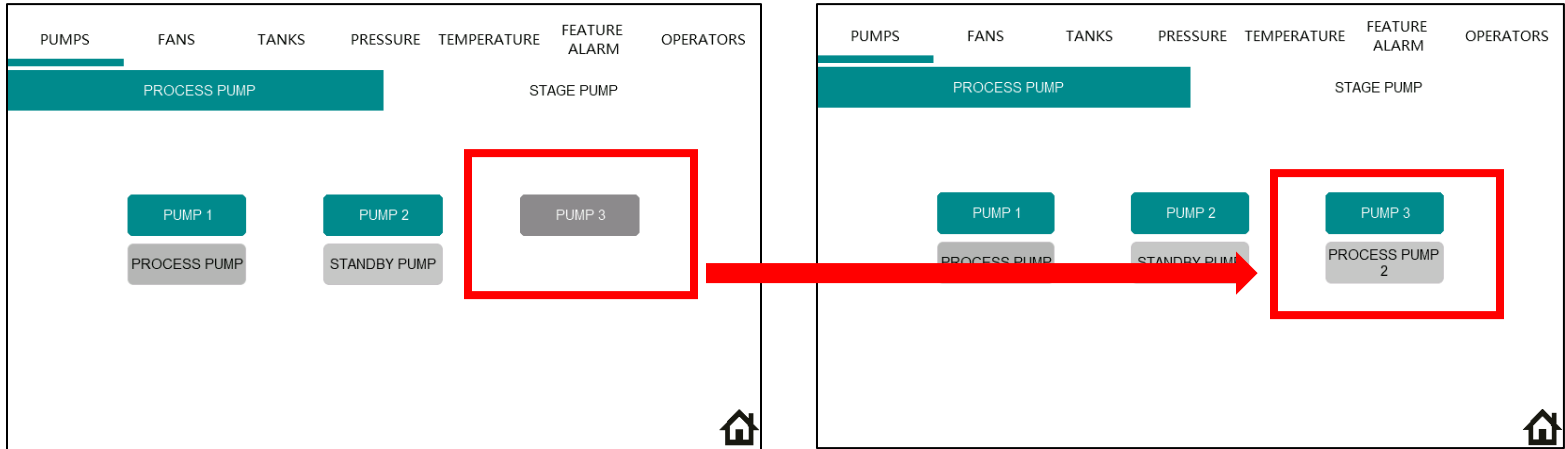


Figure 30: Enabled PUMP 3 and naming PUMP 3 as “PROCESS PUMP 2”

STAGE PUMP will have an extra button to enabled and disabled auto stage.

If **AUTO STAGE DISABLED**: You will be able to see the pump operator for stage pump available as HAND and OFF as shown in “PUMP 4” set up in **Figure 31**

If **AUTO STAGE ENABLED**: You will be able to see the pump operator for stage pump available as HAND OFF and AUTO as shown in “PUMP 5” set up in **Figure 31**

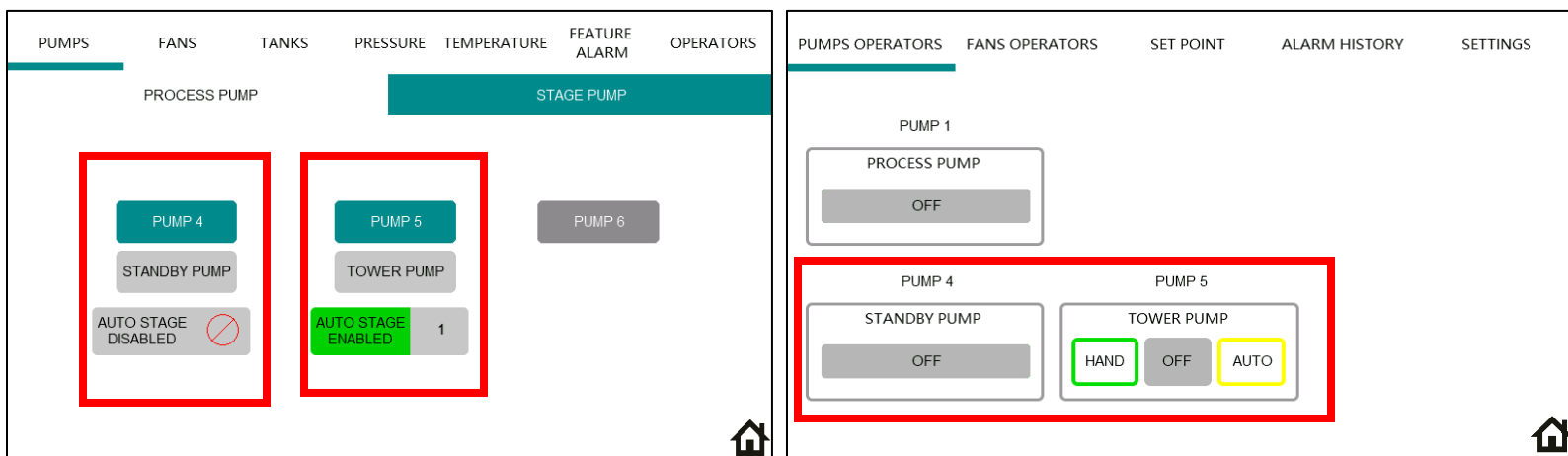


Figure 31: Example of stage pumps with auto stage disabled (Pump 4) and auto stage enabled (Pump 5)

To adjust the stages of stage pumps and or fans, select the grey button next to “AUTO STAGE ENABLED” and the stages set up window for each specific pumps or fans will pop up as shown in **Figure 32**.

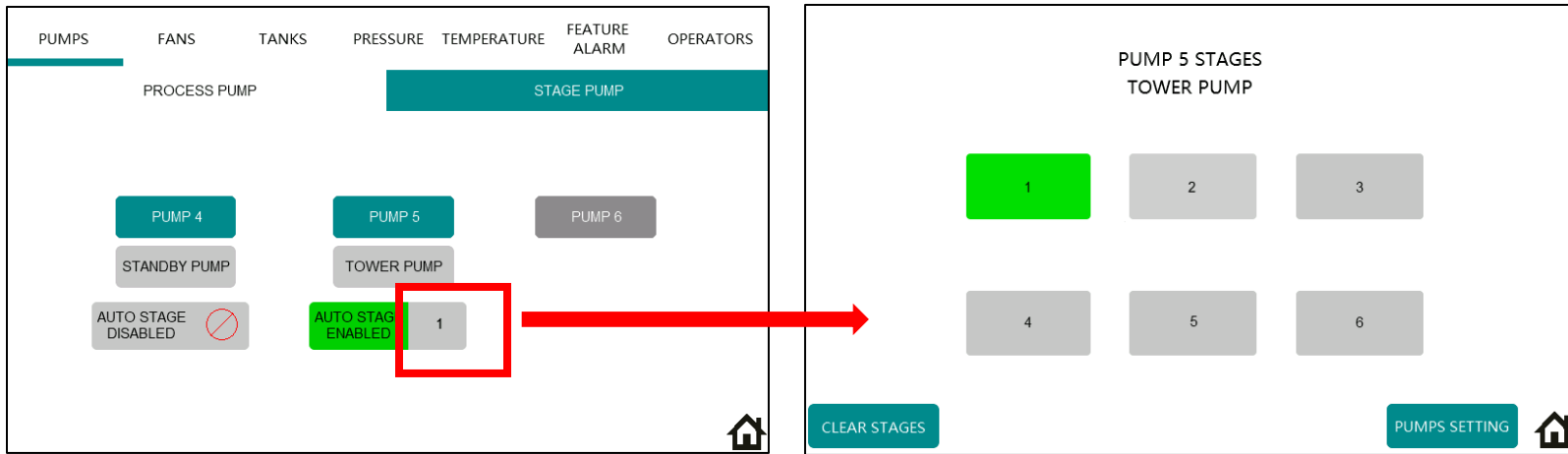


Figure 32: Accessing pump 5 auto stages set up menu.

TEMPERATURE LIMIT SETTING:

From the temperature monitoring menu, select “TEMPERATURE LIMIT SETTING” in order to access Low temperature alarm, High temperature alarm and High temperature shut off. **Figure 33** shows that “TEMPERATURE LIMIT SETTING” button located on the bottom right corner of the temperature monitoring screen.

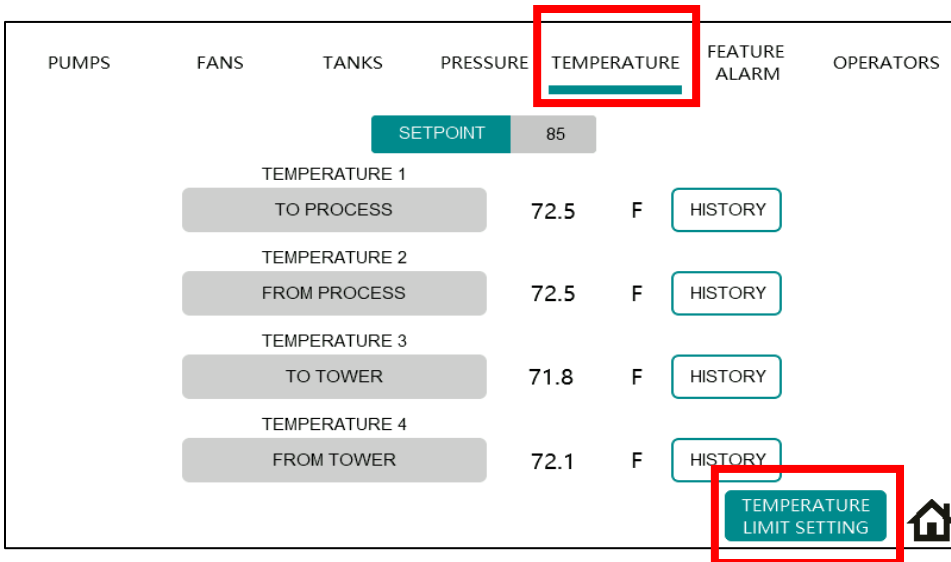


Figure 33: Access Temperature limit setting window from Temperature monitoring screen

You can adjust the temperature limit for Low temperature and high temperature limit alarm, this function cannot be disable. High temperature shut off will shut off the system once water temperature (Temperature 1) is going above the limit set point. This function can be enable and disable. See **Figure 34**.

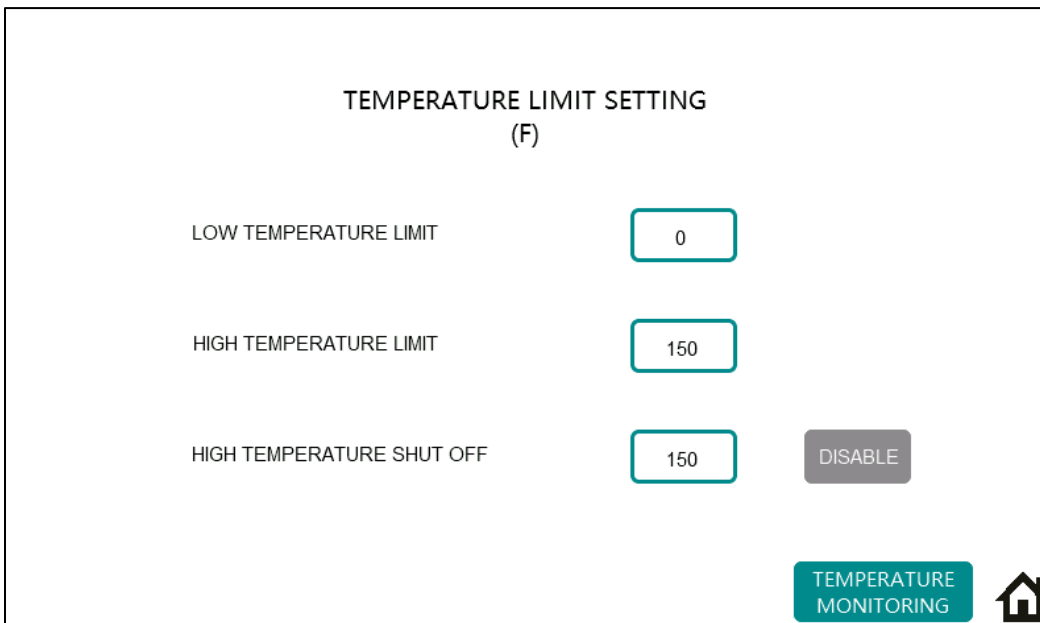


Figure 34: Temperature limit setting window

PRESSURE LIMIT SETTING:

Pressure Limit alarm setting can be accessed from Water Pressure Monitoring screen as shown in **Figure 35**.

You can only set up an alarm for pressure 1 and 2 low pressure, this alarm function can be enable and disable.

See **Figure 36**.

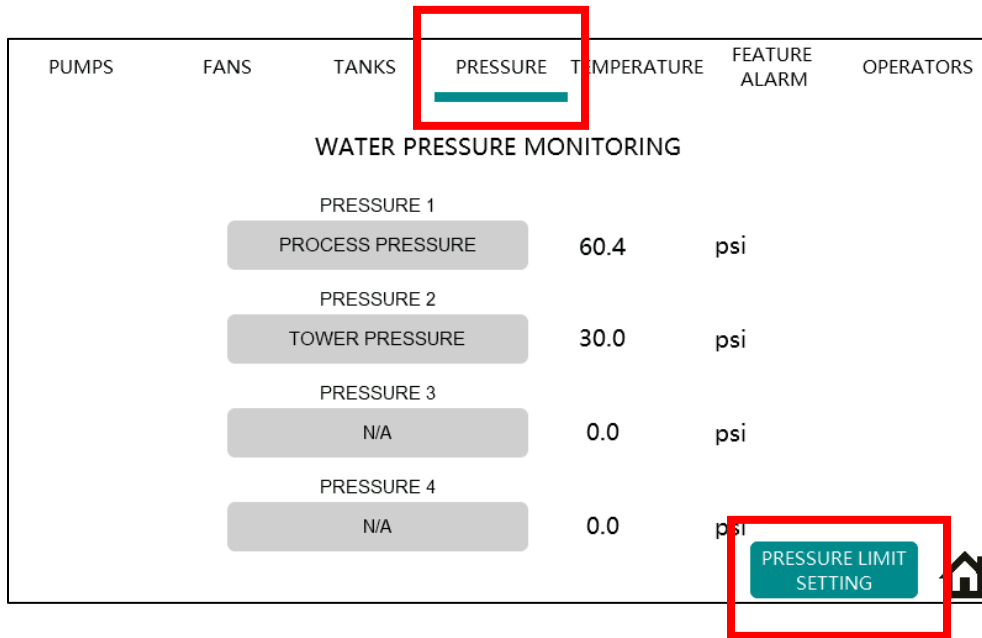


Figure 35: Accessing Pressure limit setting window from Water pressure monitoring screen.

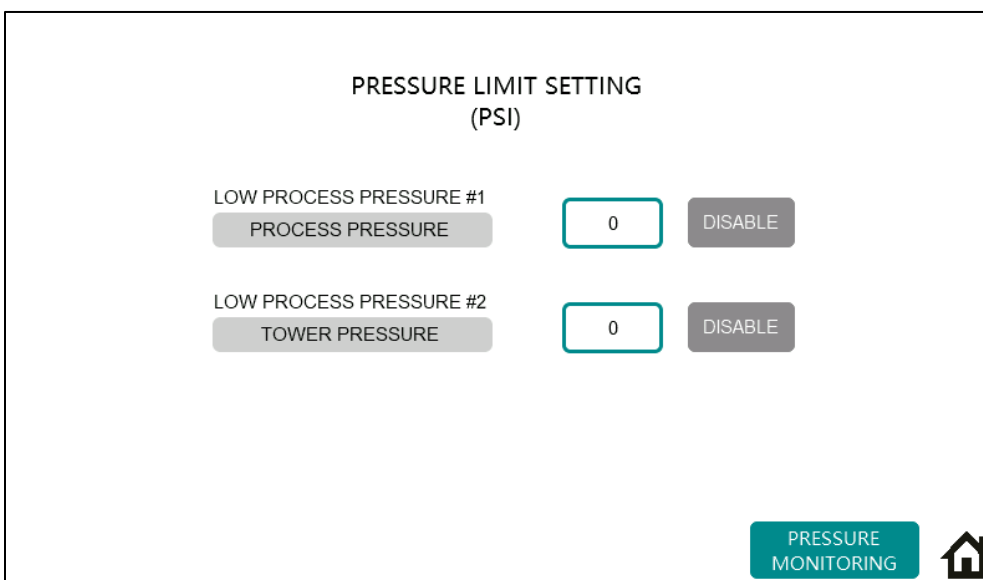


Figure 36: Pressure Limit Setting for pressure 1 and pressure 2 low pressure alarm

41543

Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Tank 1 Low Level	Low Pressure 2	Low Pressure 1	High Temp	Low Temp	Featured Alarm 2	Featured Alarm 1	Fan 3 O/L	Fan 2 O/L	Fan 1 O/L	Pump 6 O/L	Pump 5 O/L	Pump 4 O/L	Pump 3 O/L	Pump 2 O/L	Pump 1 O/L

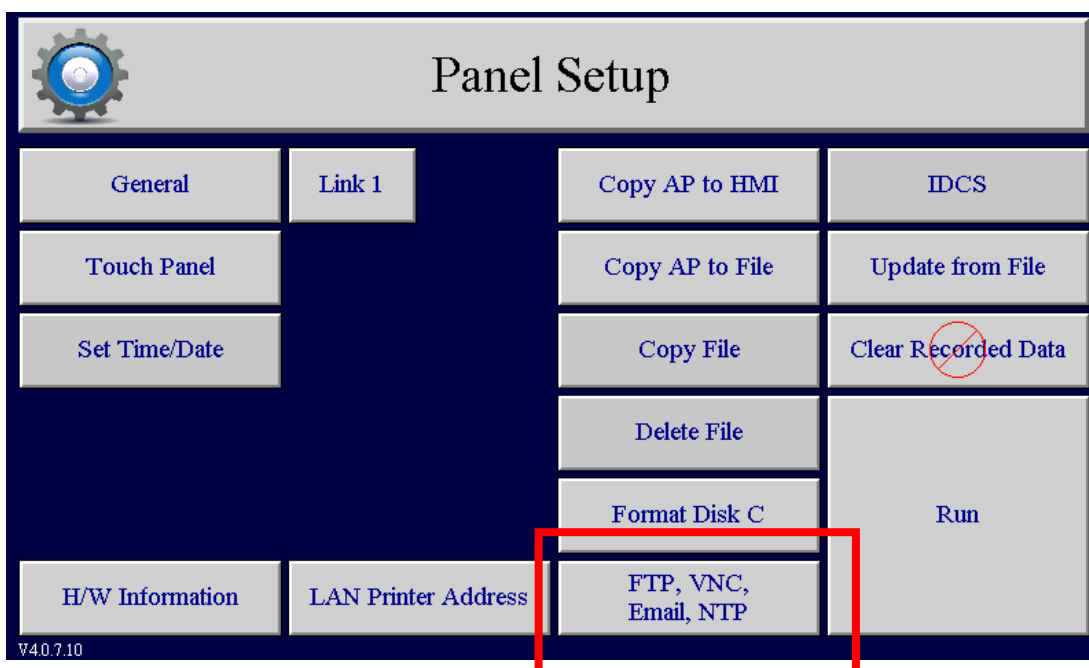
41544

Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
								Emergency Stop	Master Switch	High Temp Shutdown	Tank 2 Shut off	Tank 2 High Level	Tank 2 Low Level	Tank 1 Shut off	Tank 1 High Level

44499	Temperature Setpoint	F
44500	Temperature 1	F
44501	Temperature 2	F
44502	Temperature 3	F
44503	Temperature 4	F
44504	Pressure 1	PSI
44505	Pressure 2	PSI
44506	Pressure 3	PSI
44507	Pressure 4	PSI
44508	Tank 1 Water Level	%
44509	Tank 2 Water Level	%

E-MAIL SETUP FOR ALARM AND TEMPERATURE DATA LOGGIN:

1. Setup and verify a Google email account.
2. Enabled 2 Steps verification on your Gmail account
3. In Google Account
 - Go to Home
 - In the search bar type: "APP PASSWORD"
 - Create an App name – this can be anything such as ViewMate
 - A 16-digit code will be provided
4. In ViewMate Panel Set up
 - Select "FTP, VNC, Enail, NTP" button then Select "Email"



- Once in email set up screen, enter Gmail information

SMTP Server: smtp.gmail.com

SMTP Server Port: 465

Encryption: SSL

Username: Your Gmail address

Password: The 16-digit code from you Gmail account in step 3

To Mail boxes: E-mail addresses of who you would like to receive all the notification

Once done select “Test Sending Mail” to send the testing email. If success, the screen will display “The test succeeded.”

- Select “OK” then select “RUN” to return to ViewMate main screen

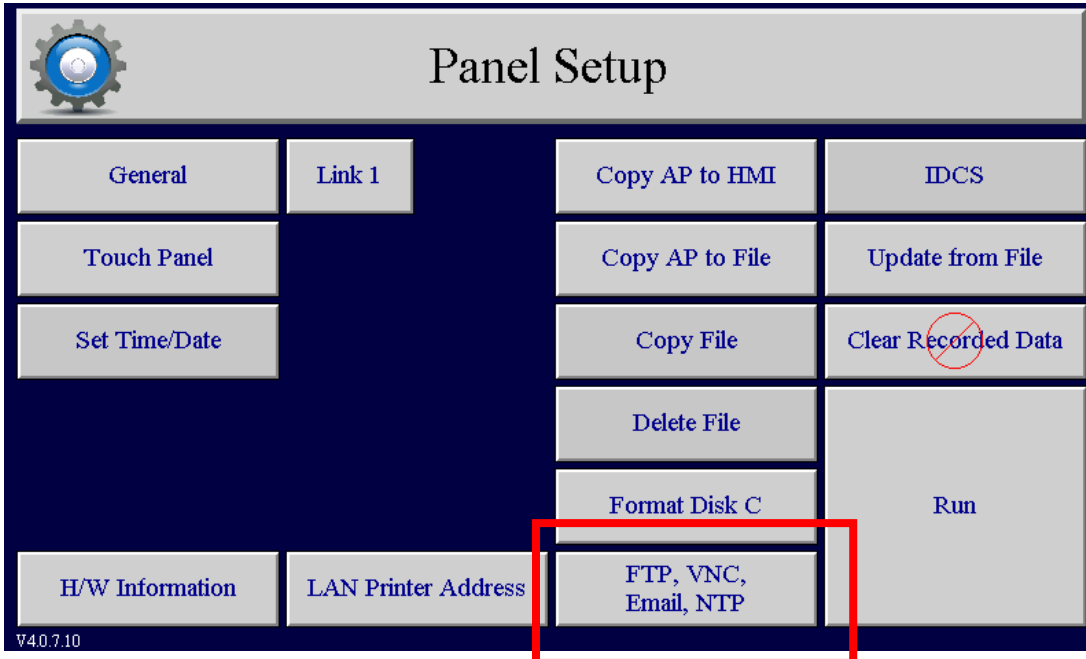
The screenshot shows a software configuration window with four tabs: FTP, VNC, Email, and NTP. The 'Email' tab is active. The configuration fields are as follows:

Field	Value
Enable:	True
SMTP Server:	smtp.gmail.com
SMTP Server Port:	465
Encryption:	SSL
User Name:	advantageengineering3@gmail.com
Password:	*****
From Mail Box:	
To Mail Boxes:	1. snuiprasit@advantageengineering.com
	2.
	3.
	4.
Subject:	
Reminder Interval:	0 minute(s)
Transmission Delay:	0 second(s)

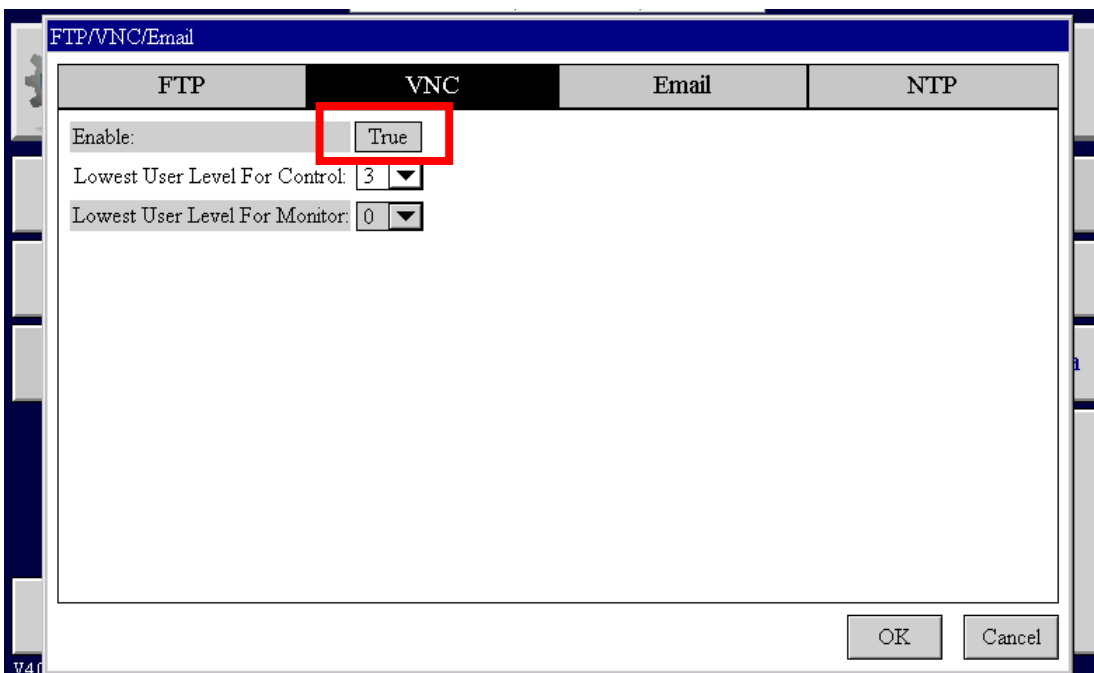
At the bottom right, there are three buttons: 'Test Sending Mail', 'OK', and 'Cancel'. These buttons are enclosed in a red rectangular box.

VNC SETUP FOR REMOTE MONITORING:

1. In ViewMate Panel Set Up
 - Select “FTP, VNC, Email, NTP” then select “VNC”



2. Once in VNC setup window
 - Select “True” to Enable VNC



3. On VNC Viewer software, search for the ViewMate IP Address (see page 20) to connect to the ViewMate for remote monitoring.

