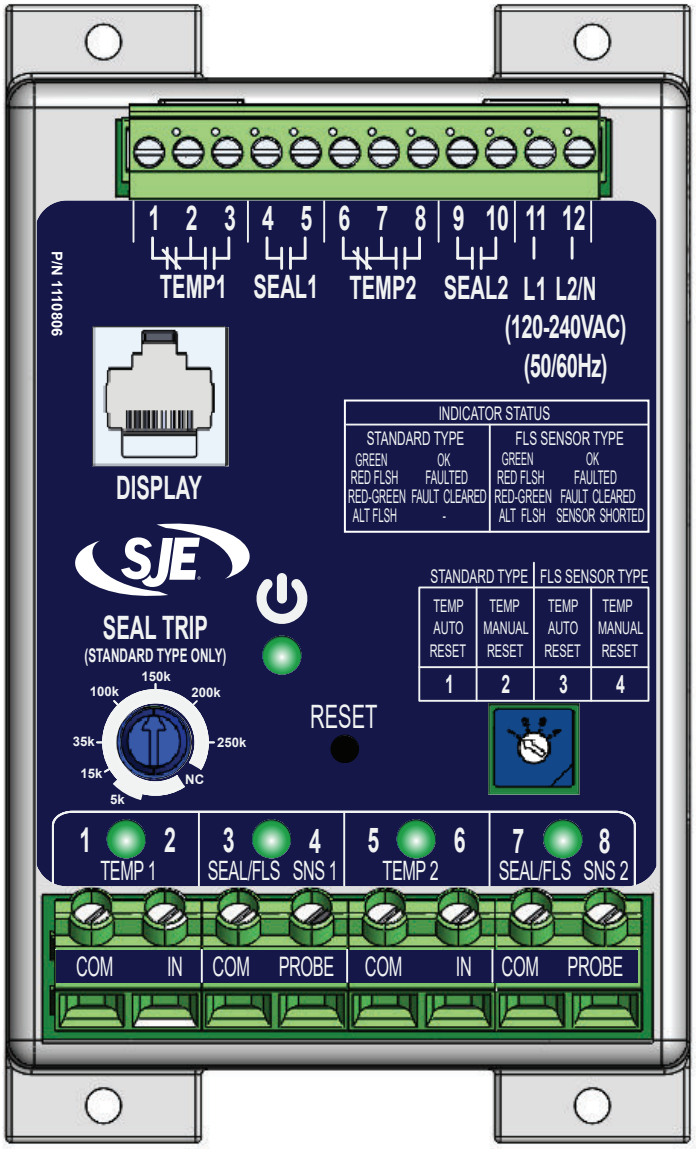
# MODEL DPM-240

## DUAL CHANNEL SEAL FAILURE & OVER TEMPERATURE ALARM RELAY

# User Manual





Manufactured by: SJE Inc.
Technical support: +1-800-746-6287
techsupport@sjeinc.com

www.csicontrols.com www.primexcontrols.com www.sjerhombus.com

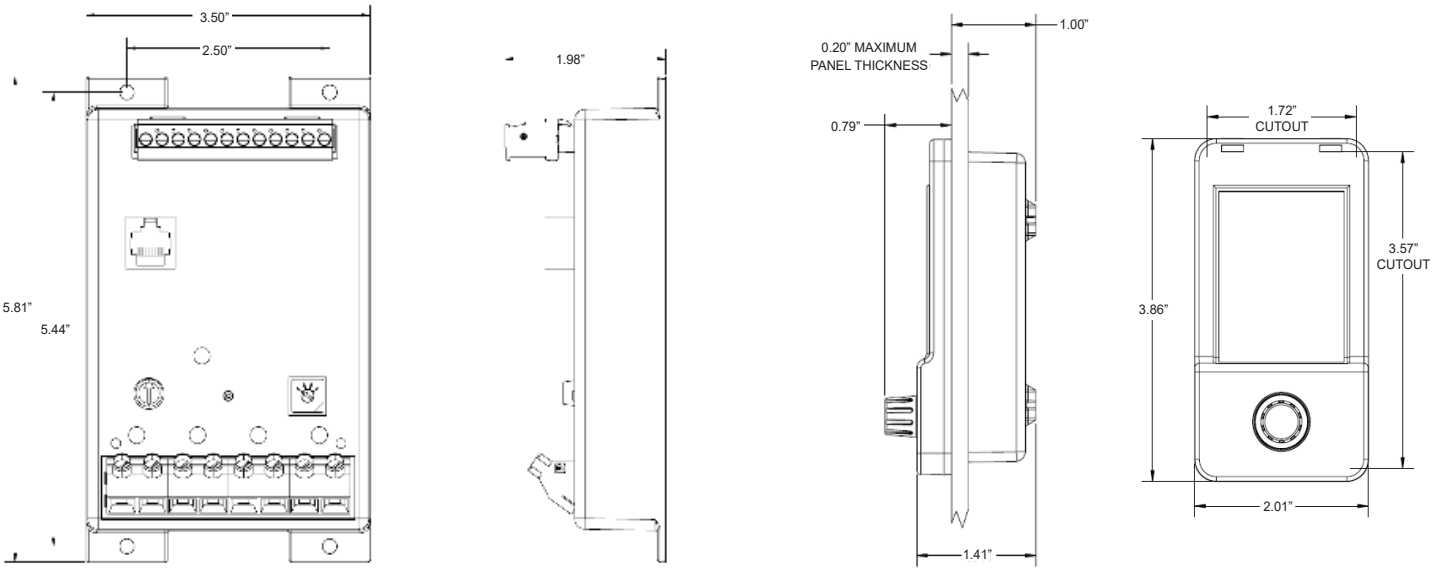
# TABLE OF CONTENTS

# OVERVIEW

The DPM-240 dual channel module pump monitor is designed to protect two submersible pumps against damage resulting from seal failure and over temperature. In Modes 1 & 2, the resistance of the seal sensor and temp sensor in each pump is continuously monitored and alarms when the seal sensor resistance drops below the adjustable trip level and alarms on a temp failure when the sensor is open. In Modes 3 & 4, the resistance of combined seal/temp sensor in each pump is continuously monitored and faults on a temp failure when the sensor is open and faults on a seal fail when the resistance drops below 400 Ohms. The measured resistance in the pump seal chamber drops as the seal leaks and contaminants enter. Each input has a corresponding output relay and indicating LED which are activated during a fault condition. The module is equipped with a Seal Trip Adjustment dial, a manual reset button, and a 4-position mode selector switch.

# FEATURES/SPECIFICATIONS

- Input Voltage: 120~240 VAC (50/60 Hz)
- Transient Protection: 30kV air/contact
- Input/Output Isolation Voltage: 4,300VAC
- Sensor Voltage: 24VDC, 5mA (TEMP), 24VDC, 0.5mA (SEAL)
- Max sensor cable length: 328 feet (100m)
- Power consumption: 2 VA
- Seal fail sensitivity: 5K Ω to 250K Ω (Adjustable – Modes 1&2)
- Relay rating: 5A, 240VAC max. 10M operation (Mechanical)
- Indicators: Green / Flashing red LED for each input
- Operating Temperature: -18°F ~ 140°F (-28°C ~ 60°C)
- Storage Temperature: -40°F ~185°F (-40°C ~ 85°C)
- Weight: 7.5 oz (213 g)




(Optional Display)

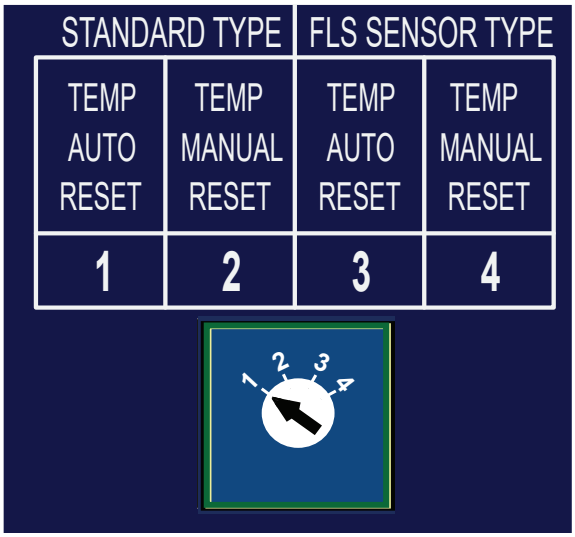
# FUNCTION

## Output Contacts

Temp Fault contacts shall be held in an energized state when no Temp Fault is present. During a Temp Fault or when the DPM-240 loses power, the Temp Fault contact shall de-energize and the state shall change from “normal”.

Seal Fault contacts shall be in an open state when no Seal Fault is present. During a Seal Fault, the Seal Fault contact shall energize, and the state shall change from “normal”. The seal sensor shall be wired to either the “SEAL/FLS SNS 1” input for motor 1, or “SEAL/FLS SNS 2” input for motor 2.

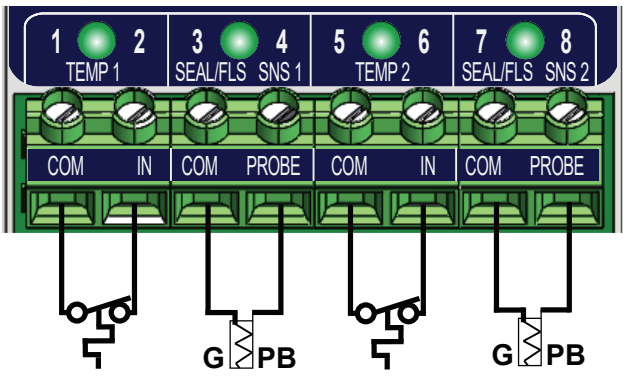
## Mode Selection




Mode Selector Switch

## Modes 1 & 2

Modes 1 & 2 are used when a standard 2-wire motor temp switch is used in conjunction with a standard 2-wire pump seal leak sensor.  The motor temp switch leads of Pump 1 shall be wired to “TEMP 1” input terminals (1 & 2), and the leads for Pump 2 to “TEMP 2” terminals (5 & 6).



## Temp Fault

The module will monitor the motor temp switch and will activate a Temp Fault when the motor temp switch opens. The indicator for the faulted input will flash red and the corresponding output contacts shall change state during an active Temp Fault.

In MODE 1 when the motor temp switch returns to a non-faulted condition, the Temp Fault will cease and the indicator for the faulted input will alternate flash between green and red and corresponding output contacts shall return to the normal state. The RESET button can be pressed to acknowledge the automatically cleared fault, which will set the corresponding indicator to solid green.

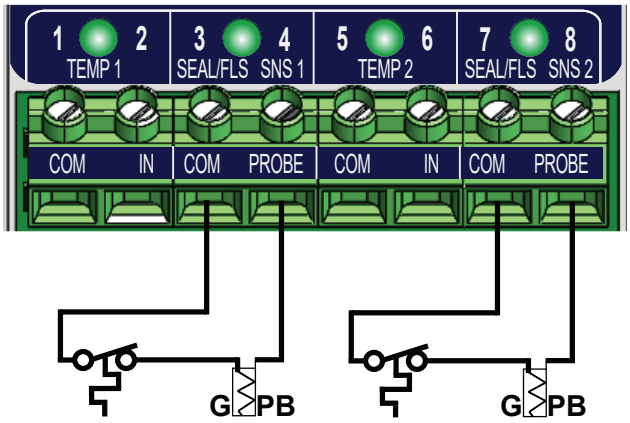
In MODE 2, when the motor temp switch returns to a non-faulted condition, the module will continue to indicate a Temp Fault. Once the RESET button is pressed, the Temp Fault will cease, the corresponding output contacts shall return to the normal state and the indicator for the faulted input shall be set to solid green. If the RESET button is pressed and the temp switch contacts are still in a faulted condidtion, the Temp Fault will remain active.

## Seal Fault

Modes 1 & 2 are used when a standard 2-wire pump seal leak sensor is used with or without a standard 2-wire motor temp switch.The module will monitor the pump seal sensor and will activate a Seal Fault when the pump seal sensor resistance drops below the Seal Trip setting. The indicator for the faulted input will flash red and the corresponding output contacts shall change state during an active Seal Fault. If the pump seal sensor returns to a non-faulted condition, the Seal Fault will cease and the indicator for the faulted input will alternate between green and red and corresponding output contacts shall return to the normal state. The RESET button can be pressed to acknowledge the automatically cleared fault, which will set the corresponding Seal Fault indicator to solid green.

## Modes 3 & 4

These modes are used to monitor a 2-wire combination motor temp switch and pump seal leak sensor.




The module will monitor the pump temp/seal sensor and will activate a Temp Fault when the pump temp/seal sensor measures an open circuit or above 1530Ω. The temp indicator for the faulted input will flash red and the corresponding temp output contacts shall change state during an active Temp Fault.

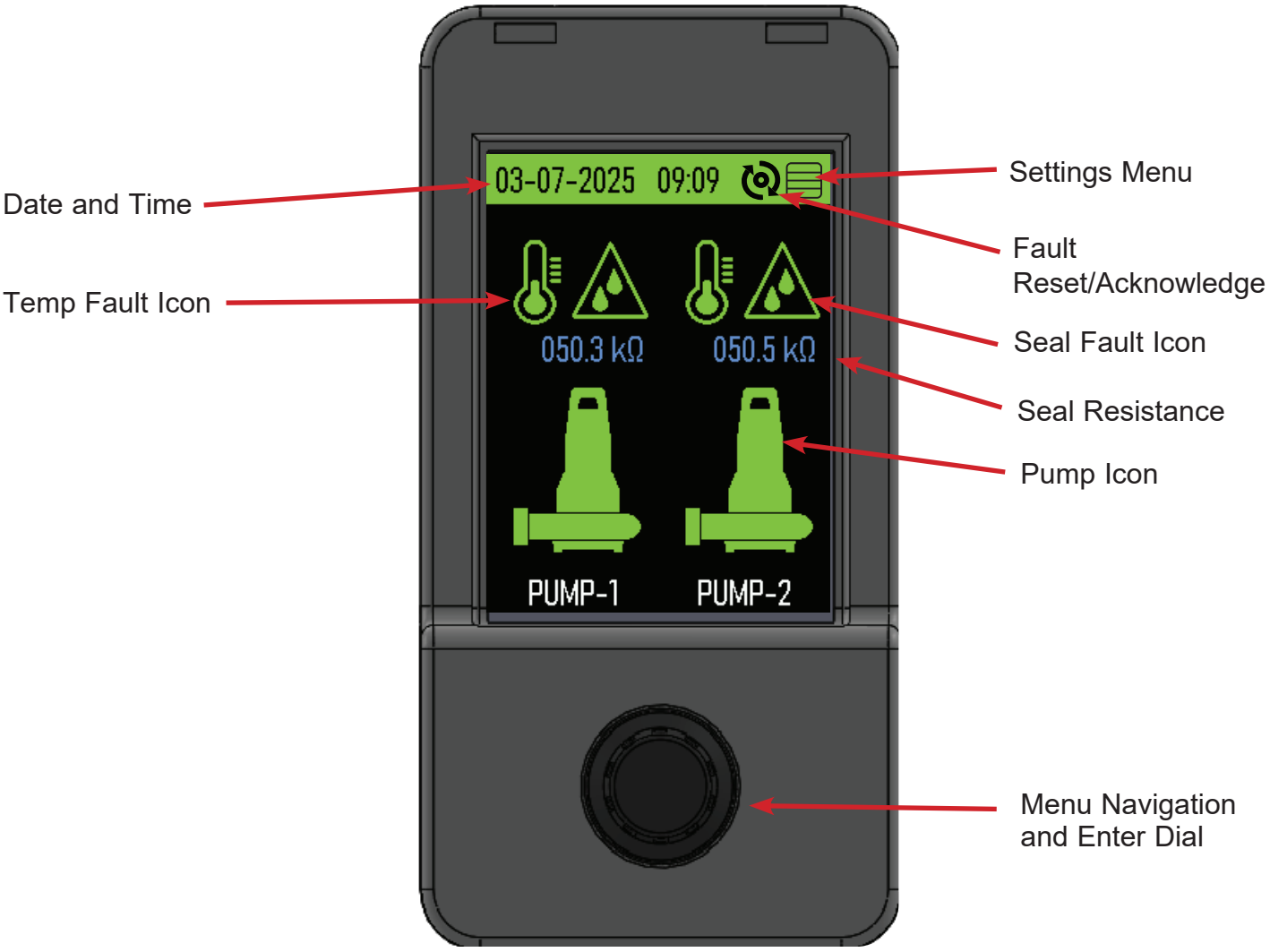
In MODE 3 when the pump temp/seal sensor returns to the normal state, the Temp Fault will cease and the temp indicator for the faulted input will alternate flash between green and red and the corresponding output contacts shall return to the normal state. If the pump temp/seal sensor measures less than 400Ω, but greater than 50Ω, the seal indicator for the faulted input will flash red and the corresponding seal output contacts shall change state. If the pump temp/seal sensor returns to the normal state, the seal indicator for the faulted input will alternate flash between green and red and the corresponding output contacts shall return to the normal state. If the pump temp/seal sensor measures less than 50Ω, the corresponding temp indicator and seal indicators shall alternate flash red. The RESET button can be pressed to acknowledge an automatically cleared fault, which will set the corresponding temp or seal indicator to solid green.

In MODE 4, when the pump temp/seal sensor returns to a normal state, the module will continue to indicate a Temp Fault. If the pump temp/seal sensor measures less than 400Ω, but greater than 50Ω, the seal indicator for the faulted input will flash red and the corresponding seal output contacts shall change state. If the pump temp/seal sensor measures less than 50Ω, the corresponding temp indicator and seal indicators shall alternate flash red. After any Temp Fault has cleared and the RESET button is pressed, the Temp Fault will cease, the corresponding temp output contacts shall return to the normal state and the indicator for the faulted temp input shall be set to solid green. If the RESET button is pressed and the pump temp/seal sensor is in a faulted state, the Temp Fault will remain active.

## Seal Fault

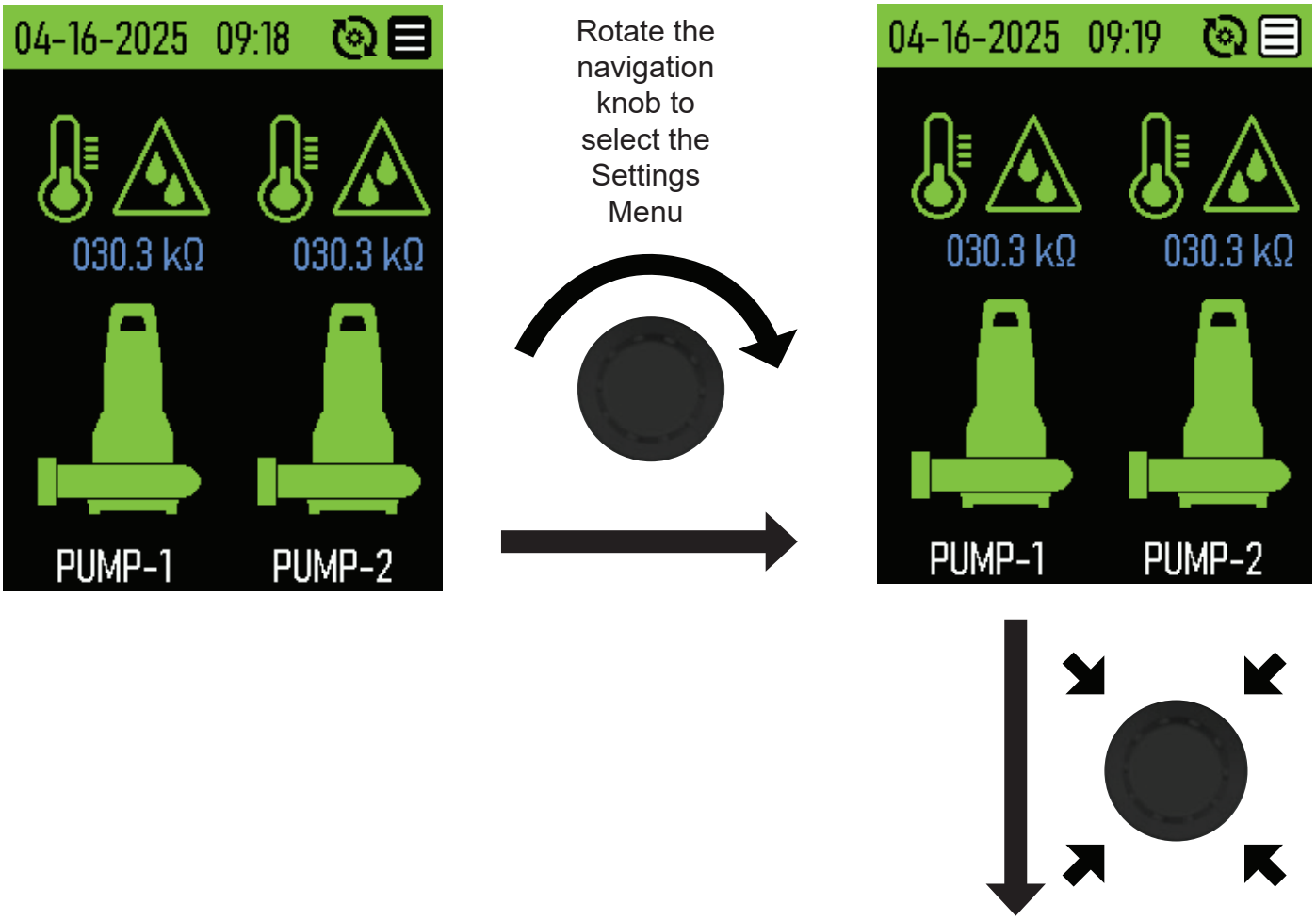
Modes 3 & 4 are used to monitor a 2-wire combination pump temp/seal sensor, commonly known as an “FLS” sensor. The pump temp/seal sensor shall be wired to either the “SEAL/FLS SNS 1” input for motor 1, or “SEAL/FLS SNS 2” input for motor 2. The module will monitor the pump temp/seal sensor and will activate a Seal Fault when the pump temp/seal sensor resistance drops below 400Ω, but above 50Ω. The indicator for the faulted input will flash red and the corresponding output contacts shall change state during an active Seal Fault. When the pump temp/seal sensor returns to a normal state, the Seal Fault will cease and the indicator for the faulted input will alternate flash between green and red and corresponding output contacts shall return to the normal state. If the pump temp/seal sensor measures less than 50Ω, the corresponding temp indicator and seal indicators shall alternate flashing red. The RESET button can be pressed to acknowledge the automatically cleared fault, which will set the corresponding indicator to solid green.

# OPTIONAL DPM-240 DISPLAY OPERATION




Upon a Temp Fault, the pump and thermometer warning graphic will alternate between red and amber. Upon a Seal Fault, the pump and water droplet warning graphic will alternate between red and amber. In the automatic reset modes (Modes 1&3), when the pump temp and/or seal sensors return to the normal state, the pump graphic shall turn green and the corresponding fault graphic shall alternate green and red to indicate the fault has automatically reset, but a fault acknowledge has not yet occurred. To acknowledge an automatically reset fault, select the reset icon on the display's top banner or at the top of the main menu, which will change the corresponding fault icon to solid green. In the manual reset modes (Modes 2&4), the pump graphic and thermometer warning graphic will continue to alternate between red and amber until the pump temp and/or seal sensors return to the normal state and the reset icon on the display's top banner or at the top of the main menu is selected.

## Settings Navigation



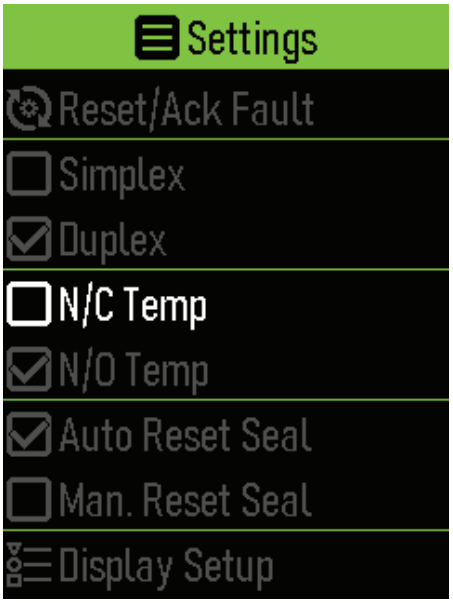

To exit any menu, select Back. Settings screens will exit upon selecting a green checkmark for save or red X for cancel. Log screens will exit upon pressing enter. Reset/Ack Faults can be selected from this main menu for any manually resettable faults that have been cleared or to acknowledge any automatically cleared faults.

## Duplex/Simplex Selection

The controller display can be configured to view either one or two pumps. If “Duplex” is selected, the status of both pump monitors will be displayed. If “Simplex” is selected, only the pump monitored by the Temp1/Seal 1 inputs will be displayed.


## N\C or N\O Temp Selection

The controller can be configured to monitor either a normally closed (N/C or normally open (N/O) thermal overload contact. If “N/C Temp” is selected, the module will activate a Temp Fault when the Temp 1 and/or the Temp 2 inputs see an open circuit between the “COM” and “IN” terminals for either input. If “N/O Temp” is selected, the module will activate a Temp Fault when the Temp 1 and/or the Temp 2 inputs see a closed circuit between the “COM” and “IN” terminals for either input. The N/C or N/O Temp selection is only available for controller Modes 1 and 2.




## Auto or Manual Seal Fail Reset Selection

The controller can be configured to either automatically reset after a Seal Fault event or require a manual reset to clear the Seal Fault. When “Auto Reset Seal” is selected, the module will activate a Seal Fault when the seal sensor resistance is in the non-normal state and will deactivate a Seal Fault when the seal sensor resistance returns to normal. When “Man. Reset Seal” is selected, the module will activate a Seal Fault when the seal sensor resistance is in the non-normal state and will continue in the Seal Fault state even after returning to a normal state, until the RESET button is pressed or the reset icon on the display’s top banner on the main screen or at the top of the main menu is selected.

# DISPLAY SETUP

## Input Naming

The module display can be configured to display a selectable pump number for each of the two inputs. This may be needed on a multiple pump system where more than two pumps are being monitored and a unique pump number is desired. Each input can be named “PUMP-X”, where “X” is any number 0 through 9.


## Color Theme

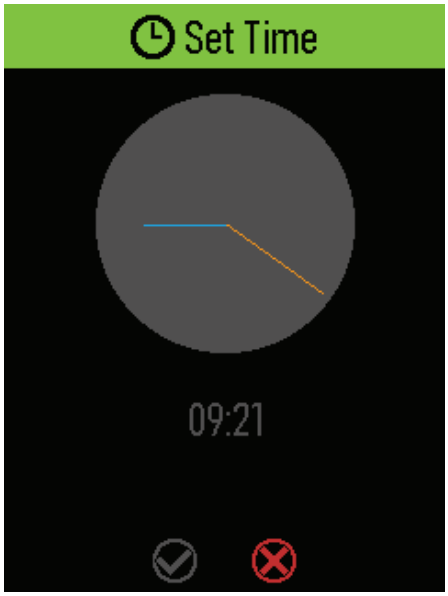
The color theme of the display can be changed to any one of three colors: Green, Orange, or Blue. This color theme generally affects the color of the status bar and accent colors.


## Language

Three languages are available: English, Spanish, and French. The language selection affects any displayed text.

## Set Time

The time should be set to the local time of the final installation location. The time format is 24h and includes hours and minutes (HH:MM). Setting the time is critical in having an accurate fault log.

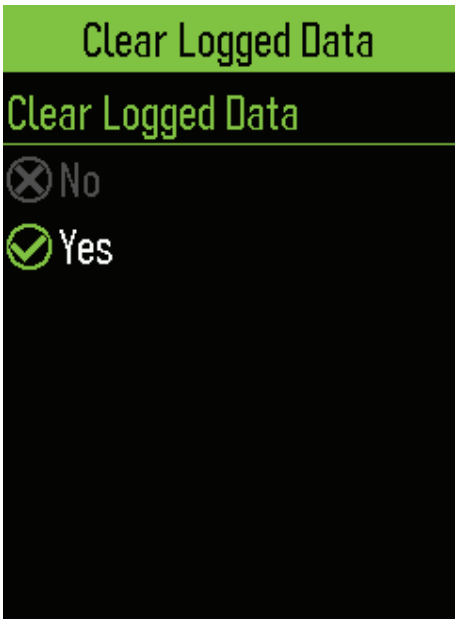



## Set Date

The date should be set to the local date of the final installation location. The date format is month, day, and year (MM-DD-YY). Setting the date is critical in having an accurate fault log.

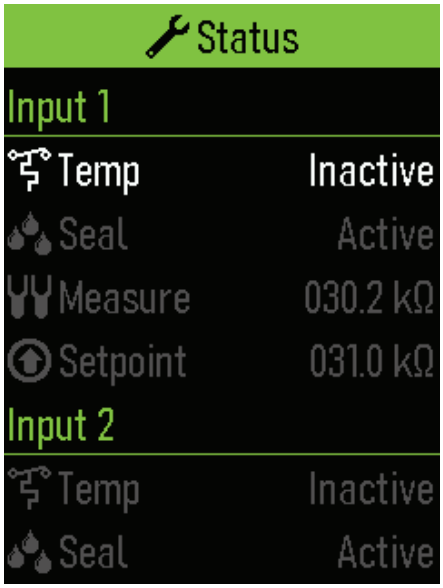

## Clear Logged Data

Select  Clear Logged Data to clear the log of faults and counts. To ensure the data is not inadvertently cleared, the request must be confirmed before any data is removed.

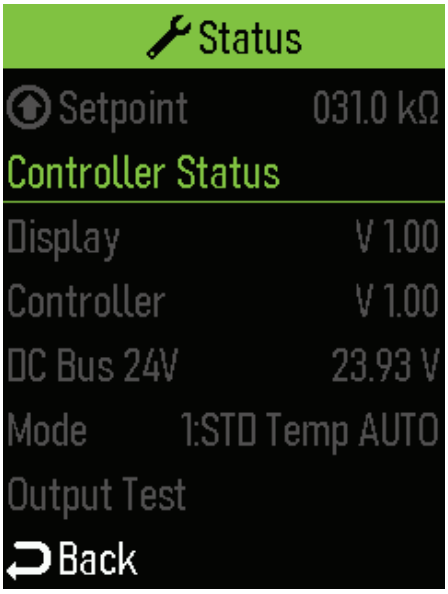


## Status

The Status screen displays the fault status of each input, the current seal sensors' resistance measurements, seal sensor trip points, firmware revisions for the display and base module, the bus voltage of the base module and the Mode Type. The Status screen is helpful for troubleshooting problems with a pump or wiring into the base module and can also help to identify a potential future problem in a pump. The Output Test function in the Status menu can be used to verify correct wiring of peripheral devices connected to the output relays. Activating the Output Test will cycle the output relays on/off from the TEMP1 relay to the SEAL2 relay.

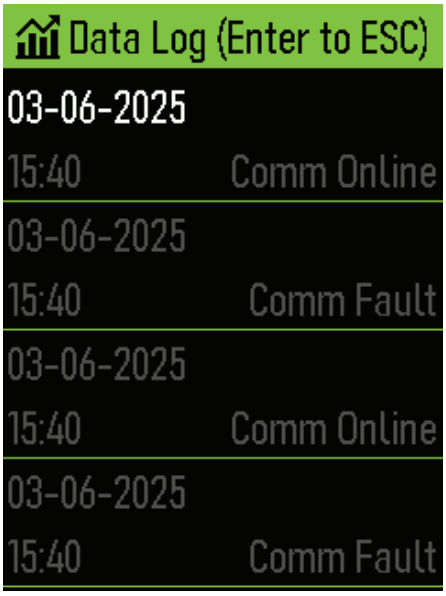







## Logged Data

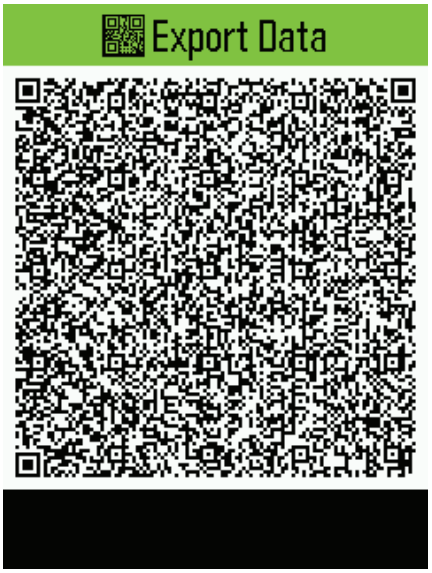
The Logged Data screen allows a user to view the last 40 fault related events stored on the base module. Events shall include the following: Temp1 Fault, Seal1 Fault, Temp2 Fault, Seal2 Fault, Power Restored, Date/Time Change, Reset/Acknowledge, Communication Online/Fault. Each event shall also be accompanied by the Date and Time that the event occurred. To exit from the logged data screen, press the enter using the navigation knob.



## Export Logged Data

The Export Logged Data screen shall allow the user to export the logged data by creating a QR code containing each event with the time/date stamp. The last 40 logged data events shall be included in the QR code, as well as the number of Temp and Seal Faults for each pump and the current measured value of the seal sensor resistance. The QR code can then be scanned by any phone and viewed in text format.

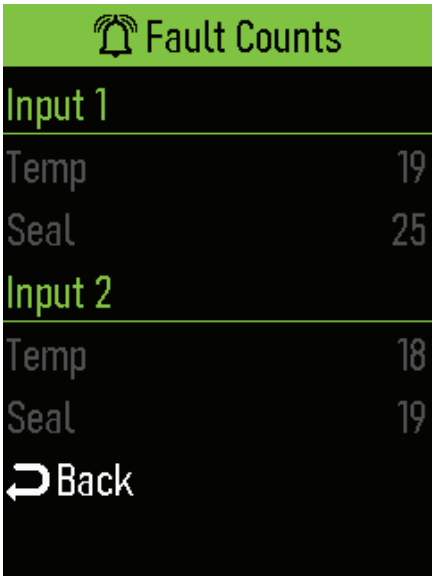
| | | |
|---|---|---|
| PWR OFF | = | Power Lost |
| PWR ON | = | Power Restored |
| COM CLR | = | Display Communication Restored |
| COM TRG | = | Display Communication Failed |
| ACK | = | Acknowledged Fault |
| DATE S | = | Date/Time Set |
| CLOCK F | = | Clock Error |
| TEMP1 C | = | Temp 1 Fault Cleared |
| TEMP1 F | = | Temp 1 Fault |
| TEMP2 C | = | Temp 2 Fault Cleared |
| TEMP2 F | = | Temp 2 Fault |
| SEAL1 C | = | Seal 1 Fault Cleared |
| SEAL1 F | = | Seal 1 Fault |
| SEAL2 C | = | Seal 2 Fault Cleared |
| SEAL2 F | = | Seal 2 Fault |




Some phones require extra steps to scan and access the logged data from the QR Code. Select the icon and select “COPY”, then open the “Notes” application, add a new document, and select PASTE. This should allow the logged data to be viewed and shared.

## Fault Counts

The Fault Counts screen shall allow the user to view the total number of Temp1, Seal1, Temp2, and Seal2 Fault occurrences. This can be useful in troubleshooting recurring pump problems.




Manufactured by: SJE Inc.
Technical support: +1-800-746-6287
techsupport@sjeinc.com

www.csicontrols.com www.primexcontrols.com www.sjerhombus.com