IC-1 Controller

Technical Manual

Version 1.1

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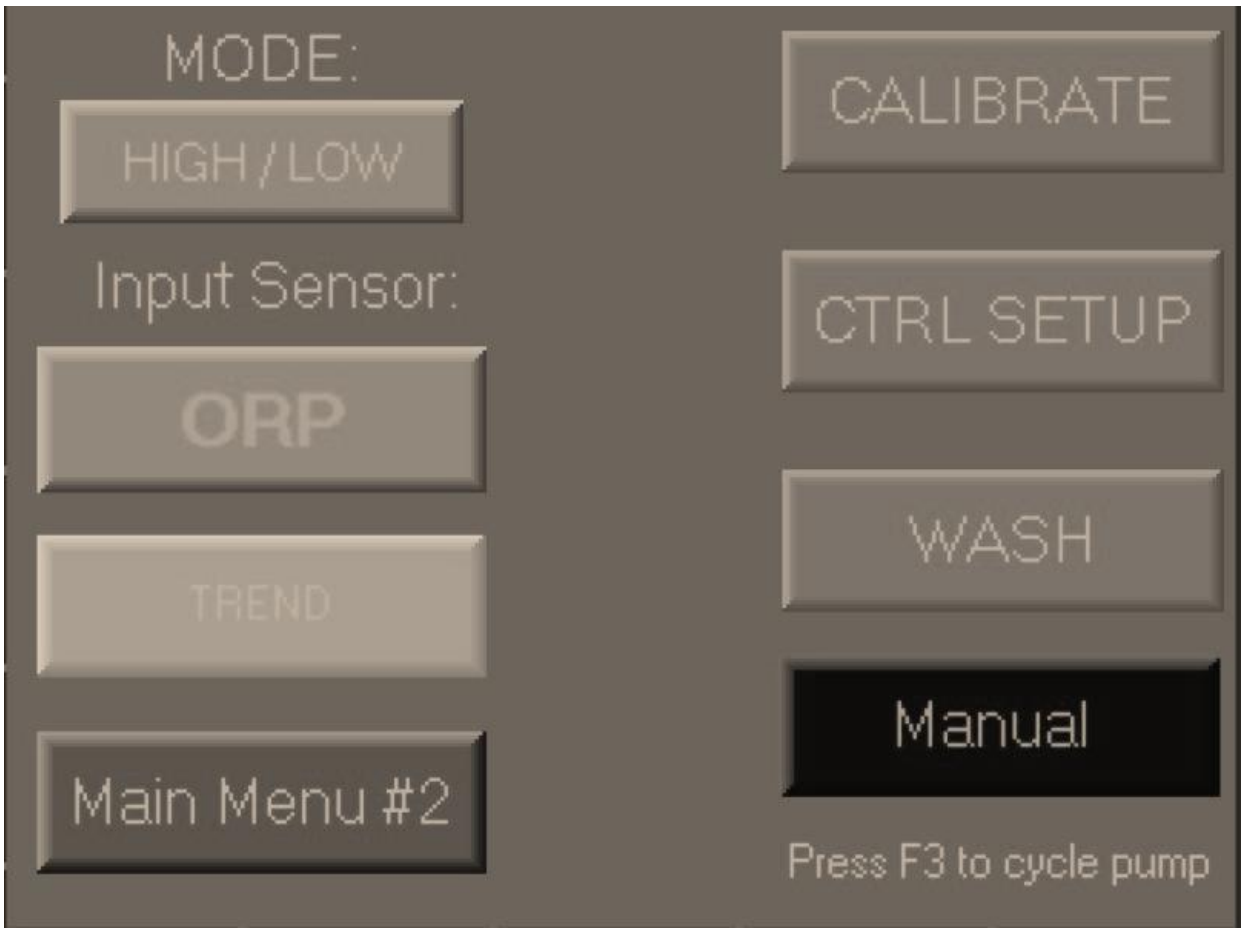
1 Introduction

The IC-1 was designed for batch style systems. With 4 modes of control it can fit most application needs.

2 Main Menu

Press ESC at any time to return to this screen.

Figure 1: Main Menu Screen



Mode: Changes mode of operation (See page 8)

Input Sensor: Chooses between ORP and pH

Trend: Takes you to the input live trending screen

Main Menu #2: Takes you to the second menu

Calibrate: Go to the sensor Calibration screen

CTRL Setup: This will take you to the setup screens for the desired control mode

Wash: Go to the Sensor wash screen

Manual: Put the system into Manual or Auto mode

3 Main Menu #2

Figure 2: Main Menu Screen #2

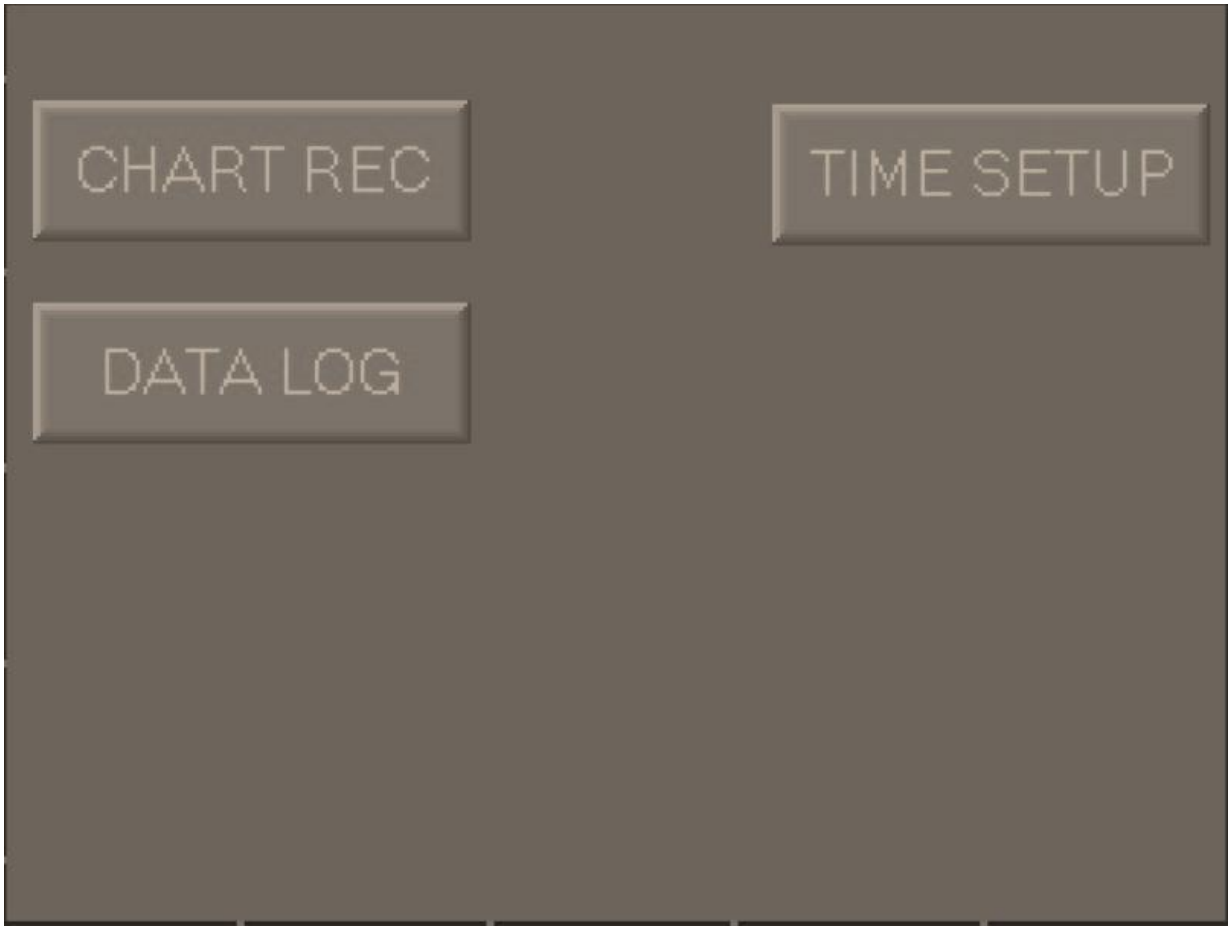


Chart Rec: Set-up 4-20mA output

Data Log: Go to data log screen for SD recording

Time Setup: Go to Time / IP setup screen

4 Mode

Monitor: This will just display the input

Hi and Low Alarms will be active and will trigger alarm relay

TBP: Time Base Proportional. This is similar to standard TBP but has a built in track aid. Alarms and overrides to help get to the set point quicker.

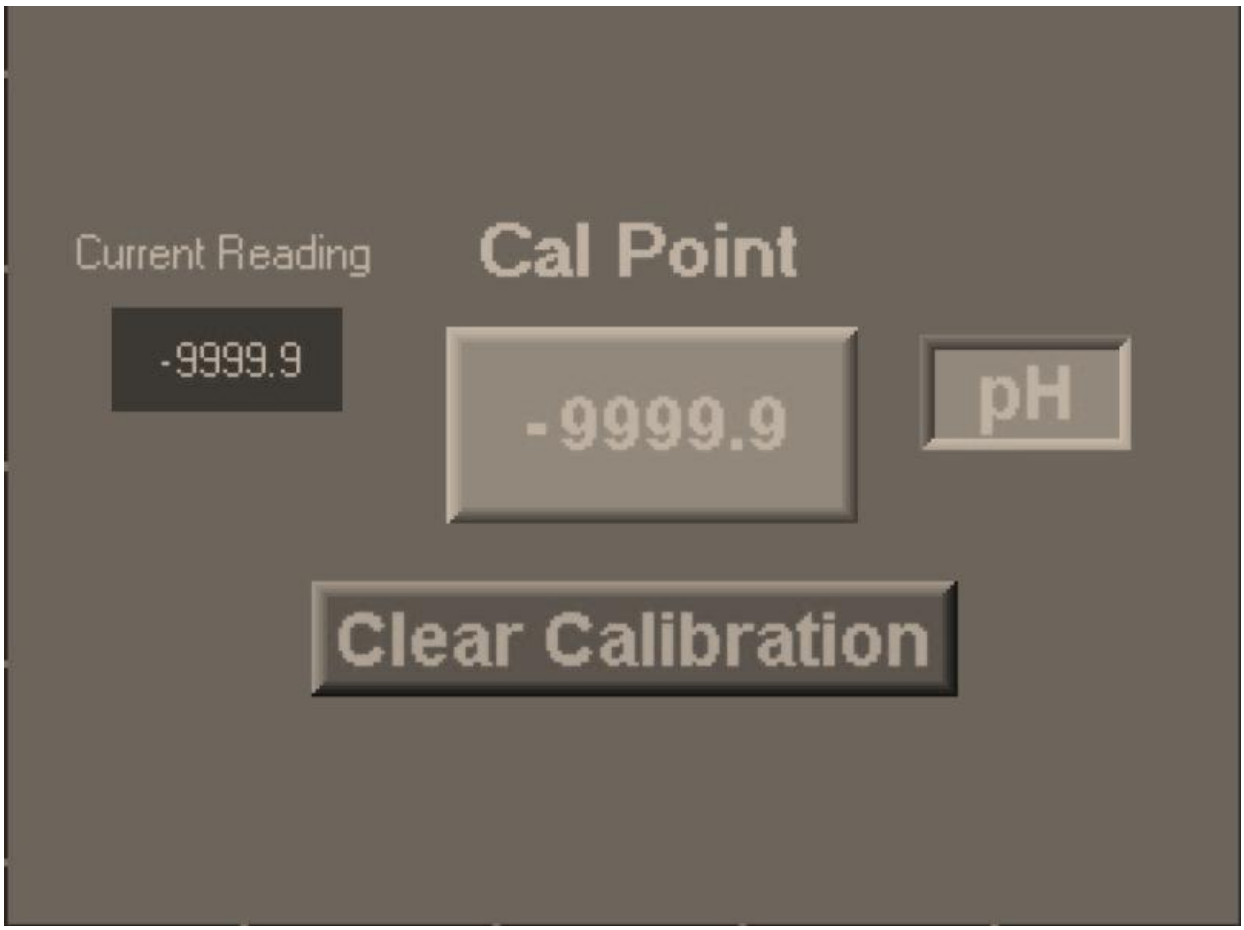
High / Low: This uses alarm point to turn on a pump. It will latch the pump on until the input reading is back inside the dead band.

CTBP: Compounding Time Base Proportional. When first started the system will run the pump for 50% of the cycle time. After that it will calculated how to move the on time. The farther you are away from set point the larger the change. With CTBP it allows for much tighter control of the chemical. (Pressing F3 on CTBP / TBP CFG screen will rest first run)

Analog TBP: This mode uses a 4-20mA output to control the pump based in CTBP controls. This mode does not cycle on and off but does make adjustments on a cycled time. The farther you are away from set point the larger the change. (Pressing F3 on Analog TBP CFG screen will rest first run)

5 Calibrate

Figure 3: Calibrate Screen



Cal Point: Touch this to set the desired reading

Clear Calibration: This will erase all calibrations

6 Monitor Setup

Figure 4: Monitor Setup

High Alarm: Will turn on a alarm when the Input reaches this value

Low Alarm: Will turn on a alarm when the Input reaches this value.

7 Analog /TBP / CTBP 1

Figure 5: TBP CFG 1

Set Point: Desired value you wish the controller to hold

Dead Band: Amount above and below set point that is allowable. The controller will not make any adjustments inside of this area.

Cycle Time: Amount of time it takes for water to completely recirculate.

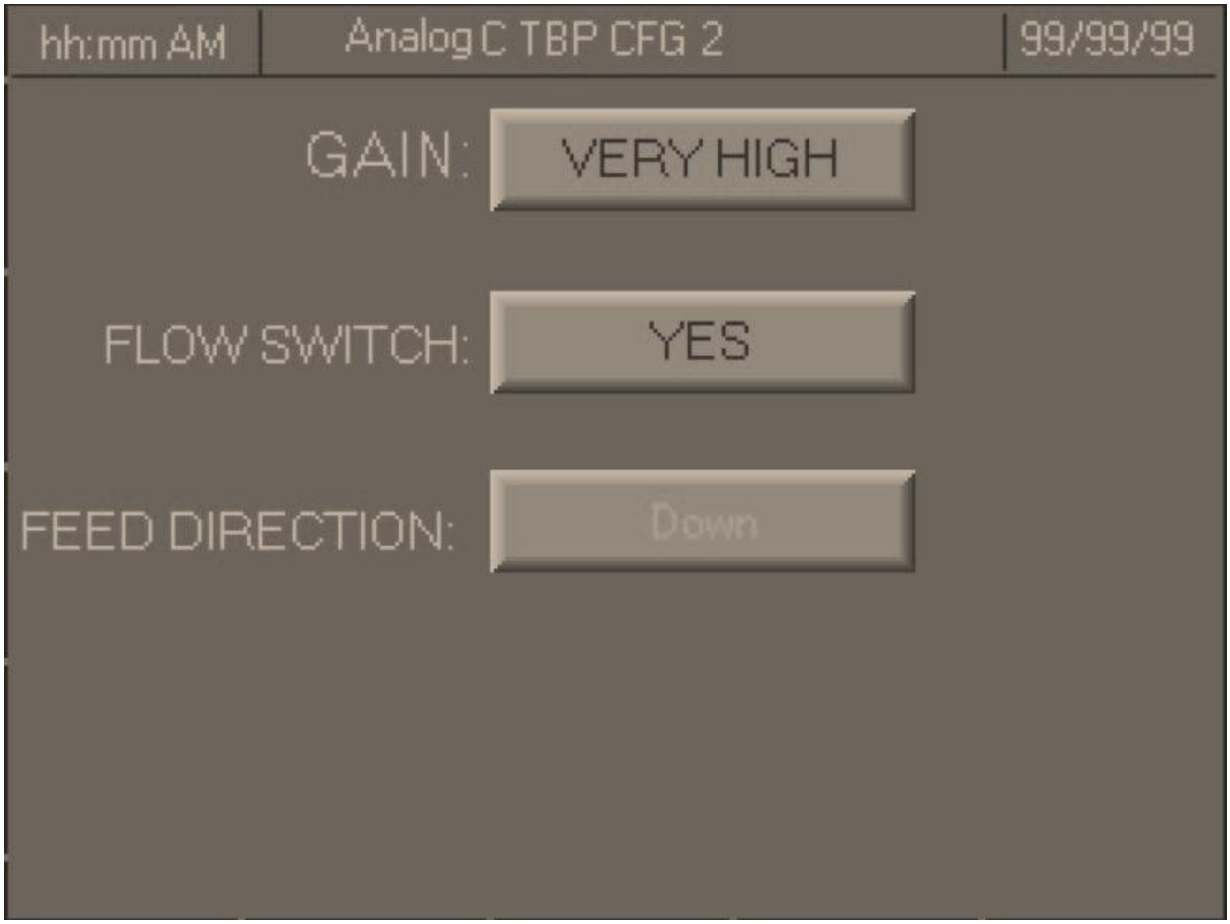
Man / Start%: (only available in analog mode) where the pump speed will first start from. In Manual this is the speed for the pump

TBP CFG2: Go to TBP / CTBP configuration screen2

TBP Alarm: Goes to Alarm Setup Screen

8 Analog / TBP / CTBP 2

Figure 6: TBP CFG 2



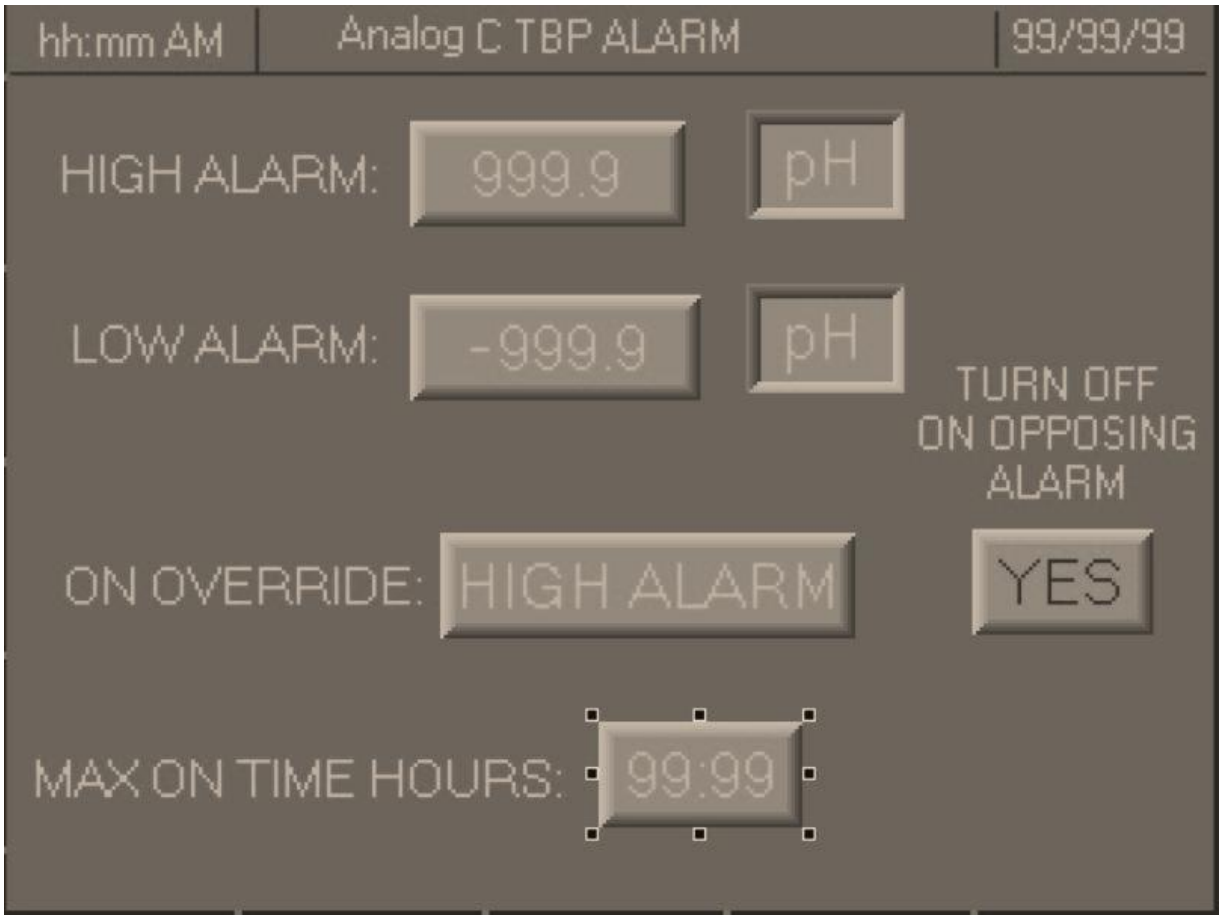
Gain: Controller will make larger changes at cycle on time

Flow Switch: Is there a Flow Switch attached to the system. Will suspend control at no flow

Feed Direction: Which why will the input respond to feeding more chemical.

9 Analog / TBP / CTBP Alarm

Figure 7: TBP CFG Alarm



High Alarm: Will turn on a alarm when the Input reaches this value

Low Alarm: Will turn on a alarm when the Input reaches this value.

ON Override: **Disabled** : Override is off

High Alarm: If controller goes into High Alarm the pump output turns on

Low Alarm: : If controller goes into Low Alarm the pump output turns on

Turn OFF on Opposing Alarm: The Opposite alarm will turn off the pump output.

Max On Time Hours: This is the maximum time the pump can stay on. On alarm it will turn the pump output off (Not available in analog mode)

10 High / Low

Figure 8: High / Low CFG

Set Point: Desired value you wish the controller to hold

Dead Band: Amount above and below set point that is allowable. The controller will not make any adjustments inside of this area

High Alarm: Will turn on a alarm when the Input reaches this value

Low Alarm: Will turn on a alarm when the Input reaches this value.

Activate: Which alarm will turn on the pump output. The pump output will stay on until the input is within the dead band.

11 Automated Probe Wash Settings

Figure 9: Probe Wash Settings Screen

ON / OFF: Turns the automated probe wash feature on or off

Rinse Time: Set how long the cleaning agent pump will run

Day of the week: Select the day or days the Probe Wash will run

Manual: this is a 20 Minute wash. It will use the rinse time for the sensor wash. Press F1 at any time to stop .

Start Time: Set the start time for the Probe Wash

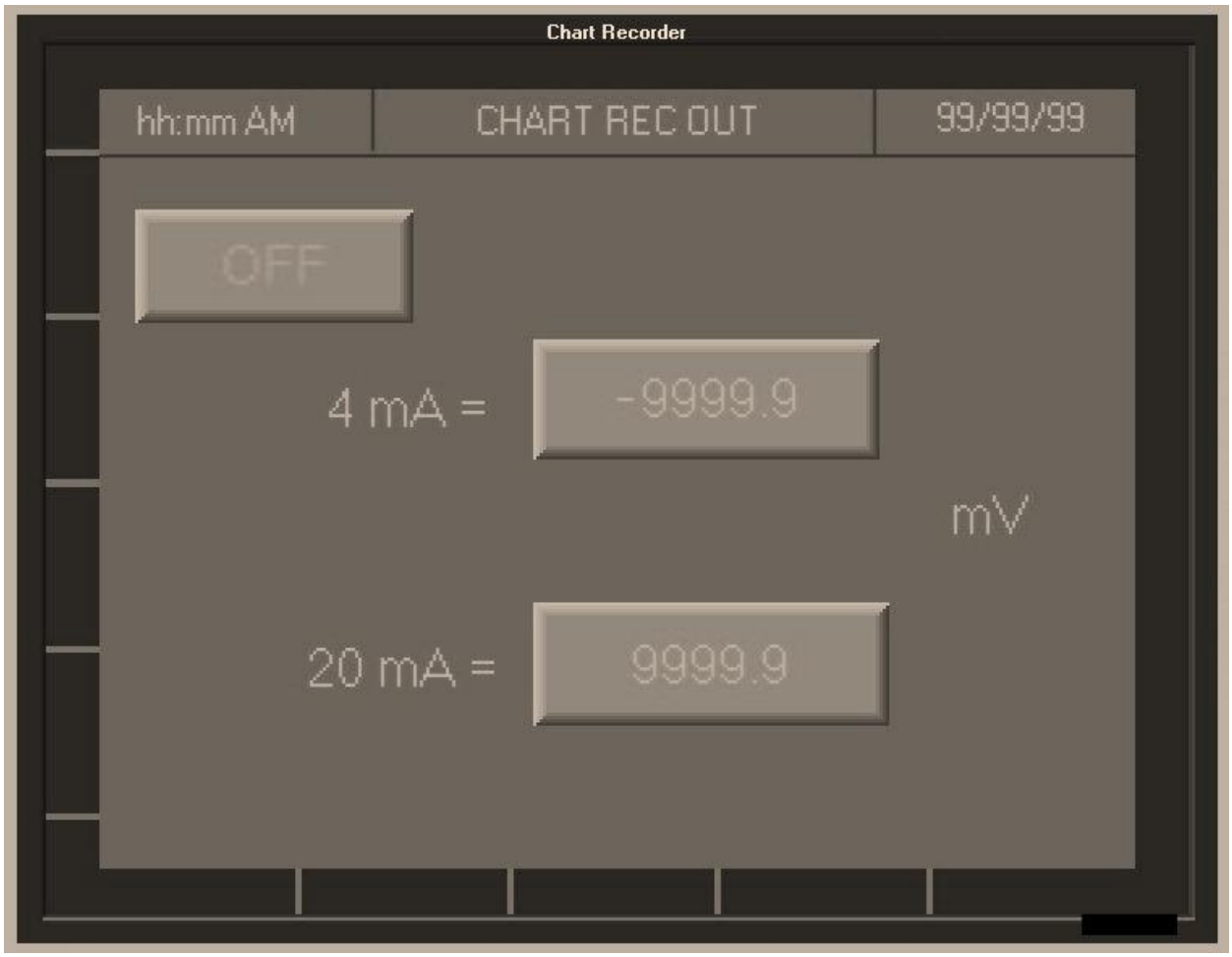
End Time: Set the end time for the Probe Wash. Allow time for probe to re-stabilize.

When Probe wash is running the Input value will be locked at the last reading prior to the Start time.

12 Chart Recorder

The Chart Recorder feature records the sensor input values over time. Analog output can be used to feed into a Chart Recorder or Remote PLC.

Figure 10: Chart Recorder Screen



ON/OFF: Turns this feature on or off

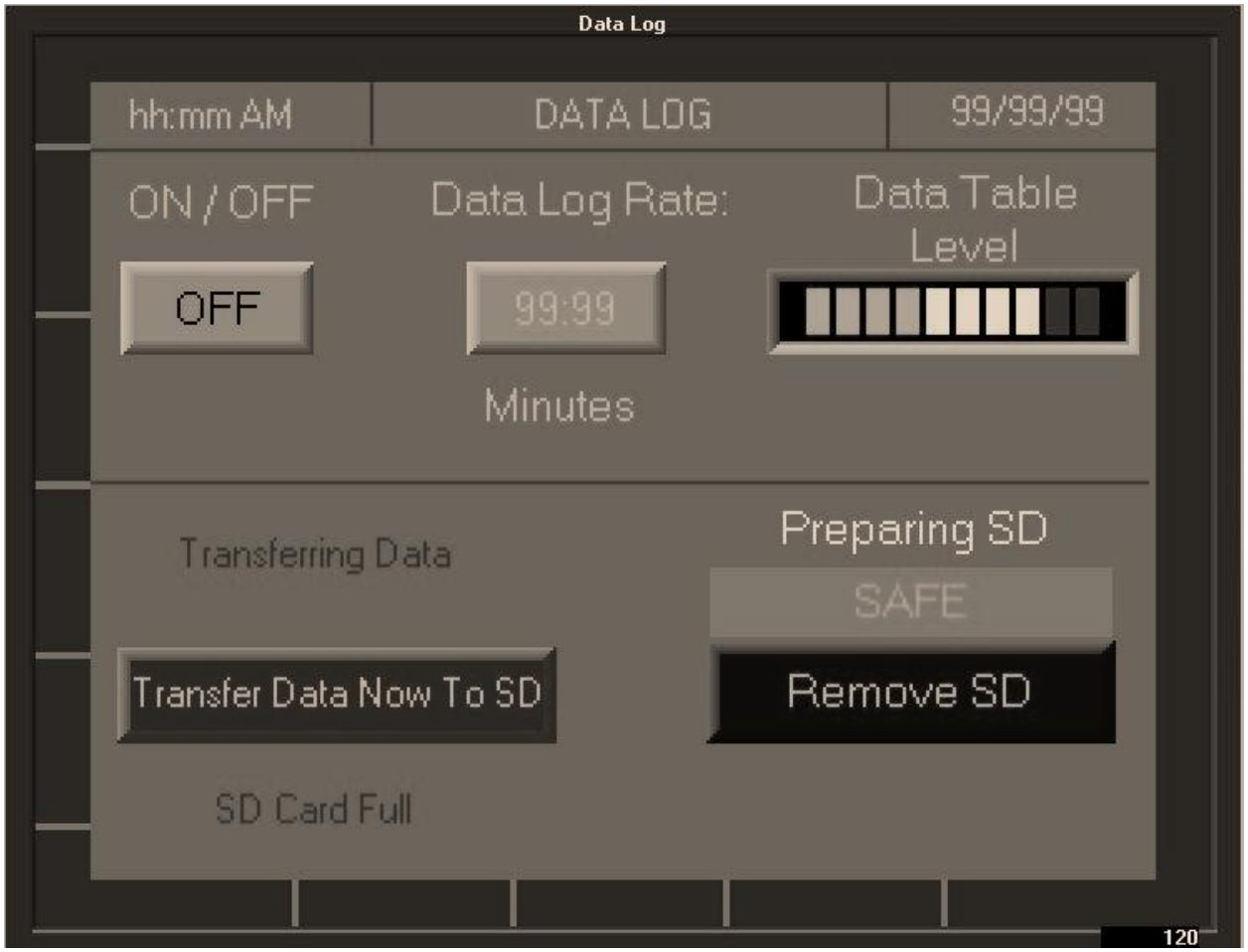
Chart Calibration: Customizes the minimum and maximum values of the Chart Recorder (4 mA and 20 mA) to the usual mV range of your application

- **4mA**: Set to the minimum value that 4mA will equal
- **20mA**: Set to the maximum value that 20mA will equal.

13 Data Log

The Data Log feature records a wide range of readings over time, and stores them internally. Data is then transferred to the SD card for further use. This transfer is done automatically at midnight each day, or can be done manually at any time.

Figure 11: Chart Recorder Screen



ON/OFF: Enables or disables the data logging feature as well as SD card back up.

Data Log Rate: Set how often data will be logged in minutes. Minimum is one minute.

Data Table Level: Indicates how full the data table is. Once the data table is full, the Data Log will stop recording.

Transfer Data Now to SD: Begins a manual transfer of the data to the SD card.

Remove SD: Use this function to remove the SD Card. It will stop the Data Log from trying to write to the SD Card. **DO NOT REMOVE THE SD CARD UNTIL THE WORD "SAFE" IS DISPLAYED.** This function will reset when a formatted SD card is re-inserted.

14 Time & System Setup

This screen is used to adjust the time/date and the network settings of the system.

Figure 12: Time System Setup Screen

Time & Date: Input the current time and date of the system in the format mm/dd/yy hh:mm:ss

IP Address: Input the IP Address for the controller

Subnet Mask: Input the Subnet Mask of the network

Gateway: Input the address of the network gateway

15 Status Screen

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Figure 13: Status Screen

Status Screen: Shows input value as well as all alarms.

Alarms:

High / Low Alarm : Will Clear automatically

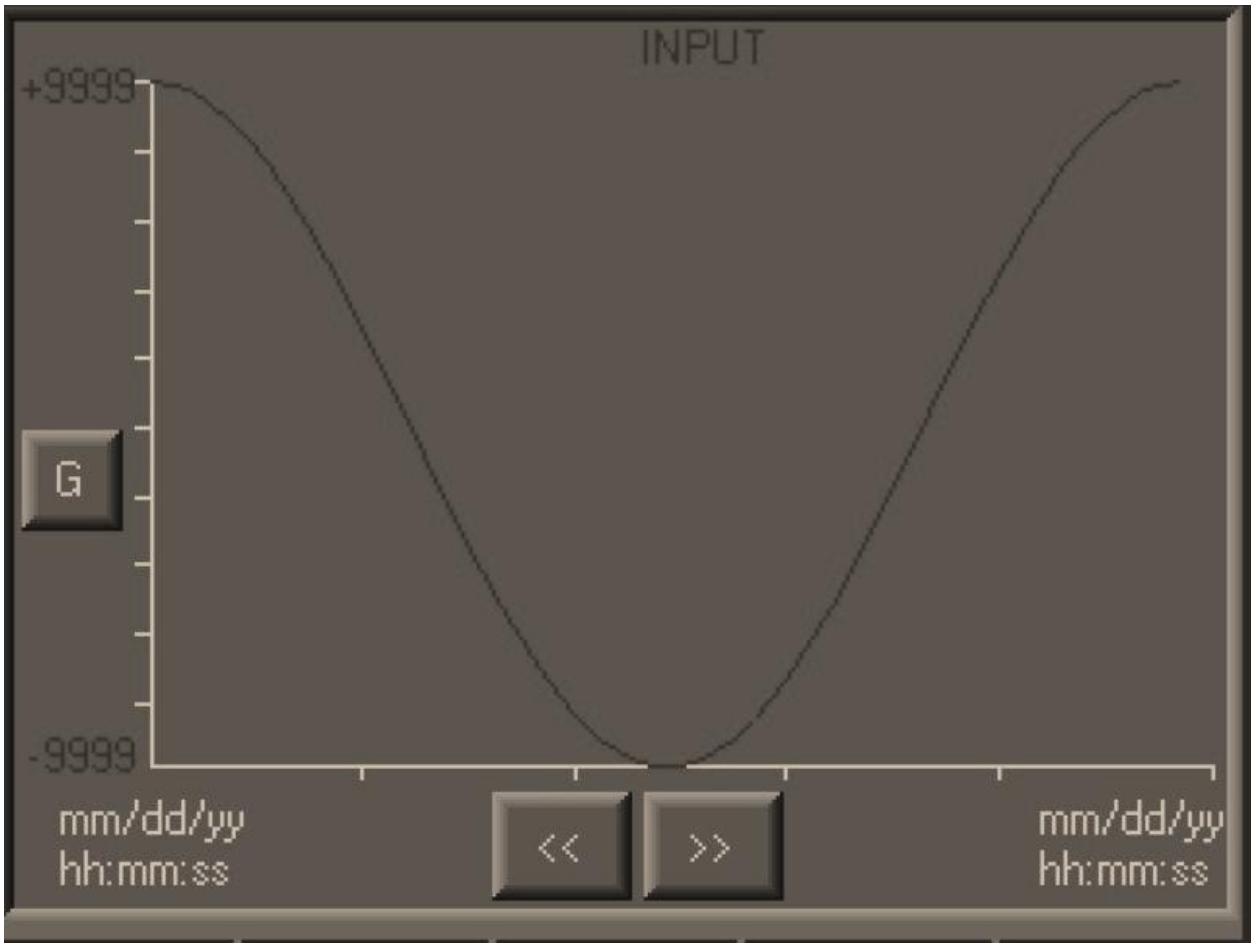
Maximum Run Time Reached: To Clear touch the Alarm Tag

Loss Of Sensor Communication: Controller is not communicating with Sensor. (consult factory)

Invalid License: Consult Factory

16 Trend

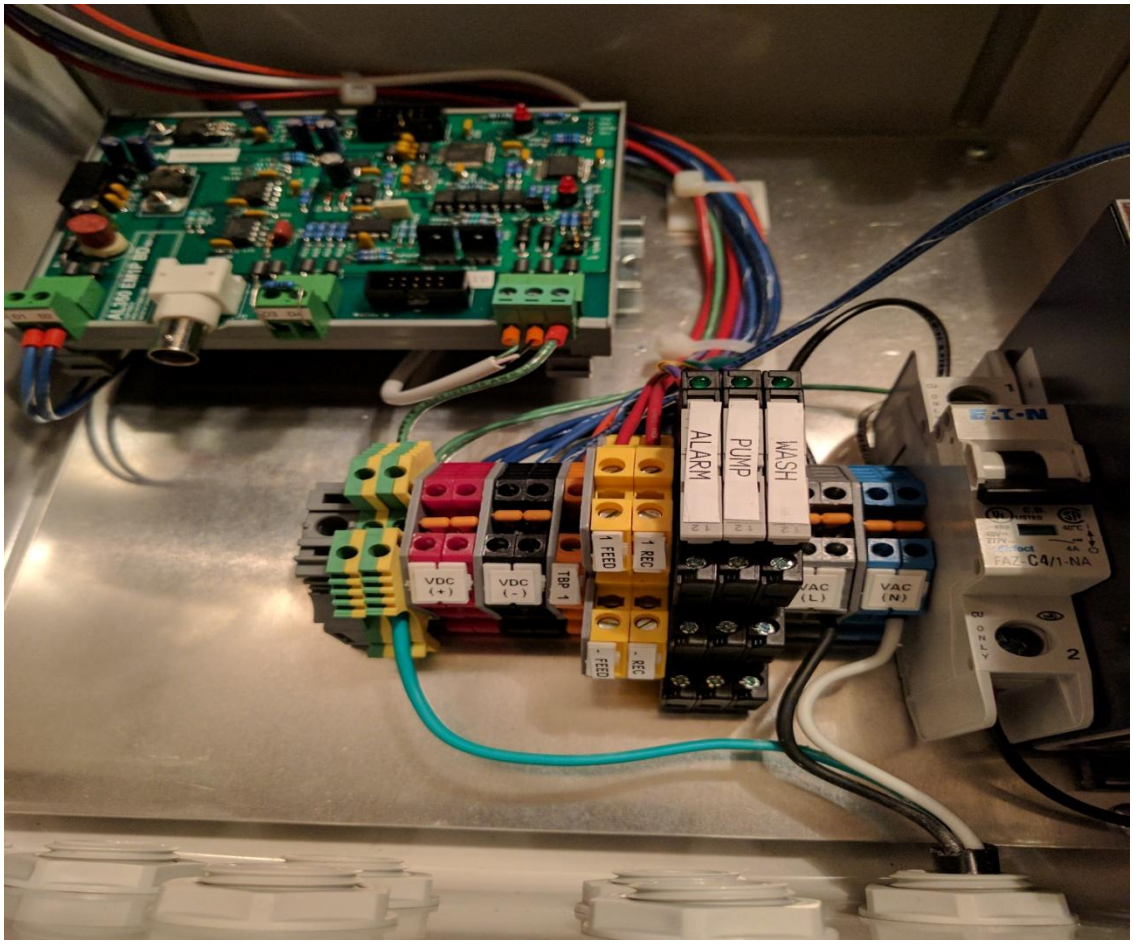
Figure 14: Trend



Touch the Y axis to change the scaling value.

17 Wiring

Figure 15 : Wiring



Terminals:

Green / Yellow : Ground

Red: 24VDC + Output

Black: 24VDC – Output

TBP1: Flow switch input. Requires a 24 VDC + Signal

1REC : Chart Rec 4-20mA output Positive

-REC: Chart Rec 4-20mA output Negative

1Feed: Analog 4-20mA pump output Positive

-Feed: Analog 4-20mA pump output Negitive

Alarm: Active on All alarms. Top: NO / Middle: ARM / Bottom: NC

PUMP: Output for Pump : Top: NO / Middle: ARM / Bottom: NC (Default : Line to Middle , Top to Pump)

Wash : Output for auto Sensor Wash: Top: NO / Middle: ARM / Bottom: NC

All relay style contacts are rated at 6 Amps.

VAC (L) : 120 VAC Line Power Input

VAC(N) 120VAC Natural input

Wires should be terminated by a qualified person.