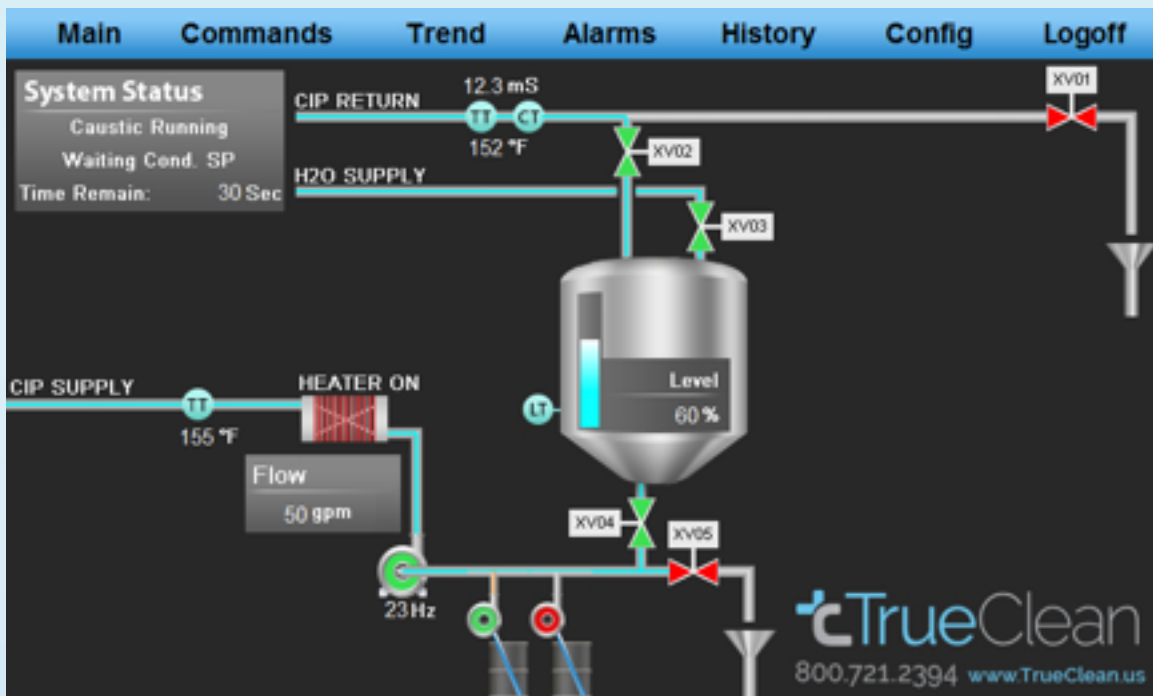


TrueClean Compact CIP

Installation, Operation, and Maintenance Manual



TrueClean Compact CIP

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Safety

Important Safety Information

Read this manual before installing, operating, and maintaining this equipment. Failure to read the manual can result in personal injury and/or equipment damage.

Do not attempt to remove and/or modify any TrueClean products or programming. Doing so can create unsafe conditions for the operator(s) and/or surrounding persons. Any change to TrueClean products or programming will void any and all warranties.

Do not place any TrueClean product in an application where general product service ratings are exceeded. Doing so puts the operator(s) and/or surrounding persons at risk of personal injury and/or result in equipment damage.

The words **DANGER**, **WARNING**, and **CAUTION** and their meanings, as used within these instructions, are listed below:



DANGER

Indicates an imminently hazardous situation, which if not avoided, has a high likelihood of resulting in death or serious injury. This symbol is used in only the most extreme at-risk cases and warrants immediate action.



WARNING

Indicates a potentially hazardous situation, which if not avoided, could result in death or serious injury. This symbol is used for moderately at-risk cases and warrants immediate action.

CAUTION

Indicates a potentially hazardous situation, which if not avoided, may result in minor or moderate injury. This symbol may also be used to alert against an unsafe operating or maintenance practice.

If, at any point during operation a Danger, Warning, or Caution indication is present, the operator should immediately take steps to resolve the problem and/or seek assistance from a supervisor.

Do not remove labeling on any TrueClean product. The customer should replace any missing labels right away.

Disclaimer of Liability

TrueClean does not assume responsibility and expressly disclaims liability for loss, damage, or expenses that arise in any way from the installation, operation, use, or maintenance performed in accordance with this manual. TrueClean assumes no responsibility for any infringement of patents or other rights of third parties that may result from use of the module. No license is granted by implication or otherwise under any patent or patent rights.

TrueClean reserves the right to make changes to the product, specifications, or this manual without prior notice.

Introduction

Thank you for purchasing a TrueClean product.

This manual contains operation instructions for the TrueClean CIP control system.

About This Manual

This manual covers the complete line of TrueClean's Compact CIP control systems. All Compact CIP systems are available, along with optional equipment that can provide additional functionality.

For questions or concerns regarding the Compact CIP control system, contact TrueClean at **800.721.2394** or **417.831.1411**.

Application

TrueClean's Compact CIP control system is a powerful, economical, and efficient way to regulate the operation of a clean-in-place (CIP) system. The Compact CIP control system takes the guesswork out of configuring and selecting the desired start, stop, flow, temperature, and chemical concentration required to have a successful clean-in-place (CIP) cycle.

Technical Data

Maximum Compressed Air Pressure	100 psig
Air Inlet Size	1/2" FNPT
Maximum Product Pressure	145 psig
Product Temperature Range	0°F–180°F
Electrical Requirement	AC 480V, 60Hz +/- 6%
Amperage Requirement Based on System Configuration	20 amps without electric heat, 57 amps with electric heater option

Introduction

Built-in Safety

Each control unit has built-in, integrated safety features including air lockout complying with Occupational Safety and Health Administration (OSHA) lockout/tagout procedures. In case of emergency, the emergency stop capabilities provide a way to halt all operations. Control units can also incorporate system timeouts, providing added protection for operators.

Air Lockout Capability

When the air is in the off position, a pad lock can be attached to the air switch to prevent accidental operation.

This complies with OSHA lockout/tagout procedures



E-Stop Capability

When the E-stop is activated, all operations are stopped.

To release the E-stop, twist in a clockwise rotation until the piece pops up.

Installation

The CIP control cabinet will arrive mounted to the skid and pre-wired to any instruments installed on the skid. Typical installation requires a dedicated 480V 3-Phase with sufficient amperage for the control system (20 amps for a standard unit and 57 amps for an unit with an electric heater) and branch circuit protection.

Electrical schematics will be provided with the control panel for the Compact CIP control system. The drawings will indicate the location, voltage, and amperage requirement for the panel. The CIP control system is designed to work as a stand-alone system and does not require any integration with the plants infrastructure.



WARNING

To avoid electrocution, a registered electrician should do all electrical work. Industrial safety standards and local codes should be followed. All power must be off and safely locked out during installation.

Air Connections

Air Input to Cabinet

Air connection 1/2" NPT Female 90 psi minimum



Note: TrueClean recommends that the cabinet be supplied with clean instrument air at the minimum pressure and flow rate for your application.

Operation

Control Panel

In this section, you will find instructions regarding selecting the wash parameters and starting a cleaning cycle through the use of the touch screen control panel.

System Start

- a.** Verify all swing, hose, and piping connections have been made.
- b.** Verify the air relief switch is in the on position.
- c.** Verify the E-Stop is not activated.
- d.** To change wash parameters, press the Config button, which will display a user login screen.
 - I.** Input user name and password.
 - II.** Default login to change configuration parameters:
 - i.** User: engineer
 - ii.** Pass: engineer
 - III.** . After logging in, a screen to adjust the desired wash settings for temperature, flow, and chemical concentration will be displayed.
 - IV.** Make the desired configuration changes, and press the Logoff button. This logs out the elevated user and returns to standard user credentials.
- e.** Before starting the system, double-check that all process connections have been made and “return to drain” is connected and routed appropriately. Press the Commands button, and the system will present the available washes.
 - I.** Select the desired wash type on the left. When ready, press the Start button on the right.
 - II.** As a safety precaution, if an issue arises during the wash, the operator can press the Abort button to cancel the current wash.
 - III.** If the operator wishes to pause, but not cancel the wash, the Hold button can be pressed. This will pause the current wash sequence, but will keep the current position and time remaining. To resume the wash, press the Restart button, and the system will resume operation.
- f.** When the system is started, it will automatically open the water fill valve and will maintain tank level based on the tank settings, located on the Config screen.
- g.** The system will continue to run in automatic mode until the operator stops the system by pressing the Abort button, Hold button, or E-Stop button. The system will also stop running in automatic mode if the system goes into a Tank High Limit Alarm state.
 - I.** If the system goes into alarm, the issue that caused the alarm must be resolved. For Tank High Limit Alarms, the operator must acknowledge the alarm before the skid can be operated again. Transmitter errors and Tank Low Level Limit Alarms auto-acknowledge themselves once the problem has been resolved.

Operator Interface Screens

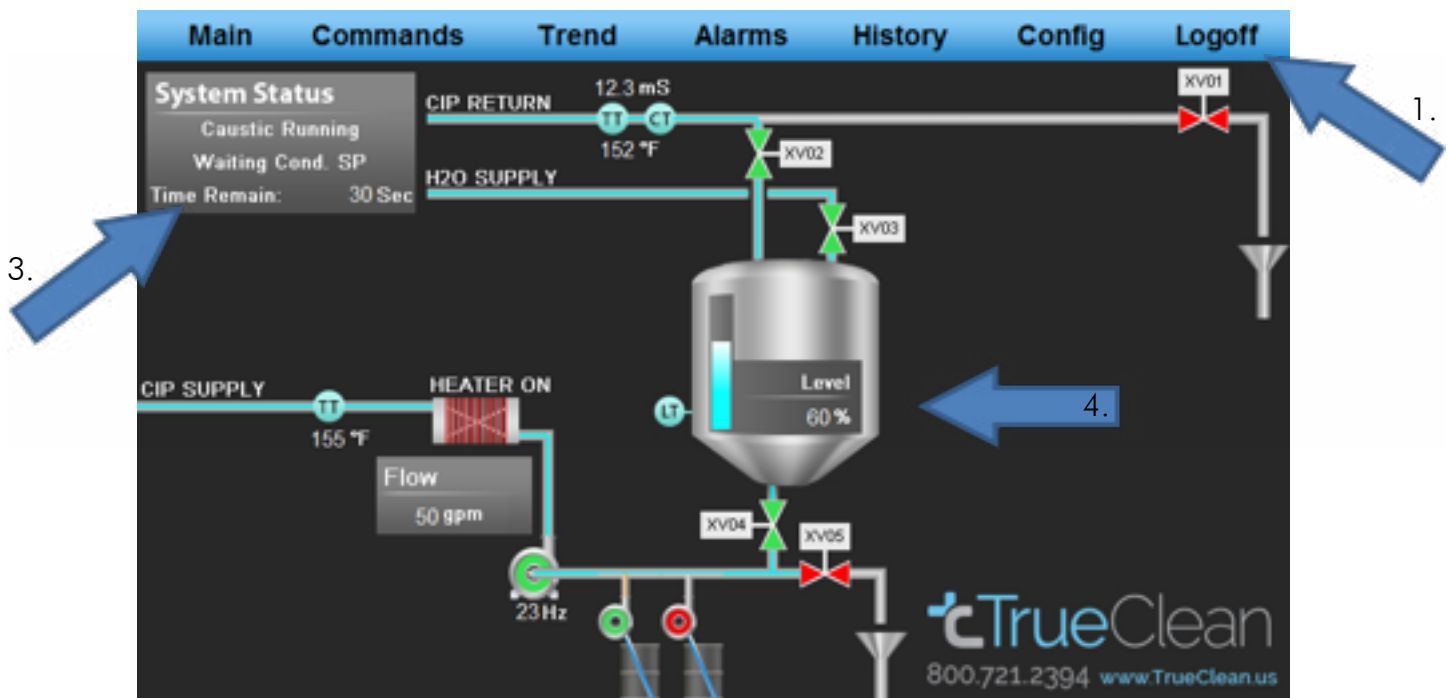


Figure 1 - Main Screen

The main screen displays all system statuses in an intuitive manner:

1. The main navigation bar is located at the top of every screen.
2. When equipment (such as valves and pumps) is running or open, the color will change to green. When equipment is closed or stopped, the color will change to red. The electric heater, if equipped, will turn red when the power has been supplied to the heater and will also display "Heater On" text above it.
3. In the top left corner of the screen, there is a grey area that contains system statuses. The statuses provide the following possibilities:
 - a. **Current Wash Phase** – This describes the current wash phase the system is currently running. This lets the operator know which part of the wash cycle they are in. Wash phases can be one of the following; system idle, pre-rinse running, caustic running, rinse running, acid running, system draining, final rinse running, and sanitizer running.
 - b. **Current Wash Conditions** – Each phase of the wash has its own configured setpoints. These items will display on the screen when there is a need to wait for setpoints to be met: Waiting Cond. SP, Waiting Temp SP, Waiting Temp & Cond. SP. "Wash Conditions Met" will display once the setpoint has been reached. Setpoints are described in greater detail at the bottom of page 9.
 - c. **Time Remaining** – This is the time remaining, in seconds, of the current wash phase. If the timer is not counting down while the system is running, then the system is waiting for a wash condition, such as temperature or conductivity, to be met.
4. The system will auto-maintain its tank level according to the tank settings configured on the Config screen.
 - a. The water supply to the skid needs to be capable at filling the same or greater rate as the CIP supply pump for effective rinsing. For example, the standard pump is rated for 50 gpm at 50 psi, so the supply water to the skids should be at least 50 gpm to maintain level.

Operator Interface Screens

5. When the system is sitting idle, without any active alarms, the operators are allowed a small amount of manual control of the system, as long as the built-in interlocks are complied with. Press the equipment object button to open or turn on that piece of equipment. The equipment will only turn on or open if the interlock permissions are correct. Press again to close or shut off the valve. Refer to the Interlocks/Alarms section on p. 20 for more information.

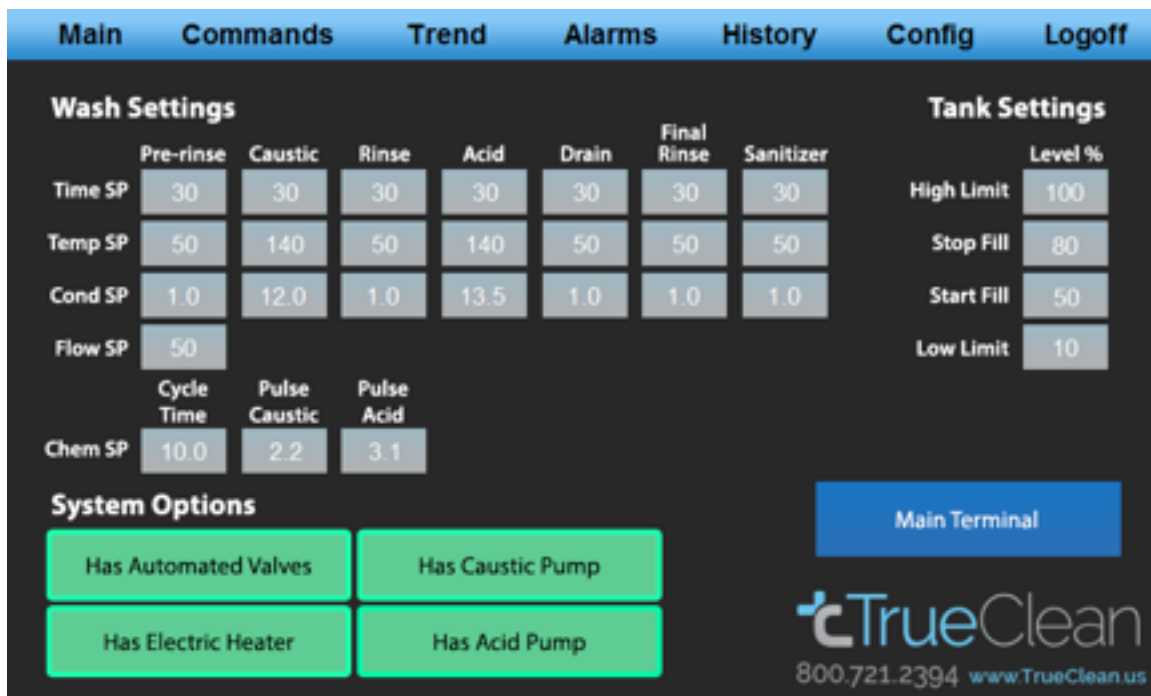


Figure 2 - Configuration Screen

The configuration screen displays system settings that can be adjusted to the desired CIP wash parameters.

- 1. Time SP** – This is the desired hold time the wash conditions require before the system can move on to the next wash phase.
- 2. Temp SP** – Only caustic and acid wash phases require a temperature setpoint is met before the timer can countdown.
- 3. Cond. SP** – This is the desired setpoint of the chemical conductivity level needed to achieve an ideal concentration. Caustic and acid phases have to be over their configured setpoints, while pre-rinse, rinse, final-rinse, and sanitizer phases need to be below their configured setpoints.
- 4. Flow SP** – This is the desired flow rate of the CIP system for all wash phases.
- 5. Chem SP** – This system is designed to pulse in small amounts of chemicals at a time and bring the whole CIP loop up to concentration, rather than initially dosing a large amount of chemicals and potentially overshooting concentration targets. If the system is configured for automated chemical dosing, the following things will appear:
 - a. Cycle Time** – How often the chemical pump will dose chemical during a caustic or acid wash phase. The default is 10 seconds.

Operator Interface Screens

b. Pulse Caustic – How long the chemical pump stays on when it doses caustic chemicals during a caustic wash phase. The default is two seconds.

c. Pulse Acid – How long the chemical pump stays on when it doses acid chemicals during a caustic wash phase. The default is two seconds.

6. Tank Options – Configures how the tank level operates when the system is active.

a. High Limit – Tank High Level Fill Alarm setpoint. System will alarm and abort any current washes if the tank becomes overfilled.

b. Stop Fill – When the system is refilling with fresh water, it will stop filling at this setpoint to prevent overfilling the tank. The default is 80%.

c. Start Fill – When the system is running and the tank volume falls below this amount, the water inlet valve will open and start refilling the system until it reaches the configured Stop Fill amount or the current wash phase completes.

d. Low Limit – Tank Low Level Limit Alarm setpoint. The system will output a warning if the tank volume falls below this amount, and the pump will be inhibited to run until the level in the tank is returned to a normal amount. This is by design, to prevent the pump seals from running dry.

7. System Options – These will be set at the factory with the options purchased with the system.

a. Has Automated Valves – Allows the system to run through the wash phases and maintain tank level without operator intervention.

b. Has Electric Heat – Allows the system to heat and maintain temperature during the caustic and acid phases of the wash cycle.

c. Has Caustic Pump – Allows automated chemical dosing of caustic during the caustic wash phase.

d. Has Acid Pump – Allows automated chemical dosing of the acid during the acid wash phase.

Wash Criteria – The criteria that need to be met for the wash timer to count down and complete a specific wash phase. If the system is running and the timer is not counting down, then one of the below criteria is not being met based on the configured wash settings.

1. Pre-Rinse

a. Flow rate has to be greater than or equal to configured Flow SP.

b. Chemical conductivity has to be less than the configured Cond. SP.

c. The system has to be running and not in the held state.

2. Caustic

a. Flow rate has to be greater than or equal to configured Flow SP.

b. Chemical conductivity has to be greater than or equal than the configured Cond. SP.

c. Return temperature has to be greater than or equal to the configured Temp SP.

d. The system has to be running and not in the held state.

Operator Interface Screens

3. Drain

- a. Tank level has to be below 5% before the timer starts counting down.
- b. Chemical conductivity has to be less than or equal than the configured Cond. SP to prevent higher than desired chemical concentrations to be sent directly to the drain.
- c. Return temperature has to be less than or equal than the configured Temp SP to prevent higher than desired water temperatures to be sent directly to the drain.
- d. The system has to be running and not in the held state.

4. Rinse

- a. Flow rate has to be greater than or equal to configured Flow SP.
- b. Chemical conductivity has to be less than the configured Cond. SP.
- c. The system has to be running and not in the held state.

5. Acid

- a. Flow rate has to be greater than or equal to configured Flow SP.
- b. Chemical conductivity has to be greater than or equal than the configured Cond. SP.
- c. Return temperature has to be greater than or equal to the configured Temp SP.
- d. The system has to be running and not in the held state.

6. Final-Rinse

- a. Flow rate has to be greater than or equal to configured Flow SP.
- b. Chemical conductivity has to be less than the configured Cond. SP.
- c. The system has to be running and not in the held state.

7. Sanitizer

- a. Flow rate has to be greater than or equal to configured Flow SP.
- b. Chemical conductivity has to be less than the configured Cond. SP.
- c. The system has to be running and not in the held state.

Note: Most sanitizers used in the sanitary industry don't have a good conductivity profile, so typical operation of this system is to dose the desired amount of sanitizer in the tank at the beginning of a sanitizer wash phase.

Operator Interface Screens



Figure 2 - Commands Screen

Wash Types

- 1. Caustic Wash** – Phases included are pre-rinse, caustic, drain, and final-rinse.
- 2. Caustic Sanitizer Wash** – Phases included are pre-rinse, caustic, drain, final-rinse, and sanitizer phases.
- 3. Caustic Acid Wash** – Phases included are pre-rinse, caustic, drain, rinse, acid, drain, and final-rinse phases.
- 4. Caustic Acid Sanitizer Wash** – Phases included are pre-rinse, caustic, drain, rinse, acid, drain, final-rinse, and sanitizer phases.
- 5. Sanitizer Wash** – Phase included is the sanitizer phase.

Wash Commands

- 1. Start** – Starts the automated sequence of the selected wash type.
- 2. Hold** – When the system is running, the operator can put the system in a hold state. This will stop the active wash, but maintain the current timers, so the system can restart from where it was paused without starting the sequence over.
- 3. Restart** – When the system is in the held position, the operator can resume the current wash from where they left off.
- 4. Abort** – Will shut down the system canceling the active wash and bring the system into an idle state. This may also happen if a High Limit Alarm goes active or an operator presses the E-Stop button on the control panel.

Operator Interface Screens



Figure 3 - Commands Screen

Starting Your First Wash Cycle

1. Select the desired wash type.
2. The selected wash is now displayed at the top. Prior to starting the wash, the operator can change the desired wash type.
3. When ready, press the Start command.



Figure 4 - Commands Screen

4. The Start button will momentarily turn green, until the system is running.

Operator Interface Screens

5. Once the system is running, the Hold and Abort buttons will be available (if needed) during the wash cycle, and the operator can return to the Main screen to monitor skid operation.



Figure 5 - Commands Screen

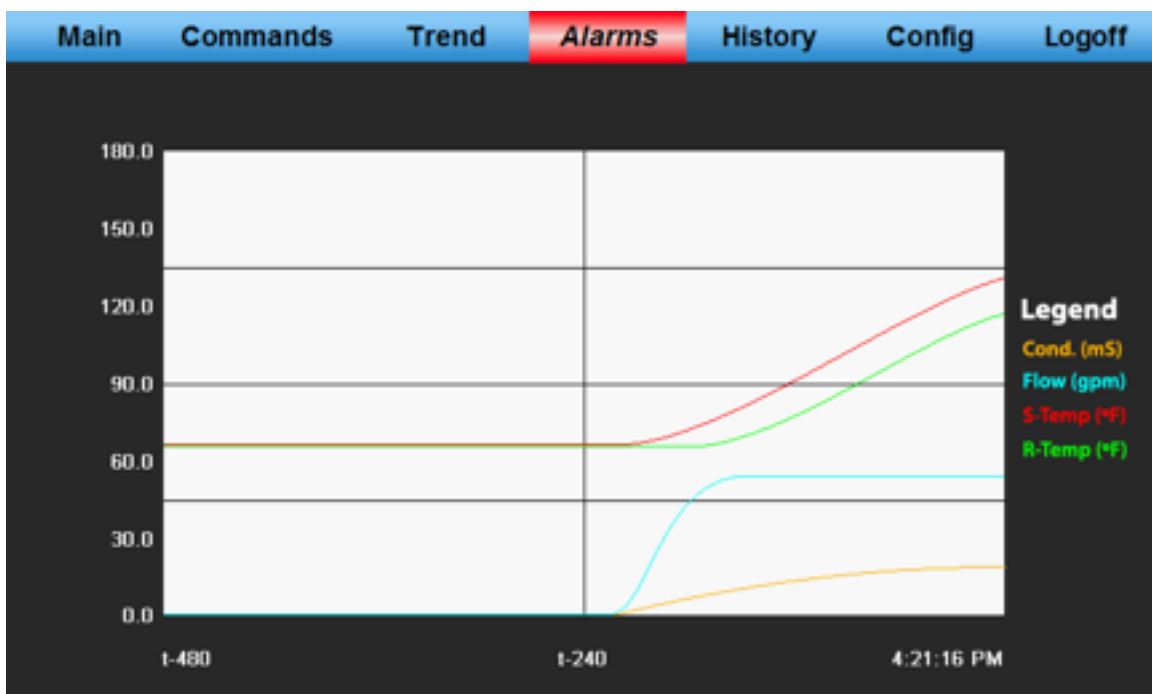
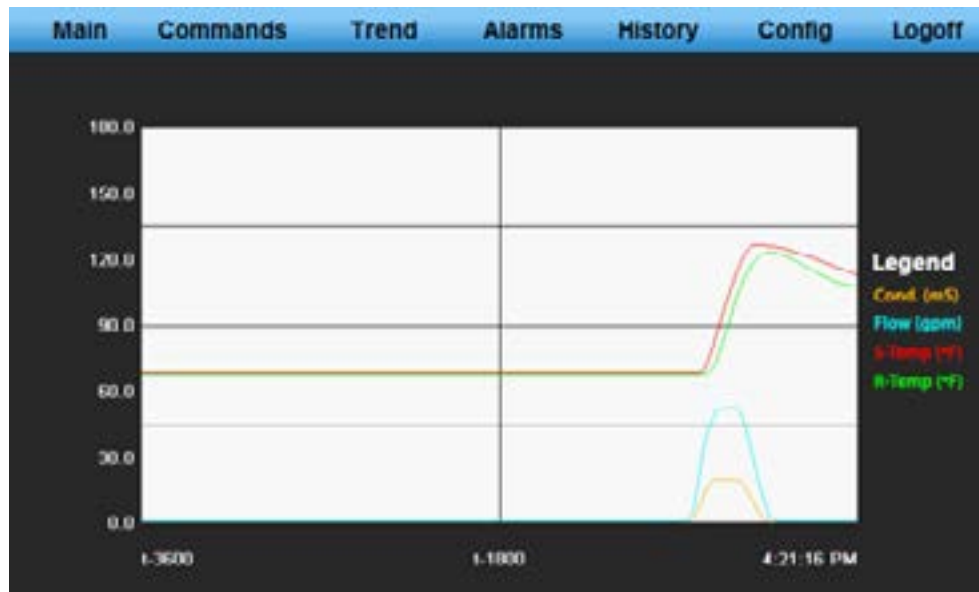


Figure 6 - Trend Screen

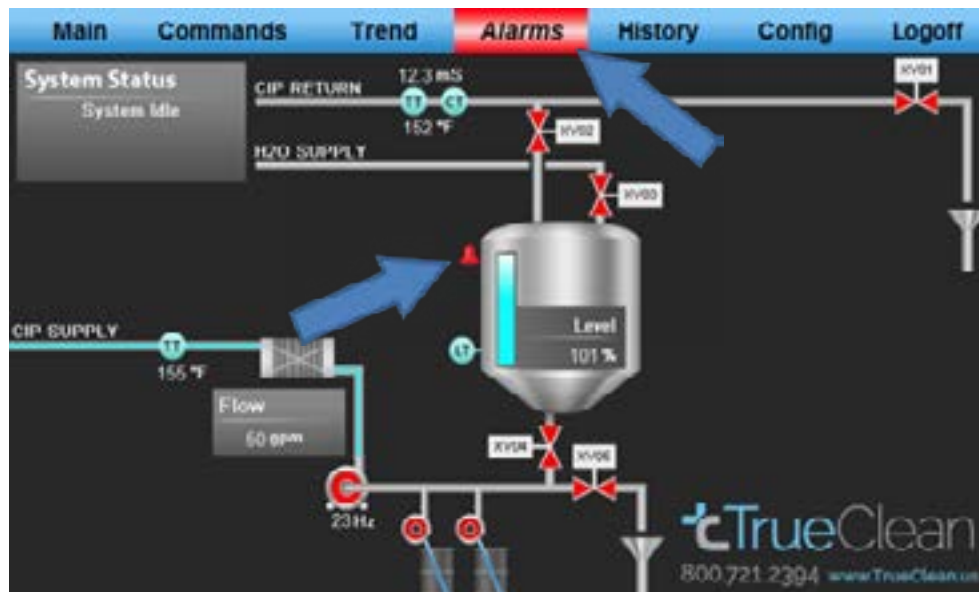
6. The Trend screen logs the process values of supply flow, supply temperature, return temperature, and return conductivity. These data points are sampled every second and plotted on the same graph for wash monitoring.

Operator Interface Screens



7. The History screen logs the actual process values of supply flow, supply temperature, return temperature, and return conductivity exactly as the Trend screen does, except the data points are sampled every eight seconds, allowing the History screen to monitor a longer time frame (i.e. a complete wash cycle).

Both the History and Trend screens are limited to 500 data points.



8. When the system has an active alarm, the Alarm button will flash red on every screen, indicating that there is a system problem. The skid will abort any current washes and return itself to an idle state. By pressing the Alarm button on the main navigation, you will be presented with the Alarm screen. On the main screen, a small red bell will also display next to the piece of equipment currently in an alarm state.

Operator Interface Screens

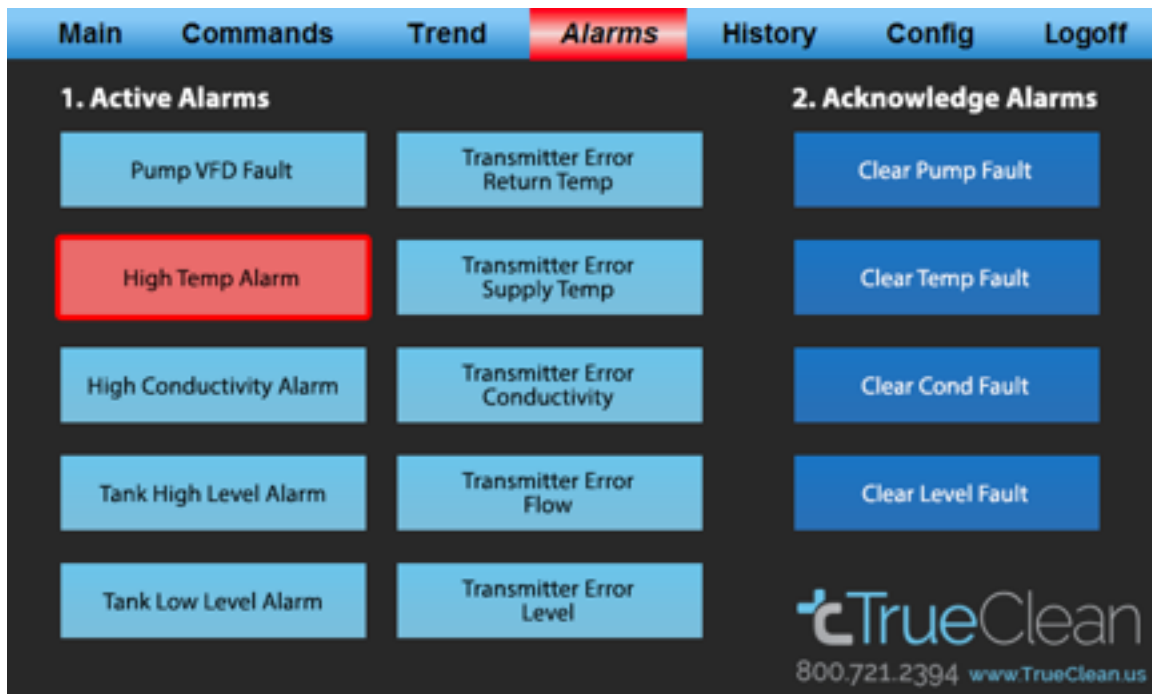


Figure 8 - Alarm Screen

9. This screen displays the system alarms built into the Compact CIP system. Any active alarms will turn red and receive an illuminated border. Transmitter errors and tank low level alarms will auto-acknowledge once the problem has been resolved, however there are an additional four alarms that require an operator to acknowledge the alarm before the system can operate again. If the alarms do not clear, then the issue that caused the alarm is still in effect.

Operator Interface Screens

Alarm Statuses Explained

Pump VFD Fault

The VFD in the control panel has a fault. This can be loss in Ethernet communication, such as when a new program is downloaded. It could also be a true VFD fault, such as overcurrent from a failing motor.

High Temp Alarm

The system is set to a max temperature of 180°F. If temperature exceeds 180°F, the High Temp Alarm will go active and any current washes will abort.

High Cond. Alarm

The system is set to a max chemical conductivity of 50mS/cm. If chemical conductivity exceeds 50mS/cm, the High Cond. Alarm will go active and any current washes will abort.

Low Flow Alarm

The system is powered on and running in automatic mode, and the supply flow is below the desired setpoint range.

Tank High Level Alarm

The system has a configurable Tank High Level limit, which is set to 100% as default. Tank level of 100% is set at the factory to be about two or three inches below the overflow in the tank. If the tank level reaches higher than the configured setpoint, the High Tank Level Alarm will go active and any current washes will abort.

Tank Low Level Alarm

The system has a configurable Tank Low Level limit, which is set to 10% as default. If the tank level drops below the configured setpoint, the supply pump will be interlocked to prevent it from running, and the Low Level Warning Alarm will go active. The current wash will not abort with this alarm, but will hold the system and wait for the tank level to return. This is done in an effort to complete the wash.

Note: For effective rinsing, the water supply to the skid needs to be capable at filling at the same or greater rate as the CIP supply pump. For example, the standard pump is rated for 50 gpm at 50 psi, so the supply water to the skids should be at least 50 gpm to maintain level.

Transmitter Errors - Return Temp, Supply Temp, Conductivity, Flow, Level

If the analog signal goes below or above the normal operating range of 4-20mA, the system assumes there is a problem with the transmitter. The transmitter alarm will activate, and any current washes will abort. Once the transmitter is fixed and receiving the 4-20mA analog range, the alarm will automatically clear itself.

Operator Interface Screens

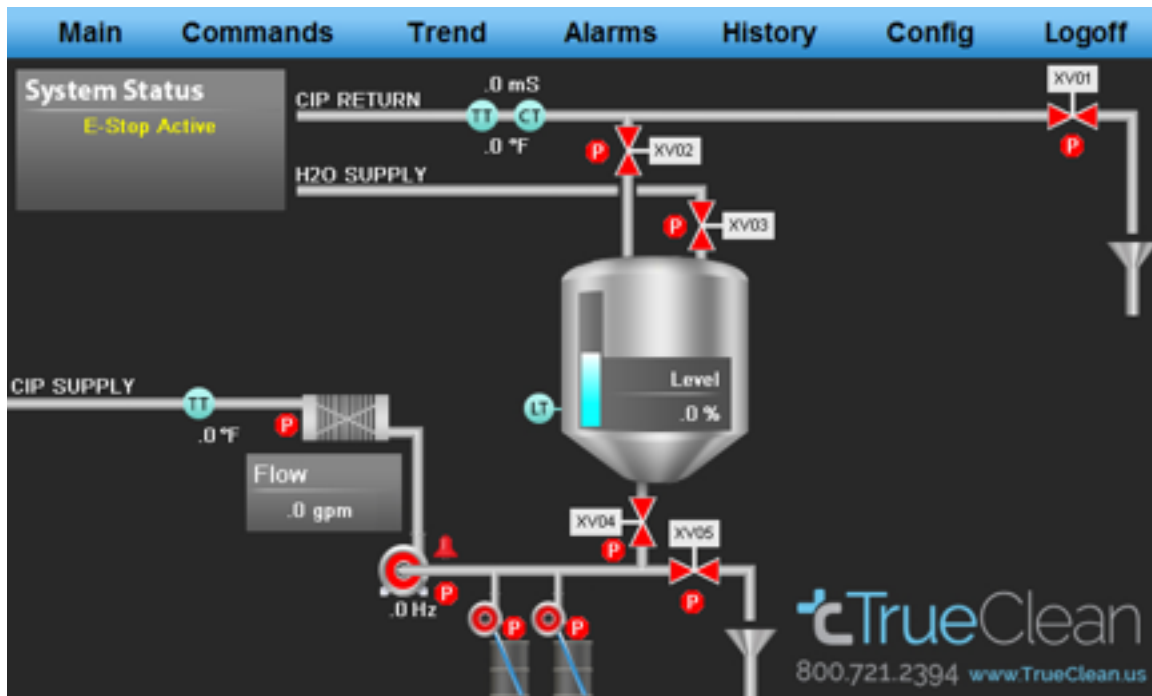


Figure 8 - Main Screen - E-Stopped

Interlocks Explained

When an interlock is active on a device in the system, a small stop sign with a “P” will display on the screen next to the piece of equipment that has an active interlock. The P stands for permission.

E-Stop Active

When the system is powered on and the E-Stop button has been activated, the system will shut down and inhibit all devices from operating until the operator has released the E-Stop button by twisting the button clockwise. There is also an E-Stop active status on the screen.

Interlock - CIP Supply Pump

The CIP supply pump has the following interlock criteria that need to be met prior to the pump operating.

1. The system is not in an E-Stop condition.
2. The pump is not in alarm.
3. The tank discharge valve is commanded to be open.
4. The tank level has more liquid than the minimum configured Tank Low Limit set under Tank settings on the Configuration screen. (Default is 10% level.)

Operator Interface Screens

Interlock – Electric Heater “If Equipped”

The electric heater has the following interlock criteria that need to be met prior to the heater being allowed to operate.

1. The system is not in an E-Stop condition.
2. The heater is not in alarm.
3. The CIP system is in a running state status.
4. The CIP supply flow is greater than 10 gpm.
5. The CIP supply temperature is less than 180°F.

Interlock – Chemical Pumps “If Equipped”

The chemical pumps have the following interlock criteria that need to be met, prior to them being allowed to operate.

1. The system is not in an E-Stop condition.
2. The heater is not in alarm.
3. The CIP system is in a running state status.
4. The CIP supply flow is greater than 10 gpm.
5. The CIP return chemical conductivity is less than 50ms/cm.

Maintenance



WARNING

Employees should not perform maintenance on the CIP control system before ensuring a safe work environment as outlined below:

To ensure a safe work environment, it is recommended, but not limited to, verifying the following precautions are met:

- o Power to the control panel should be off and locked out.
- o Remove or lock out the inbound air supply from the pressure regulator.

General cleanliness will extend the life of your control panels and its components. Where possible, the area should be kept free of spills and loose debris. Under no circumstance should the panel be sprayed down or cleaned with any wet fluids. Doing so could damage the electrical and/or pneumatic equipment.

If any hardware issues exist, cease any and all use of the CIP control panel until all issues are resolved.

Maintenance Checklist:

- o Check air lines for cracks and leaks.
- o Check pressure drop across air filter. If pressure drop exceeds maximum allowable, the filter needs to be cleaned or replaced.
 - Note:** The pressure drop should not exceed 14 psig. If the pressure drop exceeds the maximum allowable, the filter needs to be cleaned or replaced.
- o Check for loose connections or connectivity concerns regarding the solenoid valves.
 - Note:** A solenoid valve will not likely give advanced warning before failing.

Maintenance

Replacing Components

The instructions below describe how to replace components used in the manufacturing of TrueClean's CIP control system.

Replacing "Poly" Tubing

To replace "poly" tubing, follow the below instructions:

- a. Disconnect the inbound air line at the pressure regulator and ensure that the control panel is powered down.
- b. Press the outer ring of the pneumatic fitting in, and then gently pull the cracked or leaking air line from the fitting.
- c. Repeat the same procedure for the other end of the air line.
- d. Use the cracked or leaking air line as a guide for the length of the new air line.
- e. Trim the new section of air line to the appropriate length.
- f. Install air line by pressing each end into pneumatic fittings.

Note: After the new line is pressed in, the outer rings on the pneumatic fittings need to extend. If they are not fully extended outward, when subjected to sufficient pressure, the hose could be blown out from its seated position.

Replacing Pressure Regulator Filter Element

SMC, the manufacturer of the supplied filter regulator, recommends the filter element be changed every two years or when the pressure drop across the element exceeds 14 psig. To replace the pressure regulator filter element, follow the below instructions:

- a. Locate the spring-loaded release on the front of the pressure regulator.
- b. Press the release down and hold.
- c. Turn the portion of the pressure regulator body below the spring-loaded release.
 - o This may be more easily accomplished by holding the release with the thumb of the hand with which you intend to turn the body.
 - o The pressure regulator body should only need to turn approximately half of a revolution before the operator can gently pull it free.

Note: If you only turn the body a quarter of a turn, the release may try to extend back into place.

- d. Once the body of the regulator is removed, the element can be easily removed and replaced.
- e. Put the body back on and turn it back into position directly opposite of how you removed it. This should seat the body exactly where it began.

Maintenance

Replacing Solenoid Valve

Although solenoid valves used by TrueClean are rated for one million cycles, there are no performance guarantees for these items. While we do not guarantee a particular number of cycles, we are confident the valves will be free from manufacturer defects. To replace a solenoid valve, follow the below instructions:

- a. Remove retaining screws from the existing solenoid valve.

Note: Keep them until you are certain new screws have been provided.

- b. Gently remove the solenoid valve from the mounting pad.

- o Take note of how the solenoid valve is oriented.

- o Take note of any and all o-rings, as there may be small o-rings on sealing surfaces.

- o In some cases, the top or bottom of the solenoid valve may need to come out first.

- c. Verify the o-rings are properly placed on the new solenoid valve.

- d. It may be necessary to insert or seat one end of the solenoid valve before the other end will seat properly.

Note: It should never be necessary to force the new solenoid valve into place.

- e. Install the retaining screws that you removed in step (a). If new retaining screws were provided, use them and discard the screws from step (a).

Note: If at any point you have questions or concerns regarding the CIP 2.0 Control System, please contact TrueClean at **800.721.2394** or **417.831.1411**.

Troubleshooting

Q. What should I do if the automated valves are not operating?

A. Try the following solutions:

1. Ensure that the OSHA air dump valve is in the on position and the supply pressure is over 80 psi.
2. Ensure your Configuration settings have not been changed and the setting for “System has Automated Valves” is turned on.

Q. What should I do if I cannot run the CIP pump?

A. Try the following solutions:

1. Check the CIP supply pump interlocks, and ensure all criteria to operate has been met.
2. Ensure the VFD is not faulted and the E-Stop is not inhibiting its operation.
3. The supply pump can sometimes airlock when the system first starts and the process lines are dry. Command the current wash to hold and wait for the pump to stop, and then press Resume command. This will often clear the airlock of the pump.
4. Ensure the pump is rotating with the correct rotation and with the system safely locked out, ensure the pump impeller spins freely without interference or resistance.

Q. What should I do if I cannot run the heater?

A. Try the following solutions:

1. Verify that the supply flow is greater than 10 gpm; this is a safety feature to ensure there is adequate water flow for the heater to run.
2. Ensure the control system temperature setpoint is set on the desired temperature and that the return temperature is lower than that value.
3. Ensure the thermostat in the heater housing is set to the desired temperature.

Please Note: If at any point you have questions or concerns regarding your CIP Control system, please contact TrueClean at **800.721.2394** or **417.831.1411**.

Warranty

A. GENERAL PROVISIONS: Central States Industrial Equipment & Service Inc. (hereinafter referred to as the Company) warrants to the original purchaser-used (hereinafter referred to as the Customer) that equipment or parts thereof manufactured by it will be free from defects in material and workmanship only, under normal use and service, for a period of one (1) year from the original shipment date. The Company shall not be liable for any loss of profit, loss by reason of plant shutdown, non-operation or increased cost of operation, loss product or materials, or other special or consequential loss or damages. This warranty will not apply to any equipment (or parts thereof), which has been subjected to accident, alteration, abuse or misuse. This warranty is in lieu of all other warranties, expressed or implied (including the implied warranty of merchantability and fitness) and of all other obligations or liabilities on the part of the Company, and the Company will neither assume nor authorize any other person to assume for it any other obligation or liability in connection with this equipment. In the event of a breach of warranty our liability shall be limited to the purchase price of the part(s) that have failed.

B. RETURN OF PARTS OR EQUIPMENT TO COMPANY PLANT: Permission to return any parts or equipment must be obtained, in writing, and must be returned with transportation cost prepaid. In the event that equipment (or parts thereof) manufactured by the Company is returned to the plant, the Companies obligation will be limited to repairing or replacing parts, which upon examination are found (to the satisfaction of the Company) to be defective in either material or workmanship. No transportation will be paid by the Company unless written approval for transportation charges is given by the Company.

C. COMPONENTS NOT MANUFACTURED BY THE COMPANY: Components not manufactured by the Company, but furnished as part of its equipment (for example: valves, controls, gauges, electrical switches or instruments, etc.) will be warranted by the Company only to the extent of the Component manufacturer's warranty.

D. REPAIR OF EQUIPMENT INSTALLED IN THE CONTINENTAL UNITED STATES: Should an in-warranty failure occur, and it is, in the judgment of the Company, impractical to return the equipment for repairs, the Company will arrange for the repairs to be made by its personnel or, at its option, sublet to a qualified company. The Customer will be expected to cooperate by making the equipment available and accessible when the work is scheduled and is expected to provide the necessary utilities. If local labor conditions prohibit such work being done by Company personnel under the conditions and at the rates payable by its contracts with its employees, the Company obligation shall be limited to supervision of the work, replacement of defective parts, and labor costs in an amount equal to the amount which would be payable for a reasonable number of hours required to make the repairs at the rates payable under the terms of Company contracts with its employees. In such events, all labor costs shall be paid by the Customer and the Company will reimburse him to the extent set forth above.

E. REPAIR OF EQUIPMENT INSTALLED OUTSIDE THE CONTINENTAL UNITED STATES: Should an in-warranty failure occur, and it is, in the judgment of the Company, impractical to return the equipment for repairs, the Company obligation shall be limited, and the Company shall have the options of either sending a service representative to repair (or supervise the repairs) or granting a reasonable allowance for having the repairs made locally.