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USER GUIDE

UGC041-0614

Ethernet Loading System (ELS)

Please record your equipment's model and serial number(s) and the date you received it in the spaces provided.

It is a good idea to record the model and serial number(s) of your equipment and the date you received it in the User Guide. Our service department uses this information, along with the manual number, to provide help for the specific equipment you installed.

Please keep this User Guide and all manuals, engineering prints, and parts lists together for documentation of your equipment.

Date:

Manual Number: UGC041-0614

Serial Number(s):

Model Number(s):

DISCLAIMER: Conair shall not be liable for errors contained in this User Guide or for incidental, consequential damages in connection with the furnishing, performance, or use of this information. Conair makes no warranty of any kind with regard to this information, including, but not limited to the implied warranties of merchantability and fitness for a particular purpose.

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Introduction

Purpose of the User Guide

This User Guide describes the Conair Ethernet Loading System (ELS) and explains step-by-step how to install and operate this equipment.

Before installing this product, please take a few moments to read the User Guide and review the diagrams and safety information in the instruction packet. You also should review manuals covering associated equipment in your system. This review will not take long, and it could save you valuable installation and operating time later.

How the Guide is Organized

Symbols have been used to help organize the User Guide and call your attention to important information regarding safe installation and operation.

⚠ Symbols within triangles warn of conditions that could be hazardous to users or could damage equipment. Read and take precautions before proceeding.

1 Numbers indicate tasks or steps to be performed by the user.

◆ A diamond indicates the equipment's response to an action performed by the user.

❒ An open box marks items in a checklist.

• A circle marks items in a list.

Indicates a tip. A tip is used to provide you with a suggestion that will help you with the maintenance and the operation of this equipment.

✎ Indicates a note. A note is used to provide additional information about the steps you are following throughout the manual.

Your Responsibility as a User

You must be familiar with all safety procedures concerning installation, operation, and maintenance of this equipment. Responsible safety procedures include:

- Thorough review of this User Guide, paying particular attention to hazard warnings, appendices, and related diagrams.
- Thorough review of the equipment itself, with careful attention to voltage sources, intended use and warning labels.
- Thorough review of instruction manuals for associated equipment.
- Step-by-step adherence to instructions outlined in this User Guide.

ATTENTION:
Read This So No One Gets Hurt

We design equipment with the user's safety in mind. You can avoid the potential hazards identified on this machine by following the procedures outlined below and elsewhere in the User Guide.

⚠ WARNING: Improper installation, operation, or servicing may result in equipment damage or personal injury.

This equipment should be installed, adjusted, and serviced by qualified technical personnel who are familiar with the construction, operation, and potential hazards of this type of machine.

All wiring, disconnects, and fuses should be installed by qualified electrical technicians in accordance with electrical codes in your region. Always maintain a safe ground. Do not operate the equipment at power levels other than what is specified on the machine serial tag and data plate.

⚠ WARNING: Voltage hazard

This equipment is powered by three-phase alternating current, as specified on the machine serial tag and data plate.

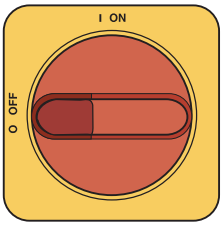
A properly sized conductive ground wire from the incoming power supply must be connected to the chassis ground terminal inside the electrical enclosure. Improper grounding can result in severe personal injury and erratic machine operation.

Always disconnect and lock out the incoming main power source before opening the electrical enclosure or performing non-standard operating procedures, such as routine maintenance. Only qualified personnel should perform troubleshooting procedures that require access to the electrical enclosure while power is on.

How to Use the Lockout Device

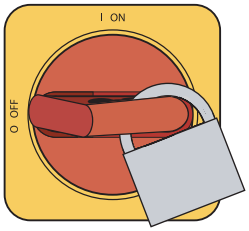
CAUTION: Before performing maintenance or repairs on this product, you should disconnect and lockout electrical power sources to prevent injury from unexpected energization or start-up. A lockable device has been provided to isolate this product from potentially hazardous electricity.

Lockout is the preferred method of isolating machines or equipment from energy sources. Your Conair products are equipped with the lockout device pictured here. Even though the ELS is not equipped with a lockout devise, the equipment that will be connected to the ELS should have lockout devices. To use the lockout device:



1 Stop or turn off the equipment.

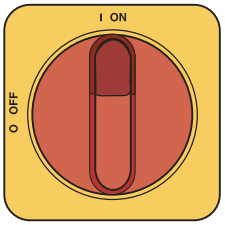
2 Isolate the equipment from the electric power. Turn the rotary disconnect switch to the OFF, or "O" position.



3 Secure the device with an assigned lock or tag. Insert a lock or tag in the holes to prevent movement.

4 The equipment is now locked out.

WARNING: Before removing lockout devices and returning switches to the ON position, make sure that all personnel are clear of the machine, tools have been removed, and all safety guards reinstalled.



To restore power, turn the rotary disconnect back to the ON position:

1 Remove the lock or tag.

2 Turn the rotary disconnect switch to the ON or "I" position.

SECTION
2

Description

What Is the ELS?

The Conair Ethernet Loading System (ELS) is a fully distributed loading control with I/O configurations for up to 512 loaders and 114 pumps, which includes some back up pumps. In addition, optional input and output I/O can be easily added for Ratio Valves and Purge/Pocket Valves. Fill Sensors and Air Operated Discharge I/O is included with the loader I/O. A color touch screen provides an intuitive, easy-to-read and easy-to-use graphical interface with on-board help and diagnostic screens.

Typical Applications

A Conair ELS can be used for the following applications.

- Conveying applications up to over 500 loaders controlled through distributed Input/Output modules on an Ethernet communications network.

- Load-pump assignments are completely flexible. Individual vacuum receivers can be assigned to any one of the over 100 loading systems distributed on Ethernet.

- The receiver operations include: First-In First-Out with priority loading, multi-source to multi-destination, reverse-regrind, single ratio, dual ratio, volume fill, positive discharge, and ratio/purge operation.

How the ELS Works

The new ELS Control is Conair's most powerful material handling system. Scalable from the basic configuration of 90 loaders to the fully deployed configuration that can manage up to 500 loaders, the ELS can be programmed for simple intuitive navigation.

I/O connections are located in compact modules near the loader or pump location. Communication between the PLC and the modules takes place via a single Ethernet cable. Adding more loaders to the system is as simple as tying it into a remote module nearby.

The ELS control makes use of Allen-Bradley ArmorBlock and ArmorPoint I/O modules. These are commonly available components that make it easy to build and grow a control network.

Each ArmorBlock provides connections for up to four loaders, three pumps, and eight material sources.

When expanding in larger increments, ArmorPoint modules can be used to add up to 16 loaders, 12 pumps, and 32 sources with 1 Ethernet connection.

Because it is all Ethernet based, ELS users have the advantage of internet connectivity. Any device - computer, tablet, or even a smart phone - with access to a company network, can be used to reach the ELS control. Whatever can be done via the in-plant Ethernet-connected monitors can also be completed on the remote device.

The ArmorBlock and ArmorPoint system allows for clean installation, and features open design that is dust-tight and water-tight. Rated for IP69K and NEMA 4X (when marked) for use without an enclosure.

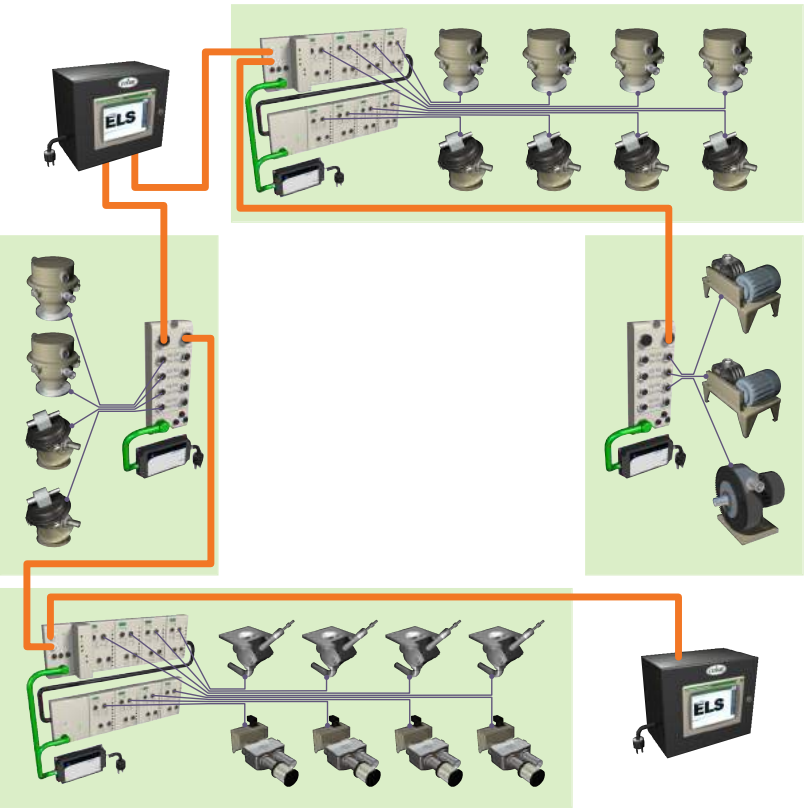
The panel can be mounted to C-channel framing and allows for easy access to the ArmorBlock and ArmorPoint connections. Connections are quick and simple, and the open design allows for easy viewing of the connections and communication lights incorporated on each panel.

ELS Features

- Industrial ethernet CAT 5 communications
- Allen Bradley/Rockwell Automation components
- Choice of ArmorBlock or ArmorPoint I/O modules
- Up to six human machine Interface panels
- Fully distributed, totally flexible, wiring and control
- Unloading (reverse regrind) system capability
- Ratio loading, positive discharge and fill sensor operation
- Purge and pocket valve operation
- MVP operation
- 10 inch {254 mm} HMI, 15 inch {381 mm} optional
- Multiple levels of password protection
- International icon control navigation

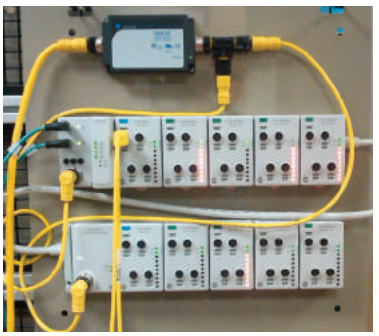
(Continued)

How the ELS Works (continued)



ArmorBlock

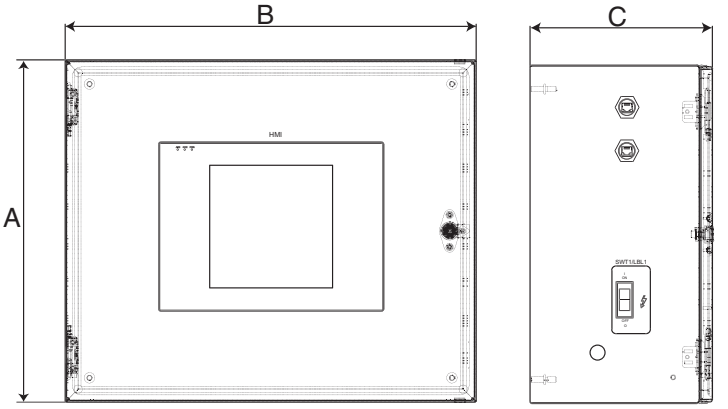
ArmorPoint



Specifications

MODEL ELS

Main Control Panel and Remote HMI



Front View† Side View

MODEL	ELS
Performance Characteristics	
Maximum Number of Vacuum Receivers	Up to 512*
Maximum Number of Vacuum Pumps	Up to 100+ (Any Pump Can Be Assigned as Backup)*
Maximum Number of Source Valves	1024
Programmable Logic Controller	
Main Control Panel	Allen-Bradley ControlLogix
Operator Interface	Allen-Bradley PanelView Plus V.6
Screen Size - Diagonal inches {mm}	10 {254} Standard, 15 {381} Optional
Output Voltage to Receivers/Valves	24 Vdc
Input Voltage to Receivers	24 Vdc
Output Voltage to Pumps	24 Vdc
Power/Amps	120 Vac/1 Phase 60 Hz (Optional 230 Vac)

Input/Output Capabilities and Maximum Number of Input/Output Devices

	Main Control Panel	Block Device	Point Device	Block Pump	Point Pump	Block Source	Point Source	Block Alarm
Receivers		Up to 4	Up to 16					
Pumps	No Inputs/ Outputs			Up to 3	Up to 16			
Valves						Up to 8	Up to 32	
Alarms								1
Max. # of Blocks or Points		30 Blocks	30 Points	6 Blocks	6 Points	30 Blocks	30 Points	6 Blocks
Totals =		512 Devices		100+ Pumps		1024 Sources		6 Alarms

Dimensions in. {mm}	
A - Height	20 {508}
B - Width	24 {610}
C - Depth	10 {254}
Weight - Main Enclosure lb {kg}	
Installed	60 {27.2}
Shipping	80 {36.3}

Maximum Number of Remote HMIs:	
Remote HMI Panel	5 Remote HMIs Maximum

SPECIFICATION NOTES:

* Maximum number of vacuum receivers, source valves, and vacuum pumps depends on the I/O expansion options.

† 10" screen shown. 15" is optional.

These tables define standard configurations only. Specifications can change without notice. Contact a Conair representative for the most current information.

SECTION
3

Installation

Unpacking the Boxes

The ELS comes in several boxes, depending on the options ordered. To unpack the main box containing the ELS base unit with Touch Screen Interface, proceed with the steps that follow.

1 **Carefully remove the ELS components from their shipping containers and set upright.**

2 **Remove all packing material,** protective paper, tape, and plastic. Compare the contents to the shipping papers to ensure that you have all the parts.

3 **Carefully inspect all components** to make sure no damage occurred during shipping. Notify the shipper immediately if damage is found.

4 **Check all wire terminal connections, bolts, and any other electrical connections** which may have come loose during shipping.

5 **Take a moment to record serial numbers, the software version number, and electrical power specifications** in the blanks provided on the back of this User Guide's title page. The information will be helpful if you ever need service or parts.

8 **You are now ready to begin installation. Follow the preparation steps in the next sub-section, paying particular attention to all wiring consideration and recommendations.**

✎ **Note:** Additional boxes may include distributed I/O plates, Remote Operator Interface Enclosure(s), and/or Ethernet Switch Enclosure(s) depending upon what was ordered.

Preparing for Installation

You should plan the location of the ELS base unit to ensure easy access and minimal wiring.

You need these tools for installation:

- ❒ Wire strain relief
- ❒ 16- or 18-inch adjustable wrench
- ❒ Set of Allen wrenches
- ❒ 1/2-inch open or box wrench
- ❒ Flashlight
- ❒ Multi-meter
- ❒ Screwdriver - regular flathead #2.

Select a mounting location for the base unit. The base unit interface can be mounted on a wall or other stable vertical surface. Select a location that:

- **Is central to loaders that the ELS will control.** Keep the ELS unit as close as possible to the loading stations to minimize the amount of wire needed to connect the vacuum receivers to the control.
- **Provides adequate clearance for safe operation and maintenance.** The base unit should be mounted at a height that allows the operator to easily see and use the touch screen. Maintain at least 3 feet (1 m) clearance in front of the base unit for safe access to the main enclosure.
- **Provides a clean, dry, vibration-free environment.** Exposure to wide temperature variations, high ambient temperature, power line fluctuations, caustic fumes, or excessive amounts of dust, dirt, vibration, shock, and moisture could harm performance and reduce the life of this equipment.
- **Provides a grounded source of 120 Vac power (230 Vac optional).** The three-prong power cords supplied with the ELS base unit and power supply requires a grounded 120 Vac (230 Vac optional) outlet rated for at least 16 amp service.

WARNING: Improper installation, operation, or servicing may result in equipment damage or personal injury.

This equipment should only be installed, adjusted, and serviced by qualified technical personnel who are familiar with the construction, operation, and potential hazards of this type of machine.

All wiring, disconnects, and fuses should be installed by qualified electrical technicians in accordance with electrical codes in your region. Always maintain a safe ground. Do not operate the equipment at power levels other than what is specified on the machine serial tag and data plate.

Plan the power/communication cable routes

- **Review all wiring guidelines and diagrams provided in the manuals and electrical diagrams supplied** with the ELS system and your conveying equipment before beginning installation. See Wiring Considerations.

(Continued)

Preparing for Installation (continued)

- **Keep communication wires away from sources of static electricity.** Static electricity can damage the controls. Communication cables should not be run near the material lines and hoses, which produce large amounts of static electricity when material is conveyed.
- **Avoid running communication cables across power feed lines.** If you must run the cable across power feed lines, run the cable at right angles (90°) to the lines.
- **Do not run power cables together with communication cables inside cable trays.** Communication cables include Ethernet communications.

Installing the ELS

ELS installation consists of:

- **Mounting the main unit;**
- **Mounting distributed I/O plates, Remote Operator Interface Enclosure(s), and/or Ethenet Switch Enclosure(s)** depending upon what was ordered;
- **Connecting the control to a main power source** and optional hardware;
- **Configure I/O via Operator Interface;**
- **Wiring Loaders to the control;**
- **Wiring Pumps to the control; and**
- **Wiring the purge and pocket valves included in the system.**

Wiring Considerations

⚠ WARNING: Improper installation, operation, or servicing may result in equipment damage or personal injury.

This equipment should only be installed, adjusted, and serviced by qualified technical personnel who are familiar with the construction, operation, and potential hazards of this type of machine.

All wiring, disconnects, and fuses should be installed by qualified electrical technicians in accordance with electrical codes in your region. Always maintain a safe ground. Do not operate the equipment at power levels other than what is specified on the machine serial tag and data plate.

- **Disconnect and lock out the main power supply to equipment in the conveying system** before attempting to wire power and communication cables between the ELS control, vacuum receivers, pumps, dust collectors, and material valves.
- **Install all wiring, disconnects, and fuses in accordance with electrical codes in your region.** All electrical installations should be done only by qualified electrical technicians.
- **Always refer to the wiring diagrams supplied with your ELS control before making electrical connections.** The diagrams show the most accurate electrical component information.
- **Protect communication cables from sources of static electricity and electrical noise.**

Use shielded cable or run wire through a contiguous metal conduit or wireway. Failure to use a metal shield can expose the controls to static electricity, which can damage electronic components.

Do not run communication cables near material lines and hoses, which produce large amounts of static electricity when conveying material.

Keep communication cables at least 5 ft. (1.5 m) from electric motors, transformers, rectifiers, arc welders, generators, induction furnaces and sources of microwave radiation.

(Continued)

Avoid running communication cable across power feed lines. If you must run cable across power lines, run the cable at right angles to the line. Keep the cable at least 6 inches (0.15 m) from AC power lines of less than 20 A; 1 foot (0.30 m) from lines of 20A to 100 kVA; and 2 feet (0.60 m) from lines of 100 kVA or more.

- **Always maintain a safe ground.** Follow the safe grounding procedures in the wiring diagram package. Ground the shielded cable inside the Input/Output enclosure only.
- **Do not operate the equipment at power levels other than those specified** on the equipment data plate.

Mounting the Base Unit

The ELS control base unit should be mounted on a wall, or other secure vertical surface, at a height providing easy access and a clear view of the touch screen panel.

1. **Bolt the base unit to a solid mounting surface.** Use the mounting brackets on the panel enclosure.

2. **Ground the base unit cabinet**. Connect a ground wire to the base unit enclosure. Follow the procedures outlined by your regional electrical codes and the wiring diagrams included with this manual.

WARNING: All wiring disconnects and fuses should be installed by qualified electrical technicians in accordance with electrical codes in your region.

Always maintain a safe ground. Do not operate the equipment at power levels other than what is specified on the machine serial tag and data plate.

Mounting Remote I/O Panels, Optional Remote HMI Enclosure(s) with or without Remote Alarm(s), and/or Switch Enclosure(s)

The distributed I/O panels should be mounted on a wall, hung from a support truss, or other secure vertical surface. The Remote HMI enclosure should be mounted at a height providing easy access and a clear view of the touch screen panel.

1. **Optional hardware connects to Main ELS via Ethernet.** The maximum distance between the connections is about 200 ft. (61.0 m) The distance may be extended if a switch box is used. See Electrical drawings for more detail or contact Conair Engineering.
2. **Bolt the enclosure to a solid mounting surface.** Use the mounting brackets on the base unit enclosure.
3. **Ground the cabinet.** Connect a ground wire to the base unit enclosure. Follow procedures outlined by your regional electrical codes and the wiring diagrams included with this manual.

Installing the ELS (continued)

WARNING: All wiring disconnects and fuses should be installed by qualified electrical technicians in accordance with electrical codes in your region.

Always maintain a safe ground. Do not operate the equipment at power levels other than what is specified on the machine serial tag and data plate.

Connecting the Main Power Source

The ELS base unit and optional hardware are equipped with a three-prong plugs and power cords.

1 **Plug the power cords into grounded 120 Vac outlets** rated for at least 16 Amp service.

2 **Make sure the base unit is grounded.**

WARNING: Electrical shock hazard. Failure to provide proper grounding can cause control malfunctions and could result in personal injury from electrical shock.

The control must be connected to a grounded power source. A properly sized conductive ground wire must be connected to the chassis ground terminal inside the base unit enclosure.

! **IMPORTANT:** Always refer to the wiring diagrams that came with your ELS before making electrical connections. The wiring diagrams show the minimum size main power cable required for your ELS, and the most accurate electrical component information.

WARNING: Electrical shock hazard. All wiring disconnects, and fuses should be installed by qualified electrical technicians in accordance with electrical codes in your region. Always maintain a safe ground. Do not operate the equipment at power levels other than what is specified on the machine serial tag and data plate.lectrical shock hazard. Failure to provide proper grounding can cause control malfunctions and could result in personal injury from electrical shock. The control must be connected to a grounded power source. A properly sized conductive ground wire must be connected to the chassis ground terminal inside the base unit enclosure.

Wiring Loaders

The loader wires connect from the I/O designated as Device I/O to the connectors located on the loader. The number of loaders and options in the conveying system will determine the number of connections that are required.

Refer to electrical prints provided with the ELS Control for all electrical connections to the loader control. Additional information is found on the Configure I/O Help screens. All loader inputs and outputs are 24 Vdc.

WARNING: Electrical hazard
Before performing maintenance or repairs on this product, disconnect and lock out electrical power sources to prevent injury from unexpected energization or start-up. A lockable device has been provided to isolate this product from potentially hazardous electricity.

Wiring Pumps

The pump wires connect from the I/O designated as Pump I/O to the pumps starter box panel. The number of pumps in the conveying system will determine the number of connections that are required.

Refer to the electrical prints included with the ELS control for all connections to the vacuum pumps. Additional information is found on the Configure I/O Help screens. All the pump inputs and outputs are 24 Vdc.

WARNING: Electrical hazard
Before performing maintenance or repairs on this product, disconnect and lock out electrical power sources to prevent injury from unexpected energization or start-up. A lockable device has been provided to isolate this product from potentially hazardous electricity.

Wiring Purge, Pocket, and Ratio Valves (Sources)

The ELS can operate purge and/or pocket conveying valves, which are used in central drying and distribution systems. The pocket valve allows multiple loaders to draw dry material as needed from a single drying hopper.

Refer to electrical prints provided with the ELS for all electrical connections to the loader control. Additional information is found on the Configure I/O Help screens. All the valve outputs are 24 Vdc.

WARNING: Electrical hazard
Before performing maintenance or repairs on this product, disconnect and lock out electrical power sources to prevent injury from unexpected energization or start-up. A lockable device has been provided to isolate this product from potentially hazardous electricity.

Starting the ELS Control and Testing the Installation

1. Once the system is completely assembled, check that all connections are terminated correctly.

2. Provide power to the ELS control.

3. Wait for the ELS control to initialize. The control will check the I/O connected during the boot-up and initialization process. This may take from eight to ten seconds.

Configure the Distributed I/O

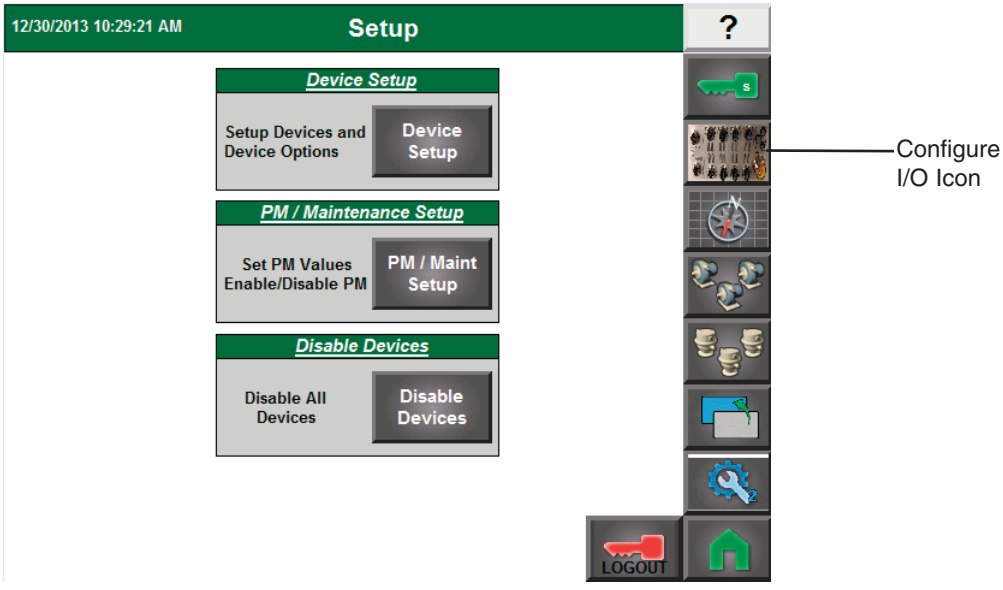
The I/O of the ELS control will need to be configured prior to wiring loaders, pumps, and valves. The ELS base I/O has no local I/O. All I/O is distributed and is enabled through each IP address to customize the ELS to loading system requirements.

1. In order to configure I/O, **provide power to the ELS**.

2. **Wait for the control to initialize.** The control will check the I/O connected during the boot-up and initialization process. This will take up to ten seconds.

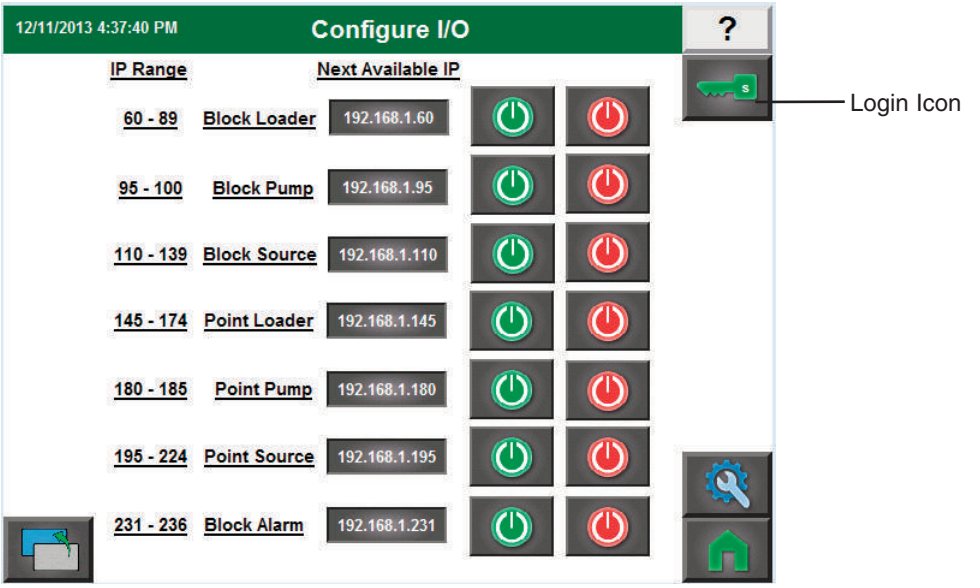
3. From the Main screen, **select the Setup Icon.** The Setup screen will appear.

4. From the Setup screen, **select the Configure I/O Icon**. The Configure I/O screen will appear.



Configure the Distributed I/O (continued)

5 From the Configure I/O screen, **login as "admin"**. Use the default password for user admin.

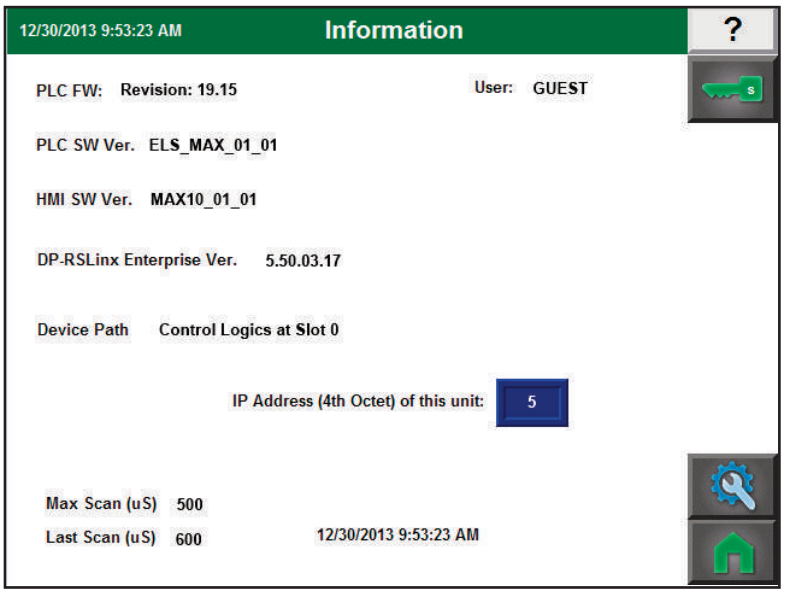


6 **Choose the correct Increment(Green)/Decrement(Red) button to increase/decrease the IP address** of the selected type of I/O.

7 **Repeat the process until all I/O addresses match the system's drawings that establish the full I/O count.**

Installation Information

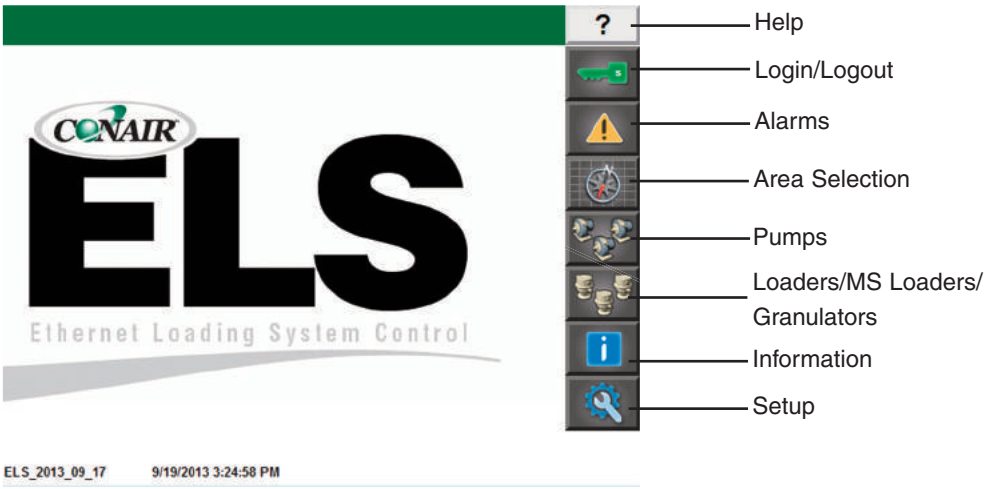
The Information Screen contains valuable information on the setup of the ELS system. It shows the current firmware of the PLC, the software version of the PLC, the software version of the HMI, what current User Level is of the operator logged in, and the IP address of this machine which is important when setting up multiple HMIs on one control. This information is mostly used by Conair Service or Maintenance personnel.



SECTION
4

Operation

ELS Control Main Screen



This ELS Control Main screen appears after the control has initialized.

ELS Control Screen Icons

Help 

Help screens are available from most screens. The help varies from general overview to detailed instructions. If "Help" is available for a screen, a "question mark" will be present in the upper right hand corner on the green title bar. Press the "question mark" to open the help screen.

Languages

The current language available is English. All screens are displayed in English.

Security

Operator actions and screens can be password protected. There are five levels of programmable password protection.

User Names and Default Passwords

User Name	Default Passwords
guest	
oper	oper
super	super
super2	super2
service	service

Note: "guest" has no security level and requires no password.

ELS Control Screen Icons

Tasks / Operations and Default Security Level

Task	Password Level Required				
User Level	0	1	2	3	4
Level internal to HMI	A	B	D	E	F
User name	GUEST	OPER	SUPER	SUPER2	SERVICE
Enable/Disable Loader	YES	YES	YES	YES	YES
Enable/Disable Pump	YES	YES	YES	YES	YES
Change all times, Load time, Dump time, etc.	NO	YES	YES	YES	YES
Setup Pump	NO	YES	YES	YES	YES
Test Pump	NO	YES	YES	YES	YES
Change Source for Pocket and Purge	NO	NO	YES	YES	YES
Assign Backup Pump	NO	NO	YES	YES	YES
Lockout Source for Loader	NO	NO	NO	YES	YES
Shutdown HMI	NO	NO	NO	YES	YES
Reset PM Cycles: Pumps, Loaders, Sources	NO	NO	NO	YES	YES
Change Date and Time	NO	NO	NO	YES	YES
Change Device Names	NO	NO	NO	YES	YES
I/O Configuration	NO	NO	NO	YES	YES
Add Devices	NO	NO	NO	YES	YES
PM Set Point / Enable Alarms	NO	NO	NO	YES	YES
Backup/Restore	NO	NO	NO	YES	YES
Disable All Loaders/Pumps from Maintenance Screen	NO	NO	NO	YES	YES
View I/O Status	NO	NO	NO	YES	YES
Clear Database	NO	NO	NO	NO	YES
Access Backup/Restore from Maintenance Screen	NO	NO	NO	NO	YES
Change Password	NO	NO	NO	NO	YES

(Continued)

ELS Control Screen Icons (continued)

Login/Logout

The User will have to login for operator actions or screens which require security. Once logged in, the User will remain logged until either the User logs out or the login times out (five minutes).

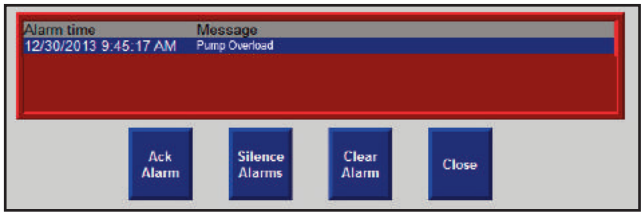
To Login, press the "Green Key" button located on the column of buttons at the right hand side of the screen.

When logged in, the key will turn "Red", indicating the system is locked under the current logged in level.

The number in the Key Icon represents the level at which the current User is logged in at.

Alarm Summary

When alarm occurs, an audible sound will be triggered and the status light on the operator interface will flash if the optional alarm blocks are installed. The alarm banner will be displayed with the latest alarm.



The following buttons are available from the alarm banner:

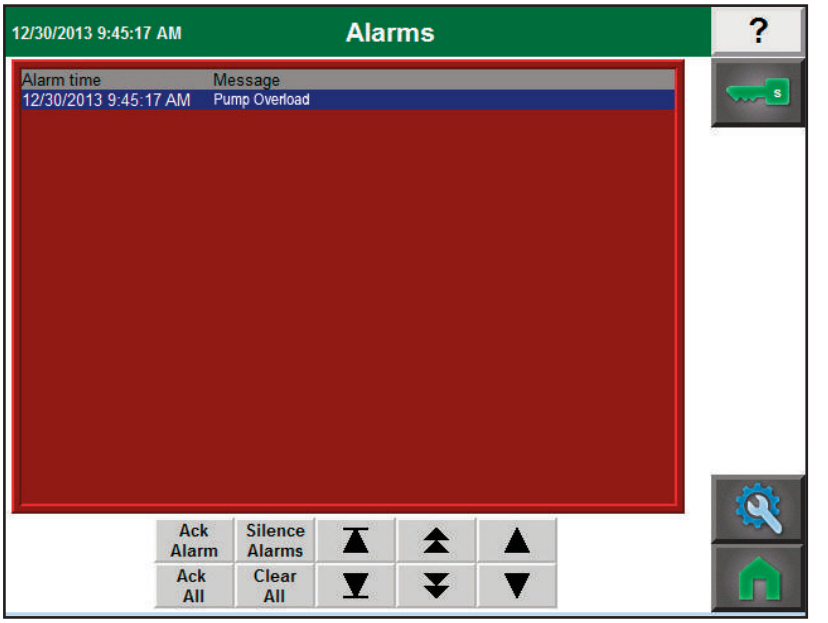
- Acknowledge (Ack) Alarm – The Ack button is used to acknowledge the alarm. The audible alarm will be silenced. The ALM indicator will continue to blink until the alarm condition is resolved.
- Silence Alarms – The Silence Alarms button silences the ALM Horn.
- Clear Alarm – The Clear Alarm button is used to clear the alarm from the alarm banner.
- Close – The Close button closes the alarm banner popup screen.

ELS Control Screen Icons (continued)

Alarms

A log of all alarms can be found on the Alarms screen. The Alarms screen is accessible from the Main or Home screen and most other screens.

Press the Alarms Icon for access to the Alarms screen. 



The following buttons are available from the Alarms screen:

- Ack Alarm (Acknowledge Alarm) – The Acknowledge Alarm button is used to acknowledge the alarm. The audible alarm will be silenced. The ALM indicator will continue to blink until the alarm condition is resolved.
- Ack All (Acknowledge All) – The Acknowledge All button acknowledges all the alarms.
- Silence Alarms – The Silence Alarms button silences the ALM Horn.
- Clear All – The Clear All button is used to clear all the alarms from the alarm history or list. Once cleared, the history will be erased.

Navigation

The ELS Human Machine Interface (HMI) system provides three ways to navigate through the screens, via pump navigation, device navigation or Area navigation in which pumps and devices have been assigned.

Area Selection 

The Area Navigation Icon takes the User to the Area Selection screen.

Pumps 

The Pumps Icon takes the User to the Pumps screen.

(Continued)

ELS Control Screen Icons (continued)

Loaders/MS Loaders/Granulators 

The Loaders/MS Loaders/Granulators Icon takes the User to the Loaders/MS Loaders/Granulators screen.

Information 

The Information Icon takes the User to the Information screen.

Setup 

The Setup Icon takes the User to the Setup screen.

Home 

The Home Icon does not appear on the ELS Control Main screen but commonly appears on other screens. The Home Icon takes the User from the screen on which the Home Icon appears directly to the ELS Control Main screen.

Area Navigation

The Area Selection screen is shown below. Devices and pumps can be assigned to different areas. The devices and pumps can be navigated to by the Area Selection screen. If a pump was assigned to Area #3, by depressing the #3 button on the Area Selection screen, which shows all areas by a matrix of pushbuttons, the Area Popup screen will display and the operator can choose whether the pumps are displayed for this area, or the devices are displayed.

The graphic on the Area Selection screen can be setup to look like the plant or have a representative feel of the whole control area. This can lead an operator to where the devices can be found.

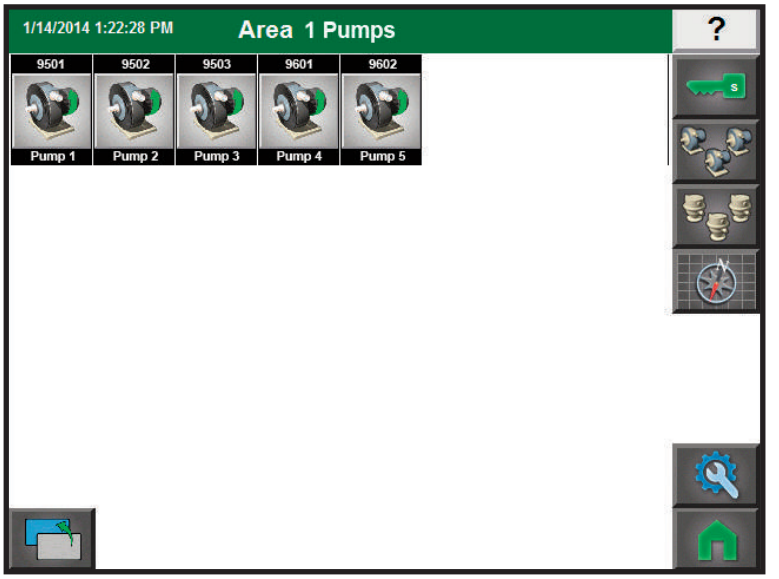
Area Selection Screen

Area Selection Popup Screen

The Area Selection Popup screen lets the operator select the Loaders or Pumps that are assigned to that area.

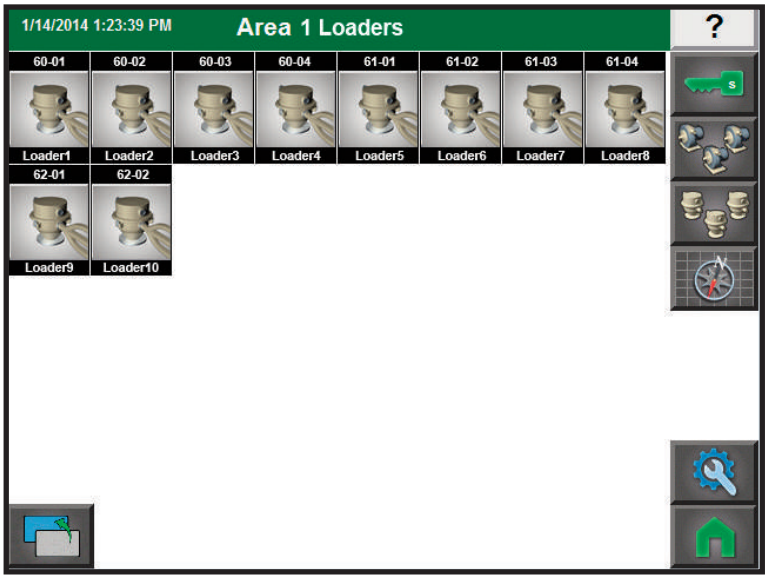
(Continued)

Area Navigation (continued)



Area Selection - Pump Screen

The Area Selection - Pump (Area ### - s...s Pumps) screen shows all the pumps that are assigned to this area. This assignment is for navigational purposes only. The area can signify a number or letter or a location in the plant represented on the screen.

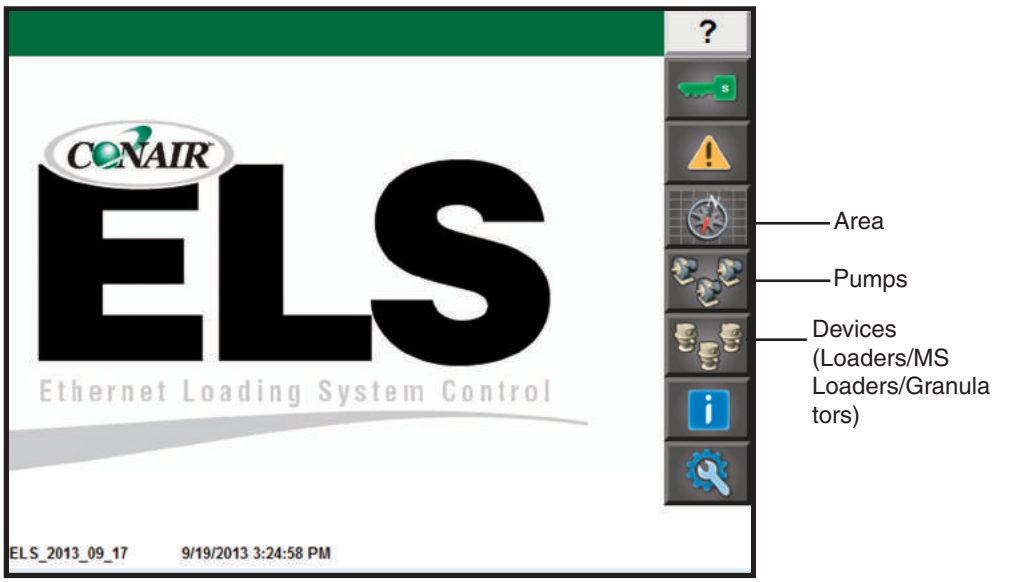


Area Selection - Loader Screen

The Area Selection - Loader (Area ### - s...s Loaders) screen shows all the loaders that are assigned to this area. This assignment is for navigational purposes only. The area can signify a number or letter or a location in the plant represented on the screen.

How to Navigate the ELS Control Main Screen

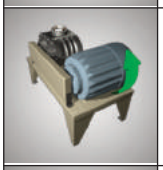
The ELS Control system provides three ways to navigate through the system screens, via Area navigation (in which pumps and devices have been assigned), Pump navigation, or Device navigation (Loaders/MS Loaders/Granulators).



Icon Descriptions

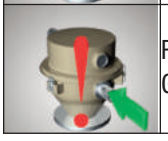
Icons are used to symbolize the different types of devices. The icon's appearance and symbol/color change based upon the status of the device/pump.

Pump Icons

Icon	Appearance/ Condition	Description
	Ghosted	The pump is disabled. No vacuum will be provided to any of the attached receivers.
	Full Color	The pump is ready to provide vacuum to any of the attached receivers when there is a demand.
	Green Arrow	The pump is providing vacuum to one of the attached receivers. Material is being conveyed.
	Blue Arrow	Pump is in the clean cycle. Pump has stopped to allow for dust collector to empty.
	Red Exclamation	The pump is in a fault condition. The pump will not provide vacuum to any of the attached receivers until the fault is cleared.

Icon Descriptions (continued)

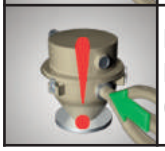
Loader/Receiver Icons

Icon	Appearance/ Condition	Description
	Ghosted	The loader is disabled and will not be serviced by the pump.
	Full Color	The loader is ready but not running because there is no demand for material.
	Yellow Asterisk	The loader is calling for material, but the pump is servicing another loader at this time so it waits.
	Green Arrow	The pump is servicing this loader. Material is being conveyed to the loader.
	Blue Arrow	The loader has completed its load cycle and is in its discharge cycle.
	Red Exclamation	The loader is in a fault condition and not being serviced by pump. See Loader Alarms for more details.
	Red Exclamation / Green Arrow	The loader is in a fault condition but is being serviced by the pump. See Loader Alarms for more details.

(Continued)

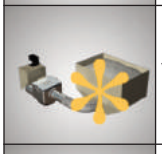
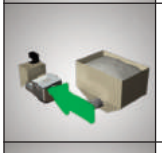
Icon Descriptions (continued)

MS Loader Icons

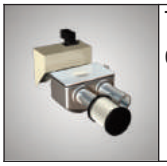
Icon	Appearance/ Condition	Description
	Ghosted	The multi-source loader is disabled and will not be serviced by the pump.
	Full Color	The multi-source loader is ready but not running because there is no demand for material.
	Yellow Asterisk	The multi-source loader is calling for material, but the pump is servicing another loader at this time so it waits.
	Green Arrow	The pump is servicing this multi-source loader. Material is being conveyed to the multi-source loader.
	Blue Arrow	The multi-source loader has completed its load cycle and is in its discharge cycle.
	Red Exclamation	The multi-source loader is in a fault condition and not being serviced by pump. See Loader Alarms for more details.
	Red Exclamation / Green Arrow	The multi-source loader is in a fault condition but is being serviced by the pump. See Loader Alarms for more details.

Icon Descriptions (continued)

Granulator/Grinder Icons

Icon	Appearance/ Condition	Description
	Ghosted	The granulator is disabled and will not be serviced by the multi-source loader.
	Full Color	The granulator is ready but not running because there is no demand for material.
	Yellow Asterisk	The granulator is calling has material, but the multi-source loader is servicing another loader at this time so it waits.
	Green Arrow	The multi-source loader is servicing this granulator. Material is being conveyed from the granulator.
	Red Exclamation	The granulator is in a fault condition and not being serviced by multi-source loader. See Loader Alarms for more details.

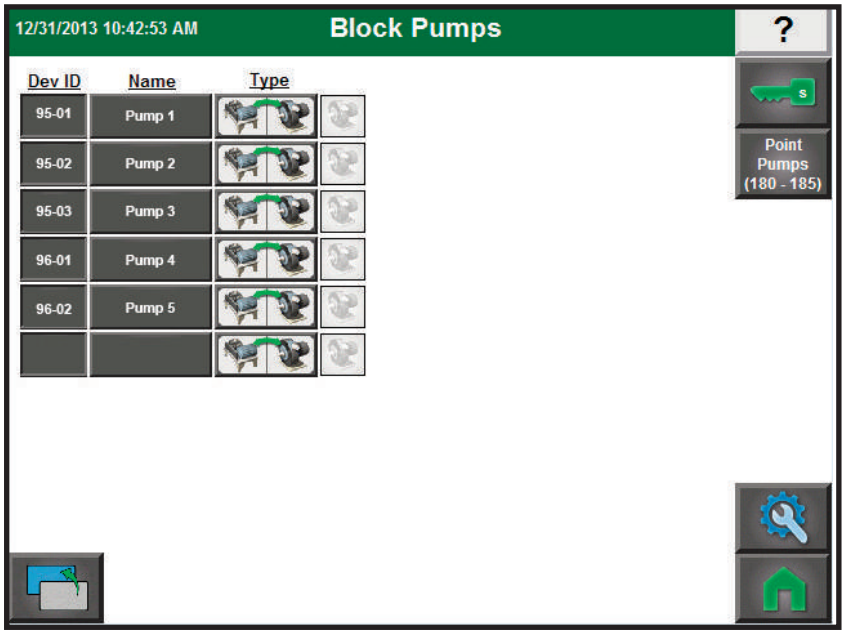
Source Valve Icon

	The source valve icon is either a purge valve or pocket valve depending upon how it was configured in the device setup screen.

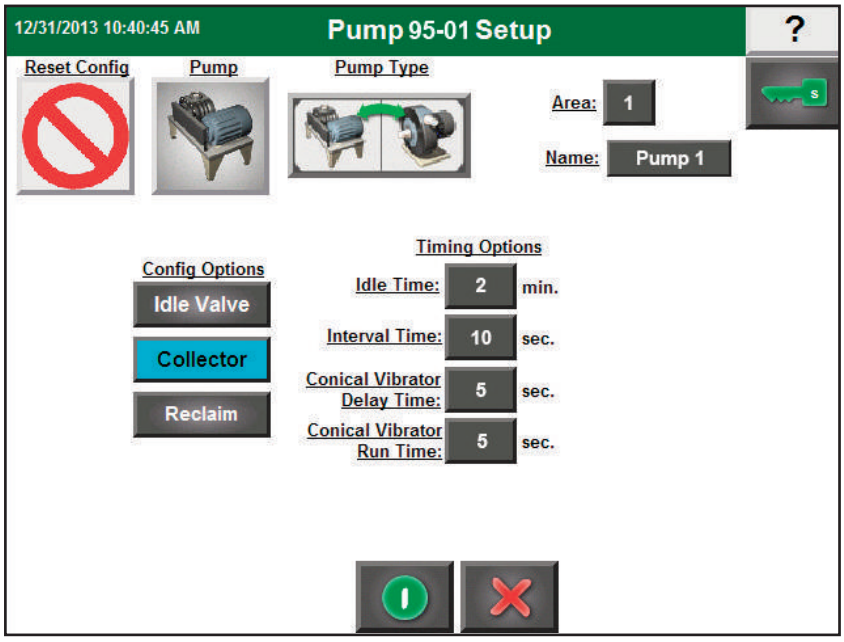
Loader with Ratio Valve Icon

	On the device detail screen, if the loader is configured with a ratio valve, the icon displayed will be a loader with the ratio valve attached.

Pump Block and Setup



Block Pump Selection Screen
The operator selects the pump to be setup by depressing the Dev ID button. This opens up the Pump Setup Screen.



Pump Setup Screen
The operator selects the necessary options. Pump Type is for display icon only.

ELS Control Operator Instructions - Main Screen

The ELS Control Main screen is displayed automatically upon power up after the system is done initializing.

Below is the basic functionality of the Help and Login/Logout buttons on the ELS Control Main screen. The explanations for the other screens accessible from the ELS Control Main screen buttons appear with their screens described within this section.

Help: Help screens are available from most screens. The help varies from general overview to detailed instructions. If "Help" is available for a screen, a "question mark" will be present in the upper right hand corner on the green title bar. Press the "question mark" to open the help screen

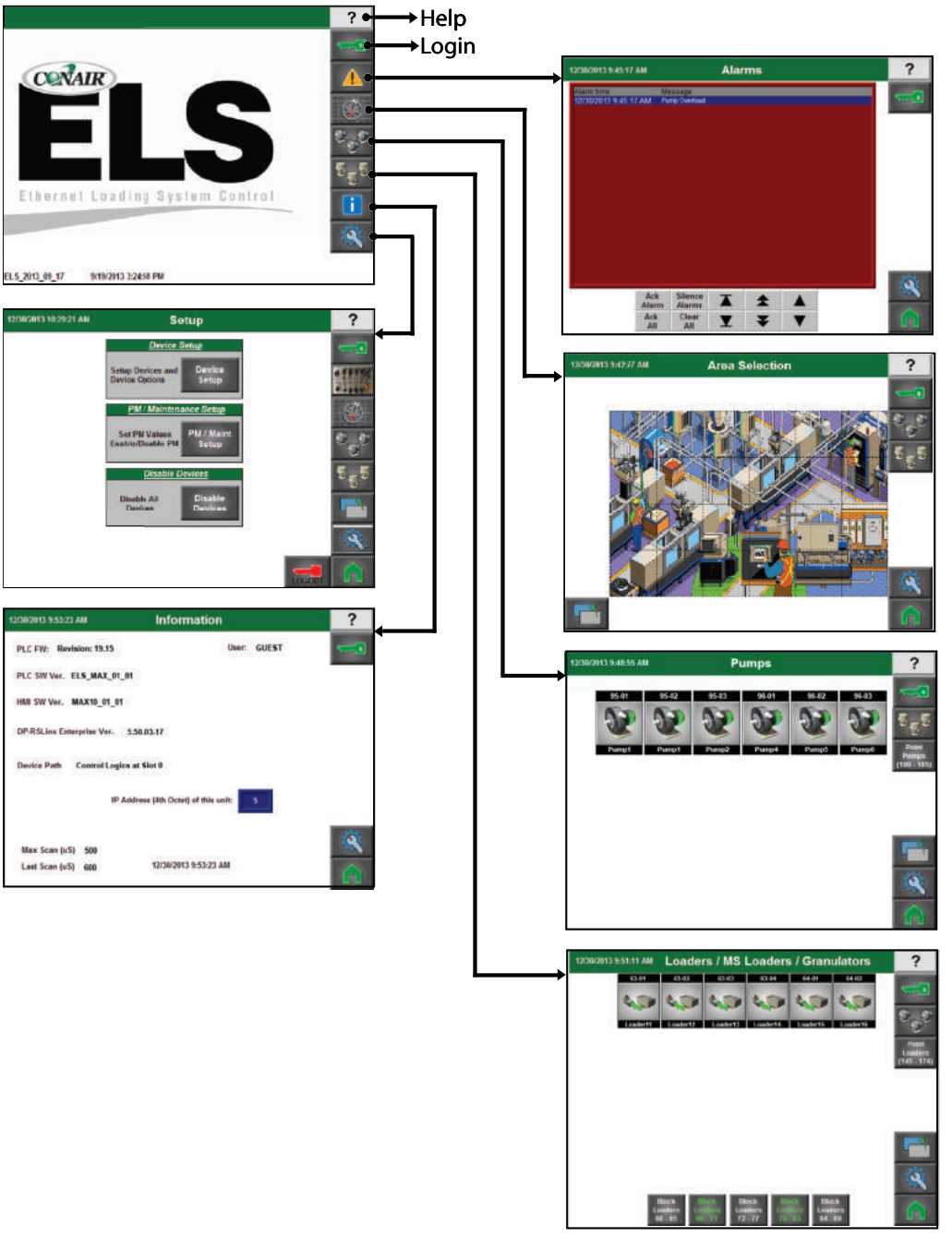
Login/Logout: The User will have to login for operator actions or screens which require security. Once logged in, the User will remain logged until either the User logs out or the login times out (five minutes).Pushing the menu square will take you to the menu page.

To Login, press the "Green Key" button located on the column of buttons at the right hand side of the screen. When logged in, the key will turn "Red", indicating the system is locked under the current logged in level.

The number in the Key Icon represents the level at which the current User is logged in at.

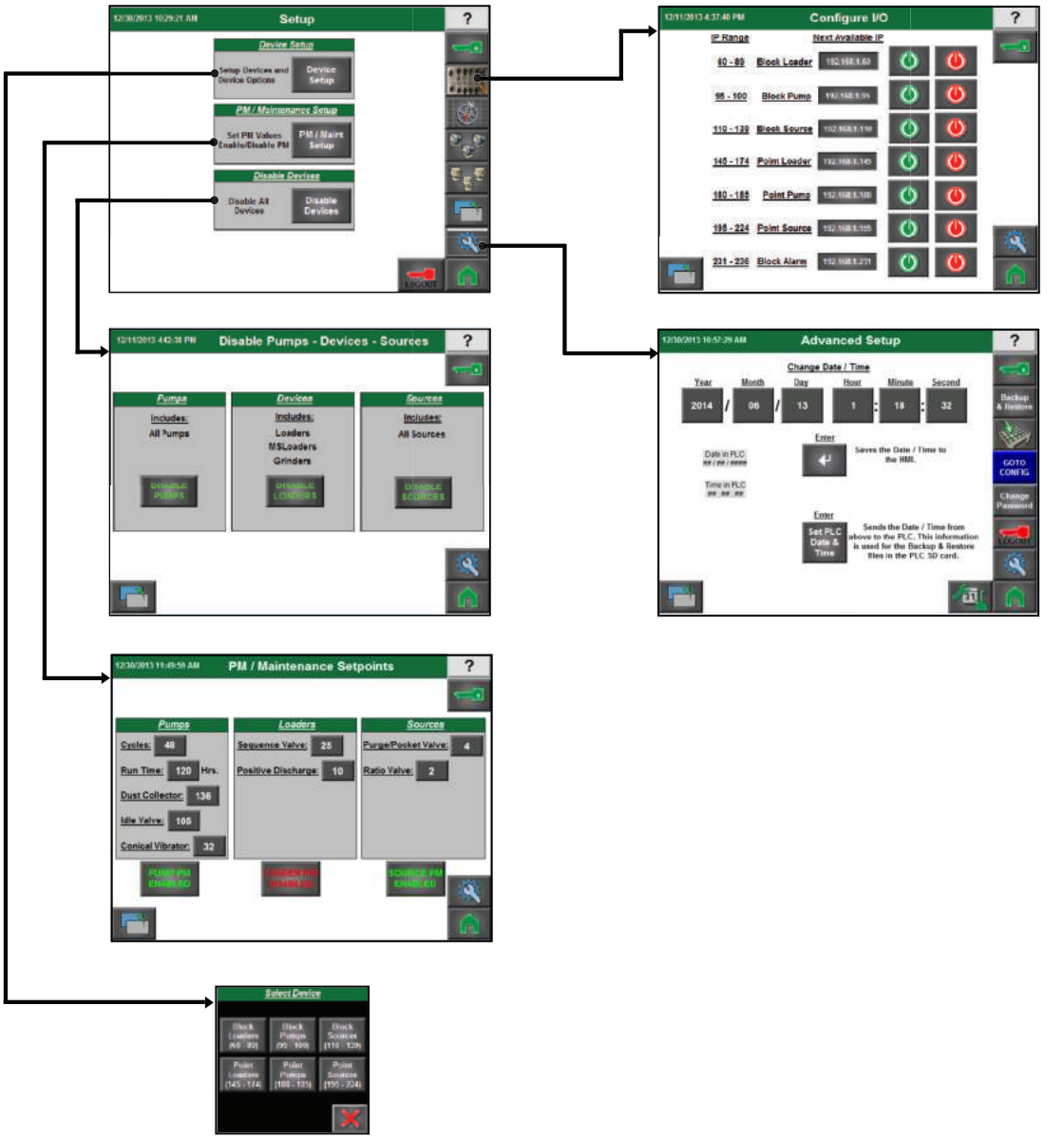
ELS Control Function Flow Charts

Accessed from Main Screen



ELS Control Function Flow Charts (continued)

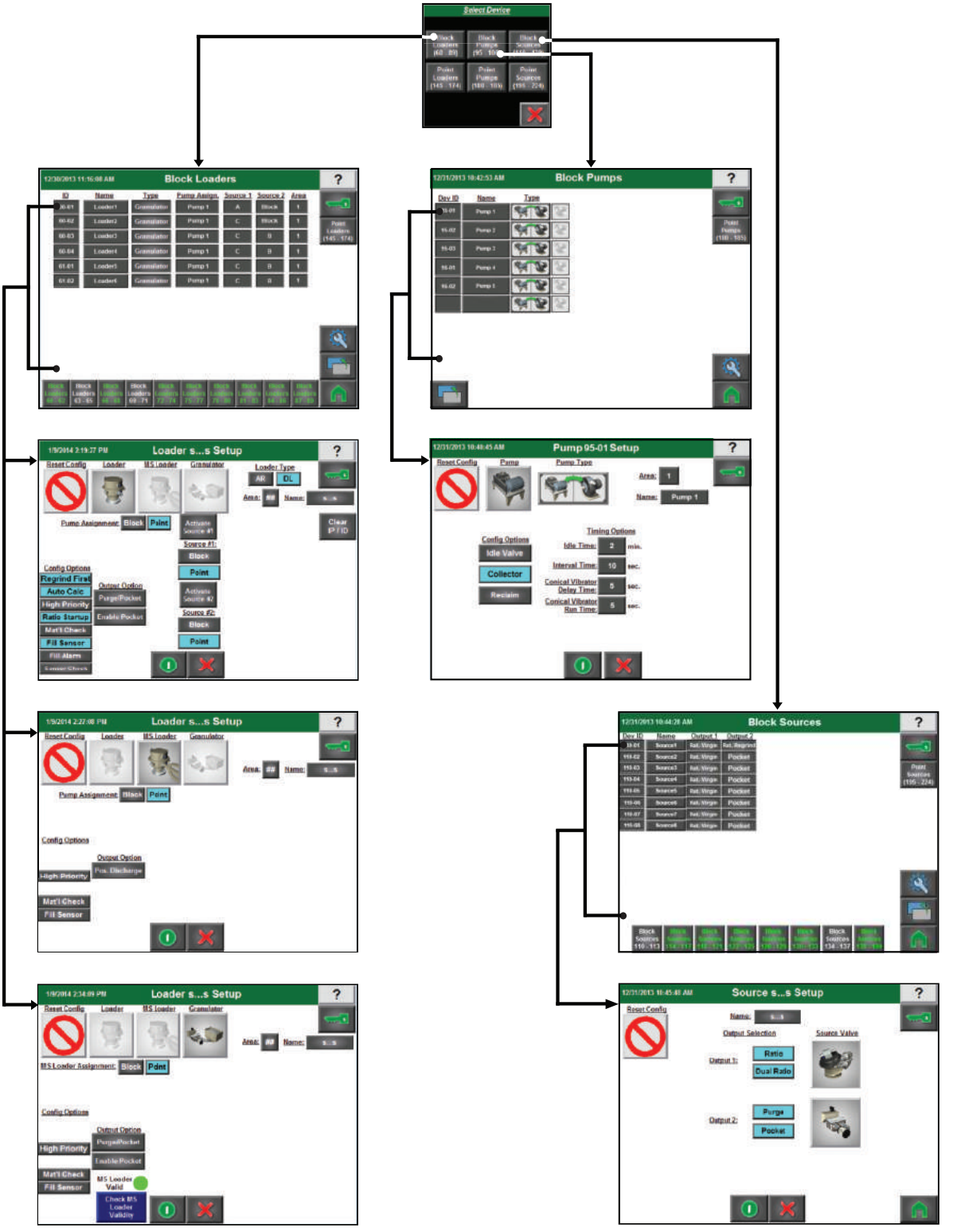
Accessed from Setup Screen



(Continued)

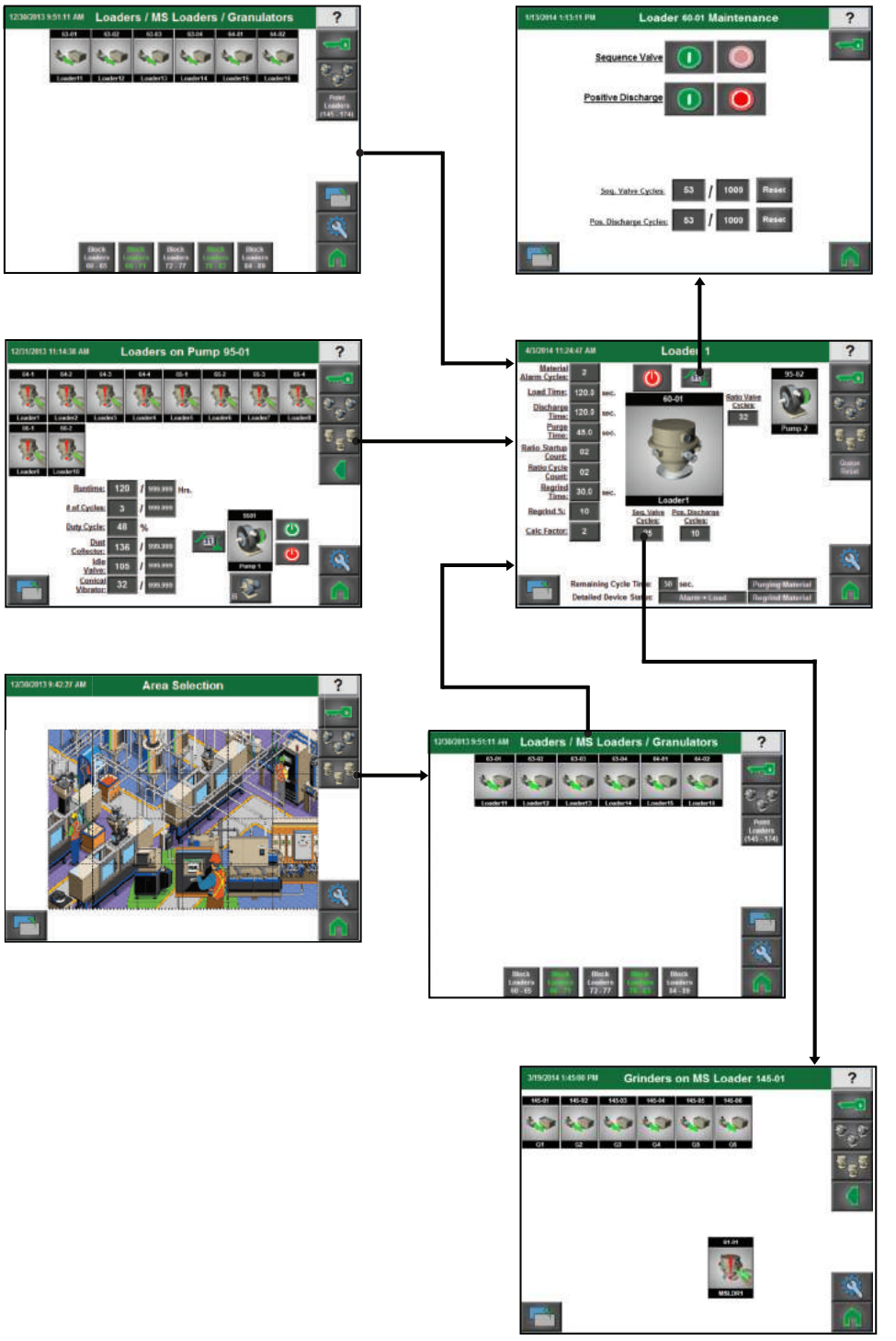
ELS Control Screen Flow Charts (continued)

Accessed from Device Setup Pop-up



ELS Control Screen Flow Charts (continued)

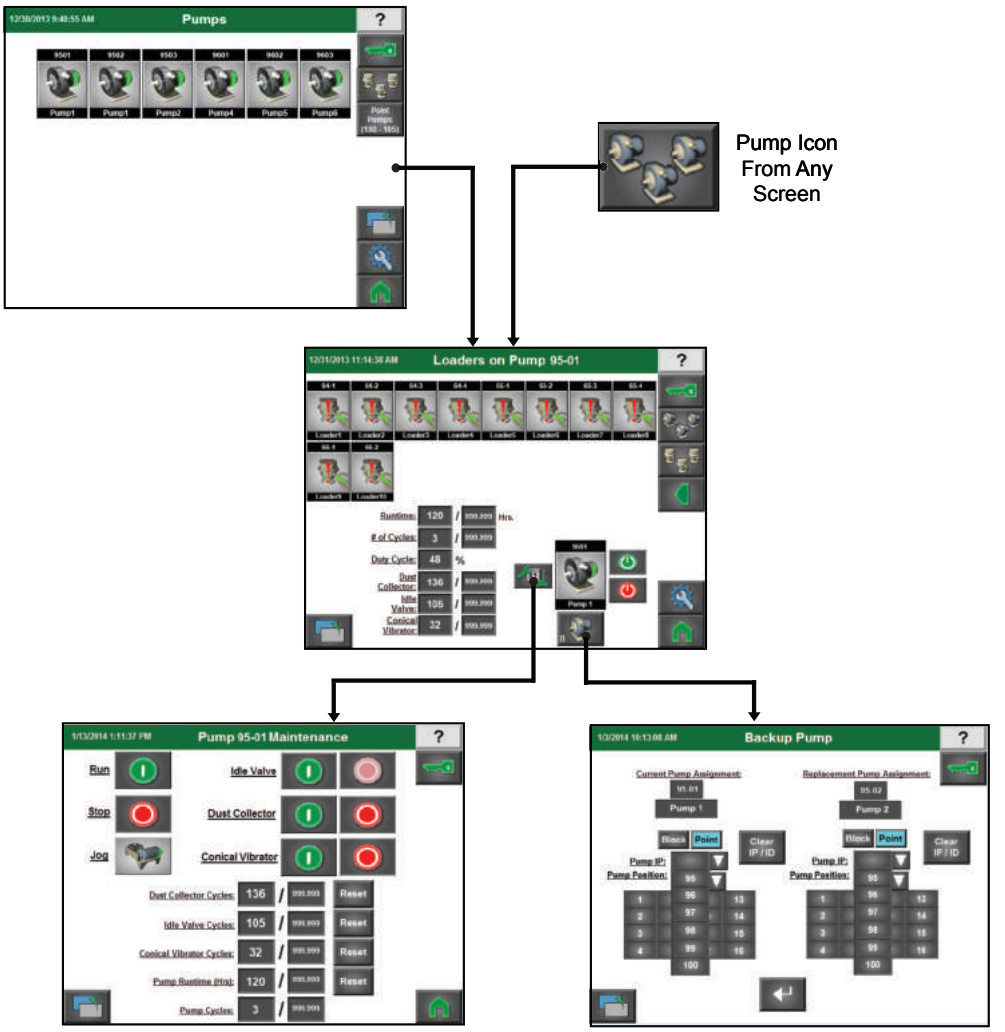
Accessed from Loader Details Screen



(Continued)

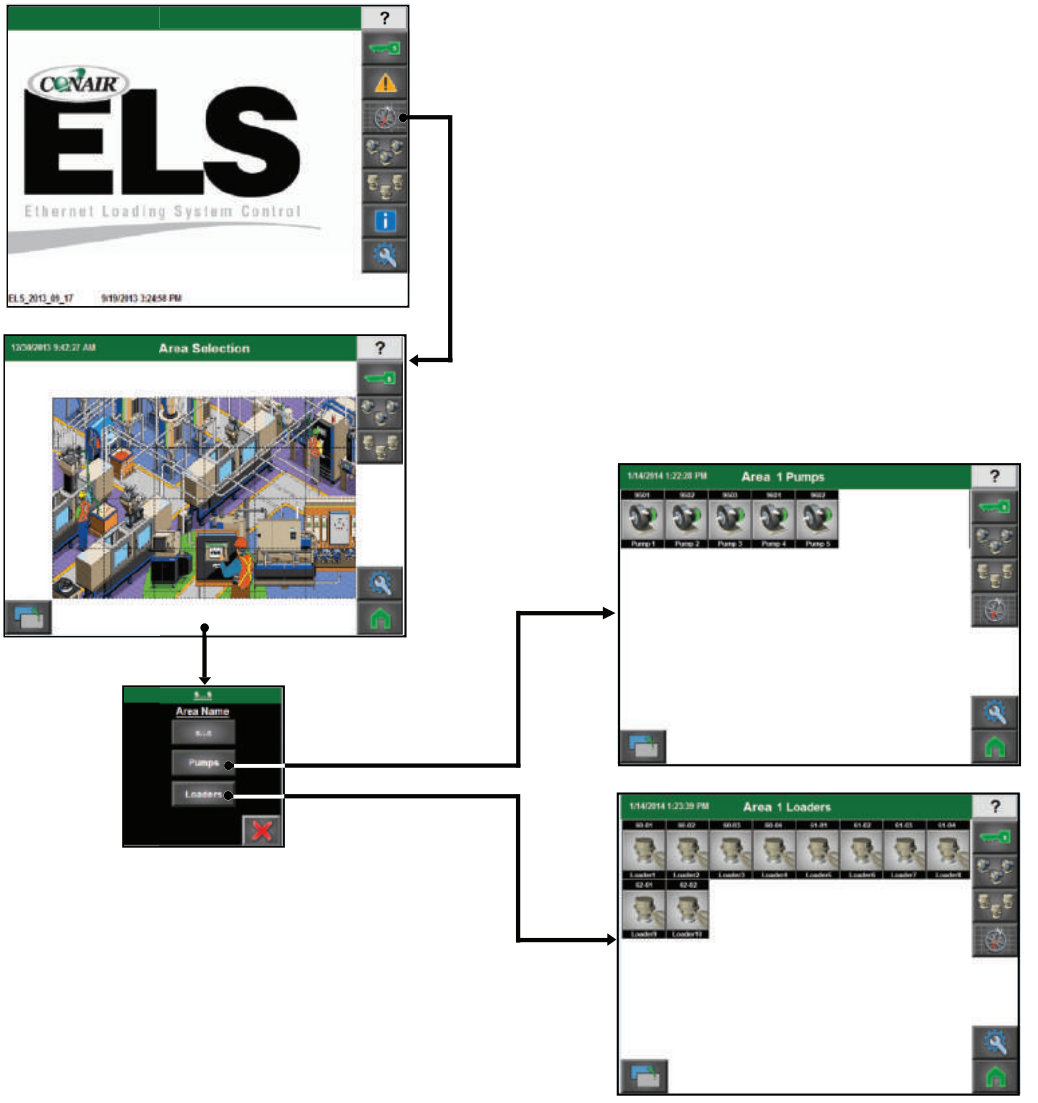
ELS Control Screen Flow Charts (continued)

Accessed from Pumps Screen



ELS Control Screen Flow Charts (continued)

Accessed from Area Selection Screen



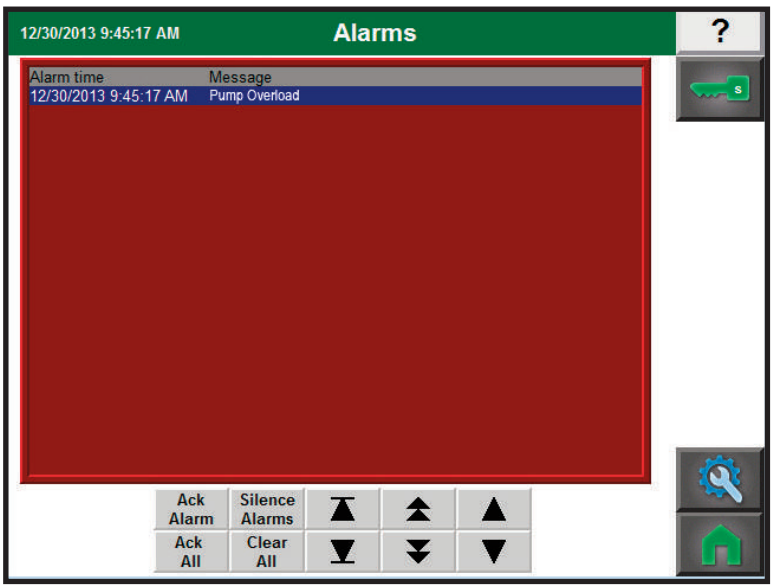
Control Function Descriptions

ELS Control Main Screen
This is the ELS Control Main screen. The icons on the ELS Main Control screen provide access to the following screens:

- Help;
- Login:
- Area Selection;
- Pumps;
- Loaders / MS Loaders, and Granulators;
- Setup; and
- Information.

The functionality of the icons on the screen are described in the *ELS Control Main Screen* section.

Control Function Descriptions (continued)



Alarms Screen

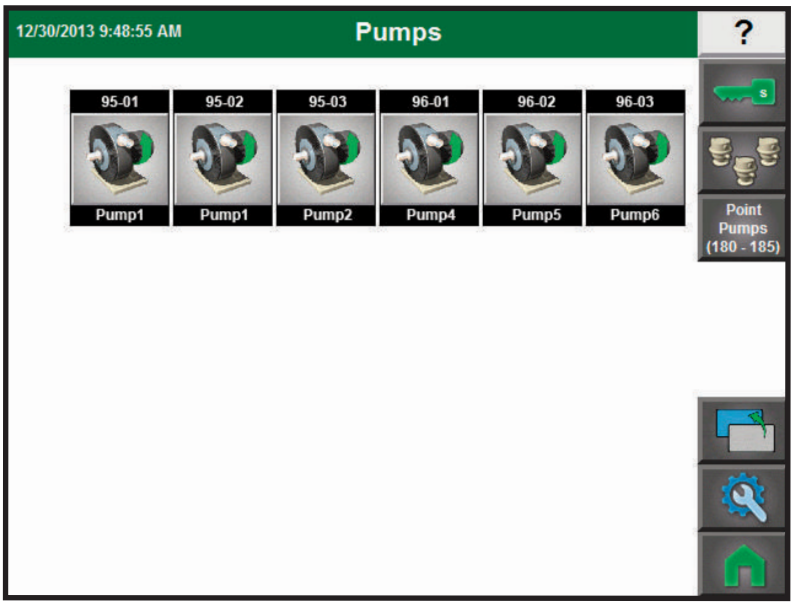
The Alarms screen is accessed by pressing the Alarms icon on the ELS Control Main screen.

The following buttons are available from the Alarms screen:

- Ack Alarm (Acknowledge Alarm) – The Acknowledge Alarm button is used to acknowledge the alarm. The audible alarm will be silenced. The ALM indicator will continue to blink until the alarm condition is resolved.
- Ack All (Acknowledge All) – The Acknowledge All button acknowledges all the alarms.
- Silence Alarms – The Silence Alarms button silences the ALM Horn.
- Clear All – The Clear All button is used to clear all the alarms from the alarm history or list. Once cleared, the history will be erased.

(Continued)

Control Function Descriptions (continued)



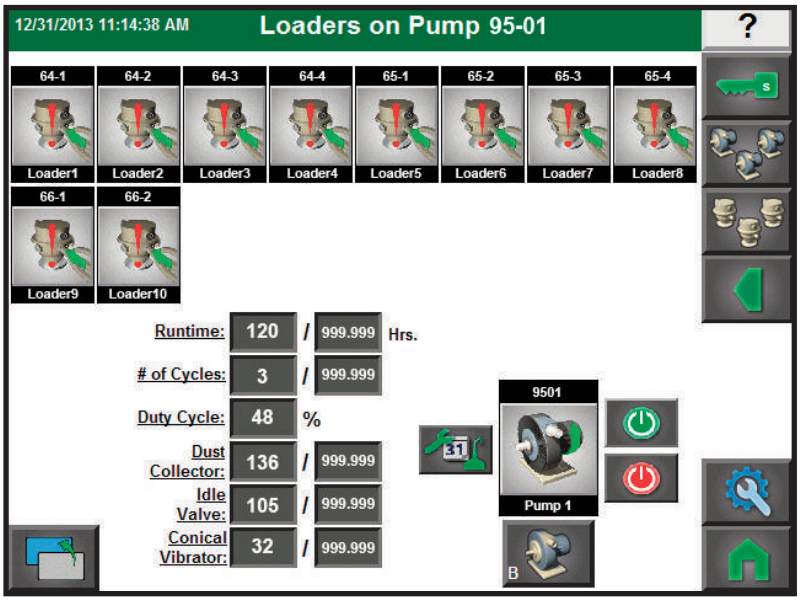
Pumps Screen

On the Pumps screen (Pumps Overview screen), all the pumps will be shown. Pumps are segregated by the I/O type – Blocks and Points.

- Block Pump Addresses: 95 – 100
- Point Pump Addresses: 180 - 185

Each pump icon displays the pump ID number (IP address and number of I/O), name, and the status of the pump. The pump status can be determined by the color of the arrow on the pump's icon. The icon is "ghosted" if the pump is disabled.

Control Function Descriptions (continued)



Note: The Loaders on Pumps screen can also be accessed from any screen on which the Pumps icon appears.

Loaders on Pumps Screen

The Loaders on Pumps (Pumps Attachment) screen can be reached by selecting pump icons on other screens. On this screen, all the loaders including their number, name, and status being serviced by the pump are shown. The loader status can be deciphered by the color of the loader icon's background.

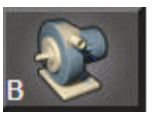
- The Pump is enabled and disabled by pressing the Enabled/Disabled button next to the pump icon.

- Pressing the Pump icon opens the pump detail window. The following is displayed:
  - Pump Starts – The number of times the pump is commanded to turn on.
  - Duty Cycle - The percentage the pump is running while enabled. Run time/Enabled time x 100.

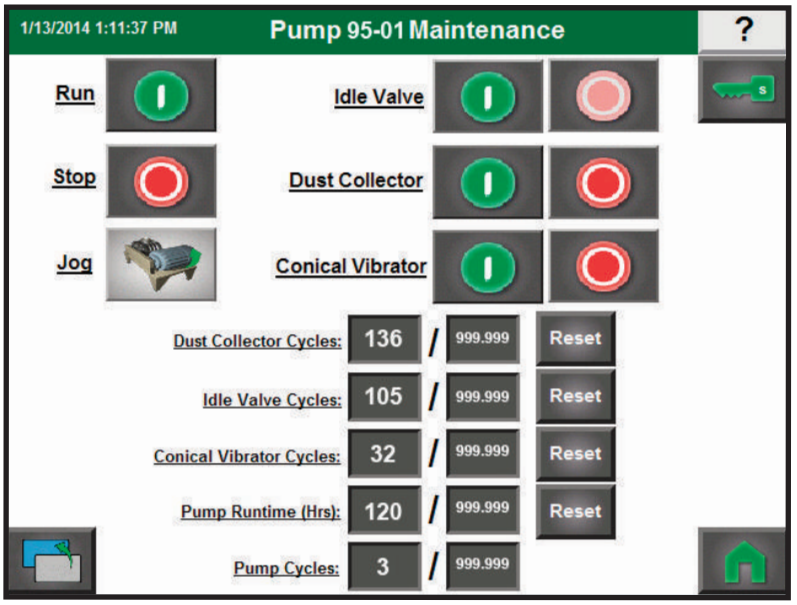
- Pressing left arrow scrolls to the previous pump and pressing the right arrow scrolls to the next pump.

- If there are more than 16 loaders attached to the pump, press the right arrow button to view more loaders attached to pump.

A "B" in the lower left hand corner of the Pump icon opens the Backup Pump assignment screen.



(Continued)



Test Pump Output Screen

This is the Test Pump Output (Pump s...s Maintenance) screen. This feature allows the output to the pump starter to be energized.

⚠ **CAUTION:** Pump will be under high vacuum when tested. The pump test should be performed by qualified technical personnel. Pump damage could occur if the pump is deactivated.

To test the pump, use the following procedure.

1 **Disable the pump.**

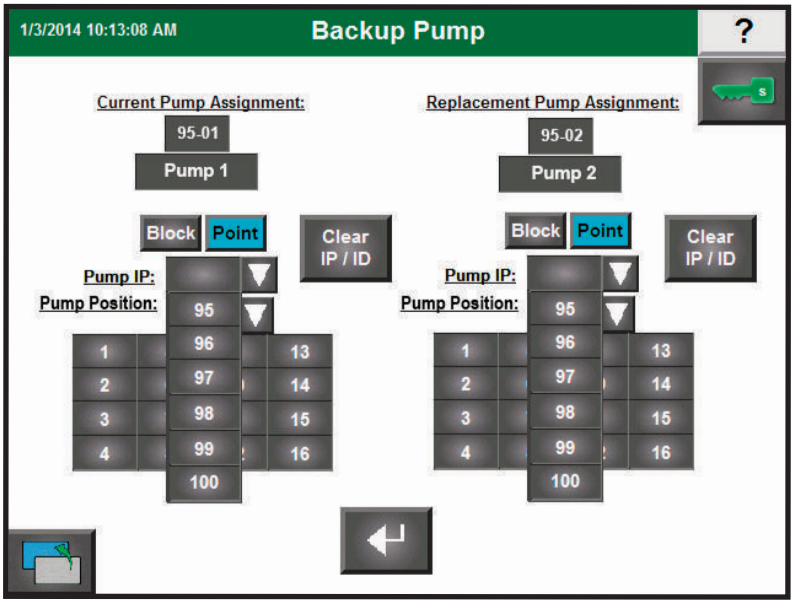
2 From the "Loaders on Pump" (Pump Attachments) screen, **press the pump icon.**

3 **Press the Maintenance Icon button.** Proper login is required. The icon will be invisible if login level is incorrect.

4 **The Pump Maintenance screen will open. The jump can be "jogged" momentarily or run for a short period.** Once complete, press the return to the previous screen icon.

✎ **Note:** While the Test Pump Output is being tested ON, the Pump Maintenance screen will remain open.

Control Function Descriptions (continued)



Assign Backup Pump

This is the Test Pump Output (Backup Pump) screen. This feature allows a pump to be backed up in the event it fails or it needs service. Any pump can be assigned as the backup pump. The pump that will be the backup pump must be plumbed into the system and be isolated from the regular pumps by means of manually operated valves. Once the valves are switched over to run the replacement pump, the operator chooses the designated backup pump by its location ID and the software swaps the IO configuration of the current operating pump with the backup pump.

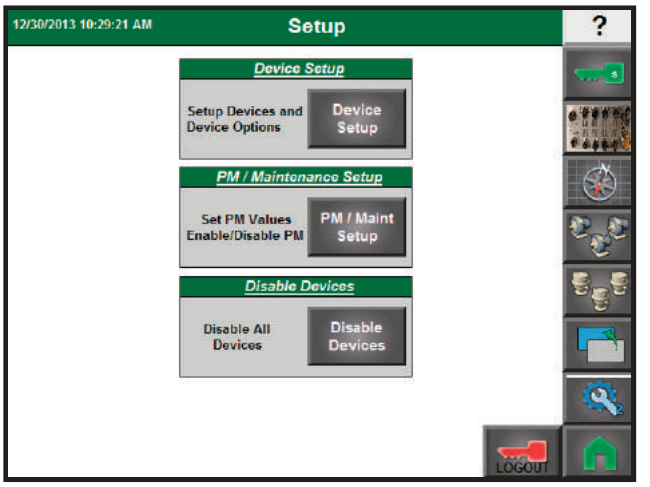
To assign the backup pump, use the following procedure.

1. **Sign in with the appropriate User level.**
2. **From the Pump Attachment screen with the title "Loaders On Pump", disable the pump.**
3. **Depress the pump icon with the letter "B".**
4. **The Backup Pump screen opens and the Current Pump Assignment ID is shown on the left of the screen with the selectable Replacement Pump Assignment ID shown on the right.**
5. **Select "Block" or "Point" under the "Replacement Pump Assignment" area** and use the drop down bars to select the ID of the pump to be the Backup.
6. **Depress the large enter button at the center bottom of the screen.**

To remove the pump from the backup pump, re-enter the original pump ID on the Replacement Pump Assignment (right) side of the screen again and depress the enter button.

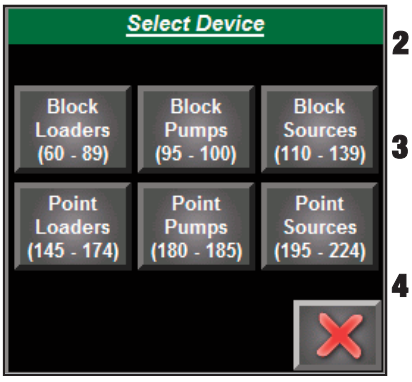
(Continued)

Control Function Descriptions (continued)



Device Setup

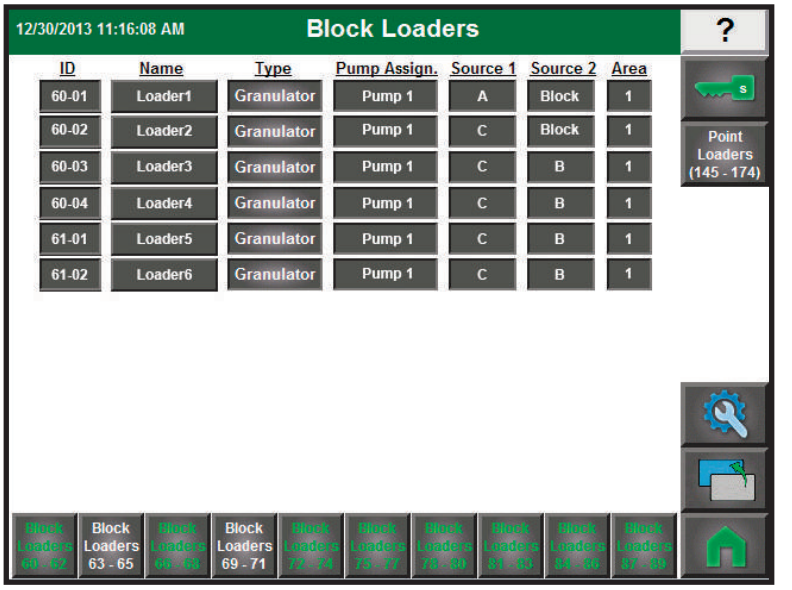
1 **Select the Setup Icon** from the Main screen to access the Setup screen.



2 **Select the Device Setup button** to access the setup selection popup screen.

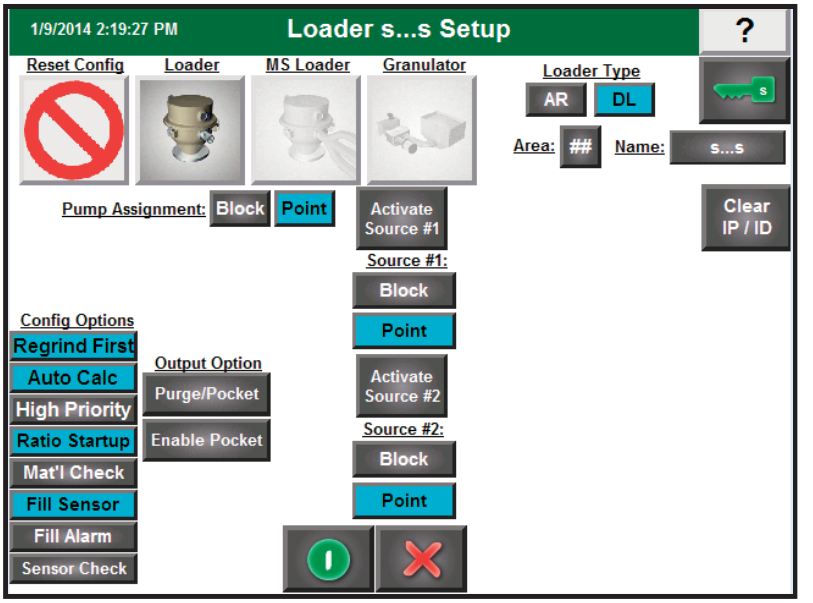
3 **Select the type of device to setup: Loader, Pump or Source.**

4 **Selecting the Block Loader** opens up the following selection screen:



On the Block Loaders screen, select the ID of the loader to be setup. The first part of the ID is the node address of the loader, the second part of the ID is the number of the loader on that address. There are four loaders on a Block node. Selecting the ID will take you to the loader setup screen.

Control Function Descriptions (continued)



Loader/Receiver Configuration Screen

On the Loader/Receiver Configuration (Loaders s...s Setup) screen, the Loader, MS Loader, or Granulator icon is selected as the device. If a loader is chosen, a type is selected to display the proper icon throughout the other screens. The loader can be assigned to an area and given a name through this screen. Configuration options are enabled by selecting the appropriate buttons.

The loader shall be assigned to a pump on this screen as well. Select whether the pump resides on a Block or Point I/O address. A drop down list will appear and the operator must select the IP and ID of the pump that will be assigned this to this Loader.

If any valves are needed for this loader, the selection happens here. Chose the Source #1 Block or Point button to access the drop down list of the IP and ID address of the location of the ratio valve or purge valve. If a purge valve is needed in a different area of the plant and a ratio valve is already used on this particular Loader, select the Source #2 Block or Point button to access its address through the drop down list. When all options and accessories are chosen or enabled for the Loader, select the Green On/Off icon at the bottom of the screen to accept all the parameter changes.

After the Loader is assigned to a pump and its appropriate options, the operator should go to the Pump Setup and Source Setup screens and apply the proper setup options according to the address selected by the Loader setup.

Fill Alarm

A Fill Alarm activates if the receiver does not fill before the load time is reached. This alarm requires an optional fill sensor in the receiver. The load time acts like an alarm time. If the load time timer reaches its preset value before the fill sensor goes “true”, an alarm bit is set. This is a passive alarm; the pump will continue to service the loader. An operator should set the load time longer than it requires to fill the receiver and reach the fill sensor. If the alarm is set, it lets the operator know a problem has occurred during the load cycle. The possibilities are low material, pinched hose or material flow problem, etc. When a Fill Sensor is

(Continued)

applied, the operator must enable the Fill Sensor by selecting Fill Sensor in the Device Configuration screen. Once the Fill Sensor has been enabled, the Fill Alarm may be selected for an annunciation on the HMI.

Material Check
A material alarm is activated if the receiver or hopper is not filled by the loader within the number of tries set by the User (set-point). This function requires a demand sensor in the vessel below the receiver.

Purge
Used to purge material from the conveying line at the end of the loading cycle. This function requires the installation of a valve at the base of the drying hopper or vessel and I/O output options required. The Source #1 or Source #2 must be assigned to the Receiver first.

Discharge
Enable the discharge output during the discharge cycle.

Priority Load
The loader will be loaded before other loaders.

Ratio
This feature allows control of more than one material into one vacuum receiver. This function requires an optional ratio valve at the material inlet of the receiver.

- **Auto-Calc** - The Ratio Cycles may be automatically calculated based upon a User defined calculation factor. The Calc Factor is configured in the Loader Detail screen. Auto-Calc is used with a ratio valve only. It is not used when a purge/pocket valve is present with a ratio valve.

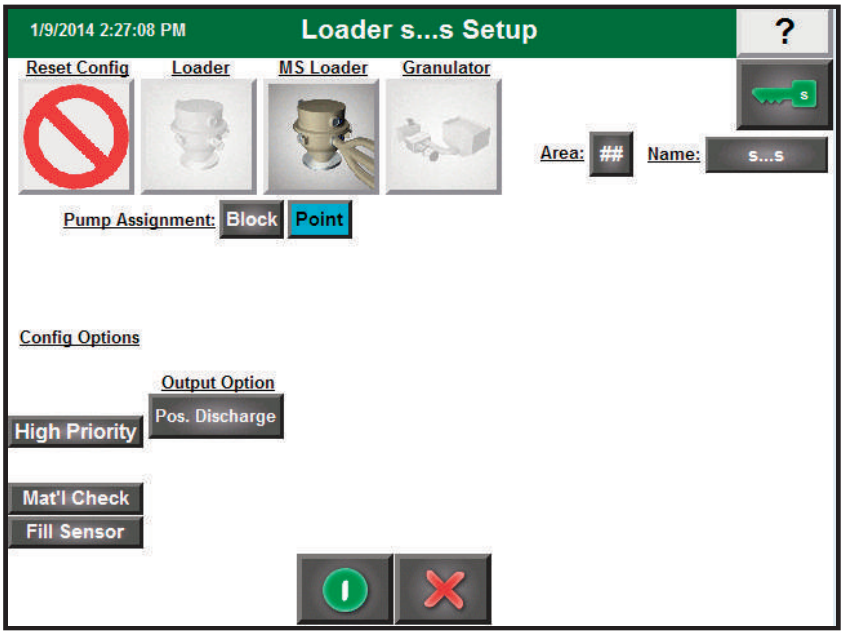
- **Regrind First** – If enabled, regrind will be loaded first then the virgin material. If disabled, virgin will be loaded first (default), then regrind.

- **Ratio Startup** - This feature allows only virgin material to be loaded for a User defined count. At the end of the count, regrind will be included in the load cycle. The Ratio Start-up Count is configured in the Setup screen.

Note: An option can be enabled and setup in the Source Setup screen to configure both outputs of the Source for a dual solenoid ratio valve.

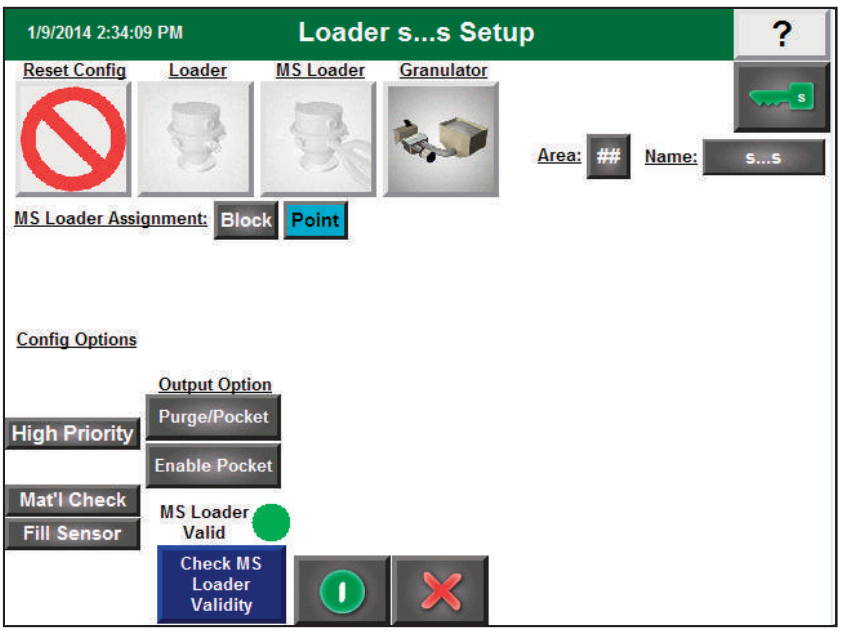
Sensor Failure Detection
When the fill sensor is enabled for a loader, besides enabling a fill alarm, a Sensor Failure mode can be enabled to check for a condition of the demand sensor being on at the same time as the fill sensor. Since this is an impossible scenario, an alarm will be set to indicate the problem. This alarm would mean one of the sensors is bad or a load problem has occurred.

Control Function Descriptions (continued)



MS Loader Configuration or Setup Screen

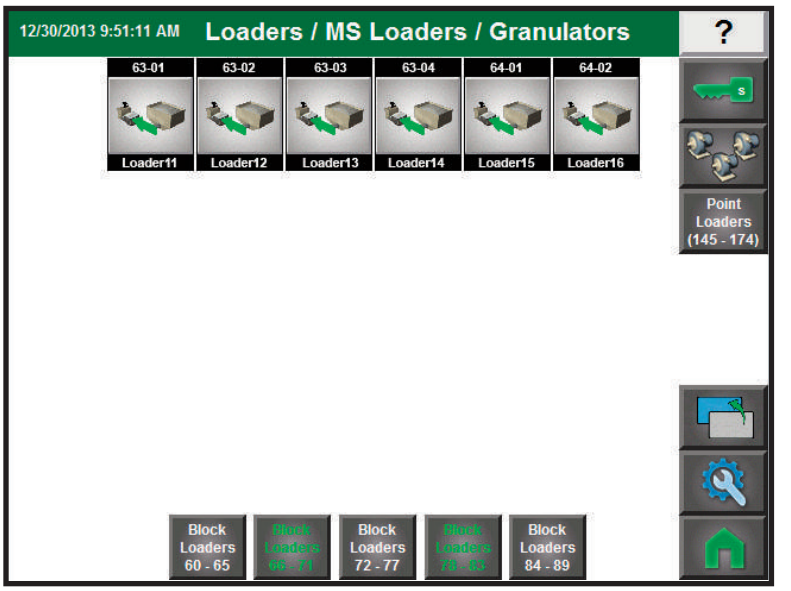
To Setup a Device as a MS loader (Multi-Source), select the MS Loader icon in the Device (Loader) screen. The operator can assign the MS loader to a vacuum pump and then attach the needed granulator(s) that will need to be emptied.



Granulator Configuration or Setup Screen

To Setup a Device as a granulator, select the Granulator icon in the Device (Loader) screen. The operator can assign the granulator to a MS Loader. More than one granulator can be attached to a MS Loader.

(Continued)

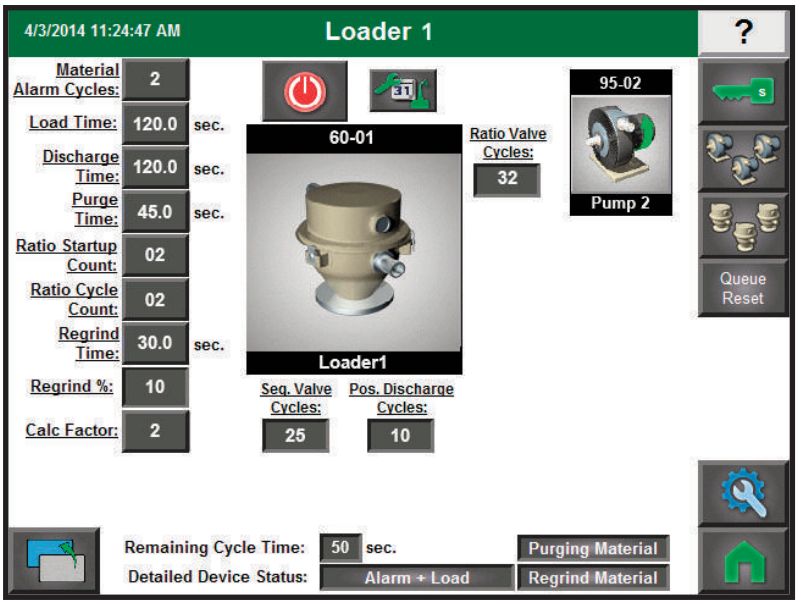


Loader / MS Loader / Granulator Screen

The Loader / MS Loader / Granulators screen is accessed from the Main screen and most other screens. By selecting the Loader icon on the right hand side of most screens, the Loaders, MS Loaders, or Granulators are displayed by Block order first. The Block order is based on the Block IP and ID that the Loader or Device is plugged into. By default, the order is Blocks first.

If the Loader or Device that is being searched is located on a Point I/O, select the Point Loader button that now appears in the navigation bar on the right hand side of the screen. The Point Loader screen is identical to this screen, but with additional navigational buttons going across the bottom of the screen labeled Point Loaders. When navigating the Point Loader screens, the Block Loader button appears on the side and the operator can navigate back to the Block Loaders by depressing this button.

Control Function Descriptions (continued)



Loader/Receiver Detail Screen

On the Loader/Receiver Detail screen, the loader including the number, name, and status is displayed. The status can be deciphered by the color of the device icon's background

Overview of Screen

- The Remaining Cycle Time is visible when the loader is currently being serviced. The time starts at the amount of time the device requires to be serviced.

- The Detailed Device Status displays a descriptive status of the current state of the loader.

- The Cycle Counts are visible for the each of the valves that are enabled. The counts can be reset by a Supervisor or Administrator.

Material Alarm Cycles

- Used for selection of the number of cycles (1 – 20) a receiver or loader should go through before the demand signal goes away. This is typically used when the demand sensor is located in a hopper or container mounted below the receiver. If the Material Alarm is enabled, this set point value will be enabled and will set the alarm when the count reaches the set point.

Load Time

The number of seconds (0-300) the receiver loads material.

Discharge Time

The number of seconds (1-300) the receiver will discharge material into a vessel before the next load cycle begins. If the time is left at 0, the program will automatically set it to 1.

(Continued)

Control Function Descriptions (continued)

Purge Time and Source Selection
When a purge valve is configured, the purge time and source selection will be visible. The purge valve can be configured on Source #1. If a ratio valve is already configured on Source #1 and a purge valve is needed, it may be necessary to add Source #2 if the physical I/O is not close to the purge valve. Source #1 would be wired to a ratio valve mounted on a receiver. The purge valve may be located several hundred feet away from the ratio/receiver. Now Source #2 can be selected and a Source I/O panel can be installed in close proximity to the purge valve.

Purge time is the number of seconds (0-300) that the vacuum continues to pull material through the line after a purge or pocket valve closes to the material source. This clears the line of material.

A purge valve is Material OPEN/Ambient Air CLOSED for material and Material CLOSED / Ambient Air OPEN for purge. A pocket valve is CLOSED for material and OPEN for purge (opposite electrical signal logic from the purge valve).

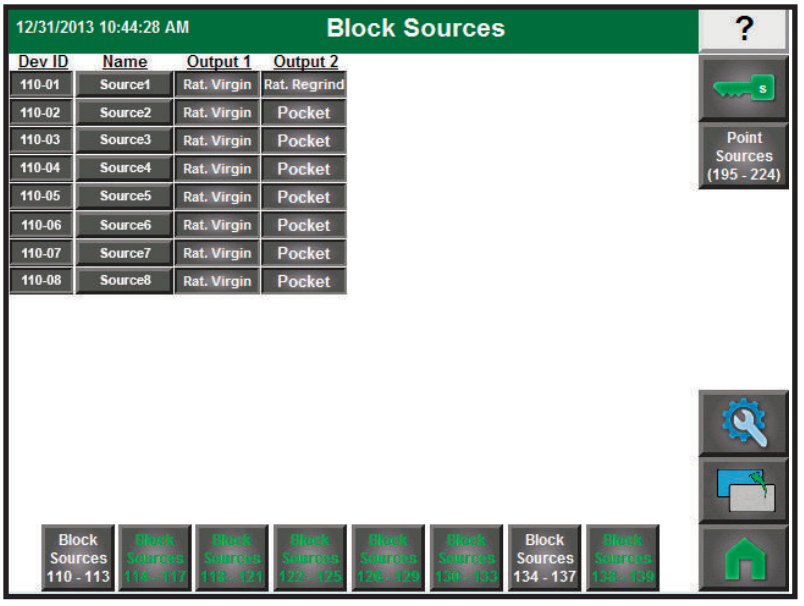
The source currently selected is displayed next to the valve. The valve icon will display a green arrow when purging is taking place.

To change the source (proper login required):

1 **Disable the loader.**

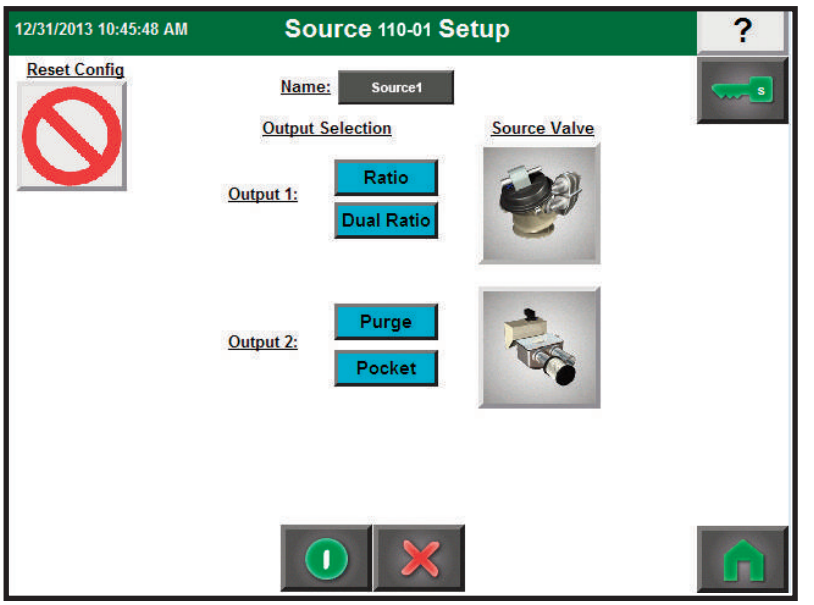
2 **Navigate to the Loader Configuration screen and select Source #1 or Source #2 if the Source #1 is already assigned.** It is selected by Block or Point designation and the address (IP) and ID number of the I/O.

3 To configure the source just selected, **navigate to the appropriate Block or Point Source selection screen. Select the source based on Device ID (IP and ID number).**



Control Function Descriptions (continued)

4 Once the Device ID button is depress, **the Source Configuration screen will open.**



5 **Select Output 1 for a ratio valve or a Dual Solenoid Ratio valve if it is so equipped.**

✎ **Note:** If a purge valve is needed in close proximity of the Loader/Receiver, the Output 2 may be used as either purge or pocket, depending on application. The ELS system will control the valve based upon its type.

6 If a Purge valve is needed and it is located at a great distance from the Loader, **the operator or supervisor can use another source by selecting one in the Loader Configuration screen. Then navigate to Source Setup again and select only the purge valve. The ratio valve cannot be used on a Source #2 device.**

7 **To accept the changes, select the green on/off icon. To cancel, select the red "x" and all changes will be discarded.**

Ratio Valve Parameters

When a ratio valve is configured, the Ratio Startup Count, Ratio Cycle Count, Regrind Time, Regrind Percent, and the Calc Factor will be visible.

Ratio Startup Count - The ELS provides a Ratio Start-up feature. This feature allows only virgin material to be loaded for a user defined count. At the end of the count, regrind will be included in the load cycle. The Ratio Start-up Count is the set point for the count. It will determine how many cycles of virgin material are loaded and then switch over to both regrind and virgin.

Ratio Cycle Count - is the number of times (0-20) that a ratio valve switches between virgin and regrind material.

Regrind Time - is the number of seconds (0-300) that regrind, or a second material, should be loaded with a virgin material.

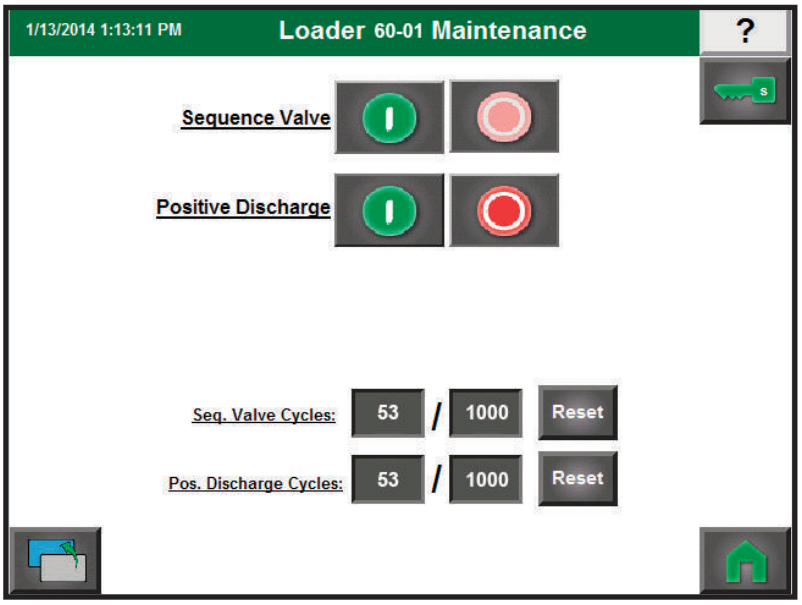
(Continued)

Control Function Descriptions (continued)

Regrind % - is the percentage of regrind to use for each load cycle. This is calculated in the PLC based on the Load and Regrind Time. Display only.

Regrind First - is configurable from the Loader Configuration screen. By default, the virgin material is loaded first.

✎ **Note:** The Ratio Cycles may be automatically calculated based upon a User entered Calc Factor. The Auto Calc is enabled in the Loader Configuration screen. The Calc Factor is entered in the Loader Detail screen.



Loader Maintenance Screen

To access Loader Maintenance (Loaders s...s Maintenance) screen this screen, the loader must be disabled and the proper login credentials are needed. The Loader Maintenance screen displays the current cycle counts of valves – Sequence and Positive Discharge. The display of current counts is compared to the Preventative Maintenance (PM) set-point for each device that is shown.

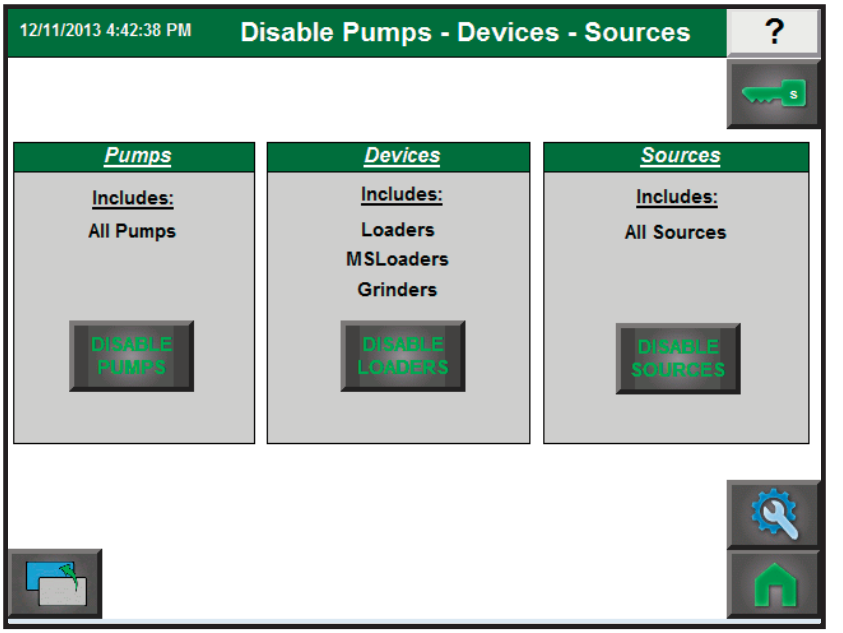
The PM set-point is configured from the PM/Maint Setup screen, accessed from the Setup screen.

An alarm message can be displayed to alert maintenance personnel preventative maintenance is required. This feature is Enabled/Disabled from the PM/Maint Setup screen.

Control Function Descriptions (continued)

Test I/O

The Maintenance screen allows the installation technician or maintenance personnel to test the I/O of the Sequence or Positive Discharge valves by pressing the appropriate On/Off button. The I/O available to test depends upon /I/O configuration and loader configuration. When the test is being performed, the Previous screen or Back button is unavailable, requiring the personnel doing the test to turn off the output before leaving this screen.



Disable Pumps - Devices - Sources Screen

Sometimes it becomes necessary to disable all the pumps, devices like loaders, MS loaders, and granulators, or even sources. This is done from this screen that is accessible from the Setup Screen, once logged in as a Supervisor with the "Super" login.

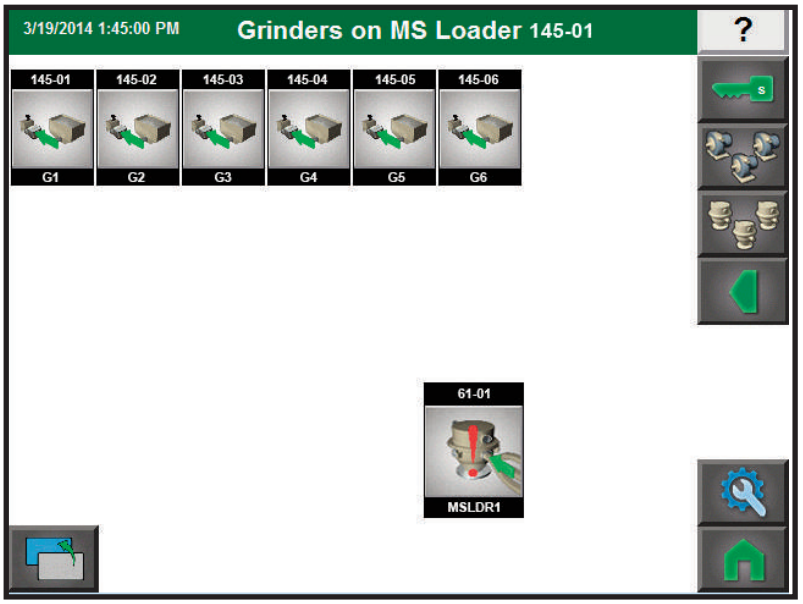
Reverse Regrind/Regrind Recovery Navigation

A device can be configured as a Multi-Source(MS) Loader or a Grinder (Granulator). A grinder is attached to a MS Loader and then a MS Loader is assigned to a pump. A MS Loader Demand must be true and the grinder attached to it must also have a demand. However, the demand on a grinder is of opposite logic to that of a loader. A Grinder will request that it be unloaded by a MS Loader as long as the demand signal is false.

⚠ **CAUTION:** When an output is energized the valve will activate. The test should be performed by qualified technical personnel.

(Continued)

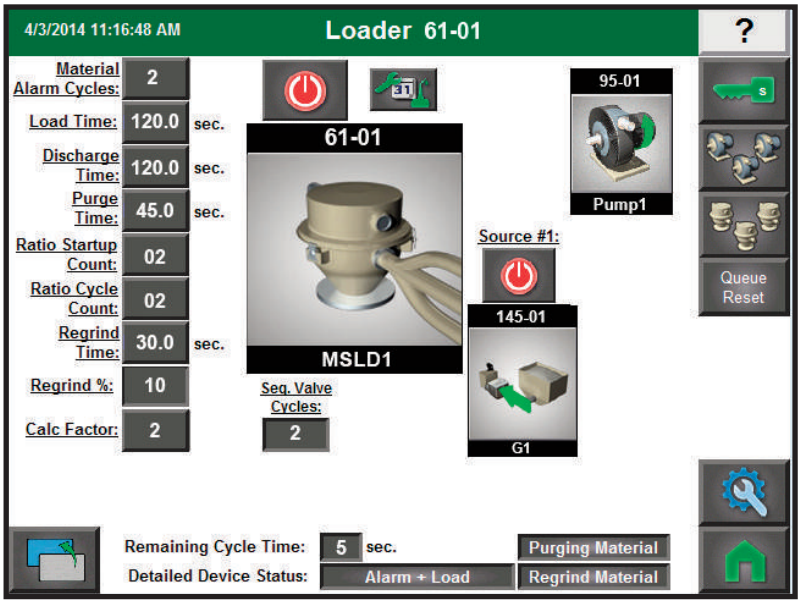
Control Function Descriptions (continued)



Multi-Source Loader Network Screen

On the Multi-source Loader Network (Grinders on MS s...s) screen, the multi-source loader and attached granulators will be shown. Each icon displays the number, name, and the status of the granulator and multi-source loader. The status can be determined by the icon's colored arrow.

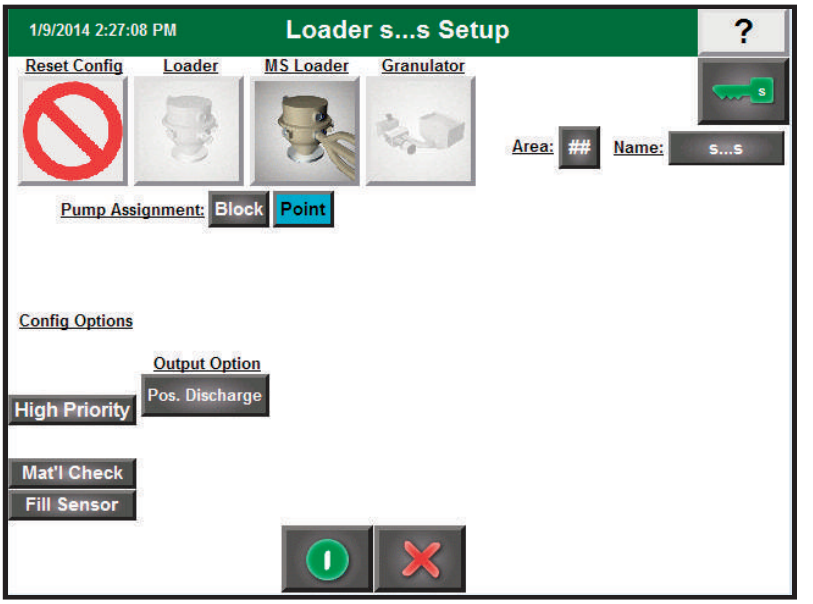
Pressing a granulator icon will open the granulator's detail screen. Pressing the MS Loader icon will open the MS Loader's detail screen.



Multi-Source Loader Screen

On the Multi-source Loader (Loader s...s) is screen, the multi-source loader including the number, name, and status is displayed. The status can be deciphered by the color of the device icon's arrow or background.

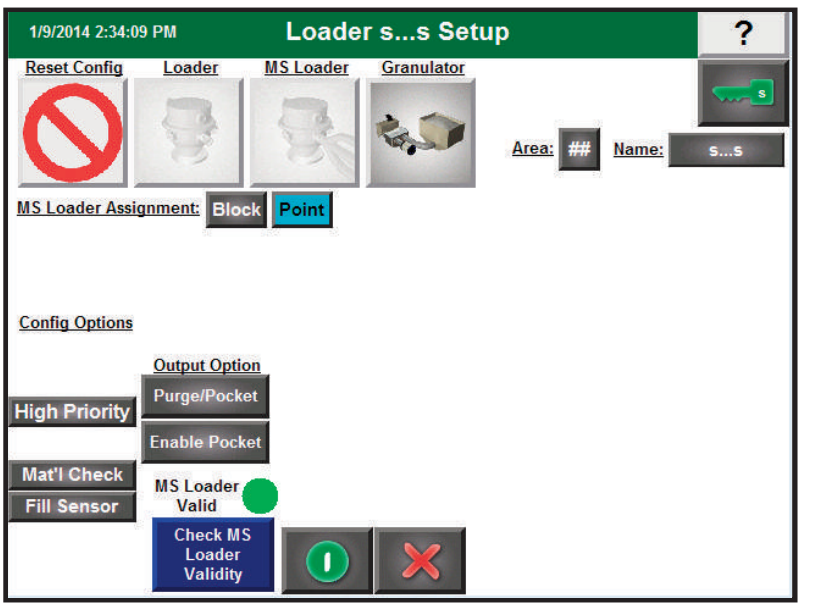
Control Function Descriptions (continued)



Multi-Source Loader Configuration Screen

The multi-source loaders are configured individually. Proper login is required. The Configuration screen is the same as a Loader or Grinder configuration screen. This is the Device Configuration screen and the device is determined by the selection of a Loader, MS Loader, or Grinder icon.

From the multi-source loader screen press the Config button.



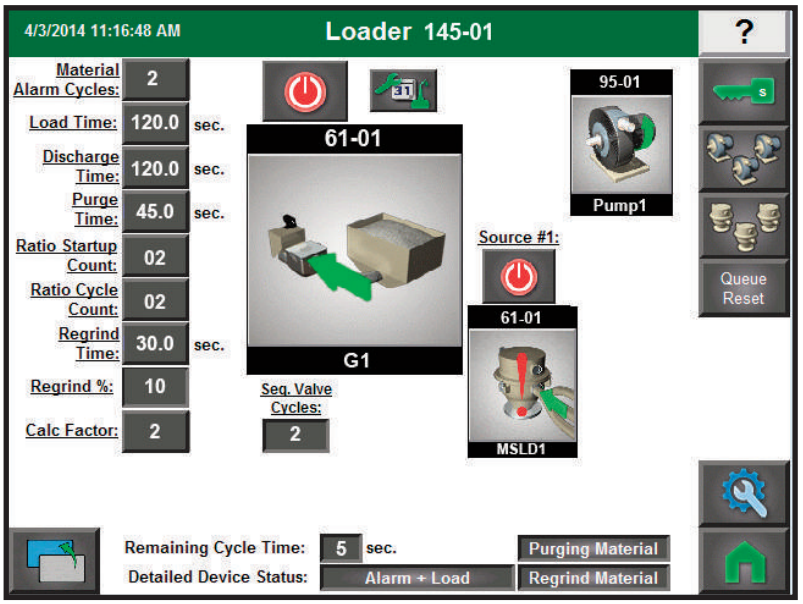
Granulator Configuration Screen

Each granulator is configured individually. Proper login is required. From the granulator screen press the Config button. Depending upon I/O configurations, some multi-source loader configurations may not be available.

Purge

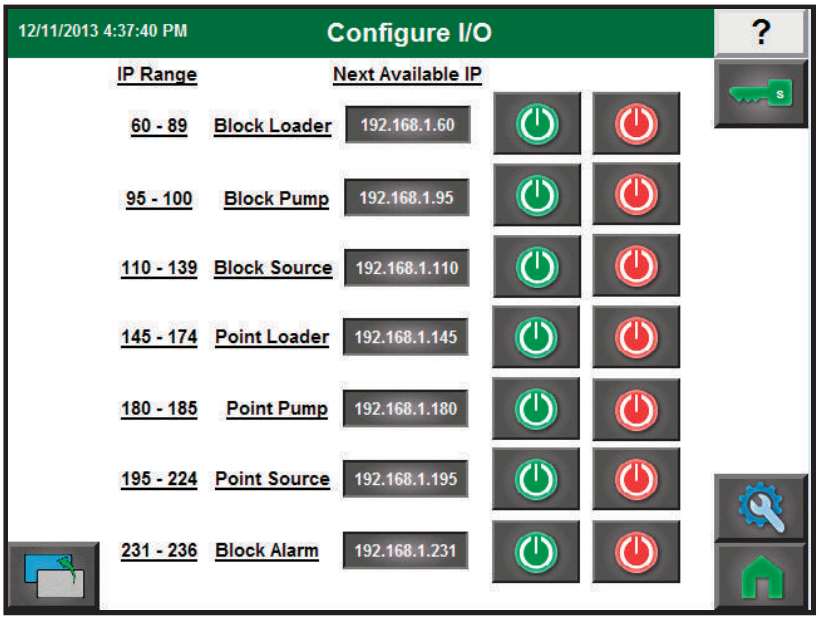
Purge material from the conveying line at the end of the loading cycle. This function requires the installation of a valve at the base of the vessel and I/O output options required. (Continued)

Control Function Descriptions (continued)



Granulator Screen

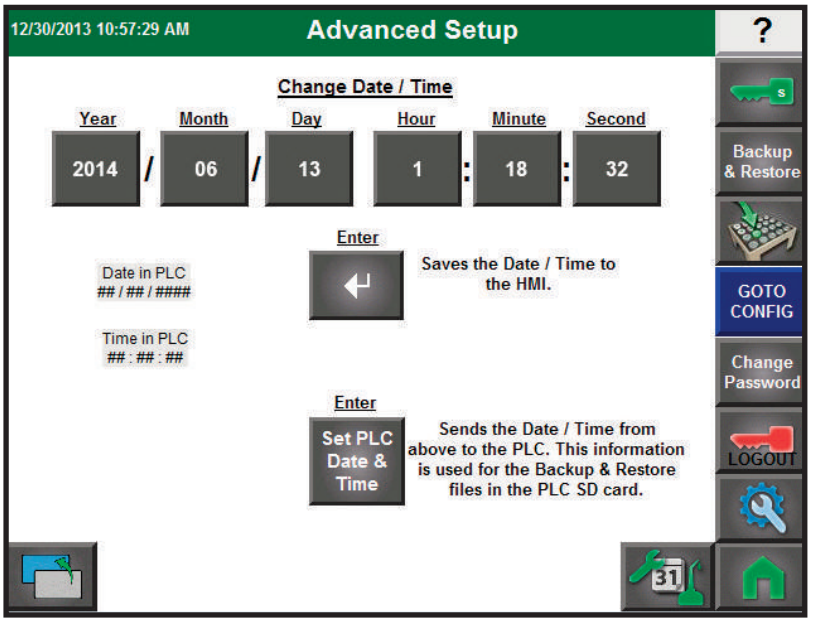
On the Granulator (Loaders s...s) screen, the granulator including the number, name, and status is displayed. The status can be deciphered by the color of the device icon's arrow or background.



Configure the Distributed I/O Screen

The Configure the Distributed I/O (Configure I/O) screen is used to configure the ELS control once the unit powers up. For more information, refer to the *Configure the Distributed I/O in the Installation section*.

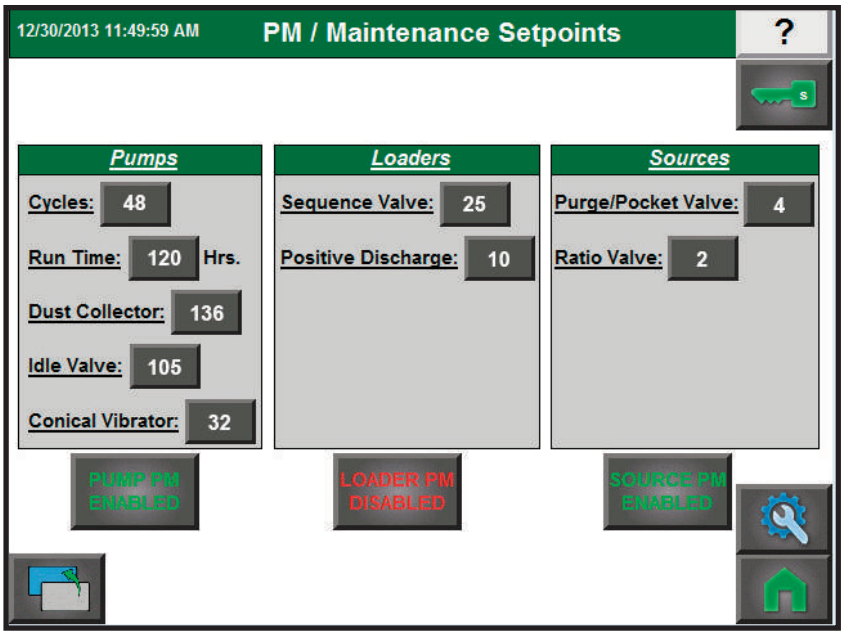
Control Function Descriptions (continued)



Advanced Setup Screen

The Advanced Setup screen provides access to the following:

- Year;
- Month;
- Day;
- Hour;
- Minute; and
- Second



PM / Maintenance Setpoints Screen

The PM / Maintenance Setpoints screen is used to setup the set points for PM/Maint for the valves (load, discharge, purge, ratio) and pump cycles. An alarm can be activated for PM/Maint for each of the groups – Pumps, Loaders and Sources.

Setup

Prior to operation the ELS requires an initial setup. The setup of the ELS should be completed as follows.

1. **Configure I/O** – The I/O should have been configured prior to wiring but needs to be verified prior before operation.
2. **Setup Devices**
3. **Customize Pump Names**
4. **Customize Source Names** (when purging is used)
5. **PM/Maint. Setup**
6. **Setup Calc. Factor and Ratio Startup** (when ratio is used)
7. **Setup Passwords**
8. **Setup Security Levels**

All setup screens are accessible from the Setup screen or Advance Setup screen.

- **Setup Screen** – accessible from the Main Screen Setup button.
  - Pump Names – Change names of pumps.
  - Source Names – Change names of sources.
  - Device Setup – Setup Devices.
  - PM / Maint Setup – Setup up PM/Maint set point and PM alarms.
  - Ratio System Setup – Setup calculation factor and startup counter.
- **Advance** Setup – accessible from the Setup screen.
  - Default Names – Restore default pump, device and source names.
  - Clear Setup/Config – Clear setups and/or configurations of ELS.
  - Change Password – customize user passwords.
  - Security Level – customize the security level for operations/tasks.
  - I/O Configure – Configure/verify I/O configurations.
  - Setup Wizard – Initial setup wizard for setting up the ELS.
  - Network Address – Change the network address of the Operator Interface.
  - PLC Connection – Change the network path address of the PLC.
  - Remote Alarm – Set network paths for remote alarms.

When a ratio valve is configured, the Ratio Startup Count, Ratio Cycle Count, Regrind Time, Regrind Percent, and the Calc. Factor will be visible.

Pump Names

The Pump Names can be assigned during Pump setup.

Source Names

The Source Names can be assigned during Source setup. The Sources displayed are based upon I/O configurations and if device output options have been configured for either Ratio, Purge or Pocket.

Device Setup

The Device Setup screen is used to setup the device which includes the following:

- Device type,
- Pump or multi-source loader assignment,
- Select the output option(s), and
- Name the device.

Number of devices and output options availability are based upon I/O configurations.

In order to setup the device, the device should be disabled.

Ratio System Setup

The ratio system setup is viewed and changed from the Setup screen. These values are only used when ratio has been configured on a loader.

- **Calc. Factor used in Auto Calculation** – The factor is used to determine the number of ratio cycles to use with ratio loading. The lower of the two setpoints (regrind time and load time) is used to determine the number of ratio cycles. This factor is only used when Ratio and Auto-Calc has been configured for a loader/receiver. Valid selections are 2, 3, 4, and 5.

- **Ratio Startup Counter Set Point** – The ratio startup counter set point is the number of load cycles only virgin material will be loaded when a loader has been configured for ratio and ratio startup has been enabled.

Clear Database

The Clear Database feature returns data to null values. **This feature is only to be used by Conair service.** If data is cleared the setups and configurations would have to be entered and the system would have to be setup as if it was an initial install.

The procedure requires an Administrator password to prevent accidental clearing of data.

⚠ **CAUTION:** Clearing the database will return the control to its default values. All configuration information would be lost and the system would have to be set up as an initial install.

Configure I/O

The I/O of the ELS control will need to be configured prior to wiring loaders, pumps, and valves. The ELS base has no I/O. All additional I/O is configurable to customize the ELS to loading system requirements. The procedure to configure I/O can be found in the Installation section.

SECTION

5

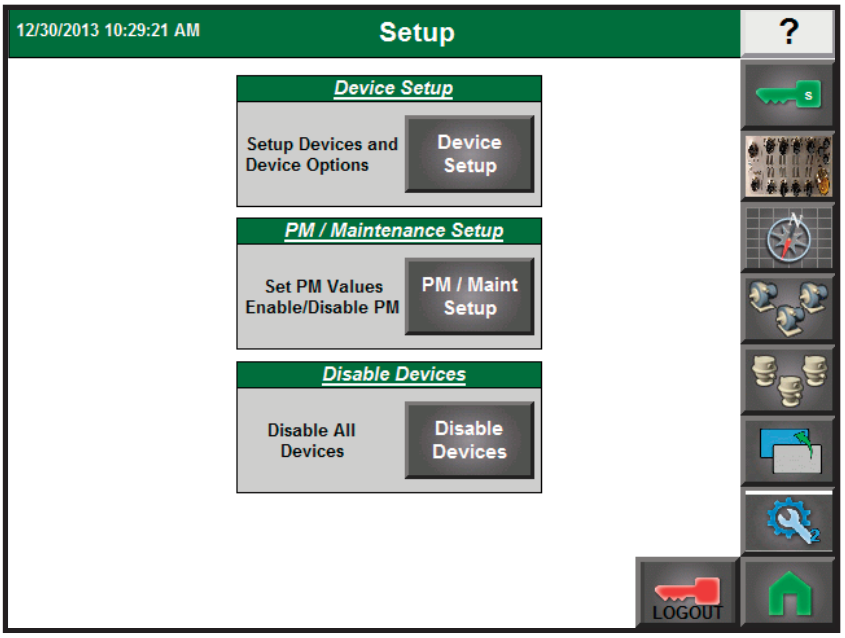
Maintenance

Maintenance Features

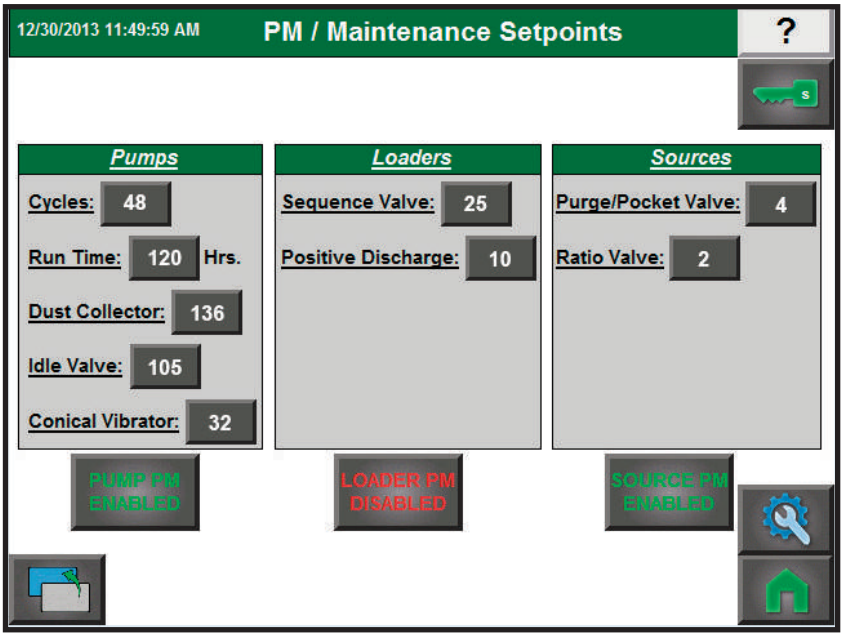
This section provides information on the screens associated with the maintenance features of the ELS.

PM/Maint Setup

To access the PM/Maintenance screen, start from the Setup screen and, after logging in with the proper level, depress the PM/Maint Setup button.



The PM/Maintenance screen will now be available.

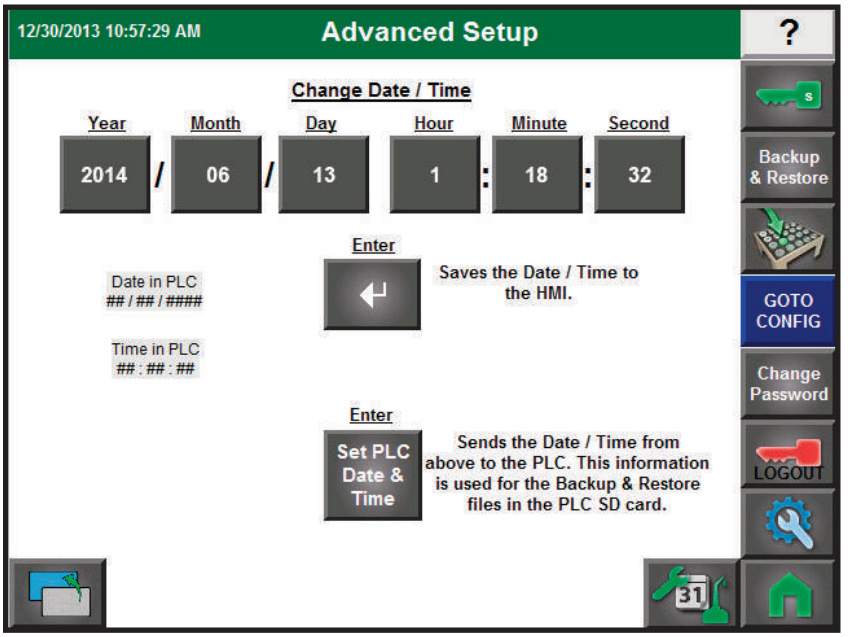


- The PM / Maintenance Setup screen is used to setup the set points for PM/Maint for the valves (load, discharge, purge, ratio) and pump cycles.
- An alarm can be activated for PM/Maint for each of the groups – Pumps, Loaders and Sources.

Maintenance Features (continued)

Advanced Setup

The Advanced Setup screen provides access to the following:



Backup & Restore

See *Appendices B and C* a full explanation on usages.

Changing Passwords

The passwords for the Users can be changed. To change the passwords, the "admin" login must be used to get to the Change Password screen. Then the operator or supervisor would login at the User level so that the password for that User can be changed.

1. From the Main screen, **select Setup**.
2. From the Setup screen, **select Advanced Setup**.
3. From the Advanced Setup screen, **login as "admin"**.
4. **Logout and Login as the User that needs the password change**.
5. **Select Change Password**.
6. From the Change Password screen, **enter the old password, then new password and then confirm password.**

✎ **Note:** The Passwords are stored in the operator interface. If remote operator interfaces are used, the passwords would have to be changed each in remote operator interface.

(Continued)

Maintenance Features (continued)

Date/Time

The date and time are used locally at each operator interface. The date and time are used for the alarm summary, alarm history, and for naming the file on Backup and Restore, which gets the file name information from the PLC. Each operator interface date and time will need to be set. The date and time should be set on the PLC before going through a Backup.

To set date and time:

- From the Maintenance screen select Change Date / Time.
- Follow the step by step procedure on the screen.

SECTION
6

Troubleshooting

Before Beginning

You can avoid most problems by following the recommended installation, operation, and maintenance procedures outlined in this User Guide. If you have a problem, this section will help you determine the cause and tell you how to fix it.

Before you begin troubleshooting:

- ❏ Find the manuals and wiring diagrams that were shipped with your equipment. These materials contain details you will need to diagnose and repair problems in specific components, including custom wiring, features, or I/O options not covered in this User Guide.

- ❏ Check that you have manuals and wiring diagrams for other equipment connected to the ELS Control. Troubleshooting may require investigating other equipment connected to the ELS Control.

A Few Words of Caution

⚠ **WARNING: Improper installation, operation, or servicing may result in equipment damage or personal injury.**

The ELS Control should only be installed, adjusted, and serviced by qualified technical personnel who are trained in the operation and troubleshooting potential hazards of this type of equipment.

⚠ **DANGER: Electrical shock hazard.**

Diagnosing the cause of electrical system and CPU problems in this equipment may require the use of precision electronic measuring equipment, as well as access to the electrical enclosure while power is on. Only qualified electrical technicians, trained in the use of the equipment and in avoiding exposure to voltage hazards, should perform procedures that require access to the enclosure while power is on.

⚠ **WARNING: Develop and follow procedures for safe operation and maintenance of the system.**

The ELS allows operators and maintenance personnel to disable and enable conveying system components. The unexpected energizing of these components could result in equipment damage or injury. Safe maintenance procedures should include:

- Disconnect any loader, pump, or material valve from the main power and/or compressed air sources before servicing. Ensure that all energy sources for the device are locked out and tagged.

- Before removing lockout devices and enabling system components, verify that all personnel are clear of the machine.

Identifying the Cause of a Problem

The Troubleshooting section covers problems directly related to the operation and maintenance of the ELS Control. This section does not provide solutions to problems that originate with other equipment. Additional troubleshooting help can be found in manuals supplied with the other equipment connected to the ELS Control.

Additional troubleshooting help can be found in the documentation manuals included with this User Guide.

Human Machine Interface (HMI) Alarms

The following is a description of the alarms that may be displayed on the HMI.

ALARM	DESCRIPTION
Pump Overload at {Pump Name}	Indicates a pump overload. l Check pump overload. l Check overload wiring.
Material Alarm at {Device Name}	The number of load cycles exceeds the alarm check value without satisfying the demand. l Check location where material is being loaded from (not empty). l Check sensor for proper operation. l Check for valves for proper operation. l Check for plugged lines.
Fill Alarm at {Device Name}	The material fails to reach the fill sensor within the cycle time. l Check location where material is being loaded from (not empty). l Check sensor for proper operation. l Check for valves for proper operation. l Check for plugged lines.
Demand and Fill at {Device Name}	The demand sensor (vessel empty) and fill sensor (vessel full) are both ON. l Check sensors for proper operation.
PM/Maint Required at {Pump Name}	The actual cycle counts exceed set point (ump on/off cycles). l Perform required maintenance and reset counters.
PM/Maint Required at {Device Name}	The actual cycle counts exceed set point (load, purge, ratio, discharge on/off cycles). l Perform required maintenance and reset counters.
Controller Not in Run Mode or Comms Lost	The operator interface does not detect the controller in run mode. l Verify controller is in run mode. l Verify network communication addresses are set correctly.
Controller Modules Not Configured	The operator interface cannot determine the controller's I/O configuration. l Verify controller is in run mode. l Verify network communication addresses are set correctly. l Verify controller rack is properly assembled.
Remote I/O Not in Run Mode or Comms Lost	The operator interface does not detect the Remote IO controller in run mode. l Verify Remote I/O controller is in run mode. l Verify network communication addresses are set correctly.
Remote I/O Modules Not Configured	The operator interface cannot determine the Remote IO controller's I/O configuration. l Verify Remote I/O controller is in run mode. l Verify network communication addresses are set correctly. l Verify Remote I/O controller rack is properly assembled.

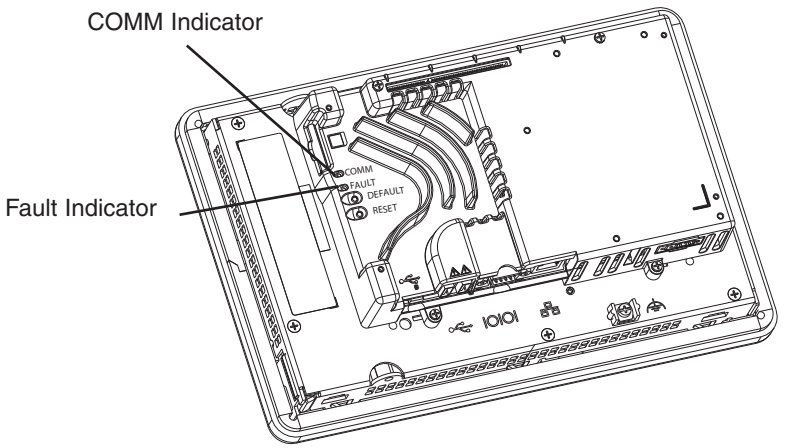
Operator Interface

LEDS – Status Indicators

The terminal has two status indicators to isolate operating anomalies:

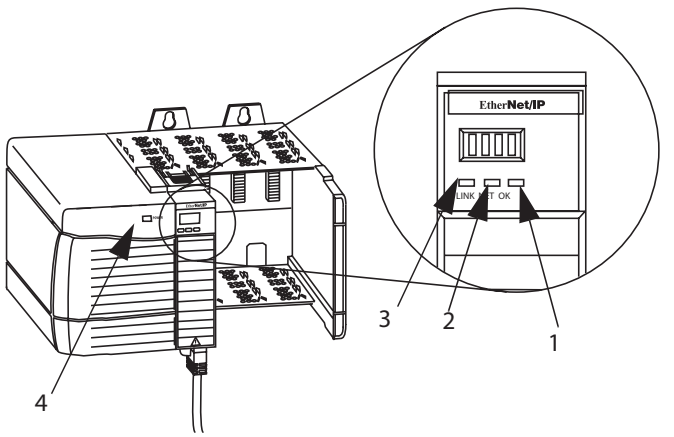
- COMM indicator (green) for communication
- FAULT indicator (red) for hardware and firmware faults

The LEDs are located on the back of the operator interface as shown in the figure below.



Ethernet Communication Module

The Ethernet Communications Modules in the ELS are model 1756-EN2t. The ELS utilizes two modules for all the communications needs. The figure below shows one module in the first slot. This is just for simplicity and clarity in showing the EN2t details. The ELS system has two EN2T modules located in the 2nd and 3rd slots. The processor resides in the first slot. Use the chart below the illustration to interpret the status indicators.



Item	Description	Item	Description
1	OK indicator is red during self-test, then green.	3	LINK status indicator.
2	NET status indicator.	4	Power supply indicator is green.

(Continued)

Operator Interface (continued)

Status Indicators

Indicator	Status	Description
NET	Off	The module is not powered. Verify that there is chassis power and that the module is completely inserted into the chassis and backplane. The module does not have a valid IP address. Make sure the module has been configured with a valid IP address.
	Flashing green	The module has an IP address, but has no established connections.
	Green	The module has an IP address and at least one established connection.
	Red	The module is attempting to use an IP address already in use on the network. Assign a unique IP address to the module.
Link	Off	The module is not ready to communicate. Verify that the module has power.
	Green	The module is ready to communicate.
	Flashing green	The module is communicating over the network.

Controller

Overview

The ELS utilizes the ControlLogix platform. The processor is model 1756-L72, with two ENT2 Ethernet modules for communications with all the distributed I/O. The I/O is either a 1732E ArmorBlock – 24 Vdc power, inputs and outputs, or a 1738 ArmorPoint rack, also using 24 Vdc power, inputs and outputs.

LEDS and Status Indicators

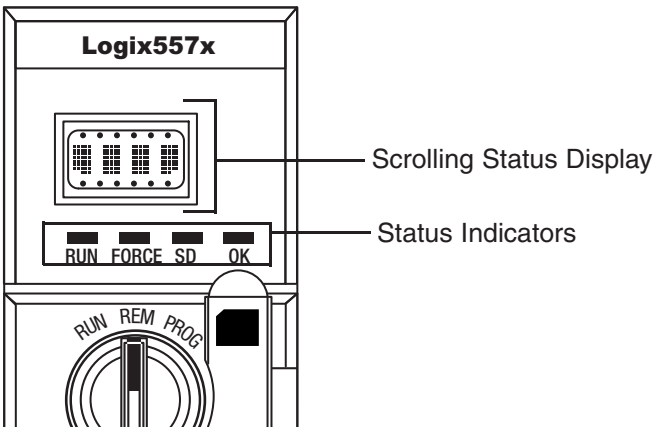
The LEDS and Status Indicators are located on the front of the controller.

Status Indicators

Controller (continued)

1756-L7x Controller Status Display and Indicators

The 1756-L7x controllers have four status indicators and one four-character scrolling status display.



1756-L7x Controller Status Display

The 1576-L7x controller status display scrolls messages that provide information about the controller's firmware revision, ESM status, and major faults.

The status indicators are below the status display on the controller. They indicate the state of the controller as described in the tables that follow.

Run Indicator

To change the controller mode indicator by the Run indicator, either use the mode switch on the front of the controller or use the controller Status menu in the Logix Designer application.

State	Description
Off	The controller is either in Program or Test mode.
Steady green	The controller is in Run mode.

Force Indicator

The Force indicator shows if I/O forces are enabled on the controller.

State	Description
Off	No tags contain I/O force values.
Solid amber	I/O forces are active (enabled) though I/O force values may or may not be configured. **Use caution if you install (add) a force. If you install (add) a force, it immediately takes effect.**
Flashing amber	One or more input or output addresses have been forced to an On or Off state, but the forces have not been enabled. **Use caution if you enable I/O forces, all existing I/O forces take effect.**

(Continued)

Controller (continued)

SD Indicator

The SD indicator shows if the Secure Data (SD) card is in use.

State	Description
Off	No activity is occurring with the SD card.
Flashing green	The controller is reading from or writing to the SD card. Do not remove the SD card while the controller is reading or writing.
Solid green	
Flashing red	The SD card does not have a valid file system.
Solid red	The SD card is not recognized by the controller.

OK Indicator

The OK indicator shows the state of the controller.

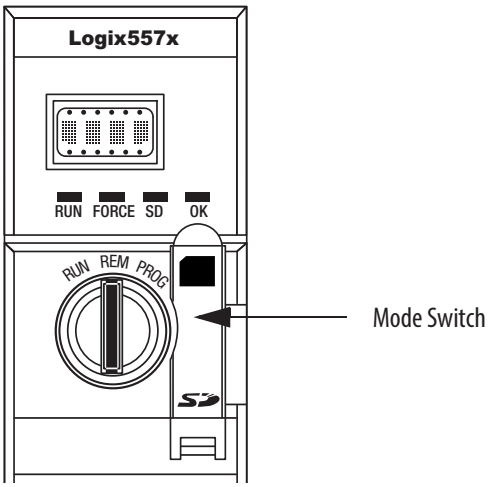
State	Description
Off	No power is applied to the controller.
Flashing red	Either of the following is true. • It is a new controller, just out of the box and it requires a firmware upgrade. If a firmware upgrade is required, the status display indicates "Firmware Installation Required". To upgrade of firmware, *see "Upgrade Controller Firmware" on page 50 of the controller manual.* • It is a previously used or in use controller and a major fault gas occurred. For details about major recoverable and non-recoverable faults, see the *Logix 5000 Major, Minor, and I/O Fault Codes programming manual*, publication 1756-PM014.
Solid red	One of the following is true. • The controller is completing power-up diagnostics. • The charge of the capacitor in the ESM is being discharged upon power-down. • The controller is powered but is inoperable. • The controller is loading a project to nonvolatile memory.
Solid green	The controller is operating normally.

Mode Switch

The Mode Switch in front of the controller can be used to change the controller in to one of these modes:

- Run (RUN);
- Remote (REM); and
- Program (PROG).

Controller (continued)



Mode Switch Position	Available Controller Modes	ATTENTION ⚠
RUN	**Run Mode** - The controller is actively controlling the process/machine. Projects can not be edited in the Logix Designer application when in Run mode.	Run mode should only be used when all conditions are safe.
REM	**Remote Run Mode** - This mode is identical to Run mode except you can edit the project online.	
	Remote Program Mode - This mode is identical to the Program mode.	
	Remote Test Mode - The controller mode during which code is executing. I/O is not controlled, and limited editing operations are available. Output modules are commanded to their Program mode state (On, Off, or Hold).	
	✎ The mode of the controller can be changed from within the Logix Designer application.	
PROG	**Program Mode** - The controller mode during which programming language is not executing. I/O is not controlled, and limited editing operations are available. Output modules are commanded to their Program mode state (On, Off, or Hold). In this position, controller modes can not be changed through the Logix Designer application.	

(Continued)

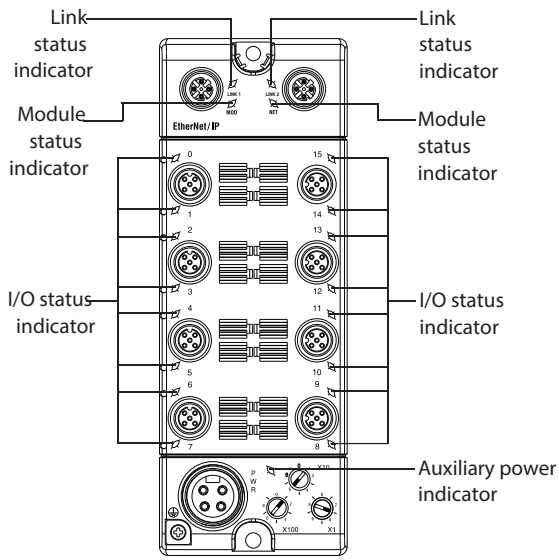
Controller (continued)

Mode Switch

LEDS and Status Indicators

The LEDS and Status Indicators are located on the front of the controller.

- Network, Module, and Link status indicators for Ethernet/IP;
- Auxiliary Power indicator; and
- Individual I/O status indicators for unputs and outputs.



Normal operation is MOD and NET with solid green light. The Link 1 light should be flashing at a fast rate.

The Link 2 light will be flashing at a fast rate if the Ethernet cable is connected to the second port for a continued run. If there is no connection, the Link light will be off.

Controller (continued)

Indicator Status for Modules

Indicator	Status	Description
Module status	Off	No power applied to the device.
	Flashing red/green	The module is performing POST (Power-On Self Test) which completes within 30 seconds.
	Green	Device is operating normally.
	Flashing red	Recoverable fault.
	Red	Unrecoverable fault - may require device replacement.
Network status	Off	The device is not initialized or the module does not have an IP address.
	Flashing green	The device has no CIP connections. The device has a IP address, but no CIP connections are established.
	Green	The device is on-line, has an IP address, and CIP connections are established.
	Flashing red	One or more connections have timed out.
	Red	The module has detected that its IP address is already in use.
	Flashing red/green	The module is performing a power-up self-test.
Network link status	Off	No link established.
	Green	Link established on indicated port at 100 Mbps.
	Flashing green	Link activity present on indicator port at 100 Mbps.
	Yellow	Link established on indicated port at 10 Mbps.
	Flashing yellow	Link activity present on indicator port at 10 Mbps.
Auxiliary status	Off	No auxiliary power to device or input not valid.
	Green	Auxiliary power applied to device.
Digital output status[1]	Off	Output is not energized.
	Yellow	Output is energized.
	Red	Output is shorted.
	Flashing red	Output open load.
Digital input status[1]	Off	No valid input.
	Yellow	Valid input.
	Red	Sensor source voltage is shorted.
	Flashing red	Sensor source open wire.

1 Only diagnostic modules 1732E-*DR have red I/O status indicators.

(Continued)

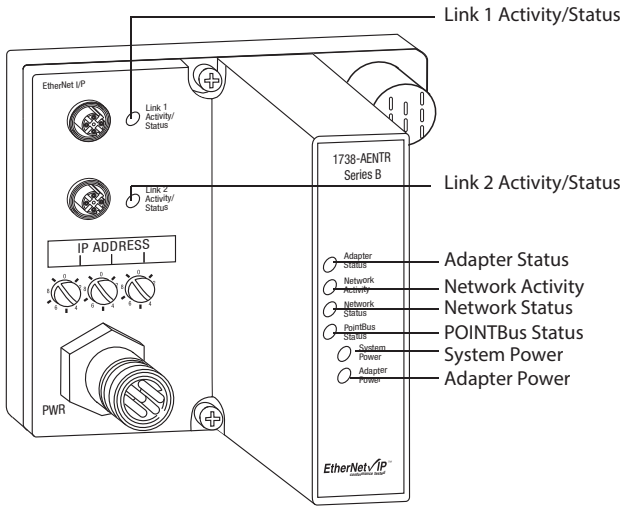
Controller (continued)

ArmorPoint I/O

The 1738 module rack has the following indicators:

Status Indicators for ArmorPoint I/O Adapters

The following describes the status indicators on the 1738 AENTR.



Status Indicators for 1738-AENTR Adapters

Indicator	State	Description
Adapter status	Off	No power is applied to the device.
	Flashing green	Device needs commissioning due to missing, incomplete, or incorrect configuration.
	Solid green	Device is operating normally.
	Flashing red	Recoverable fault. • Complete firmware update. • Verify address switches.
	Solid red	Nonrecoverable fault. • Self-test failure/check-sum failure, RAM test failure at cycle power. • Firmware fatal error.
	Flashing red/green	Device is in self-test.
Network activity	Off	No link established with Port 1 of Port 2.
	Flashing green	Transmit or receive activity present at Port 1 and/or Port 2 at 100 Mbps. Transmit or receive activity present at Port 1 and/or Port 2. One port at 100 Mbps and one port at 10 Mbps.
	Solid green	Link established with Port 1 and/or Port 2 at 100 Mbps. Link established with Port 1 and/or Port 2. One port at 100 Mbps and one port at 10 Mbps.
	Flashing yellow	Transmit or receive activity present Port 1 and/or Port 2 at 10 Mbps.
	Solid yellow	Link established with Port 1 and/or Port 2 at 10 Mbps.

Controller (continued)

Status Indicators for 1738-AENTR Adapters (Continued)

Indicator	State	Description
Network Status	Off	Device is not initialized. Device does not have an IP address.
	Flashing green	No CIP connections present. Device has an IP address, but no CIP connections are established.
	Solid green	CIP connections present. Device on-line and has an IP address, and CIP connections are established.
	Flashing red	One or more CIP connections in timed out state. Check for I/O module failure and controller operation.
	Solid red	Duplicate IP address detected. Verify IP address setting and connect as needed.
	Flashing red/green	Device is in self-test.
Link 1 and Link 2 Activity Status	Off	No link established.
	Flashing green	Transmit or receive activity is present at 100 Mbps.
	Solid green	Link established at 100 Mbps.
	Flashing yellow	Transmit or receive activity present at 10 Mbps.
	Solid yellow	Link established at 10 Mbps.
System power	Off	Not active. Adapter power is off, or DC-DC converter problem is present.
	Solid green	System power is on. DC-DC converted output is active (5 V).
Adapter power	Off	Not active. Adapter power is off.
	Solid green	Power is on. 24 V input is present.
POINT bus status	Off	Device is not on-line. • Device has not completed Dup_MAC_ID test. • Device is not powered. Check Adapter Status indicator.
	Flashing green	Device is on-line but has no connections in the established state. Firmware (NVS) update in progress.
	Solid green	Device is on-line and has connections in the established state.
	Flashing red	Recoverable fault occurred. • At cycle power, the number of expected modules does not equal the number of modules present. • A module is missing. • Node fault (I/O connection time out) occurred.
	Solid red	Unrecoverable fault has occurred. • POINT bus is off.
	Flashing red/green	LED cycle power test present.

We're Here to Help

Conair has made the largest investment in customer support in the plastics industry. Our service experts are available to help with any problem you might have installing and operating your equipment. Your Conair sales representative also can help analyze the nature of your problem, assuring that it did not result from misapplication or improper use.

Additional manuals and prints for your Conair equipment may be ordered through the Customer Service or Parts Department for a nominal fee. Most manuals can be downloaded free of charge from the product section of the Conair website. www.conairgroup.com

How to Contact Customer Service

To contact Customer Service personnel, call:

✎ **NOTE:** Normal operating hours are 8:00 am - 5:00 pm (EST). After hours emergency service is available at the same phone number.

From outside the United States, call: 814-437-6861

You can commission Conair service personnel to provide on-site service by contacting the Customer Service Department. Standard rates include an on-site hourly rate, with a one-day minimum plus expenses.

Before You Call...

If you do have a problem, please complete the following checklist before calling Conair:

- ❒ Make sure you have all model, control type from the serial tag, and parts list numbers for your particular equipment. Service personnel will need this information to assist you.
- ❒ Make sure power is supplied to the equipment.
- ❒ Make sure that all connectors and wires within and between control systems and related components have been installed correctly.
- ❒ Check the troubleshooting guide of this manual for a solution.
- ❒ Thoroughly examine the instruction manual(s) for associated equipment, especially controls. Each manual may have its own troubleshooting guide to help you.
- ❒ Check that the equipment has been operated as described in this manual.
- ❒ Check accompanying schematic drawings for information on special considerations.

Equipment Guarantee

Conair guarantees the machinery and equipment on this order, for a period as defined in the quotation from date of shipment, against defects in material and workmanship under the normal use and service for which it was recommended (except for parts that are typically replaced after normal usage, such as filters, liner plates, etc.). Conair's guarantee is limited to replacing, at our option, the part or parts determined by us to be defective after examination. The customer assumes the cost of transportation of the part or parts to and from the factory.

Performance Warranty

Conair warrants that this equipment will perform at or above the ratings stated in specific quotations covering the equipment or as detailed in engineering specifications, provided the equipment is applied, installed, operated, and maintained in the recommended manner as outlined in our quotation or specifications.

Should performance not meet warranted levels, Conair at its discretion will exercise one of the following options:

- Inspect the equipment and perform alterations or adjustments to satisfy performance claims. (Charges for such inspections and corrections will be waived unless failure to meet warranty is due to misapplication, improper installation, poor maintenance practices, or improper operation.)
- Replace the original equipment with other Conair equipment that will meet original performance claims at no extra cost to the customer.
- Refund the invoiced cost to the customer. Credit is subject to prior notice by the customer at which time a Return Goods Authorization Number (RGA) will be issued by Conair's Service Department. Returned equipment must be well crated and in proper operating condition, including all parts. Returns must be prepaid.

Purchaser must notify Conair in writing of any claim and provide a customer receipt and other evidence that a claim is being made.

Warranty Limitations

Except for the Equipment Guarantee and Performance Warranty stated above, Conair disclaims all other warranties with respect to the equipment, express or implied, arising by operation of law, course of dealing, usage of trade, or otherwise, including but not limited to the implied warranties of merchantability and fitness for a particular purpose.

Customizing Network Connections

Overview of ELS Control System Network

The ELS Control system with Ethernet option uses the Ethernet/IP specification. All the hardware is networked via the switch located in the main cabinet and/or remotes.

In order for all the ELS Control system hardware's (controller, operator interface, and remote alarms) to communicate properly, the network addresses must be configured properly. The network addresses consist of the IP address, subnet mask, and gateway address. The IP address is the logical address of the device. The subnet mask is the network address plus the bits reserved for identifying the sub-network. The gateway address is the next hop to which a packet goes to whenever the destination subnet is not present in the routing table for that specific packet.

Example of the ELS system Networked

Conair Default Network Addresses

Hardware	IP Address	Subnet Mask	Gateway
Controller (PLC)	192.168.1.1	255.255.0.0	0.0.0.0
Main Operator Interface	192.168.1.5	255.255.0.0	0.0.0.0
Remote Operator Interface(s)	192.168.1.6 to 192.168.1.10	255.255.0.0	0.0.0.0
Remote Alarm(s)		255.255.0.0	0.0.0.0

Backup/Restore Controller Program

Configuration Backup/Restore

The following information is backed up: device configurations (loaders, MS loaders, grinders, etc.), pump configurations, and source configurations.

- Device configurations include names, parameters, set-points, and pump/loader assignments.
- Pump configurations include names, parameters, and control bits.

Backups can be completed as follows: User Initiated, Automatic, and As Installed.

User Initiated - The User Initiated backup can be performed anytime, however pumps must be disabled during this backup. (Super2 login required).

Automatic - The Automatic backup will perform backups either daily or weekly at either 12AM or 12PM. (Super2 login is required to configure).

As Installed - The As Installed backup will be initiated when the equipment has been setup for the first time. (Service login required- consult factory for service password and login information).

All backups and restorations require the following:

- An SD card formatted for FAT16 file system.
- The SD card should be inserted into the PLC processor SD slot.

⚠ CAUTION: Do Not Cycle Power.

Do not cycle the power to the PLC or remove the SD card during the backup/restore process. Removing the SD card or cycling the power on the PLC will cause the data to be corrupt or possibly damage the SD card.

(Continued)

Backup/Restore Controller Program
(continued)

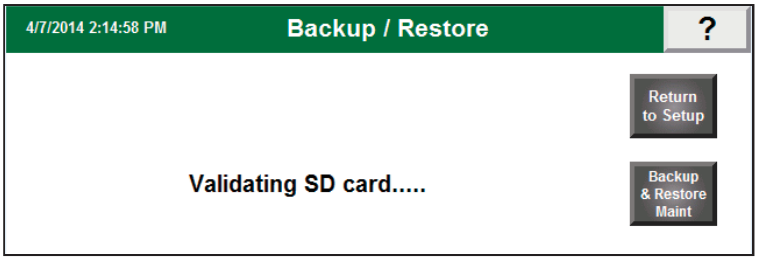
Performing a User Initiated Backup

1 **Login as Super2** on the Login/Logout screen.

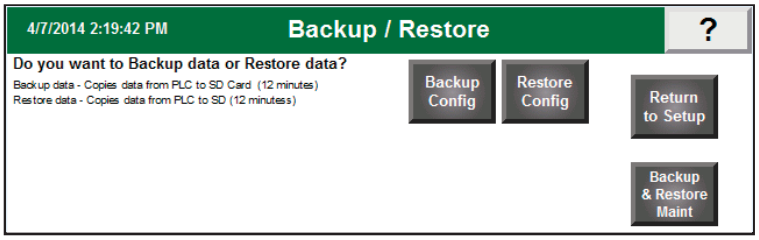
2 If pumps are enabled, **manually disable them from the Pump screens or go to the Setup screen => Maint Page => and select the Disable Pumps button**.

3 **Select Backup/Restore** from the Setup screen.

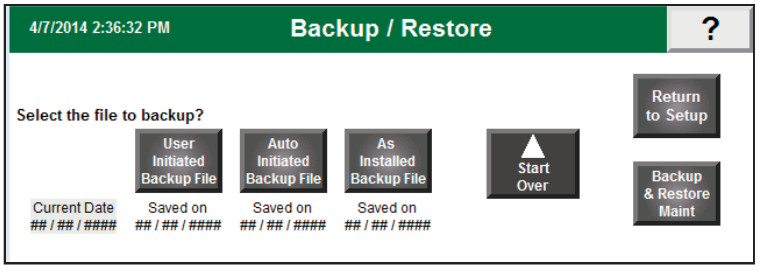
4 The Backup/Restore window validates the SD card. If there is an error, refer to the *Backup/Restore Troubleshooting Messages* section in this Appendix C.



5 Select "Backup Config". This will copy the data from the PLC to the SD card.

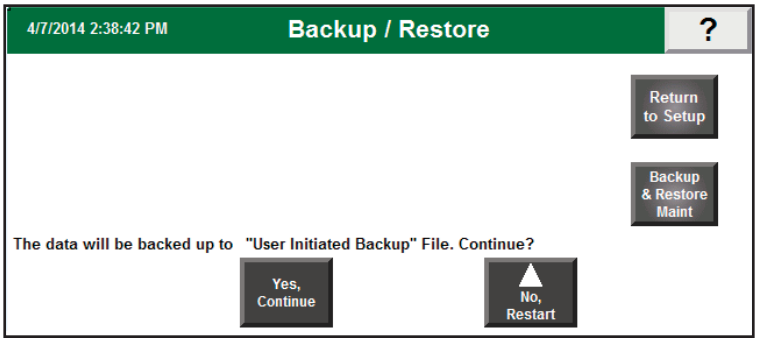


6 Select the "User Initiated Backup File". (In order to cancel the operation and exit the screen or change selection, press the "Start Over" button. The “saved on” shows the last time the file was saved.)

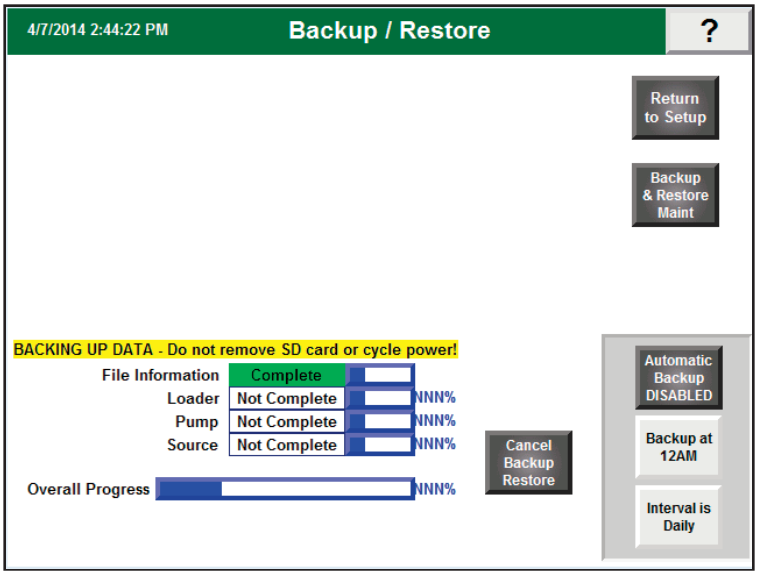


Backup/Restore Controller Program
(continued)

7 Press the "Yes, Continue" button to continue the operation or "No, Restart" to cancel or abort.



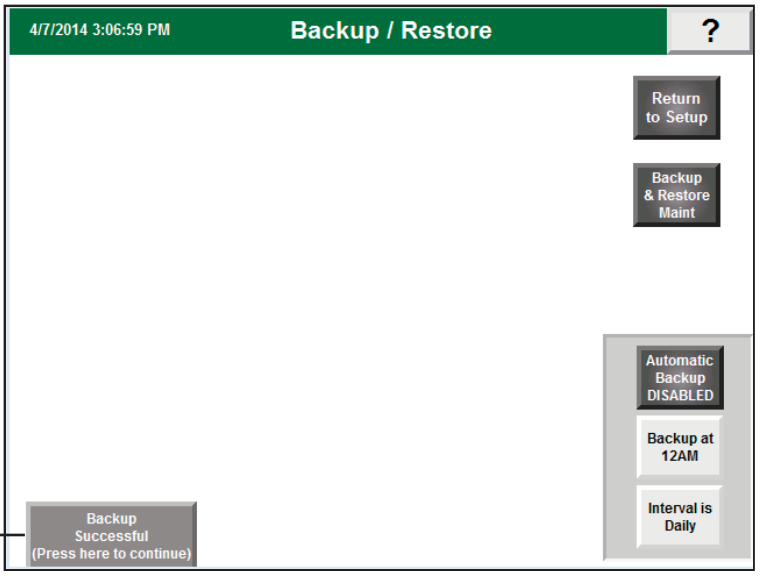
8 The backup process is shown. If there is an error, refer to the *Backup/Restore Troubleshooting Messages* section in this Appendix C.



(Continued)

Backup/Restore Controller Program
(continued)

9 Press the "Backup Successful (press here to continue)" button. If there is an error, refer to the *Backup/Restore Troubleshooting Messages* section in this Appendix C.



Backup Successful (Press Here to Continue)

10 Exit the screen by pressing the "Return to Setup" button.

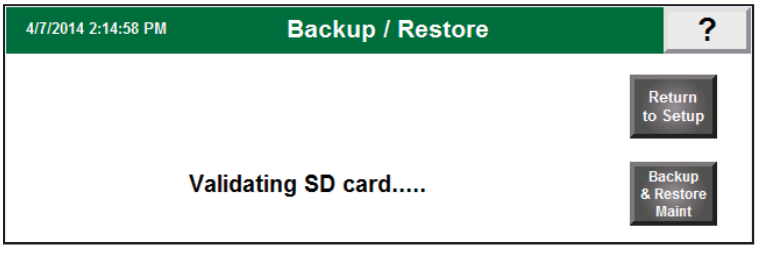
Restoring Saved Data

1 Login as SUPER2 from the main menu.

2 If pumps are enabled, manually disable them from the pump screens or go to the Setup screen => Maint Page => and select the Disable Pumps button.

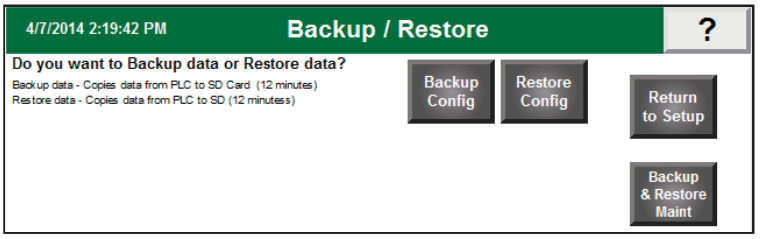
3 Select Backup/Restore from the Setup screen.

4 The Backup/Restore window validates the SD card. If there is an error, refer to the *Backup/Restore Troubleshooting Messages* section in this Appendix C.

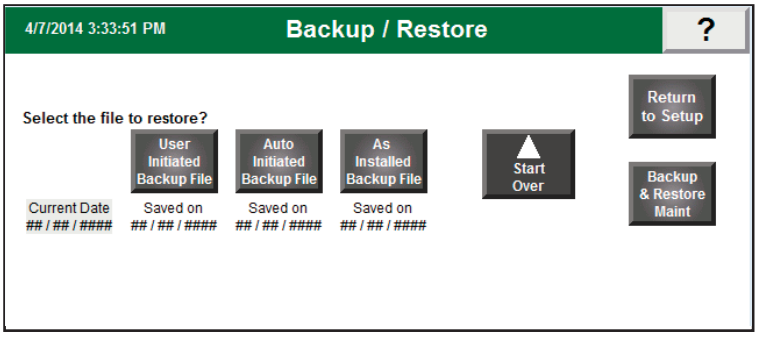


Backup/Restore Controller Program
(continued)

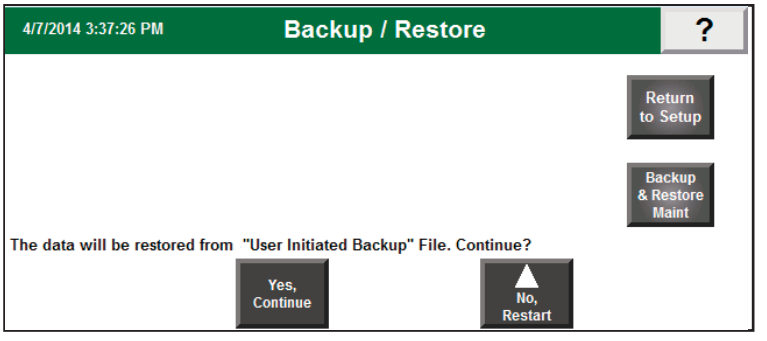
5 Select "Restore Config". This will copy from the SD card to the PLC.



6 Select the file you want to restore. Each file will show the last time the file was saved. If a file does not exist on the SD card it will not be an option to select.



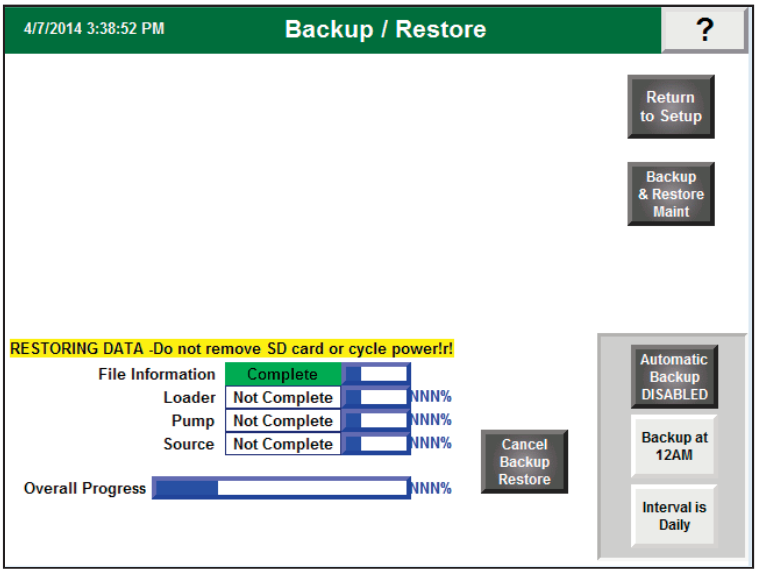
7 Press the "Yes, Continue" button to confirm and continue the operation or "No, Restart" to cancel or abort.



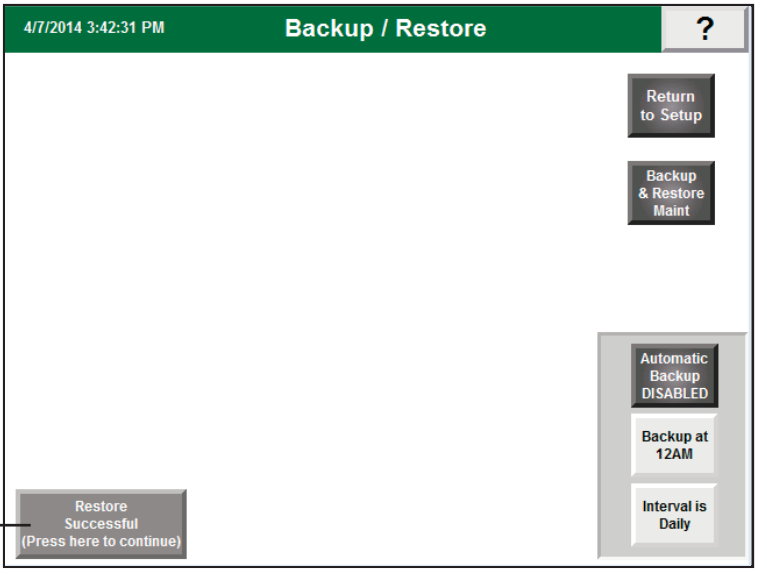
(Continued)

Backup/Restore Controller Program
(continued)

8 The restore process is shown. If there is an error, refer to the *Backup/Restore Troubleshooting Messages* section in this Appendix C.



9 Press the "Restore Successful (press here to continue)" button. If there is an error, refer to the *Backup/Restore Troubleshooting Messages* section in this Appendix C.



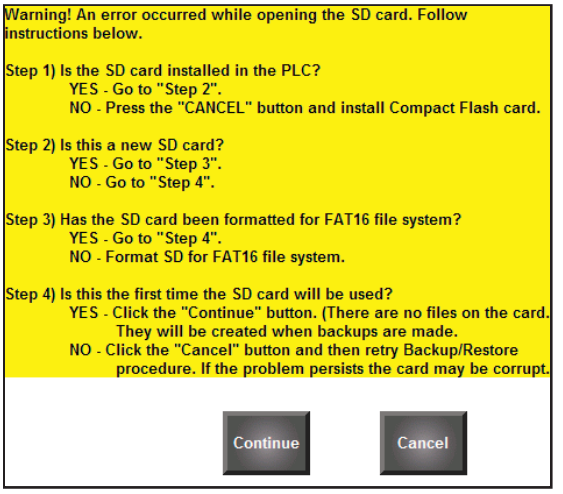
Restore Successful (Press Here to Continue)

10 Exit the screen by pressing the "Return to Setup" button.

Backup/Restore Controller Program
(continued)

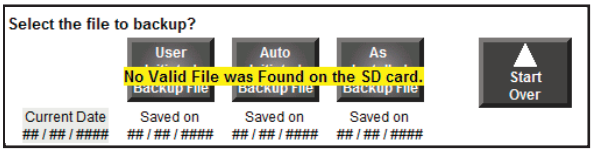
Backup/Restore Troubleshooting Messages

If the card does not pass the validation process the following error will be displayed with a procedure to troubleshoot.

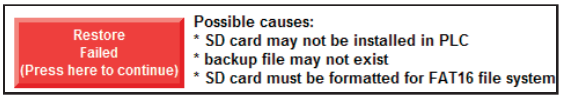


The following error occurs after the validation process if the pumps are not disabled.

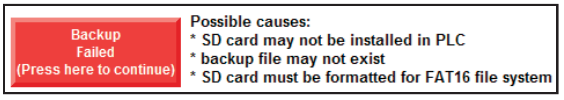
The following error occurs if there are no valid files on the SD card from which to restore.



The following error occurs during the Restore process.



The following error occurs during the Backup process.



(Continued)

Backup/Restore Controller Program
(continued)

Automatic Backup Configuration

The Automatic Backup is configured from the Backup/Restore screen. You will need to choose between a number of choices in order to run the Automatic Backup.

1. Choose to enable/disable the Automatic Backup.

2. Choose the time of day to backup your system, either at 12AM or 12PM.

3. Choose to backup your system on either a daily or weekly configuration. Weekly is based on the day the system was enabled. Super2 login is required to perform this configuration.