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USER GUIDE

UGC038-1113

FLX-128

Central Loading Control

Corporate Office: 724.584.5500 | Instant Access 24/7 (Parts and Service): 800.458.1960 | Parts and Service: 814.437.6861

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

It's 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: UGC038-1113

Serial Number(s):

Model Number(s):

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Introduction

Purpose of the User Guide

This User Guide describes the Conair FLX-128 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 won't 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 120 VAC 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.

SECTION
2

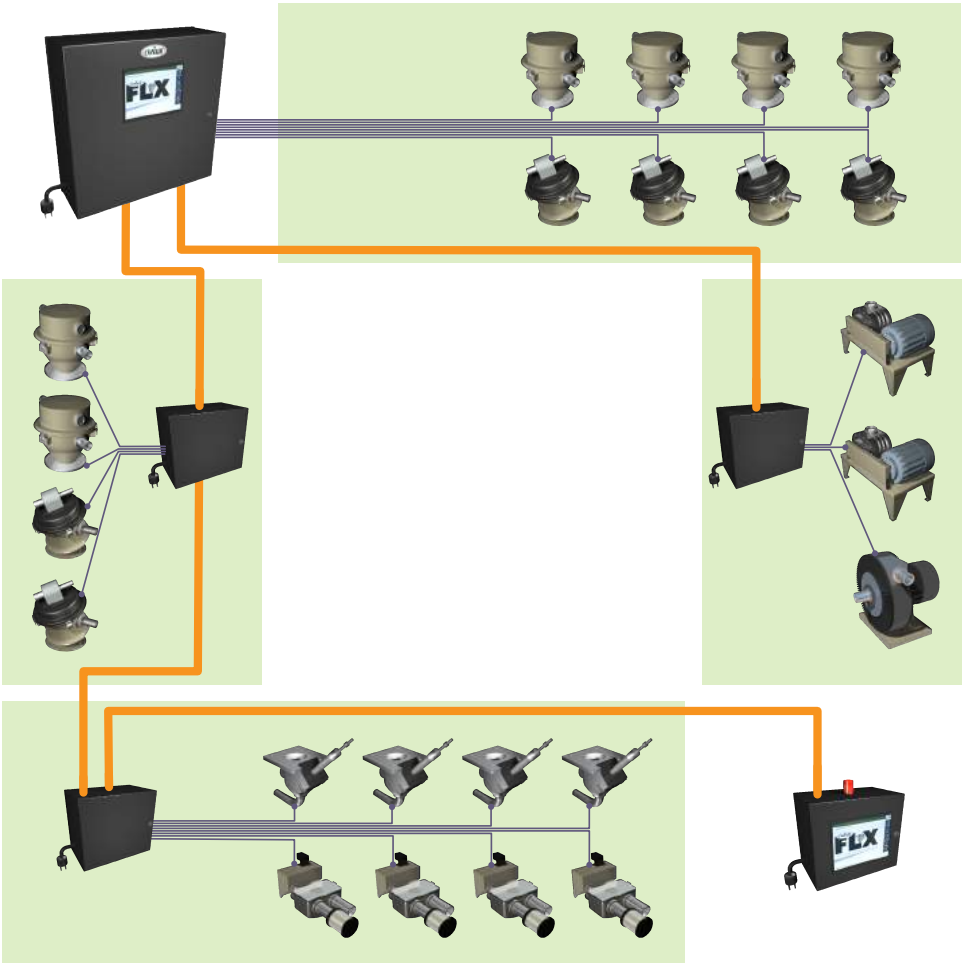
Description

What is the FLX Control?

The FLX loading control is a central vacuum conveying control consisting of a main control with I/O capacity and a range of add-on I/O modules allowing conveying system configurations up to 128 receivers, 40 pumps (plus 2 back up pumps) and 256 source valves.
In addition, optional input and output I/O can be easily added for ratio valves, purge/pocket valves, fill sensors, idle mode valve, dust collector, closed loop operation, blowback, and air operated discharge. A color touch screen provides an intuitive, easy-to-read and easy-to-use graphical interface with on-board help and diagnostic screens.

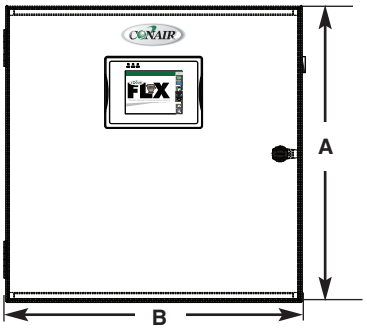
Typical Applications

- Conveying systems that start small and then grow to include increasing numbers of receivers, pumps and source valves for purging conveying lines.
- Conveying systems that are spread across a large plant area that can all be operated from central control panels (up to 6).
- Conveying system installations that can benefit from network wiring (Ethernet) VS 100% hard wiring across the expanse of the facility. The FLX system uses a combination of hard (point to point) wiring and network wiring to minimize labor and wiring costs.
- For easy understanding of conveying system operation, the FLX touchscreen control panels use easy to understand graphics and icons as well as multiple languages to aid users.



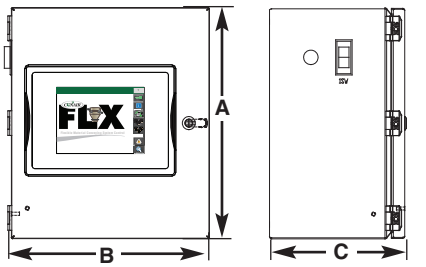
Specifications

Main control panel



Front view Side view

Remote HMI



Front view Side view

MODEL	FLX-128					
Performance characteristics						
Maximum number of vacuum receivers	up to 128					
Maximum number of vacuum pumps	up to 40 (plus 2 back-up)					
Programmable logic controller:						
Main control panel	Wago 750-880					
Remote I/O	Wago 750-871					
Operator interface	Redlion (8 inch standard, 15 inch optional)					
Output voltage to receivers/valves	24 VDC (24/120 VAC optional)					
Input voltage to receivers	24 VDC					
Output voltage to pumps	24 VDC (24/120 VAC optional)					
Power/Amps	120 VAC/16 Amps/60 Hz					
Input/Output capabilities						
	Main control panel (available with or w/o HMI)*	**Remote I/O** (available with or w/o HMI)*	**Receiver expansion panel**	**Pump expansion panel**	**Source valve expansion panel**	**Receiver/valve combo expansion panel**
Receivers	Up to 32	Up to 32	Up to 8†	-	-	Up to 8
Pumps	Up to 10, (plus 1 back-up)	Up to 10, (plus 1 back-up)	-	Up to 4	-	-
Valves	Up to 64	Up to 64	-	-	Up to 16	Up to 16
Dimensions inches {mm}						
	Main control panel	**Main control w/ optional voltage**	**Remote I/O w/ HMI**	**Remote I/O w/HMI w/ optional voltage**	**Remote HMI**	**Expansion panels**
A - Height	24 {609}	36 {914}	24 {609}	36 {914}	14 {355}	14 {355}
B - Width	24 {609}	30 {762}	24 {609}	30 {762}	12 {304}	12 {304}
C - Depth	8 {203}	8 {203}	8 {203}	8 {203}	8 {203}	8 {203}
Weight lb {kg}						
Installed	60 {27}	48 {21}	60 {27}	60 {27}	29 {13}	22 {10}
Shipping	72 {32}	60 {27}	72 {32}	72 {32}	36 {16}	35 {15}

SPECIFICATION NOTES

*Maximum of six HMI total.

† Total number of receivers on the Receiver expansion panel can be 8 with options (fill sensor) and alarms, or 16 with no options.

Selected I/O expansion panels cannot exceed the total FLX capacity of 128 receivers, 40 pumps and 256 source valves.

Specifications may change without notice. Check with a Conair representative for the most current information.

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SECTION
3

Installation

Unpacking the Boxes

The FLX loading control comes in one or more boxes, depending on options ordered. The boxe(s) include a touch screen interface and other options as ordered:

CAUTION: Lifting

To avoid personal injury or damage to the FLX, lift the equipment out of the box carefully. A second person may be helpful in removing equipment from the box(es).

1. **Carefully remove the FLX components from the shipping containers, and set upright.**

2. **Remove all packing material,** protective paper, tape, and plastic. Compare 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. Check all wire terminal connections, bolts, and any other electrical connections, which may have come loose during shipping.

4. **Record serial numbers and specifications** in the blanks provided on the back of the User Guide's title page. This information will be helpful if you ever need service or parts.

5. **You are now ready to begin installation.** *See Installation Section entitled, Preparing for Installation.*

NOTE: Additional boxes may include Remote I/O panel, Remote Operator Interface Enclosure(s), Remote Alarm Enclosure(s), and/or Switch Enclosure(s) depending upon what was ordered.

Preparing for Installation

The FLX is easy to install if you plan the location and prepare the mounting area properly. You should plan the location of the FLX base unit (and any additional control panels to be included in the system) to ensure easy access and minimal wiring.

1 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 FLX will control. Keep the FLX 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 three (3) feet {1 meter} clearance in front of the base unit for safe access to the input/output 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. The three-prong power cords supplied with the FLX base unit and power supply requires a grounded 120 VAC outlet rated for at least 16 amp service.

✎ **NOTE:** Other power options are available.

2 Plan the power/communication cable routes.

- Review all wiring guidelines and diagrams provided in the manuals and electrical diagrams supplied with the FLX system and your conveying equipment before beginning installation. *See Installation: Wiring Considerations.*
- Keep communication wires away from the 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.

⚠ **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.

Installing the FLX

⚠ **CAUTION:** Always disconnect and lock out the main power supply before making electrical connections. Electrical connections should be made only by qualified personnel.

⚠ **IMPORTANT:** Always refer to the wiring diagrams that came with your FLX to locate specific electrical components. Illustrations in the User Guide are intended to be representative only.

Installation of the FLX consists of:

- ❒ Mounting the base unit.
- ❒ Mounting the optional Remote I/O panel, Remote Operator Interface Enclosure(s), Remote Alarm Enclosure(s), and/or Switch Enclosure(s) and expansion modules, depending upon what was ordered.
- ❒ Connecting the control to a main power source and optional hardware.
- ❒ Installing Ethernet wiring, connecting all panels and I/O panels together.
- ❒ Configuring I/O via operator interface.
- ❒ Wiring loaders to the control.
- ❒ Wiring pumps to the control.
- ❒ Wiring the purge and pocket valves included in the system.

Wiring Considerations

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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 FLX control, vacuum receivers, pumps, dust collectors, and material valves.
- ❒ Always refer to the wiring diagrams supplied with your 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 can produce large amounts of static electricity when conveying material.
  - ● Keep communication cables at least five (5) feet {1.5 meters} from electric motors, transformers, rectifiers, arc welders, generators, induction furnaces and sources of microwave radiation.
  - ● 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 six (6) inches {0.15 m} from AC power lines of less than 20 amps; one (1) foot {0.30 m} away from lines of 20 amp to 100 kVA; and two (2) feet {0.60 m} from lines of 100 kVA or more.
- ❒ Follow the safe grounding procedures in the wiring diagram package. Ground the shielded cable inside the Input/Output enclosure only.

Mounting the Base Unit

The FLX 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 the mounting surface.** Use the mounting brackets on the base unit enclosures.

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

CAUTION: 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 Optional Panels and Enclosures

When mounting optional Remote I/O Panel, Remote Operator Interface Enclosure(s), Remote Alarm Enclosure(s) and/or Switch Enclosure(s), and Expansion Modules, the following guidelines should be followed:

1 **Mount the optional enclosure(s) on a wall or other secure vertical surface at a height providing easy access and a clear view of the touch screen panel.**

2 **Connect the optional hardware to the main FLX via Ethernet.** The maximum distance between the connections is 328 feet {100 meters}. The distance may be extended if a switch box is used. See electrical drawings for more detail.

3 **Using the mounting brackets on the enclosures, bolt the enclosures to the mounting surface(s)**.

4 **Ground the cabinet by connecting a grounding wire to the enclosure.** Follow procedures outlined by your regional electric codes and the wiring diagrams included with this user guide.

CAUTION: 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

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. Always follow your company's internal lockout/tagout procedure for all maintenance and 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.

IMPORTANT: Always refer to the wiring diagrams that came with your FLX before making electrical connections. The diagrams show the most accurate electrical component information.

The FLX base unit and optional panels are equipped with three-prong plugs and power cords.

1. **Plug the power cords into grounded 120 VAC outlets rated for at least 16 Amp service.**
2. **Verify that the base unit is grounded.**

Preparing to Configure the I/O

The FLX-128 conveying control system represents the ultimate in flexibility and system configuring. As a result, before it is wired, the components of your system need to be configured for their location, function and specific wiring connection points. The steps to this process are:

1 **Provide the proper quantity of input/output capability for the system's needs.** This step usually takes place at the time of order entry, based on a definition of the system needs and includes:
a. Providing the proper number of I/O cards to operate the devices in the system (receivers, pumps, etc).
b. Providing the proper number of I/O panels to hold the selected I/O cards. These I/O panels may be installed throughout the installation, to minimize the length of final wiring connections**.**

2 **Install and interconnect all I/O panels.** I/O panels are easily interconnected via Ethernet, but their location in your installation will reduce multi-wire, point-to-point final connections to system devices like receivers, pumps, etc. Once I/O panels are installed and wired via Ethernet, the control system will automatically recognize these components.

3 **Configure the system's I/O cards for specific device functions. This is done with the set-up process and provides the final connection points for wiring devices to the system's I/O cards**.

Understanding I/O Locations

The input/output cards that provide the actual control input and output functions were specified during the system ordering process and should include all the system capacity needed for your installation. The input/output (I/O) cards are interconnected via Ethernet wiring and are provided in multiple enclosures:

- The Main FLX enclosure…this panel may be equipped with or without a touchscreen control panel and includes the main system PLC processor.
- Remote I/O enclosure…This panel may be equipped with or without a touchscreen control panel, but also includes a PLC processor.
- Expansion modules…These accessory panels (up to 4 types) may be included, in multiples, to provide additional I/O capacity for these specific system devices:
    a. 8 Receivers (up to 8 panels may be included),
    b. 4 Pumps (up to 5 panels may be included),
    c. 16 Source valves (up to 8 panels may be included),
    d. Combination Module designed for 8 receivers and 16 source valves (up to 8 panels may be included).
    e. 16 Receivers.

The use of multiple I/O panels provides the flexibility for efficient wiring arrangements, since the I/O panels can be distributed throughout the installation, near the devices that will require hard wire connections, to minimize cable.

(continued)

Understanding I/O Locations (continued)

Once all the I/O modules are installed and inter-connected via Ethernet network wiring the system will recognize these modules and they will appear on the system set-up screen accordingly.

Understanding I/O Card Functions

Each I/O panel includes a number of I/O cards designed to provide functionality to the system's receivers, pumps, source valves and alarms. This functionality includes input signals (IE: from demand switches, pump overloads, etc) and output signals (IE: to pump starters, vac valves, alarm indicators, etc). The specific functions required for each receiver, pump, valve and alarm must be configured to specific I/O cards within each I/O panel. Once the I/O cards are configured, specific point-to-point wiring instructions will be defined for final connections to each of the system's pumps, receivers, valves and alarms.

Understanding I/O Wiring

Since I/O cards are provided from the manufacturer pre-defined as input cards and outputs cards, the wires coming from receivers, pumps, etc are connected to multiple cards in order to provide the correct functionality for the device's input/output needs. A single input card will control the input signals from multiple receivers and a single output card will control the outputs to multiple receivers.

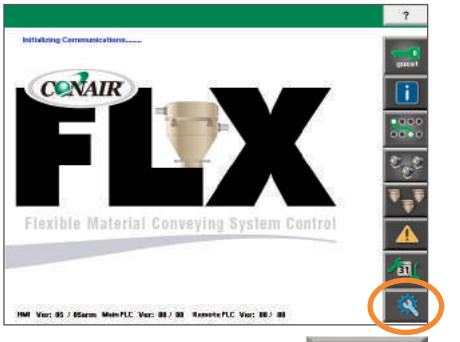
Using the Setup Wizard

Using the Setup Wizard is the most simple way to complete the initial setup of your FLX system. Use the following procedure to complete the initial setup process:

1 Provide power to the FLX.

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 10 seconds.

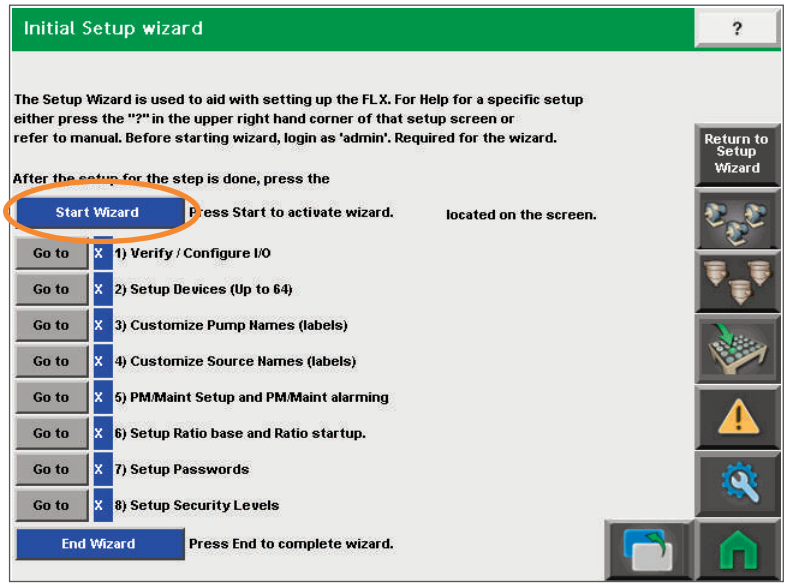
3 From the main screen, select "Setup".



4 From the Setup screen, select "Advanced Setup".

5 From the Advanced Setup screen, select "Setup Wizard".

6 From the Initial Setup Wizard screen, click "Start Wizard". The setup wizard will guide you through all the initial steps of setting up your FLX.



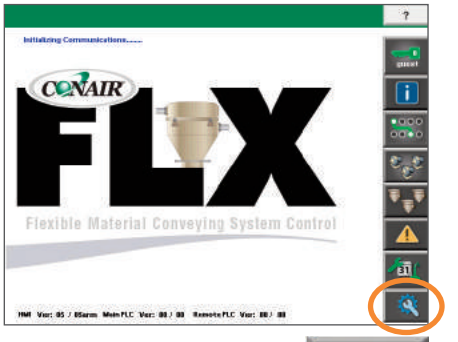
TIP: If at any point of the Setup Wizard you are unsure what to do, click on the Help button at the top of the screen. Each screen has a detailed help page to aide in determining what settings to enter.

TIP: You can use the "Return to Setup Wizard" at any time to return to the initial Setup Wizard screen.

7 Once you have completed all the parts of the Setup Wizard, press "End Wizard".

Configuring the I/O

NOTE: If you have utilized the setup wizard, you have already configured the I/O. See *Installation: Using the Setup Wizard* for more information.



1 Provide power to the FLX.

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 10 seconds.

3 From the main screen, select "Setup".

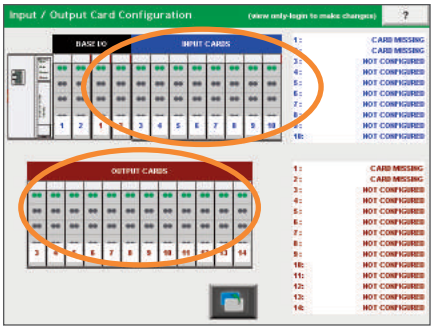
4 From the Setup screen, select "Advanced Setup".

5 From the Advanced Setup screen, select "I/O Configure".

6 From the I/O Configure screen, login as admin. Default password is admin. (If this step is necessary on your control, a popup window will prompt you to login.)

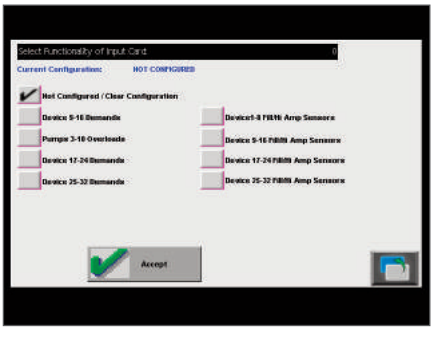
7 Select "Configure I/O".

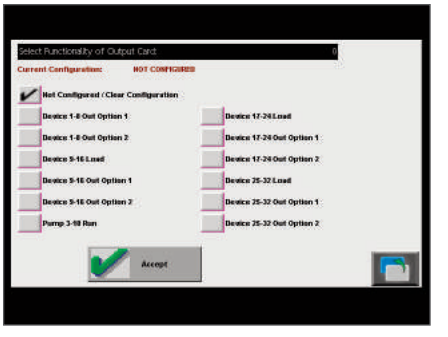
8 From the Configure I/O screen, press the INPUT or OUTPUT card to be configured.



9 From the card configuration screen, select how the card will be configured.

NOTE: Configuration options are based upon I/O expansion available and prerequisites.





10 Press "Accept" to accept changes, or the Back button to disregard.

11 Repeat steps 8 and 9 until all cards are configured.

(Continued)

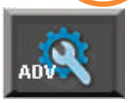
Configuring Remote I/O and Expansion I/O Modules

Configure Remote I/O only if the Remote I/O is required for your current system needs and has been included with the FLX system. The Remote I/O of the FLX control will need to be configured prior to wiring loaders, pumps, and valves. The FLX Remote base I/O is not configurable. All additional I/O is configurable to customize the FLX to loading system requirements.

1 Provide power to the FLX.

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 10 seconds.

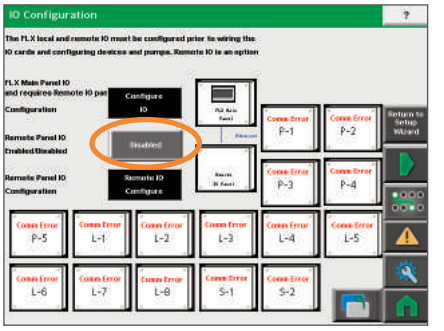
3 From the main screen, select "Setup".



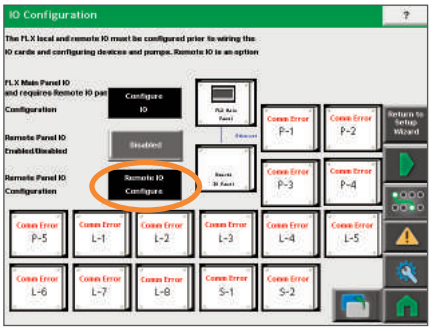
4 From the Setup screen, select "Advanced Setup".

5 From the Advanced Setup screen, select "I/O Configure".

6 From the I/O Configure screen, login as admin. Default password is admin. (If this step is necessary on your control, a popup window will prompt you to login.)



7 From the I/O Configuration screen, enable the Remote Panel I/O.



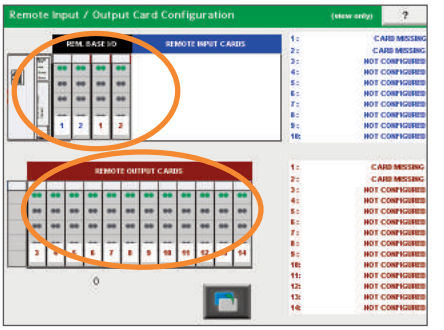
8 Select Remote I/O Configuration.

NOTE: If you have utilized the setup wizard, you have already configured the remote I/O and expansion modules. See *Installation: Using the Setup Wizard* for more information.

(Continued)

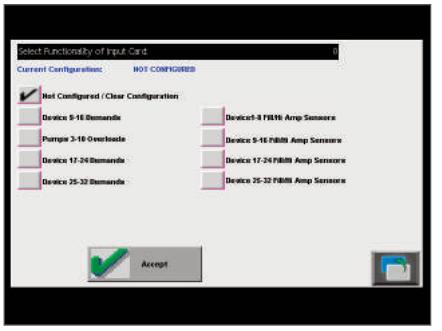
Configuring Remote I/O and Expansion I/O Modules (continued)

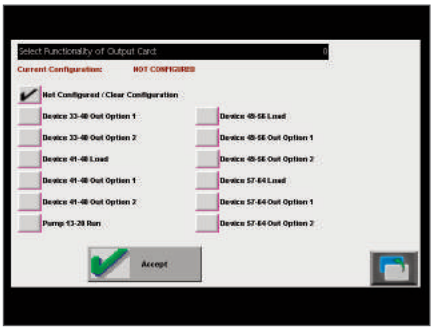
9 From the I/O Configure screen, press the INPUT or OUTPUT card to be configured.



✎ **NOTE:** Configuration options are based upon I/O expansion available and prerequisites.

10 From the card configuration screen, select how the card will be configured.





11 Press "Accept" to accept changes, or the Back button to disregard.

12 Repeat steps 8 and 9 until all cards are configured.

Wiring Receivers

The receiver wires connect to power terminals or terminals on the I/O slots inside the control enclosure. The number of receivers and options in the conveying system will determine the number of connections that are required. Refer to electrical prints provided with the FLX for all electrical connections to the receiver control or Maintenance/Card Wire Number screen. All receiver inputs and outputs are 24VDC unless the AC version was installed.

Wiring Pumps

The pump wires connect to power terminals or terminals on the I/O slots inside the control enclosure. 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 FLX for all connections or Maintenance/Card Wire Number screen. All pump inputs and outputs are 24VDC unless the AC version was installed.

Wiring Purge, Pocket, or Ratio Valves (optional)

The FLX 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 FLX for all electrical connections to the loader control or Maintenance/Card Wire Number screen. All valve outputs are 24VDC unless the AC version was installed.

Testing the FLX

Once the system is completely connected:

1. **Check that all connections are terminated correctly.**
2. **Provide power to the FLX.**
3. **Wait for the control to initialize.** The control will check the I/O connections during the boot-up and initialization process. This will take up to 10 seconds.

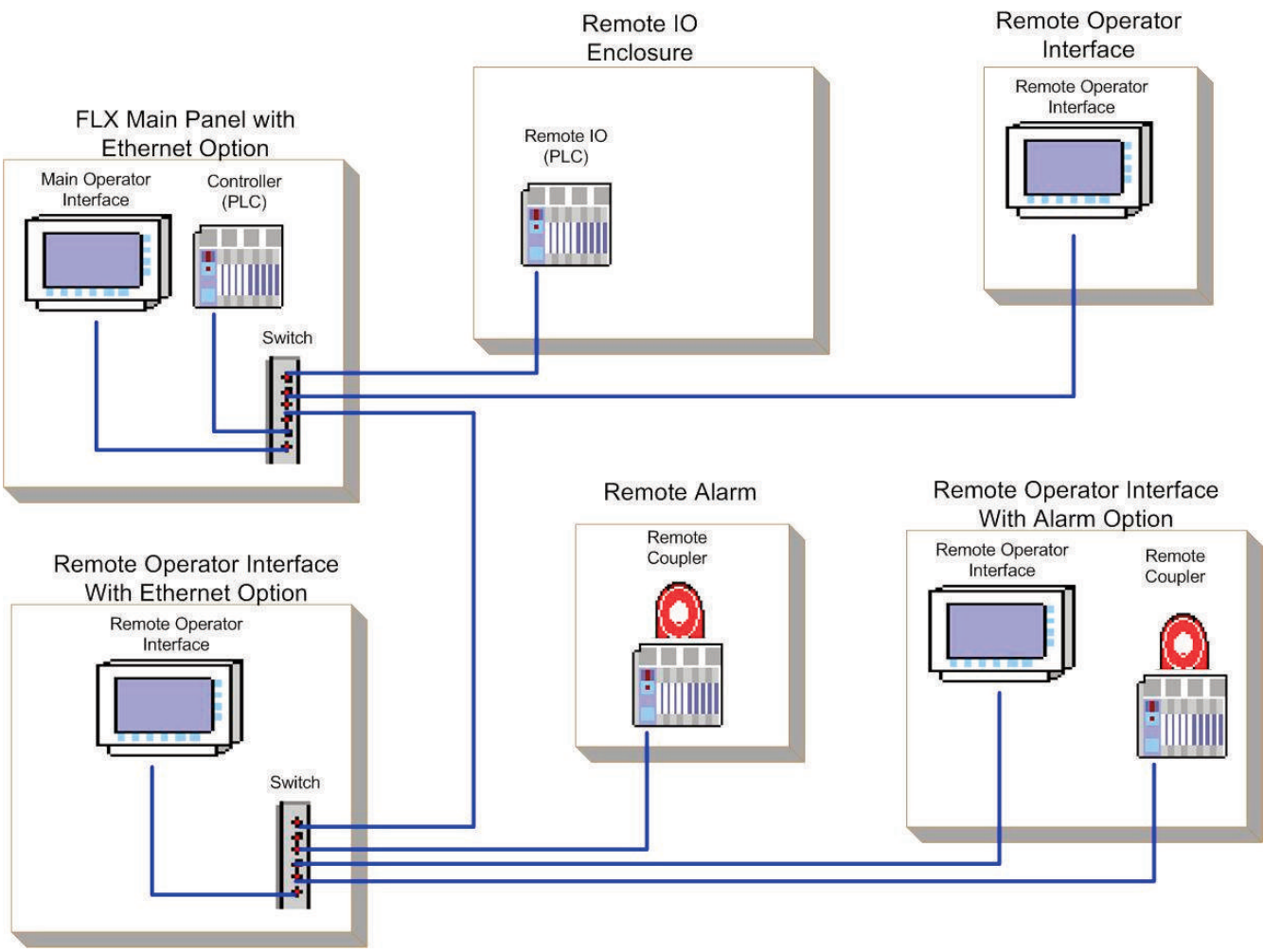
Customizing Network Connections

Overview of FLX System Network

The FLX system with Ethernet option uses the Modbus TCP/IP specification. Modbus TCP/IP uses TCP/IP and Ethernet to carry the data of the Modbus message structures between FLX system hardware. All the hardware is networked via the switch located in the main cabinet and/or remotes.

In order for all the FLX system's hardware (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 whenever the destination subnet is not present in the routing table for that specific packet.

Example of the FLX system networked:



(Continued)

Customizing Network Connections

(Continued)

Conair Default Network Addresses

Hardware	IP Address	Subnet Mask	Gateway
Controller (PLC)	10.1.61.1	255.255.0.0	0.0.0.0
Main operator interface	10.1.61.2	255.255.0.0	0.0.0.0
Remote operator interface(s)	10.1.61.3 to 10.1.61.10	255.255.0.0	0.0.0.0
Remote alarm(s)	10.1.61.11 to 10.1.61.15	255.255.0.0	0.0.0.0
Remote I/O Controller (PLC)	10.1.61.100	255.255.0.0	0.0.0.0
Pump box	10.1.61.201 to 10.1.61.205	255.255.0.0	0.0.0.0
Combo Pump box	10.1.61.206 to 10.1.61.210	255.255.0.0	0.0.0.0
8 loader box	10.1.61.211 to 10.1.61.218	255.255.0.0	0.0.0.0
Combo box	10.1.61.221 to 10.1.61.228	255.255.0.0	0.0.0.0
Source box	10.1.61.231 to 10.1.61.238	255.255.0.0	0.0.0.0
16 loader box	10.1.61.241 to 10.1.61.244	255.255.0.0	0.0.0.0

Multiple FLX systems

System	
FLX System 2	3rd octet changes to 62 as shown 10.1.62.#
FLX System 3	3rd octet changes to 63 as shown 10.1.63.#
FLX System 4	3rd octet changes to 64 as shown 10.1.64.#

Customize Network Addresses

When customizing all network addresses, the recommended order is as follows:

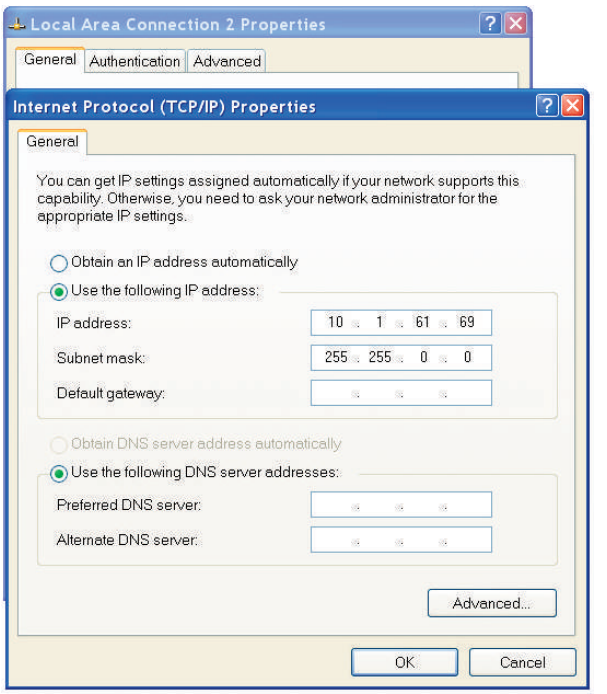
- Change Network Address for FLX Controller
- Change Network Address for FLX Remote I/O Controller (if installed)
- Change Network Addresses for Main and Remote Operator Interfaces
- Change Operator Interface Communication Path to Controller (PLC)
- Change Network Addresses for Remote Alarms
- Change Operator Interface Communication Path for Remote Alarms

When new equipment is added to the FLX system, only the new hardware network addresses must be changed. Follow the procedure for just that hardware.

Changing Network Addresses for FLX Controller PLC and/or FLX Remote I/O Controller (Wago 880)

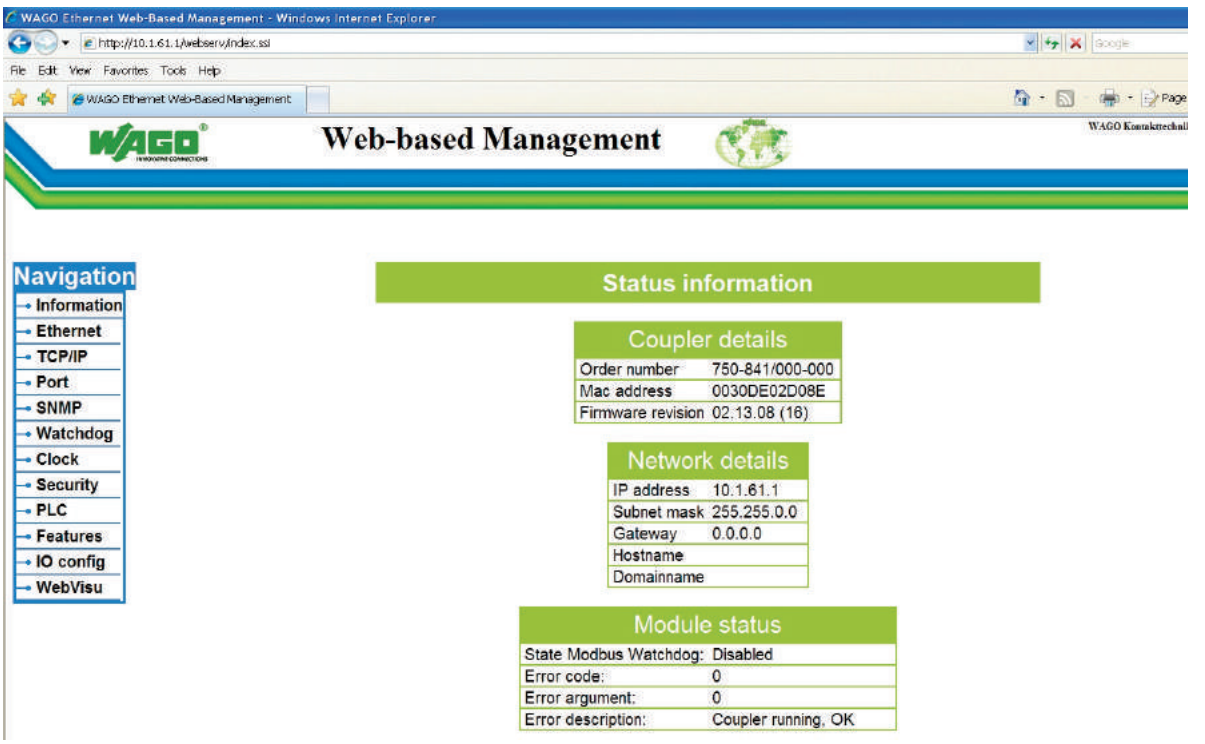
1 **Verify that the PC to be connected is on the same network as the FLX controller.** This can be done by looking at Control Panel - Network Connections - Local Area Connection.

2 **Connect the PC to the FLX system network using an Ethernet cable.** A spare Ethernet port can be found in the main cabinet.



3 **Once the PC is connected, open up Internet Explorer on the PC.**

4 **In the address bar type http://{current IP address of FLX controller}. Example: http://10.1.61.1**



(Continued)

Changing Network Addresses for FLX Controller PLC and/or FLX Remote I/O Controller (Wago 880) (Continued)

5 From the Navigation menu, select TCP/IP.

6 When prompted for User name enter "user" and password "user".

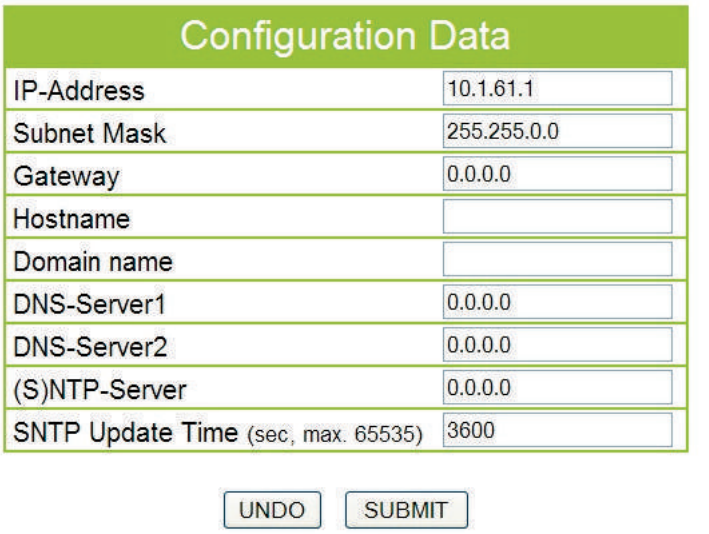
7 Enter the new network addresses (IP-Address, Subnet Mask, Gateway).

8 Once the new addresses are entered, press the Submit button.

9 When prompted for User name enter "user" and password "user".

10 Close Internet Explorer.

11 Cycle power to the FLX controller (The TCP/IP parameters are stored in an EEPROM and changes will take effect after the next software or hardware reset.)

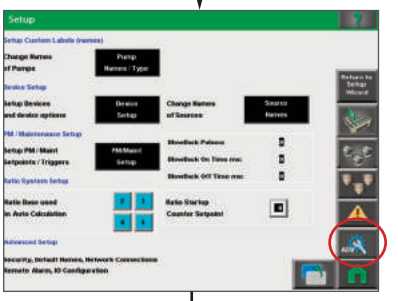


✎ **NOTE:** The operator interface communication path to controller (PLC) will have to be changed in all operator interfaces.

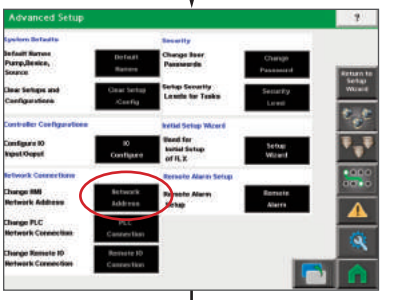
Changing Network Addresses for Main and Remote Operator Interfaces

1 **From the Main screen, press the Setup button.**

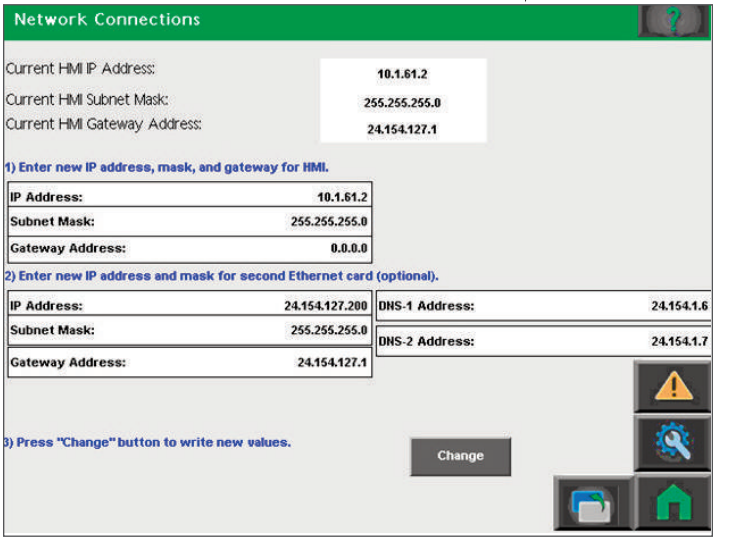
2 **From the Setup screen, press the Advanced Setup button.**



3 **Login as admin then press the Network Address button.**



4 **Follow the procedure on the screen.** The main operator interface will reboot and start up with the new network addresses.



5 **Repeat steps 2 through 5 for all operator interfaces.**

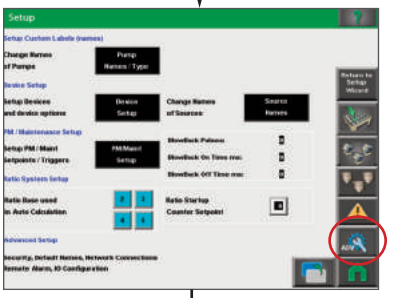
✎ **NOTE:** This page also includes the DNS for the email option. *See Operation: FLX-128 Email Feature for more information.*

Changing Operator Interface Communication Path to Controller (PLC)

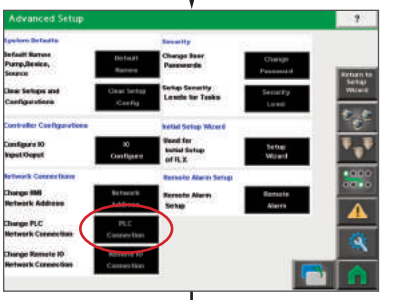
The network address of the controller (PLC) must be entered into the operator interface so the operator interface knows where to pull the data from.

1 **From the Main screen, press the Setup button.**

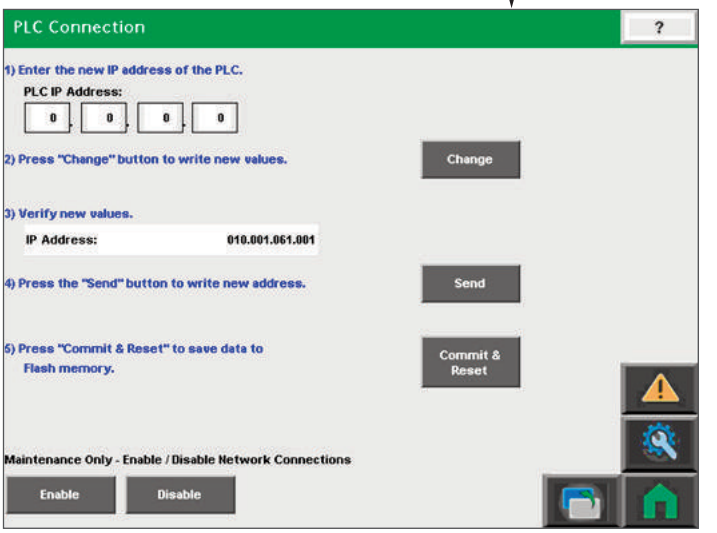
2 **From the Setup screen, press the Advanced Setup button.**



3 **Login as admin then press the PLC Connection button.**



4 **Follow the procedure on the screen.**



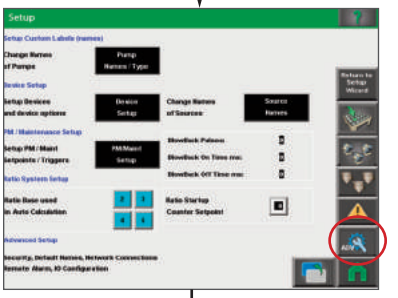
NOTE: The operator interface communication path to controller (PLC) will have to be changed in all operator interfaces.

Changing Operator Interface Communication Path to Remote I/O Controller (PLC)

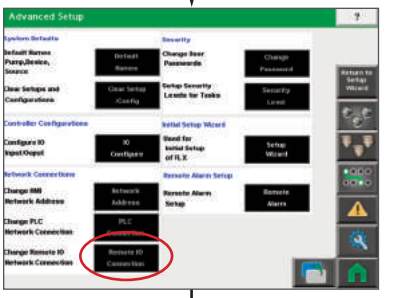
The network address of the Remote I/O Controller (PLC) must be entered into the operator interface so the operator interface knows where to pull the data from.

1 **From the Main screen, press the Setup button.**

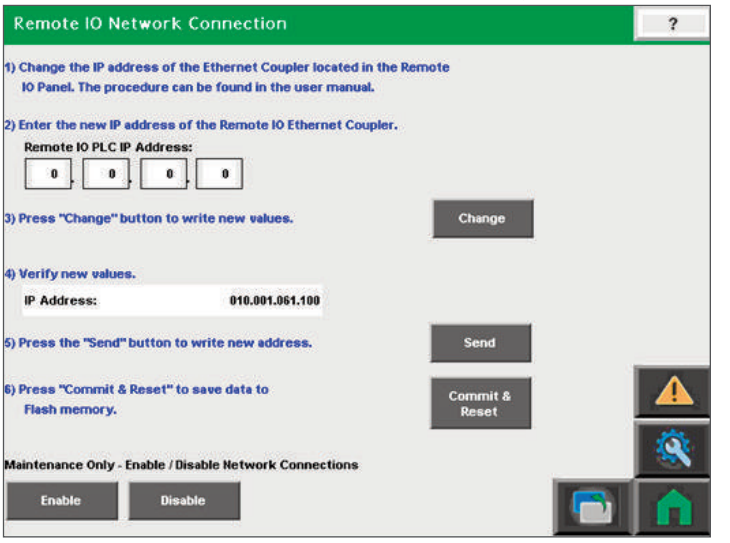
2 **From the Setup screen, press the Advanced Setup button.**



3 **Login as admin then press the Remote I/O Connection button.**



4 **Follow the procedure on the screen.**

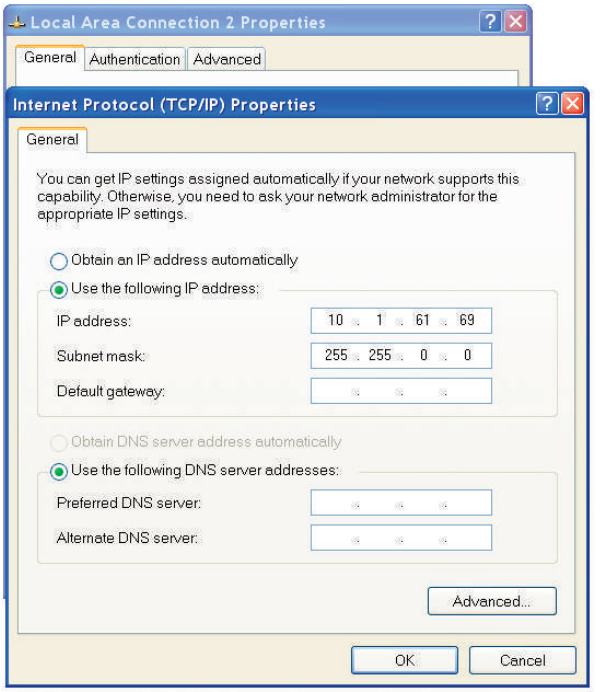


NOTE: The operator interface communication path to controller (PLC) will have to be changed in all operator interfaces.

Changing Network Addresses for Remote Alarms (Wago 352)

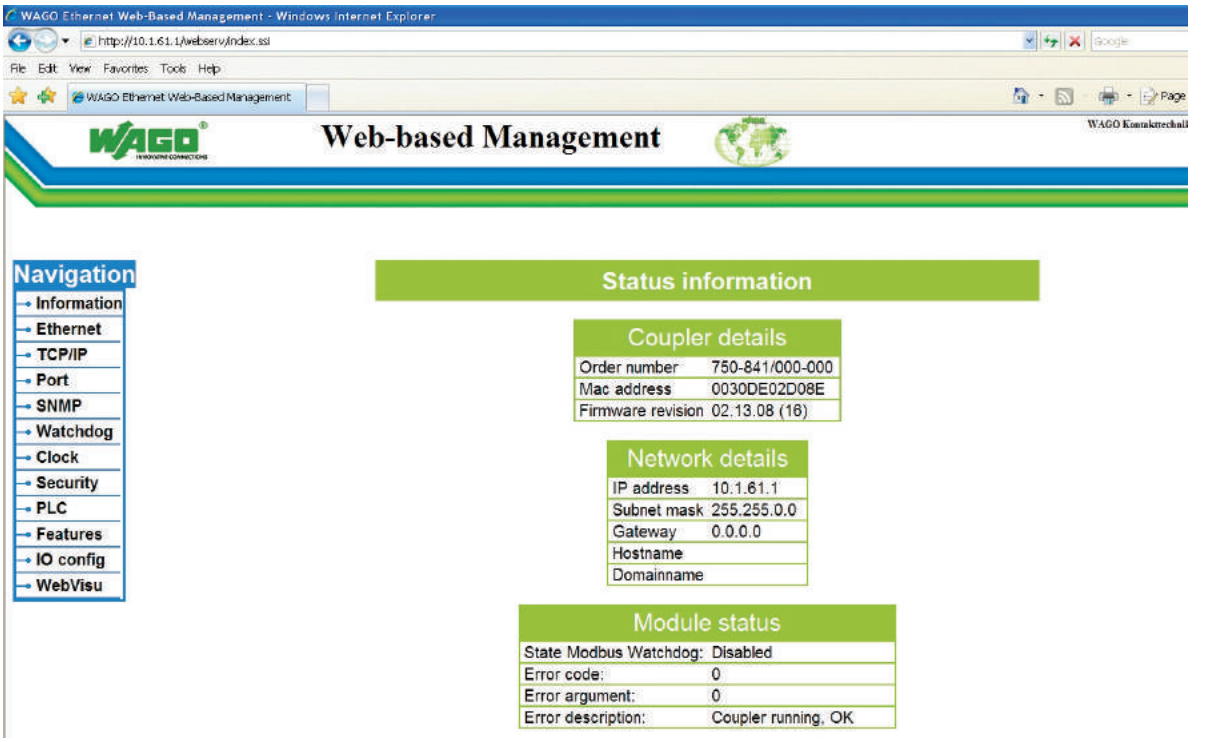
1 **Verify that the PC to be connected is on the same network as the FLX remote alarms.** This can be done by looking at Control Panel - Network Connections - Local Area Connection.

2 **Connect the PC to the FLX system network using an Ethernet cable.** A spare Ethernet port can be found in the main cabinet.



3 **Once the PC is connected, open up Internet Explorer on the PC.**

4 **In the address bar type http://{current IP address of FLX controller}. Example: http://10.1.61.1**



(Continued)

Changing Network Addresses for Remote Alarms (Wago 352) (Continued)

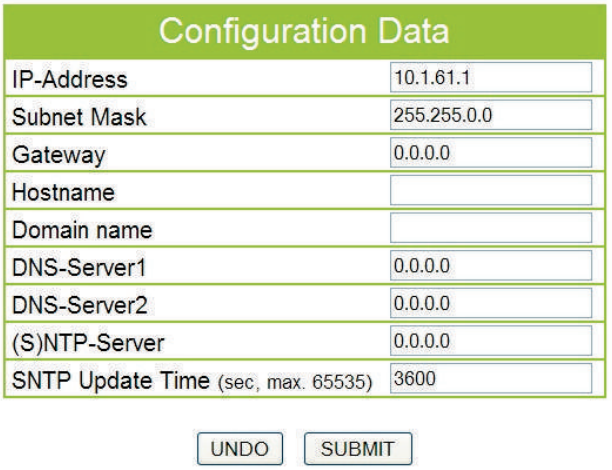
5 From the Navigation menu, select TCP/IP.

6 When prompted for User name enter "user" and password "user".

7 Enter the new network addresses (IP-Address, Subnet Mask, Gateway).

8 Once the new addresses are entered, press the Submit button.

9 When prompted for User name enter "user" and password "user".



10 If additional FLX remote alarms have to be changed, repeat steps 4 through 8.

11 Close Internet Explorer.

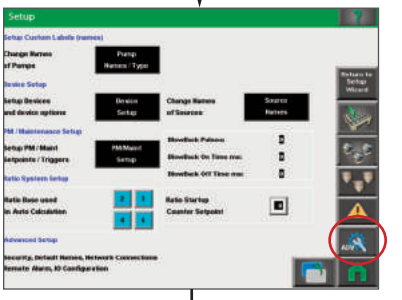
12 Cycle power to the FLX remote alarm(s) (The TCP/IP parameters are stored in an EEPROM and changes will take effect after the next software or hardware reset.)

✎ **NOTE:** The operator interface communication path to controller (PLC) will have to be changed in all operator interfaces.

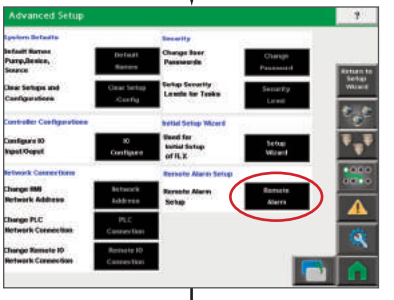
Changing Operator Interface Communication Path for Remote Alarms

1 **From the Main screen, press the Setup button.**

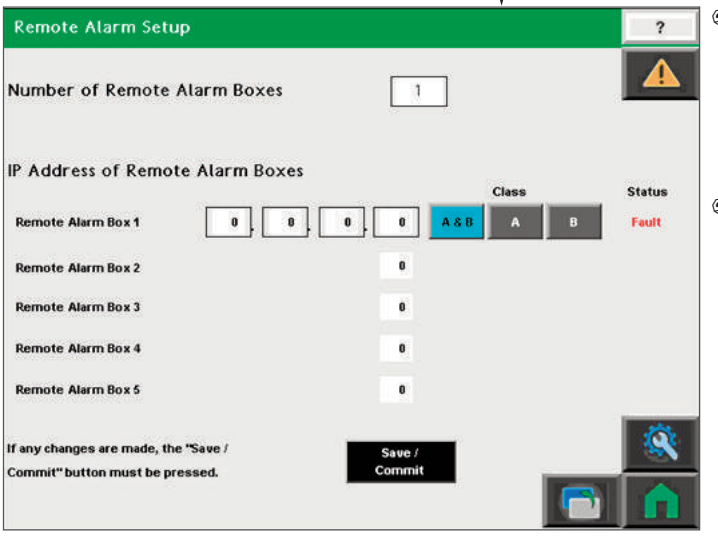
2 **From the Setup screen, press the Advanced Setup button.**



3 **Login as admin then press the Remote Alarm button.**



4 **Follow the procedure on the screen.**



NOTE: Only the addresses for the number of Remote Alarm boxes will be displayed.

NOTE: The IP addresses used for expansion boxes are shown in a table later in this User Guide. *See Appendix B-1 for more information.*

NOTE: The 1st, 2nd, 3rd octets are set in Remote Alarm box 1. Remote Alarm boxes 2 through 5 will use the first three octets which were configured for Remote Alarm box 1.

Backup/Restore Controller Program

The FLX controller (Wago 880) memory allocation is as follows:

RAM Memory
The RAM memory is used to create variables not required for communication with the interfaces but for internal processing. This memory is NOT stored and is set to 0 or false or initial values on startup and/or reset.

CODE Memory
The IEC 61131-3 program is filed in the code memory. The code memory is a flash ROM. Once the supply voltage is applied, the program is transmitted from the flash to the RAM memory. After a successful start-up, the PFC (Programmable Fieldbus Controller) cycle starts when the operating mode switch is turned to its upper position or by a start command from WAGO-I/O-PRO CAA.

NOVRAM (Remanent Memory)
The remanent memory is non volatile memory, i.e. all values are retained following a voltage failure. The memory management is automatic.

The BACKUP/RESTORE function is performed using the file transfer protocol (FTP). The file system is mapped to RAM disk. To permanently store the data of the RAM disk, the information is additionally copied into the flash memory. The data is stored in the flash after the file has been closed. Due to the storage process, access times during write cycles are long.

To Restore FLX Controller (PLC) / Remote I/O Controller (PLC):

✎ **NOTE:** If Ethernet option is installed, then plug into the Ethernet coupler outside the panel or a spare port on the Ethernet switch. If Ethernet option is not installed, then unplug the Ethernet cable currently plugged into the FLX Controller/PLC going to the operator interface and plug directly into the controller.

1. **Connect to the FLX Controller/PLC (880) via Ethernet.**
2. **Once connected, open Internet Explorer and enter the following address: ftp://10.1.61.1 For the Remote I/O Controller (PLC) enter 10.1.61.100 or the customized address.**

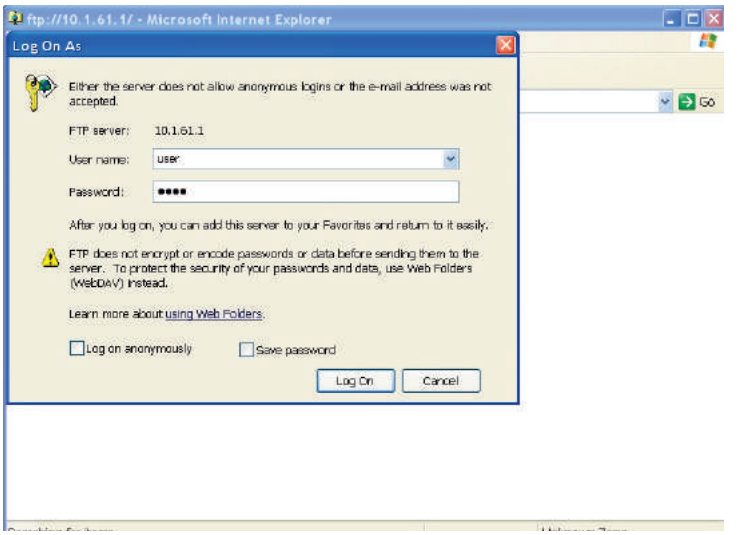
✎ **NOTE:** If IP address has been customized or multiple FLX systems are used, then enter that IP address in replacement of the 10.1.61.1

3. **When prompted for user name and password, enter "user" as username and "user" as password.**

(Continued)

Backup/Restore Controller Program

(Continued)



4 **Once the FTP site opens, select Page from Internet Explorer toolbar and then click Open FTP Site in Windows Explorer.**

5 **Windows Explorer will open and prompt for login and password to enter the FTP site.** Enter "user" as username, and "user" as password. Then press Log On.

6 **Copy the contents of the "PLC" to the PLC folder of the Controllers FTP site.** If prompted to replace files, press Yes to All. Copying procedure will take about 5 minutes.

7 **Copy the EA-config.xml from the "etc" to the etc folder of the Controller's FTP site.** If prompted to replace files, press Yes. Copying procedure will take about 1 minute.

8 **Copy the contents of the "webserv" to the webserv folder of the Controller's FTP site.** If prompted to replace files, press Yes to All. Copying procedure will take about 5 minutes.

9 **Close Windows Explorer (controller's FTP site).**

10 **Cycle power to controller.**

To Backup FLX Controller (PLC) / Remote I/O Controller (PLC):

1 **Connect to the FLX Controller/PLC (880) via Ethernet.**

✎ **NOTE:** If Ethernet option is installed, then plug into the Ethernet coupler outside the panel or a spare port on the Ethernet switch. If Ethernet option is not installed, then unplug the Ethernet cable currently plugged into the FLX Controller/PLC going to the operator interface and plug directly into the controller.

2 **Create the following folders in the backup location: PLC, etc, and webserv.**

(Continued)

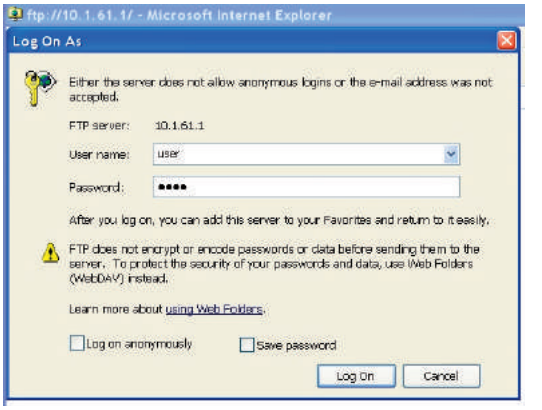
Backup/Restore Controller Program

(Continued)

3 **Once connected, open Internet Explorer and enter the following address: ftp://10.1.61.1 For the Remote I/O Controller (PLC) enter 10.1.61.100 or the customized address.**

✎ **NOTE:** If IP address has been customized or multiple FLX systems are used, then enter that IP address in replacement of the 10.1.61.1

4 **When prompted for user name and password, enter "user" as username and "user" as password.**



5 **Once the FTP site opens, select Page from Internet Explorer toolbar and then click Open FTP Site in Windows Explorer.**

6 **Windows Explorer will open and prompt for login and password to enter the FTP site.** Enter "user" as username, and "user" as password. Then press Log On.

7 **Copy the contents of the "PLC" to the Controller's FTP site to the local backup folder also named PLC.** Copying procedure will take about 5 minutes.

8 **Copy the EA-config.xml from the "etc" folder of the Controller's FTP site to the local backup folder also named "etc".** Copying procedure will take about 1 minute.

9 **Copy the contents of the "webserv" folder of the Controller's FTP site to the local backup folder also named "webserv".** Copying procedure will take about 3 minutes.

10 **Close Windows Explorer (controller's FTP site).**

Alternate Procedure: FLX Program and Settings Backup to SD Card

The main program and all settings of the FLX system reside in the WAGO PLC located in the main enclosure box. The program and settings can be backed up to a SD card if the main PLC is a model 750-880. Once backed up, the program and settings can be restored easily through an Ethernet connection.

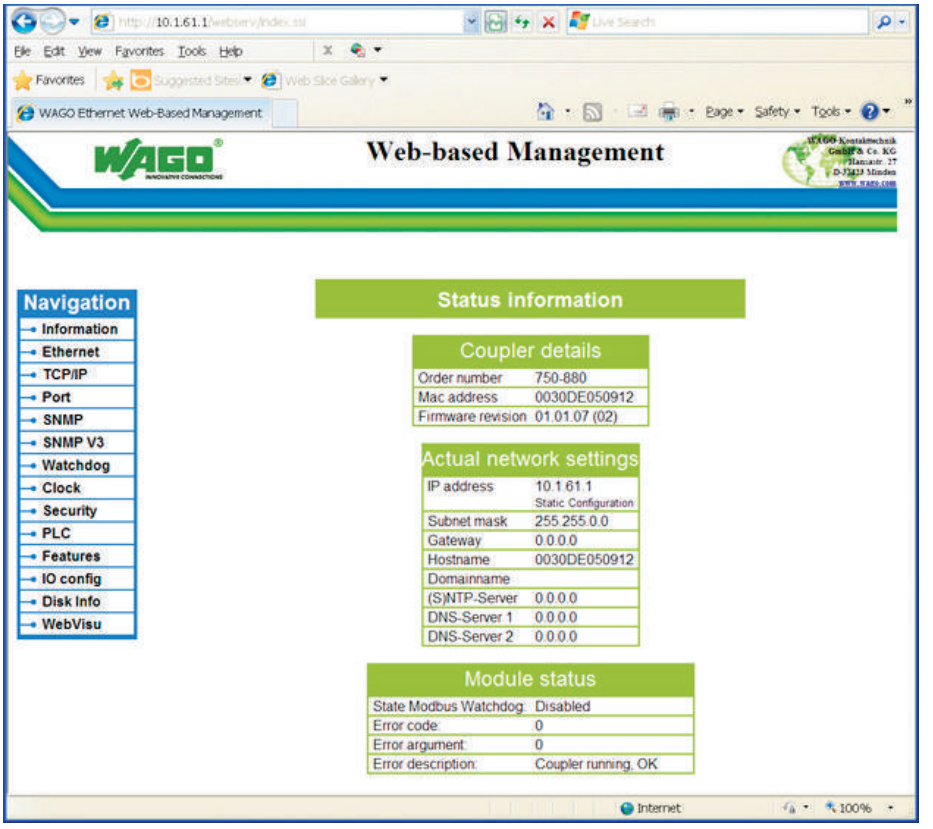
Backing up the program and settings:

1 **Turn power to the FLX control on.** The FLX must be powered during this procedure.

2 **Connect an Ethernet cable from a PC to the 750-880 PLC and insert a SD card in the slot in the 750-880.** The label on the SD card should face the Ethernet ports. If connecting directly between the PC and PLC, a crossover cable must be used.

3 **Make sure that the PC's Ethernet port is on the same network as the PLC.** Example PC's IP address is 10.1.61.200 and PLC's IP address is 10.1.61.1 (default) using a 255.555.0.0 or 255.255.255.0 subnet mask.

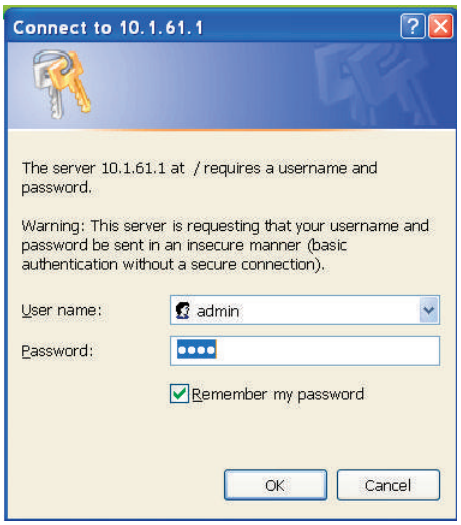
4 **Start Windows Internet Explorer and type the PLC's IP address in the address bar.** http://10.1.61.1 You should see the screen appear.



(Continued)

Alternate Procedure: FLX Program and Settings Backup to SD Card (Continued)

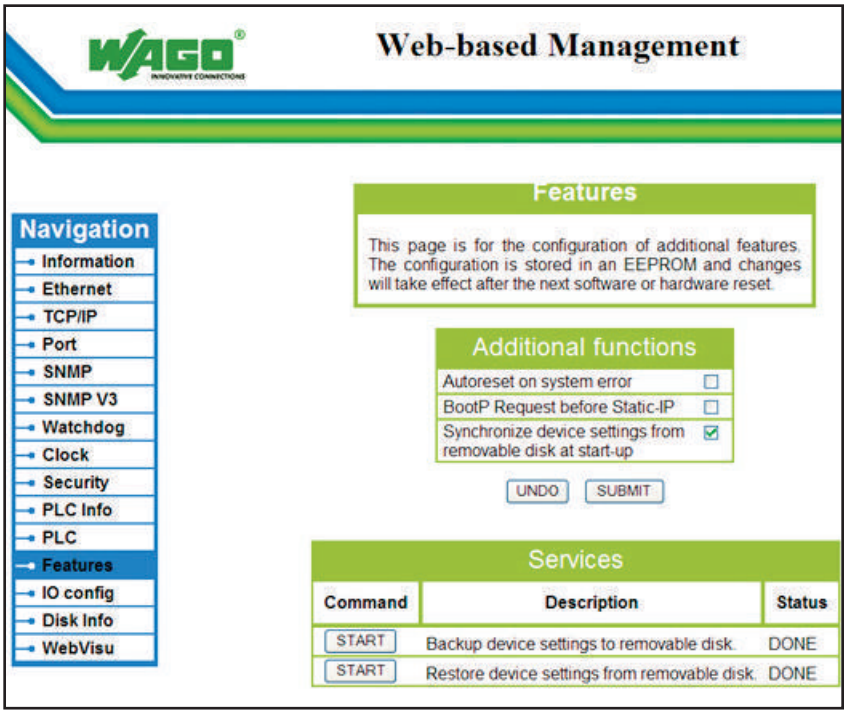
5 **Press the Features tab under navigation. A login window will appear.**



6 **Make sure the "Synchronize device settings. . ." box is checked.**

7 **Press Backup or Restore and watch the status bar until it reads DONE.** This may take several minutes.

8 **Remove the card and place it in a safe place or save the copy and settings folders to your backup drive.**



Remote Access Via Web Pages

In order to view the FLX system via web pages the following is required:

- FLX system includes Ethernet option.
- FLX network addresses have been configured to local area network.
- FLX system is connected to local area network.
- PC viewing FLX system has Internet Explorer.

1 Start Windows Internet Explorer.

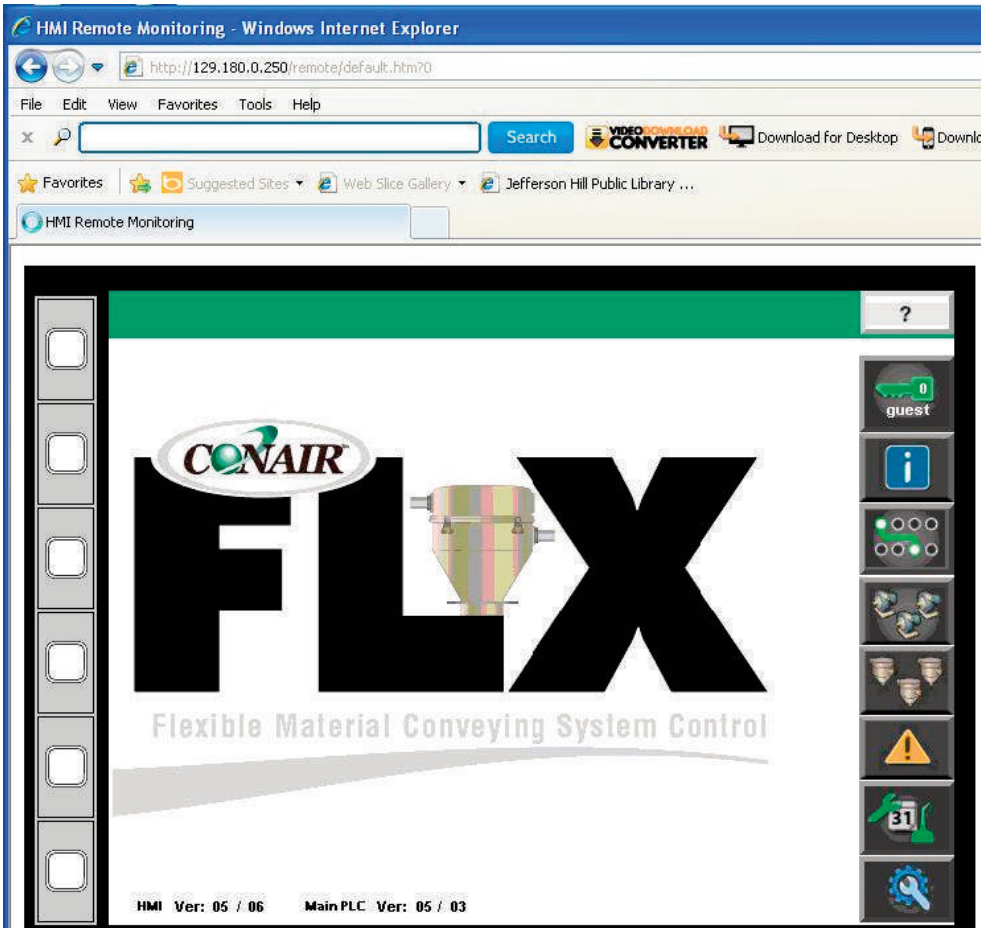
2 On the address line of Internet Explorer, type http://10.1.61.1

✎ **NOTE:** If IP address has been customized or multiple FLX systems are used, then enter that IP address in replacement of the 10.1.61.1

3 Enter the user name and password for your security level.

✎ **NOTE:** The default username is “conair” and the default password is “Web Access”. These settings can be changed by users with the appropriate security level. Users logged in as Supervisor will be able to view the current username and password for each user.

4 Select “Remote View”. You should now be connected. The screens will display just as if you were at the FLX-128 control.



SECTION
4

Operation

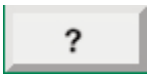
Navigating the FLX Control Panel

The Home screen

The Home screen appears on the touch screen upon energizing the FLX control panel. This screen presents the user with the product name and an illustration accompanied by the date, time, and software version along the bottom of the screen. Across the top is a green stripe. This stripe will contain the name of the page as you navigate through the FLX functions. Pressing the question mark in the top right corner on any screen where it appears will provide helpful information pertaining to that screen.

Navigation buttons for all FLX functions are located on the right side of the screen and will appear in this location on all screens. The selection of buttons will change based on the specific screen. From the Home page, the buttons include:

NOTE: Depending on which options you have ordered or have enabled, some buttons may not be visible on your FLX control.



A **Help Overview Button** for viewing help topics for the screen you are currently viewing. This screen is also where you can change the help language from English to Spanish.

A **Security Level and Login Button** displays your current security level on the button. Pressing the button allows you to login to a different security level, or to log out.

A **Help Navigation Button** shows a group of buttons with a brief description of each button function.

The MVP Button allows you to access the Conair Material Vision Proofing system.

(Continued)

Navigating the FLX Control Panel (continued)

A **Pump Network Button** allows the user to access the screens that control the pumps in your system.

The Device Select Button allows you to access your receivers and valves in your system. From these screens, you can control and adjust settings for all your devices attached to the FLX control.

The Alarms Button allows you to access the alarms screen. The alarm screen will show the current active alarms, give you the ability to acknowledge alarms, clear alarms and view alarm history.

The Maintenance Button allows you to access the maintenance screen of the FLX control. From this screen, the user can create save points, view card wire numbers, change the date and time, calibrate the screen, view network addresses and view data about the system.

The Setup Button allows you to access the setup screen of the FLX control. From the setup area, the user can make settings for pumps in the system (change pump types and name each pump), make settings for each device in the system (choose icons to accurately represent the devices in the system, name, configure and assign each device), change the names of each source, establish preventive maintenance time frames, setup the ratio system, and access the Advanced Setup page.

The Email Alarms Button allows you to access the email setup screen of the FLX control. This function is optional.

For more information about adding the email option or any other options to your FLX-128, contact Conair.

Conair's sales number is 724-584-5500.

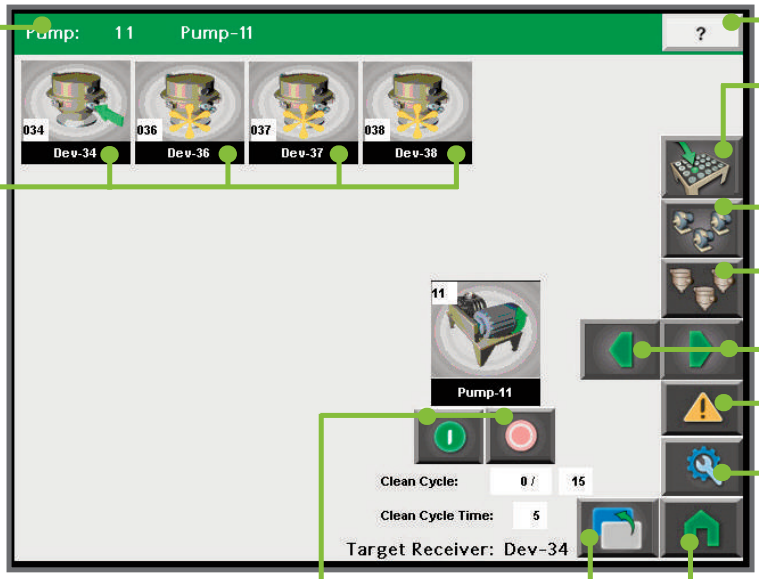
Conair's Instant Access
24/7 Parts and Service number is 800-458-1960.
Outside the U.S., dial 814-437-6861.

The FLX Control Panel

Below is a screen from the FLX while in operation. This screen is shown as a sample of functionality of a typical FLX screen. See the functional descriptions below. The following pages are helpful in understanding how to use the FLX Control.

Screen name
Indicates what screen you are currently looking at.

Individual devices or equipment
Displays the selectable individual pieces of equipment, with their current operating status. (demand, load, dump, etc.)



Help Overview button
Help for the current screen.

MVP Control button
Go to the MVP control screen.

Pump Network button
Go to the Pump Network screen.

Device Selection button
Go to the Device Selection screen.

Previous/Next buttons
Go to the previous or next screen.

Alarms button
Go to the Alarms area.

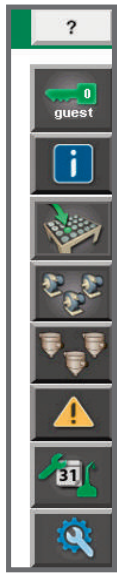
Setup button
Go to the Setup screen.

Start and Stop
Use these buttons to turn the pump (or other device) on or off.

Back/Previous Page button
Goes back to the previous page you were on.

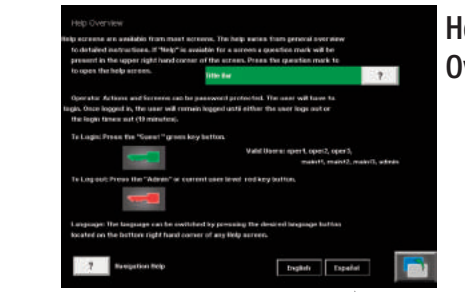
Home Button
Go to the Home screen.

NOTE: Depending upon which options were ordered or are enabled, different icons may appear in as available or unavailable.



Control Function Flow Charts

From the Home screen



Help Overview

Security Manager

Help Navigation

Home

Future addition

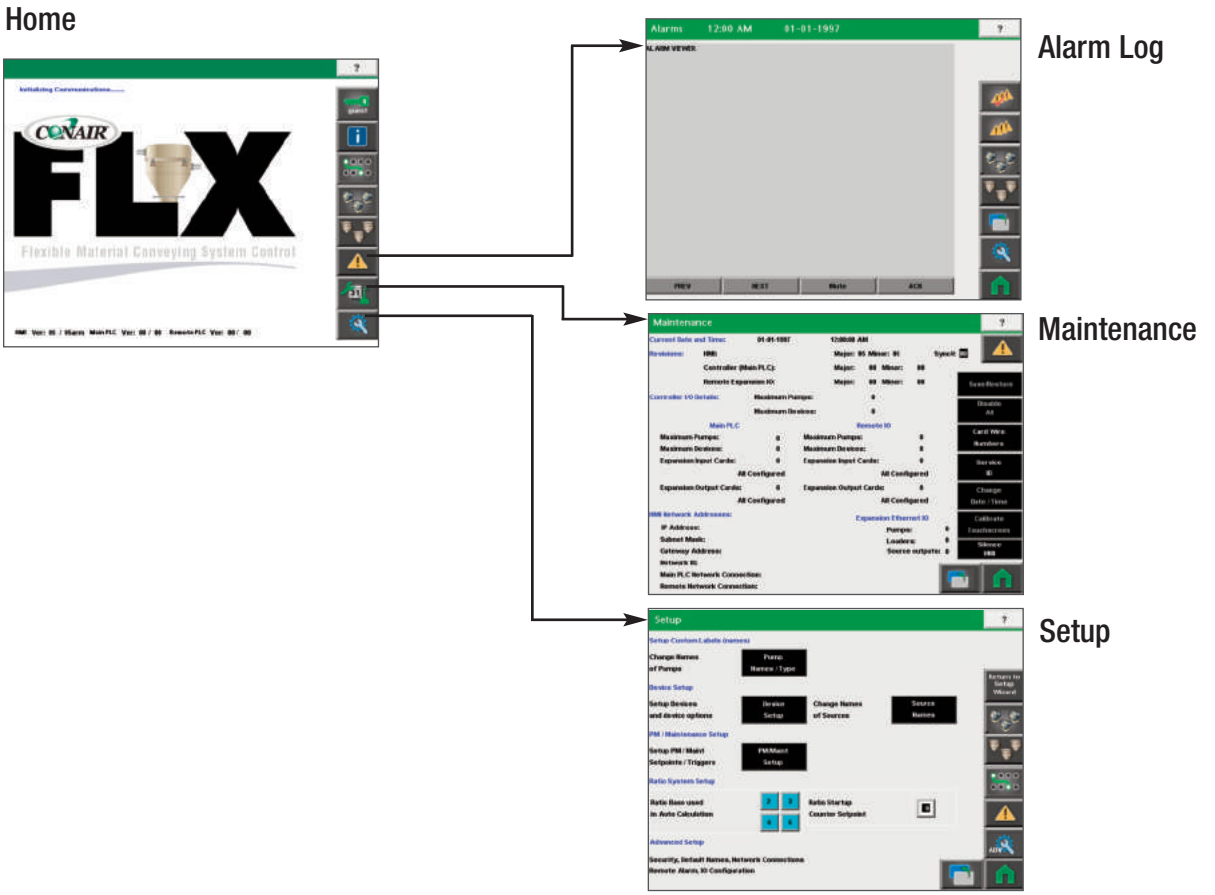
Pump Network

Devices Select

(Continued)

Control Function Flow Charts

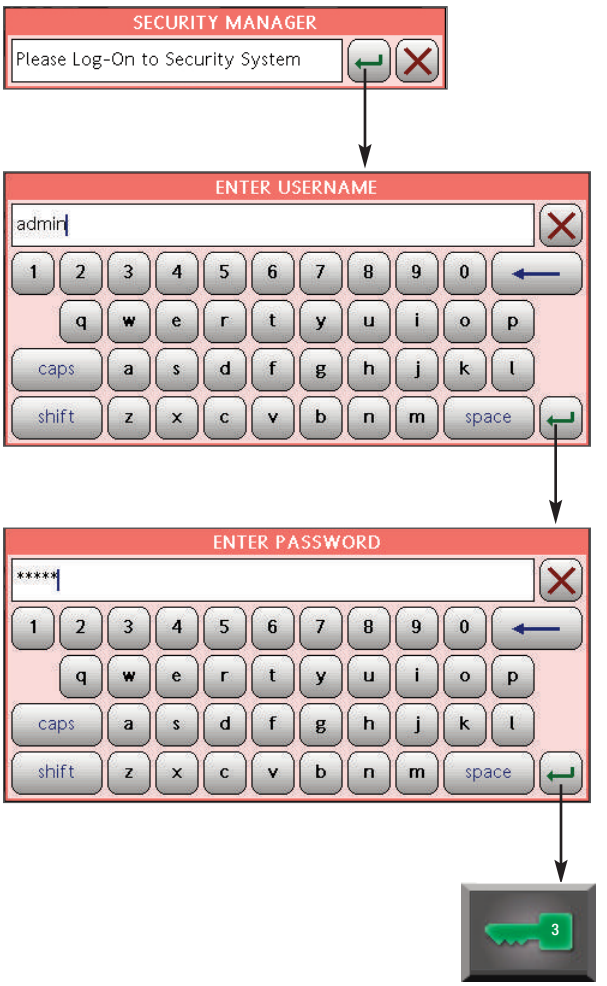
From the Home screen (continued)



Control Function Flow Charts

From the Security Manager screen (login)

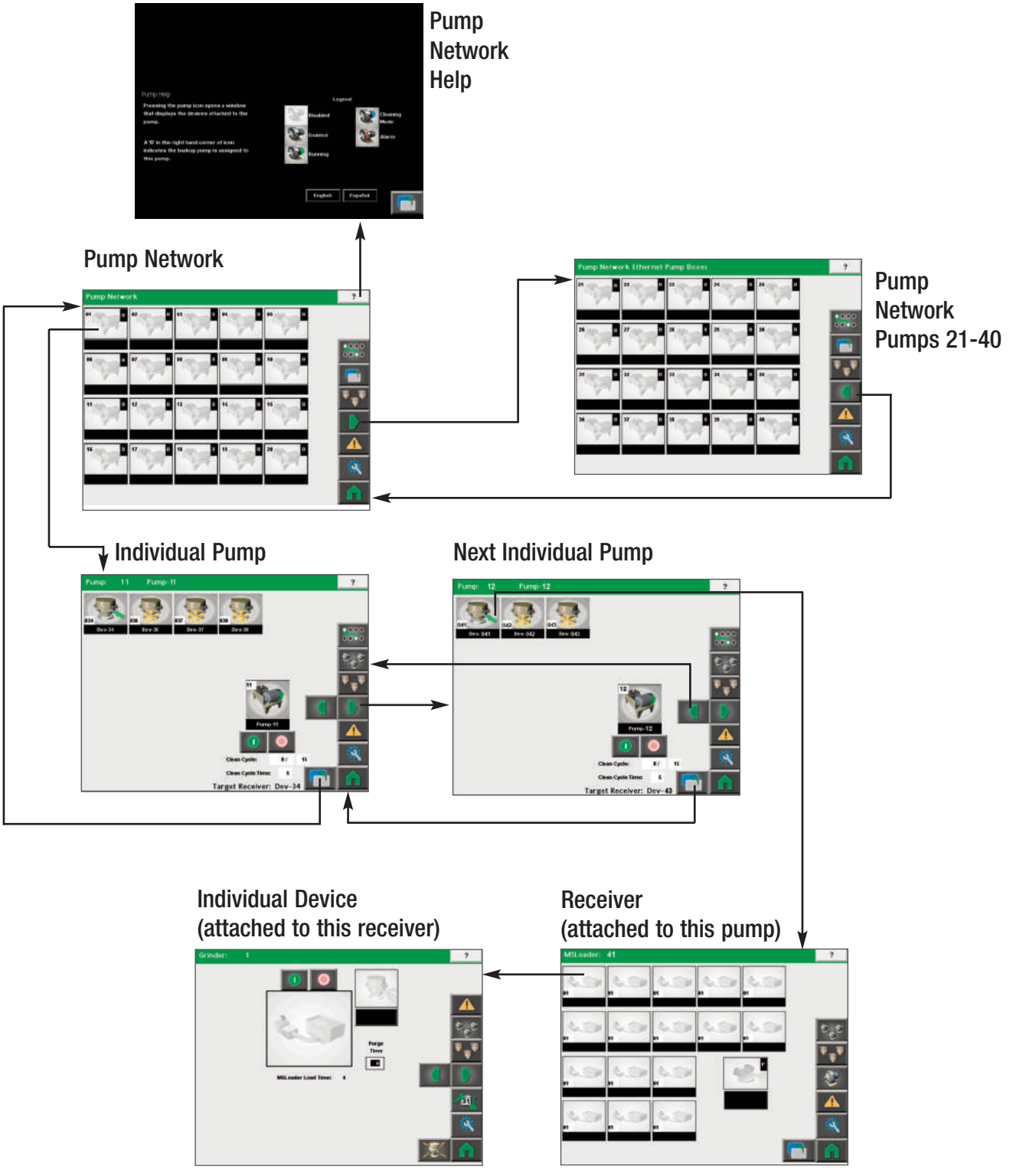
Security Manager



(Continued)

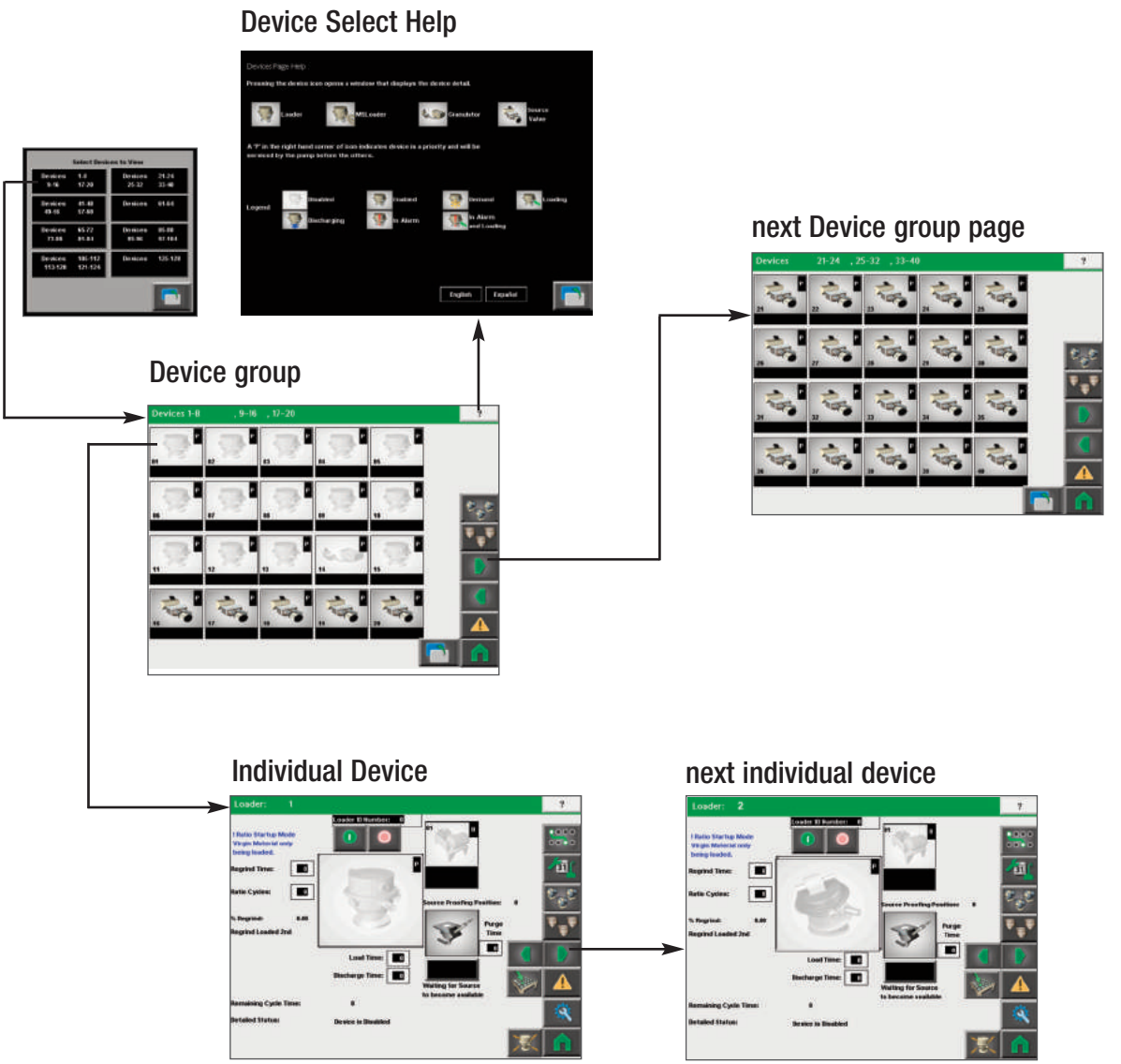
Control Function Flow Charts

From the Pump Network screen



Control Function Flow Charts

From the Device Select screen



(Continued)

Control Function Flow Charts

From the Alarms screen

Home

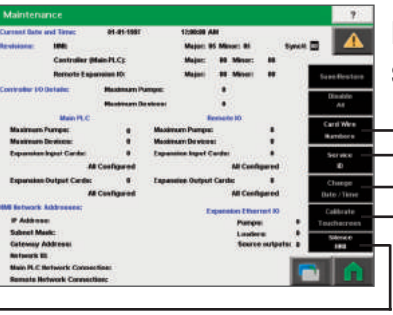
Alarm Log

Clearing alarms

Control Function Flow Charts

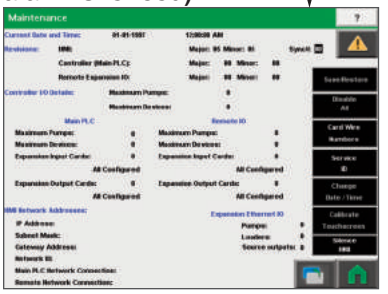
From the Maintenance screen

Home

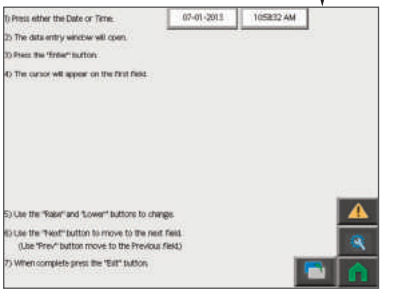


Maintenance screen

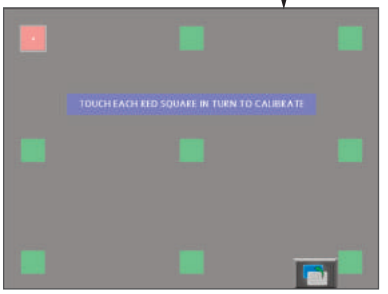
Silence HMI (internal alarm silenced)



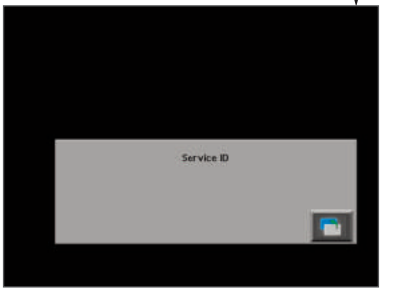
Change Date / Time

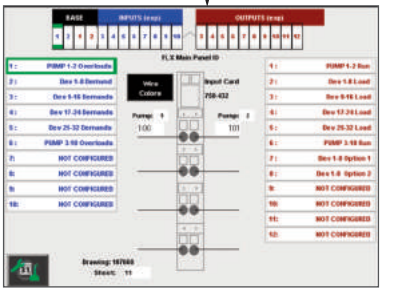


Touch screen calibrate



Service ID screen

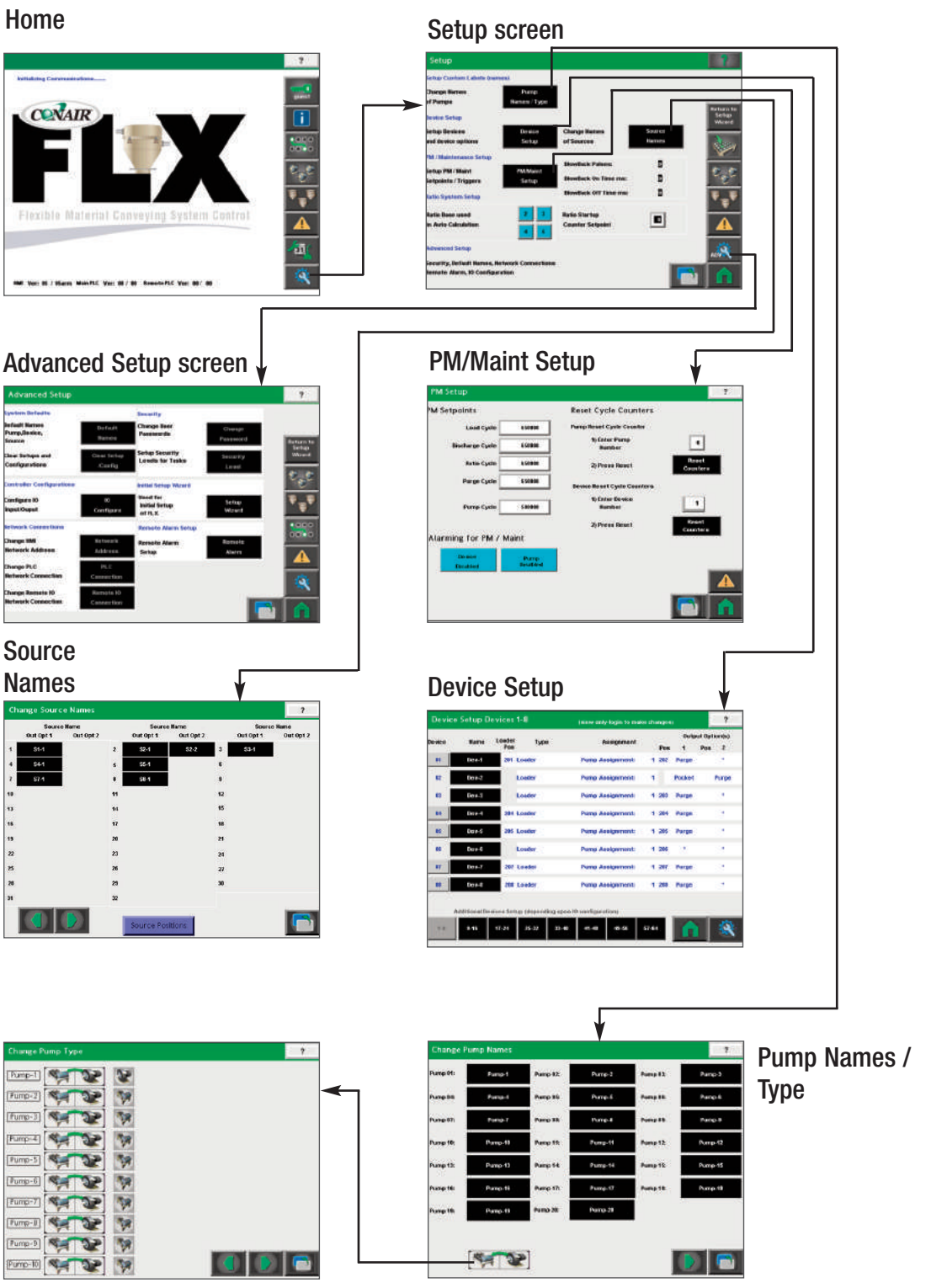




Cable / Wire numbers screen

Control Function Flow Charts

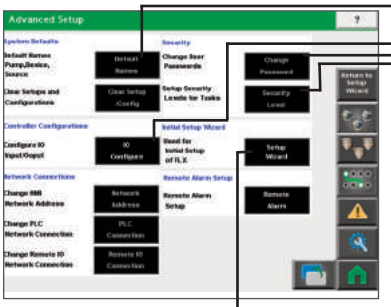
From the Setup screen



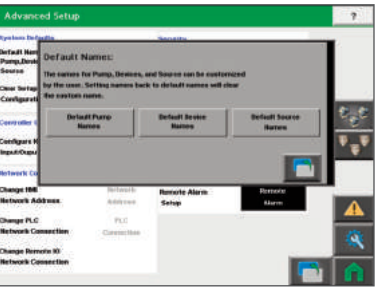
Control Function Flow Charts

From the Advanced Setup screen

Advanced Setup screen

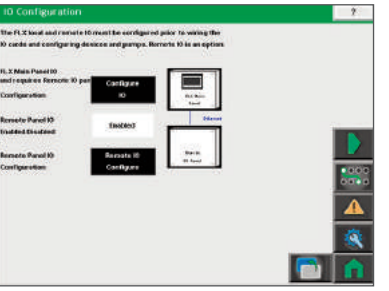


Default Names

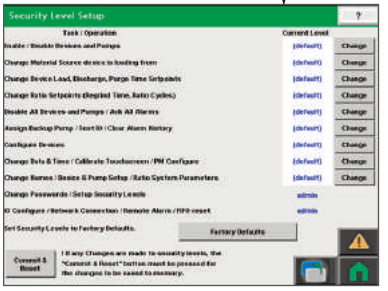


Setup Wizard

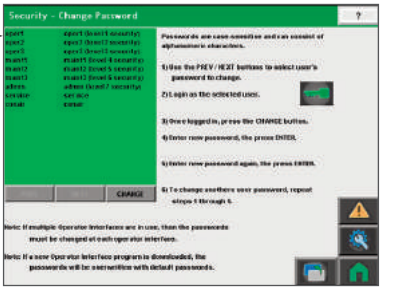
I/O Configuration



Security Level



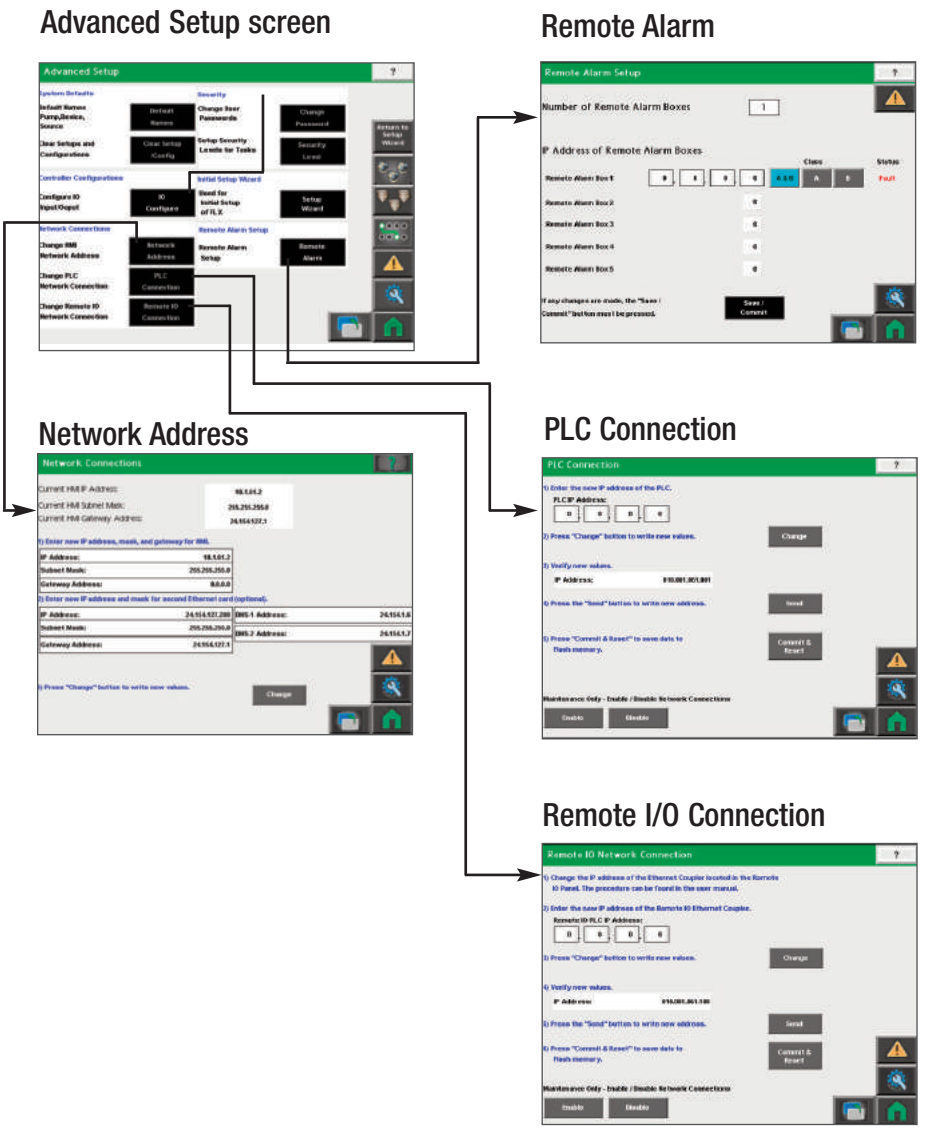
Change Password



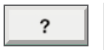
(Continued)

Control Function Flow Charts

From the Advanced Setup screen (continued)

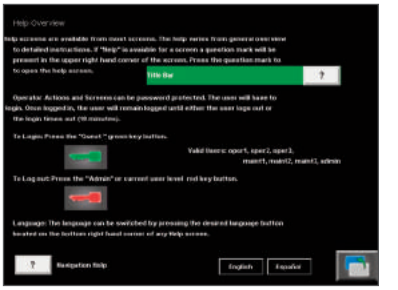


Help



Help screens

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 button will be present in the upper right corner on the green title bar. Press this button to access the help information.



Languages

Available languages

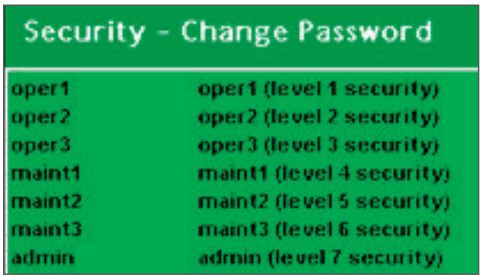
The current available FLX Control languages are English and Spanish. By default, screens are displayed in English. The language can be switched on any Help screen. Buttons are provided to select either English or Spanish.

Security

Security levels

Operator actions and screens can be password protected. There are seven levels of programmable password protection. Operator and maintenance security levels can be customized.

User names and default passwords



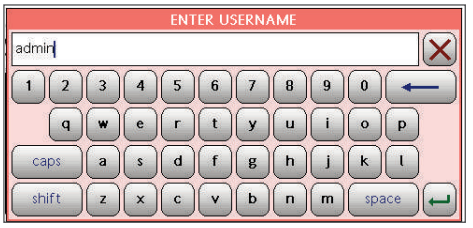
✎ **NOTE:** "default" has no security level and has no password.

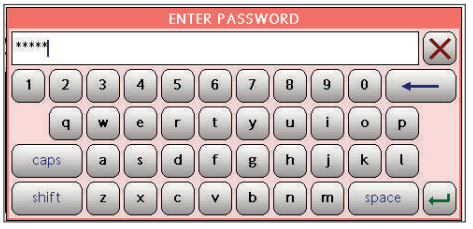
Task/Operation	Default Security Level
Enable / Disable Devices and Pumps	oper1
Change Material Source device is loading from	oper2
Change Device Load, Discharge, Purge Time Setpoints	oper3
Change Ratio Setpoints (Regrind Time, Ratio Cycles)	oper3
Disable All Devices and Pumps / Ack All Alarms	maint1
Assign Backup Pump / Test I/O / Clear Alarm History	maint2
Configure Devices	maint2
Change Date & Time / Calibrate Touchscreen / PM Configure	maint2
Change Names / Device & Pump Setup / Ratio System	maint3
Change Passwords / Setup Security Levels	admin (not configurable)
I/O Config / Network Connection / Remote Alarm / FIFO reset	admin (not configurable)

Login / Logout

To Log in

The user will have to log in for operator actions or screens which require security. Once logged in, the user will remain logged in until either the user logs out or the login times out (10 minutes). To log in:





1. **Apply power to the machine.** Allow the control to power up.
2. **Press the Security Level / Login Button.**
3. **Enter the username for your user level.** *See the Operation section entitled Security for more information.*
4. **Enter the password for your user level.**

Once you have successfully logged in, your security level will be displayed as a number in the Security Level / Login Button.

To Log out

Once you are done changing settings, or if you are moving away from the FLX control, you may want to log out so that changes to settings can not be made by others. To log out:

1. **Press the Security Level / Login Button.**
2. **Leave the Username blank and press enter.**
3. **Leave the Password blank and press enter.** The user level will return to "default" or zero.

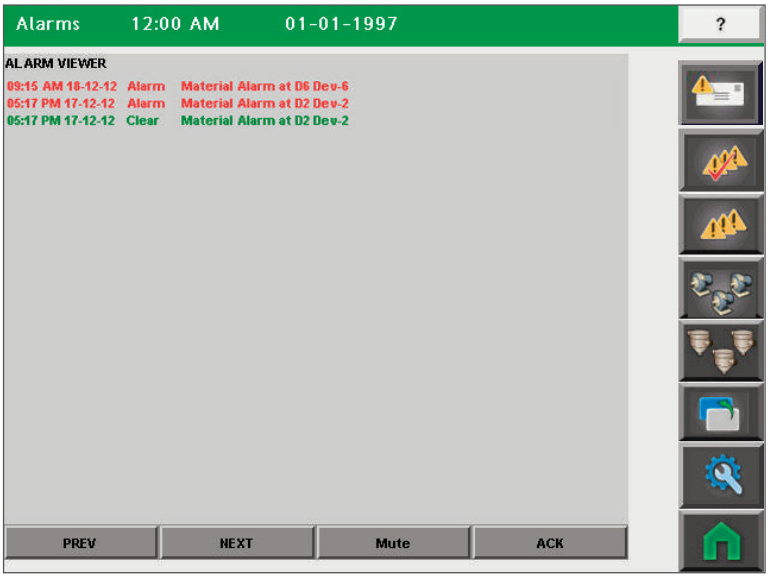
NOTE: After a period of inactivity, the FLX control will log out the user and return to security level 0 automatically. If changes need to be made to settings, it will be necessary to complete the Login procedure again.

Alarms

Alarm Summary

When an alarm occurs, an audible sound will be triggered and the operator interface will display a flashing alarm message.

To view an alarm from any operator screen, press the Alarm button.



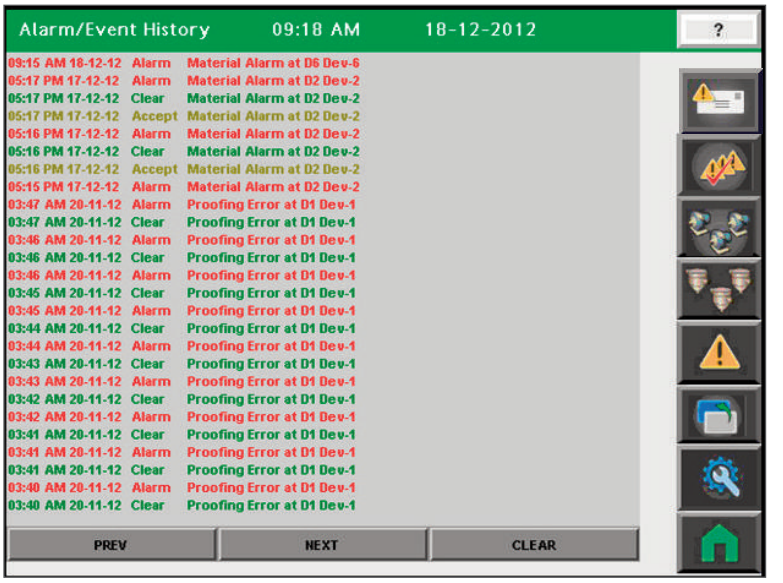
The following buttons are available from the Alarms log screen:

PREV (previous) - The previous button is used to select the previous alarm when multiple alarms are displayed.

NEXT - The next button is used to select the next alarm when multiple alarms are displayed.

Mute - The must button is used to mute the alarm that is currently selected.

ACK (acknowledge) - The acknowledge button is used to acknowledge the highlighted alarm. The audible alarm will be silenced. The alarm indication will continue to flash and be visible until the alarm condition is resolved.



Acknowledge All - The acknowledge all button is used to acknowledge all the alarms on the list.

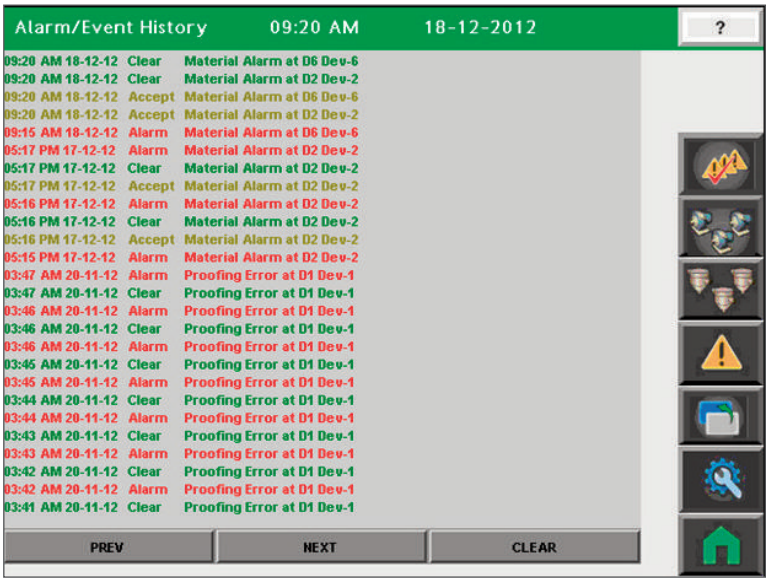
Alarm History - The alarm history button is used to view all alarms in the history. From the alarm history page, individual, or all alarms can be cleared from the history by pressing the CLEAR button.

(Continued)

Alarms (continued)

Alarm Legend

The alarm text will appear on the Alarm screen, and the Alarm History screen as colored text.



Cleared alarm

Cleared alarms are represented on the screen by green text. This alarm condition has been remedied and this alarm remains only in the history until it is cleared from the history.

Active alarm

Active alarms are represented on the screen by red text. These alarms are still active, and have not yet been acknowledged. These alarms will remain red until they are acknowledged.

Acknowledged Active alarm

Acknowledged Active alarms are represented on the screen by yellow text. Acknowledged alarms are active alarms that have been acknowledged by a user, but the alarm condition has not be remedied.

Typical navigation

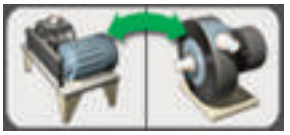
The FLX-128 system supports up to 40 pumps (plus two back-up), which can service up to 128 devices (based on I/O configuration). The FLX system provides multiple ways to navigate through the system, via pump navigation, or device navigation.

Icon Descriptions

Icons are used to symbolize the different types of devices and the actual state of their operation.

Pump Icons

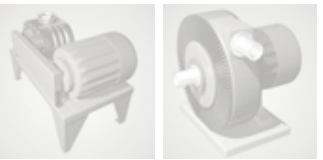
A choice of two icons may be selected for pump representation to align the icon to the actual type of pump being employed, by pressing this button on the pump set-up screen:



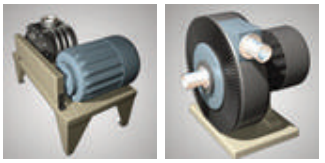
The two types are positive displacement (left) and regenerative (right). Using the correct pump icon makes recognition of the actual pump easier for operators.

Pump Icon Function Description

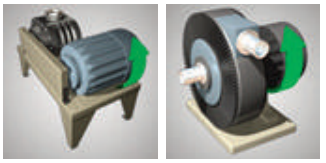
Faded: The pump is disabled. No vacuum can be provided to any of the attached receivers.



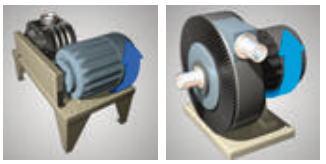
Full Color (with no symbols): The pump is enabled and ready to provide vacuum to any of the attached receivers when there is a demand.



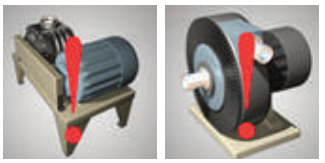
Green Arrow symbol: The pump is running and providing vacuum to one of the attached receivers. Material is being conveyed.



Blue Arrow Symbol: Pump is running in idle mode, with no load against it. The idle mode valve is open, removing vacuum from the dust collector and the rest of the system. This allows the dust collector to empty. This portion of the cycle also helps to cool the pump.



Red Alarm Exclamation Point: The pump has shut down and is experiencing a fault condition. The pump will not provide vacuum to any of its attached receivers until the fault is cleared.



Orange Arrow symbol: The pump is utilizing the idle mode valve.

Receiver Icon

A choice of two icons may be selected for receiver representation to align the icon to the actual type of receiver being employed, by pressing this button on the receiver set-up screen:

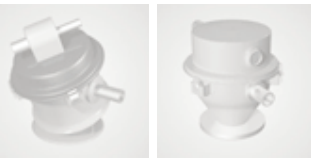
The two types are Access receiver (“tilted” model, left) and conventional receiver (upright model, right). Using the correct receiver icon makes recognition of the actual receiver easier for operators.

(Continued)

Icon Descriptions (continued)

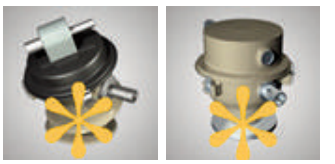
Receiver Icon Function Description

Faded: The receiver is disabled and will not be serviced by the pump.



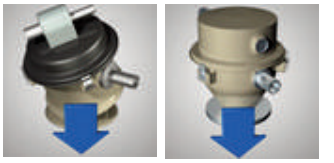
Full Color (with no symbols): The receiver is enabled, but not conveying material because there is no demand for material.

Yellow Asterisk: The receiver is demanding material, but the pump is currently providing vacuum for another receiver at this time, so it waits.



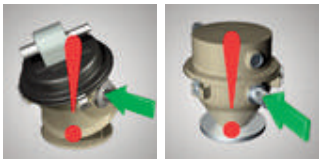
Green Arrow: The pump is providing vacuum to this receiver and it should be moving material .

Blue Arrow: The receiver has completed its load cycle and is now discharging the material from the receiver.



Red Alarm Exclamation Point: The receiver is in a fault condition and is not being serviced by pump.

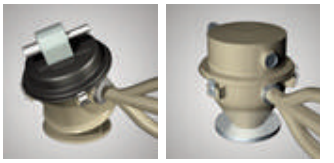
Red Alarm /Green Arrow: The receiver is in a fault condition but continues to receive vacuum from the pump.



Yellow and Orange Arrow with Pink Background: The receiver is utilizing the optional blow back setting.

Multi-Source Receiver Icon

A choice of two icons may be selected for receiver representation to align the icon to the actual type of receiver being employed, by pressing this button on the receiver set-up screen:



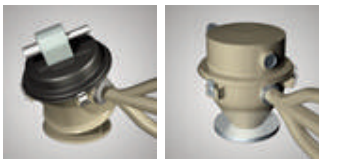
The two types are Access receiver (“tilted” model, left) and conventional receiver (upright model, right). Using the correct receiver icon makes recognition of the actual receiver easier for operators.

(Continued)

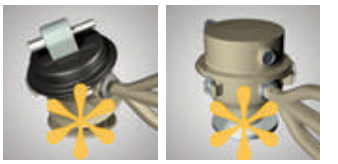
Icon Descriptions (continued)

Multi-Source Receiver Icon Function Description

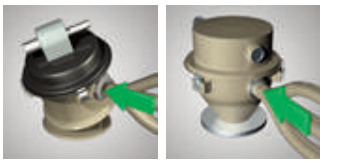
Faded: The multi-source receiver is disabled and will not be serviced by the pump.



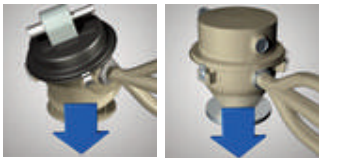
Full color (with no symbols): The multi-source receiver is enabled, but is not conveying material because there is no demand for it to convey material away from any of its multiple sources.



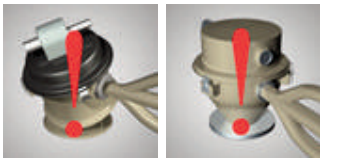
Yellow Asterisk: There is a demand from one or more of the multiple sources connected to this multi-source receiver. The receiver is calling for vacuum, but its assigned pump is servicing another receiver at this time.



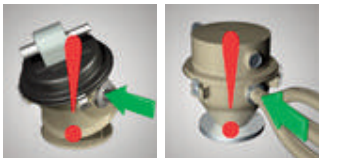
Green Arrow: The pump is currently servicing this multi-source receiver. Material should be conveying to the multi-source receiver from one of its multiple sources.



Blue Arrow: The multi-source receiver has completed its conveying cycle and is now discharging material from the receiver.



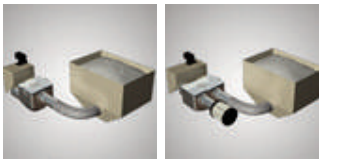
Red Alarm Exclamation Point: The multi-source receiver is in a fault condition and not being serviced by pump.



Red Alarm/Green Arrow: The multi-source receiver is in a fault condition but continues to receive vacuum from the pump.

Yellow and Orange Arrow with Pink Background: The receiver is utilizing the optional blow back setting.

Granulator/Off-loading Valve Icon



Granulator/Off-loading Valves are used to unload vessels; typically granulator drawers or granulator storage drums/bins, to keep them from overfilling. These valves are typically connected to a multi-source receiver that is often set up to sequentially off load multiple vessels. Two types of material valves may be used and the valve choice is assigned in set-up and can be:

Basic Material Line Valve (shown on left); This simple shut off valve is opened to off-load the bin it is connected to and then shuts again at the conclusion of its off-loading cycle.

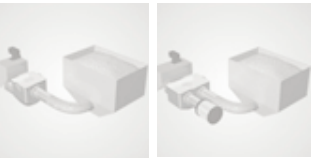
(Continued)

Icon Descriptions (continued)

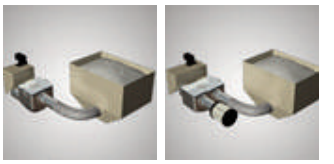
Purge Valve (shown on the right): This valve includes a second inlet, equipped with an air filter that also permits air purging of the conveying line, once material conveying is complete.

Granulator/Off-loading Valve Icon Function Description

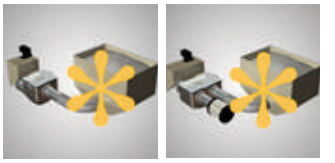
Faded: The Granulator/Off-loading Valve is disabled and will not allow material off-loading to the Receiver it is connected to.



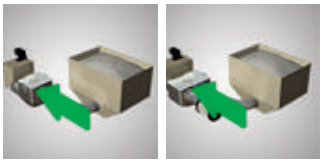
Full Color (with no symbols): The Granulator/Off-loading Valve is enabled but is not currently conveying material because there is no demand for it to move material.



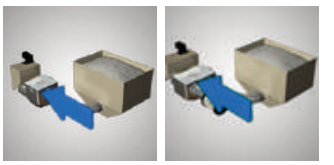
Yellow Asterisk: The demand signal for this Granulator/Off-loading Valve is calling for material to be off-loaded, but its Multi-source receiver or the pump providing vacuum are currently busy.



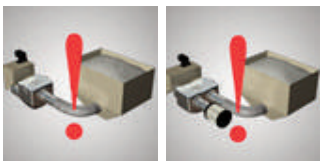
Green Arrow: Material is currently being conveyed through this valve to the receiver it is connected to.



Blue Arrow: The Granulator/Off-loading Valve has completed the loading portion of its cycle and is now purging the conveying line clean (purge valve style only).



Red Alarm Exclamation Point: The Granulator/Off-loading Valve is in a fault condition and is no longer conveying to its Multi-source Receiver.



Source Valve Icon

A choice of two icons/valves may be selected as source valves to align the icon to the actual type of source valve being employed, by pressing this button on the source valve set-up screen:

The two types operate differently so selection of the proper style of valve is important for proper signal processing and system operation. The two types are Purge Valves (shown on the left) and Pocket Valves (shown on the right).

(Continued)

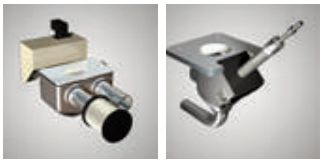
Icon Descriptions (continued)

Purge Valves (left) are typically installed on a material conveying line, wherever needed, and include two inlets on one end: One for incoming material and one for purging air. The purge valve uses the control system's purge signal to switch from material conveying to line purging.

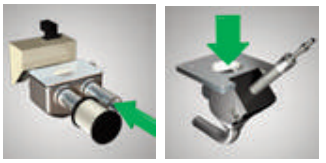
Pocket Valves are designed to be installed on the base of material bins; most often drying hoppers. Gravity causes material to flow into the top and purging air is connected to the side of the valve. In operation, an air/material mixture flows out of the bottom tube. The pocket valve uses the control system's signal to open its material valve for material flow at the beginning of the vacuum loading cycle. While vacuum continues to be applied to the system, the pocket valve's material valve is closed, allowing only purging air to flow through its conveying line.

Source Valve Icon Function Description

Faded: The Source Valve is disabled and will not work in conjunction with the material conveying system to move material and purge the conveying line.



Full color: The Source Valve is enabled, but is not conveying material because there is no demand for it to convey material away from any of its multiple sources.



Green Arrow: Vacuum is drawn upon the source valve and the valve position inside is permitting material to pass into the conveying air stream.

Blue Arrow: The vacuum pump continues to draw air through the source valve, but material flow has been halted by the internal valve. The conveying line is now being purged by the vacuum air (only).

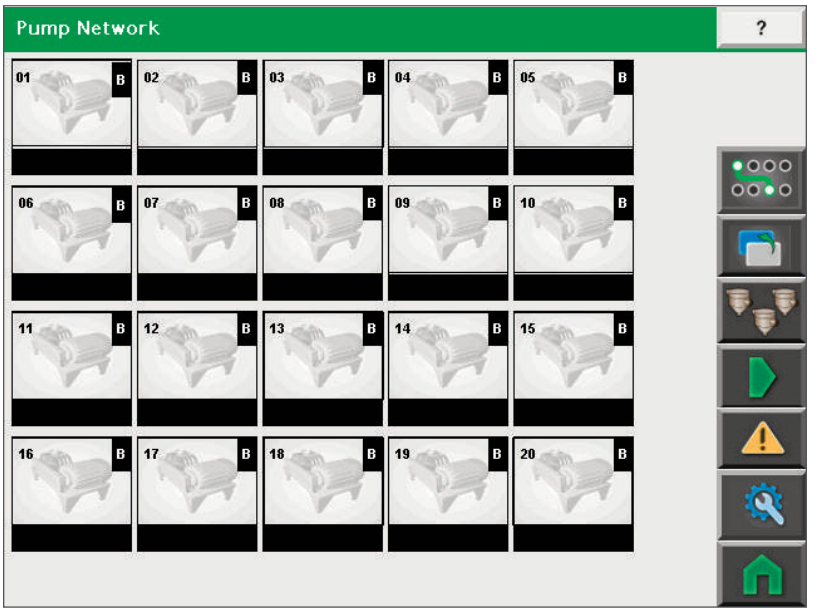
Ratio Receiver Icons

Receivers in the system may be configured to include ratio valves on their material inlets. In addition to typical vacuum conveying adjustments for these receivers, the user may also set regrind percentage and other parameters so that regrind can be loaded alternately with virgin materials.

The user may select type of receiver in the receiver set-up screen and the displayed icons will show all modes of operation, just like the standard receiver icon *(See earlier in Operation: Icon Descriptions).*

✎ **NOTE:** Virgin or regrind material type will be noted by text on the screen.

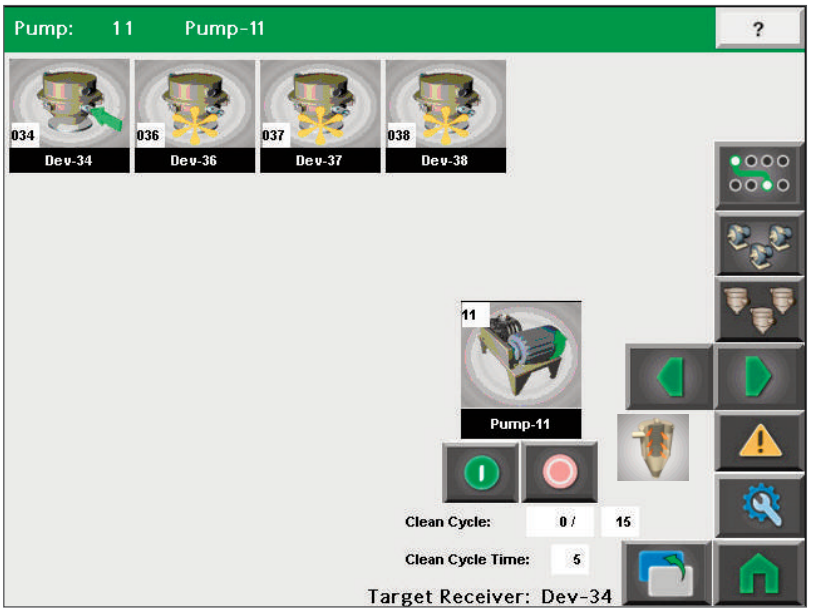
Pump Network Screen



On this screen, all the pumps will be shown. Each pump icon displays the pump number, name, and the status of the pump. The pump status can be determined by the color of the pump icon's background.

A "B" in the upper right hand corner of the Pump icon indicates the pump is using currently assigned to the backup pump.

Pump Screen



On this screen, all the devices including their number, name, and status being serviced by the pump are shown. The loader status icons display their current status. *(See Operation: Icon Descriptions for more information.)*

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

The Clean Cycle and Clean Cycle Time are configured from the Pump screen.
"Clean Cycle" is the number of individual load cycles the pump completes before the pump automatically stops temporarily to let the dust collector empty.
"Clean Cycle Time" is the number of seconds the pump temporarily stops at the end of a load cycle or when the Clean Cycle is triggered.

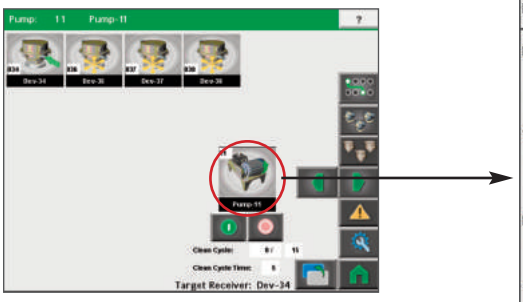
Pressing the Pump icon opens the Pump Detail window. The following is displayed:

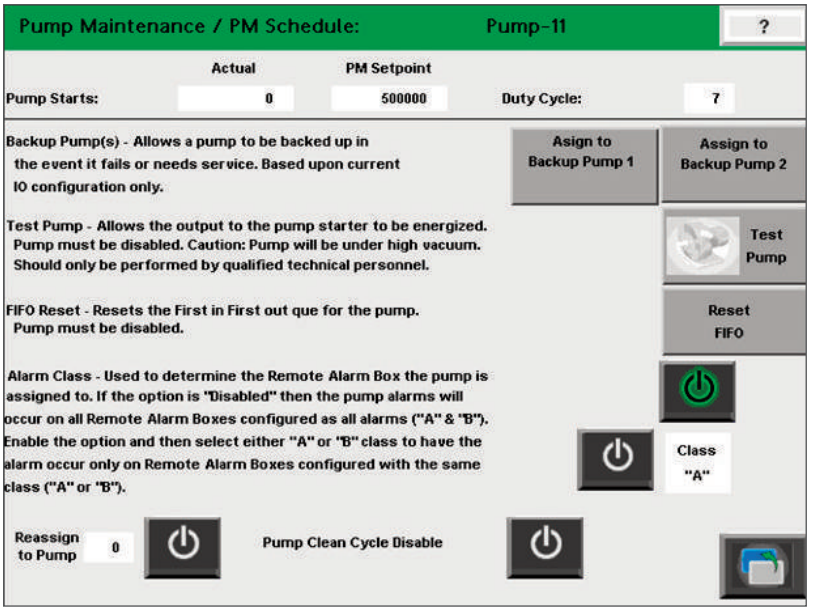
- Pump Starts – The number of times the pump is commanded to turn on.
- Duty Cycle - The percentage the pump is running while enabled.
- Pressing Left arrow scrolls to the previous pump and pressing the Right arrow scrolls to the next pump.
- If there are more than 16 loaders attached to the pump, press the Devices 17+ button to view more loaders attached to pump.

A "B" in the upper right hand corner of the Pump icon indicates the pump is currently assigned to the backup pump.

(Continued)

Pump Screen (continued)





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.
- PM Setpoint – The number of start times used as a setpoint for maintenance.
- Duty Cycle - The percentage the pump is running while enabled.

Assign a Backup Pump

This feature allows a pump to be backed up in the event it fails or needs service. One or two backup pumps are available based upon I/O configuration.

1 Disable the pump.

2 Press the pump icon from the Pump Screen to see the pump detail.

3 Press the Assign to Backup button for the pump you would like to use.

To remove the pump from the backup pump, repeat steps 1 and 2, then press the Unassign from Backup Pump button.

NOTE: The pump must be disabled, and the user must be logged in with the appropriate security level to access and change some settings.

Test Pump

This feature allows the output to the pump starter to be energized.

1 Disable the pump.

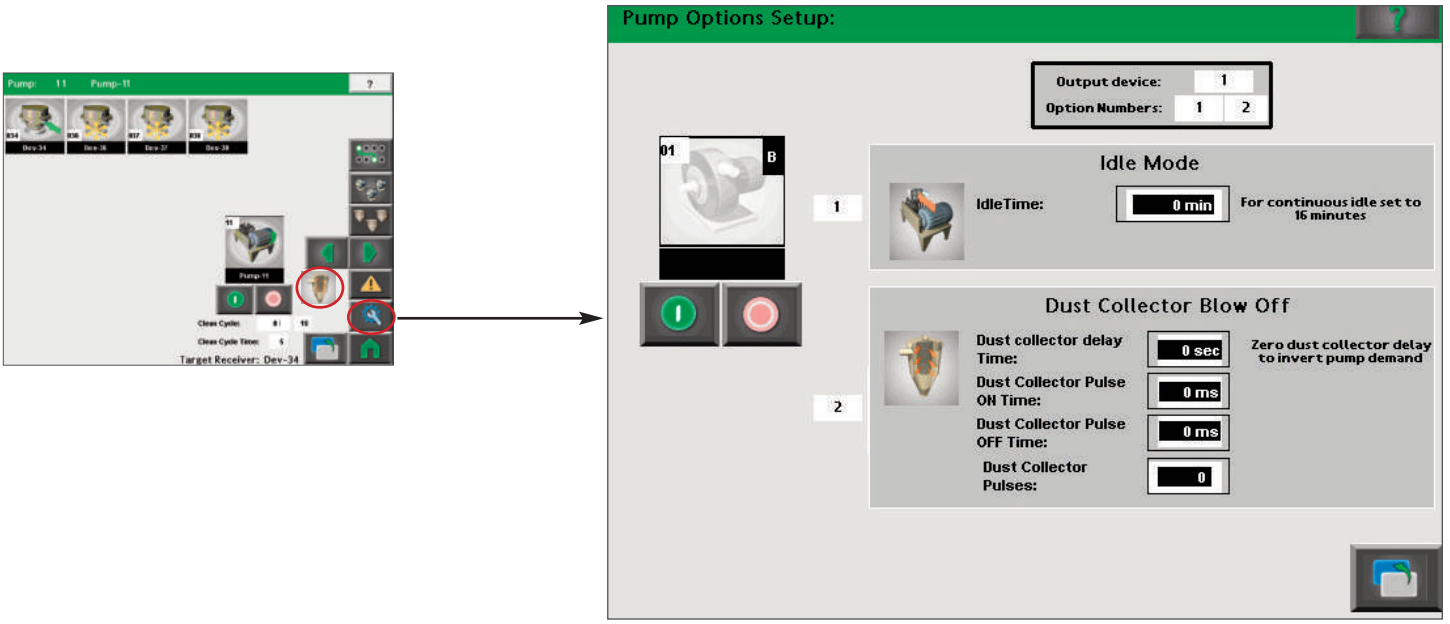
2 Press the pump icon from the Pump Screen to see the pump detail.

3 Press the Test Pump button. While the pump is being tested, the pump detail screen will remain open.

4 Once complete, press Test Pump again.

CAUTION: Pump will be under high vacuum when tested. The pump test should be performed by qualified technical personnel to prevent pump or system damage.

Pump Options Setup Screen (continued)



To view the Pump Options Setup screen:

1 From the Pump Network screen, press on the pump you would like to view.

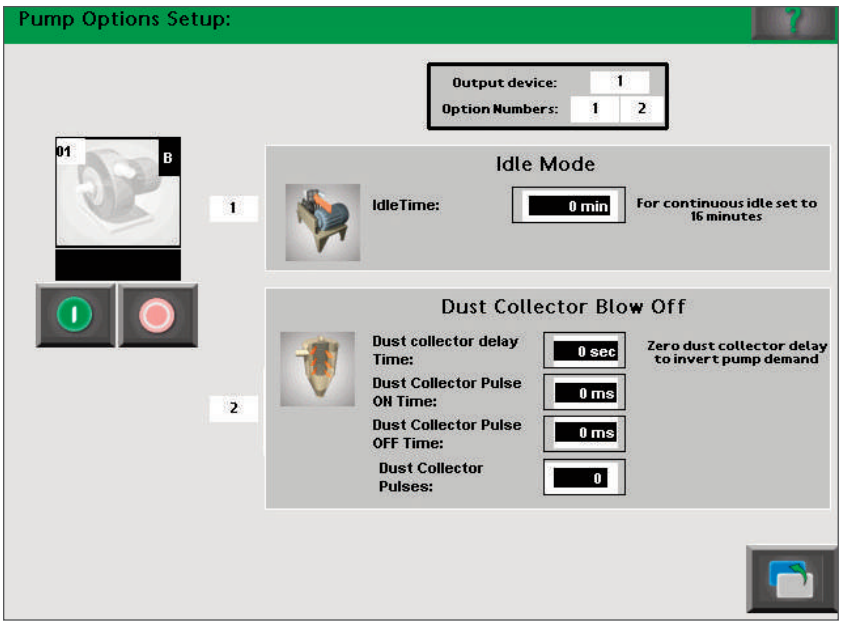
2 To adjust the options for that pump, press either the Setup button or the Dust Collector graphic.

The following may be visible depending on options you have enabled:

- Output device – The number the device.
- Option numbers – Depending on what options you have enabled, none, one, or a both of these could be highlighted.
- Idle Mode Idle Time - The amount of time for Idle Mode.
- Dust Collector Blow Off - The delay time setting for blow off.

(Continued)

Pump Options Setup Screen (continued)



Setting Idle Mode Time

This feature allows a pump to remain on during times of demand and idle, rather than shutting off and then turning back on when there is a demand. This amount of time is called the Idle Time. The Idle Time should be set for the number of minutes the pump should remain running without demand before shutting off. Setting the Idle Time for 16 minutes tells the control to run the pump continuously.

1 **Disable the pump.**

2 **Press the Idle Time data field.**

3 **Use the pop up number pad to enter the number of minutes you would like the pump to continue running with no demand. Press the Enter button to accept the setting.**

4 **Enable the pump.**

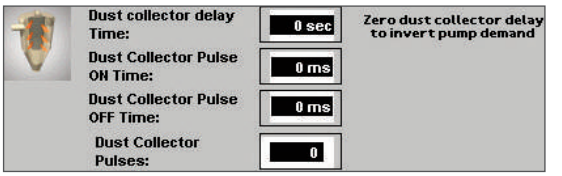
NOTE: The pump must be disabled, and the user must be logged in with the appropriate security level to access and change some settings.

Setting Dust Collector Blow Off

This feature allows the dust collector to "blow off" collected dust.

1 **Disable the pump.**

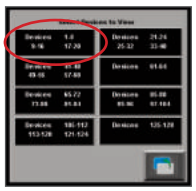
2 **Press the Dust Collector Delay Time data field.**



3 **Use the pop up number pad to enter the number of seconds you would like the Dust Collector to blow off. Press the Enter button to accept the setting.** You may also set the pulse on and off times and the number of pulses.

4 **Enable the pump.**

Devices Screen

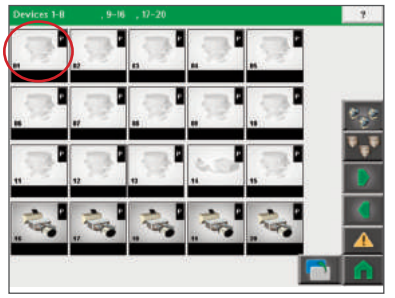


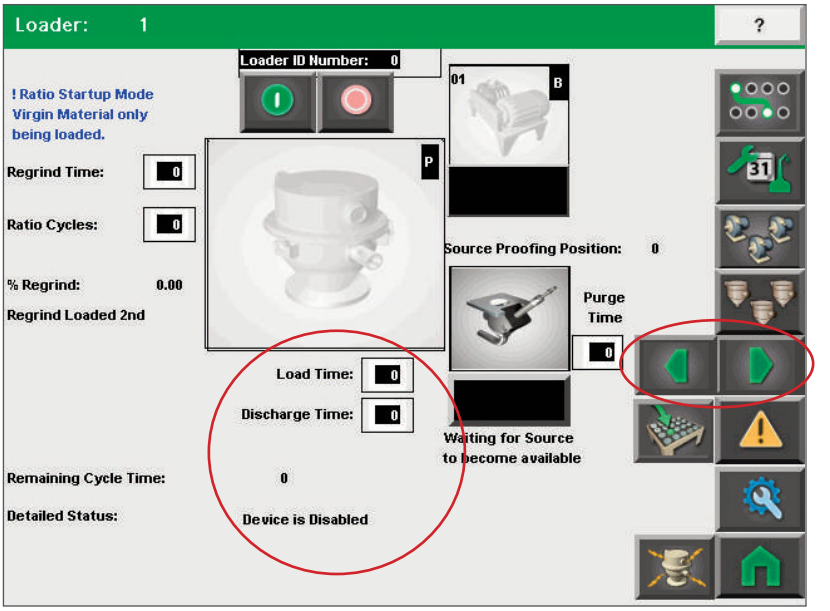
On this screen, all the devices including their number, name, and status are shown. The loader status icons display their current status. *(See Operation: Icon Descriptions for more information.)*

Pressing the device icon opens a window that displays the individual device detail.

A “P” in the upper right hand corner of the device icon indicates the device is a priority and will be serviced by the pump before the others.

Individual Device Screen





On this 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.

A "P" in the upper right hand corner of the device icon indicates the device is a priority and will be serviced by the pump before the others.

Overview of screen

- The Remaining Cycle Time is visible when the loader is currently being serviced. The time is the amount of time the device requires to be serviced.
- The Detailed Status displays a descriptive status of the current state of the loader.
- Pressing the Left arrow navigates to the previous loader and pressing the Right arrow navigates to the next loader.

Load Time

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

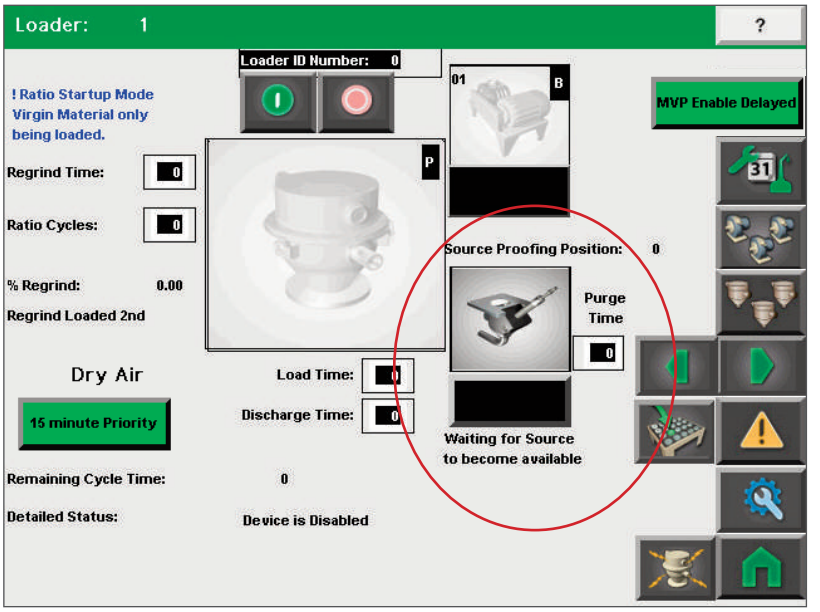
Discharge Time

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.

NOTE: If the screen was navigated from the Devices screen then the previous/next device would be the previous/next in sequential order. If the screen was navigated from the Pump screen, then the previous/next device would be the previous/next on that pump.

(continued)

Individual Device Screen (continued)



Purge Time and Source Selection

When Purge is configured, the Purge time and source selection will be visible.

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 OPEN for Material and CLOSED for Purge.
A pocket valve is CLOSED for Material and OPEN for Purge.

The Source currently selected is displayed under the valve. The valve icon's will visually display when purging is taking place. *(See Operation: Icon Descriptions)*

To change the Source (proper login required):

1 **Disable the loader.**

2 **Press either source the valve icon or the source valve name.** If no source has been selected, the source valve name will display unassigned.

3 The source selection screen will open. **View additional sources (if available) by pressing the Next arrow.**

4 **Select the new source.** The source selected will be highlighted.

5 **Press the Accept button to accept the change, or the Cancel button to disregard.** The screen will close and the new source will be displayed if a change was made.

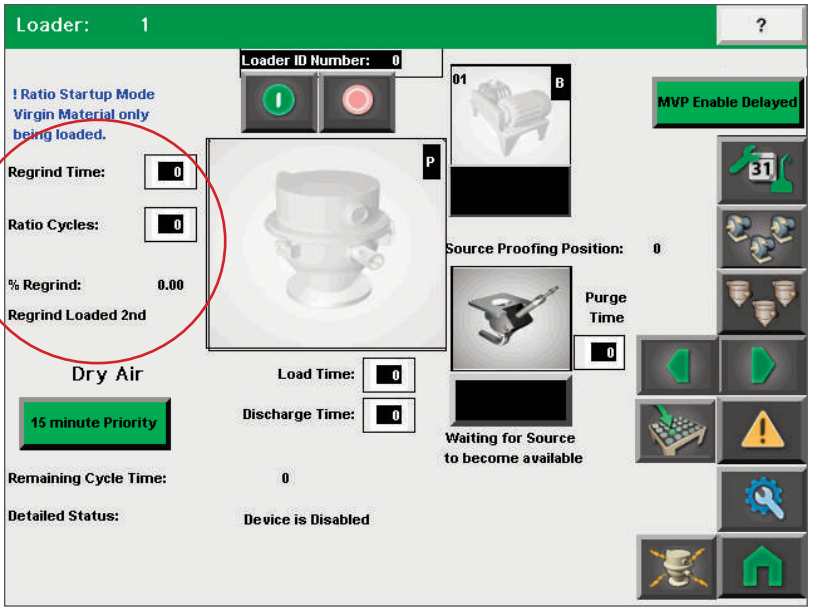
✎ **NOTE:** During operation, if the loader is to be serviced, but the source is being used by another loader, then the following message will be displayed, "Waiting for Source to become available". The next loader will be serviced.

✎ **NOTE:** Dry Air text indicates closed loop operation.

✎ **NOTE:** The type of valve the source is has been identified in the setup screen. The source screen displays purge valve or pocket valve icons. *(See Operation: Icon Descriptions).* This is for information purposes only. The FLX system will control the valve based upon its type.

(continued)

Individual Device Screen (continued)



Regrind Time

When Ratio is configured, the Regrind time and Ratio Cycles will be visible.

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

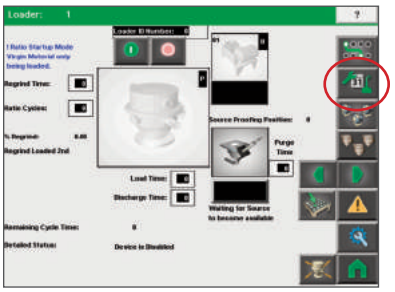
Ratio Cycles is the number of times (0-20) that a ratio valve switches between virgin and regrind material.

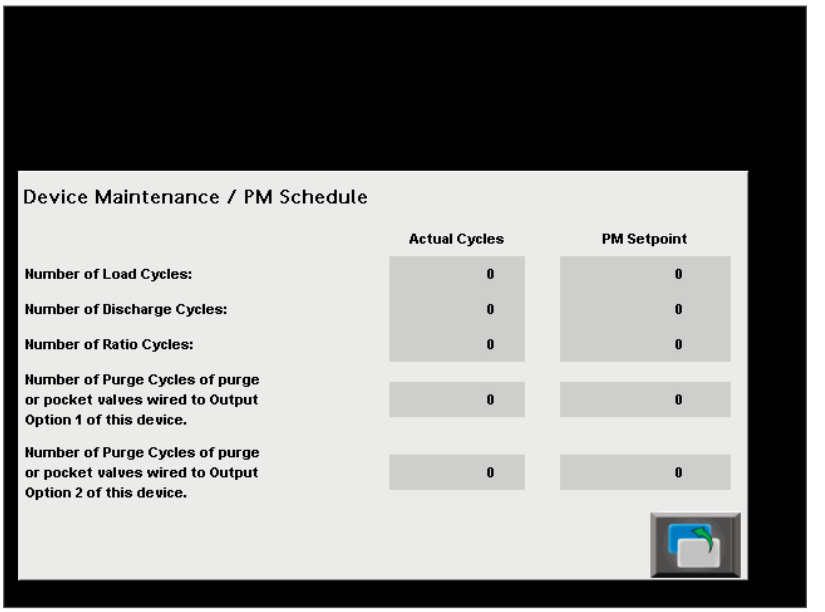
% Regrind is the percentage of regrind to use for each load cycle. Display only. Regrind Loaded 1st or Virgin loaded 1st is configurable from the Loader Configuration screen.

The FLX also provides a Ratio Start-up feature. This feature allows only virgin material to be loaded for a user defined number of load cycles. At the end of the cycles, regrind will be included in the load cycle. When in Ratio Start-up the following message will be displayed, “Ratio Startup Mode, Virgin Material Only being loaded”. The Ratio Startup is enabled in the loader configuration screen. The Ratio Start-up Count is configured in the Setup screen.

NOTE: The Ratio Cycles may be automatically calculated based upon a user defined Ratio Base. The auto calc is enabled in the Loader Configuration screen. The Ratio Base is configured in the Setup screen.

Loader Maintenance Screen



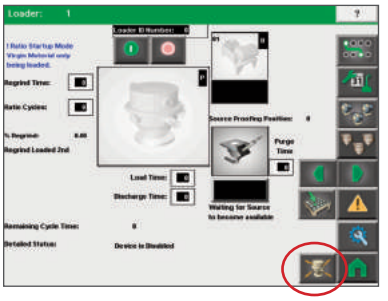


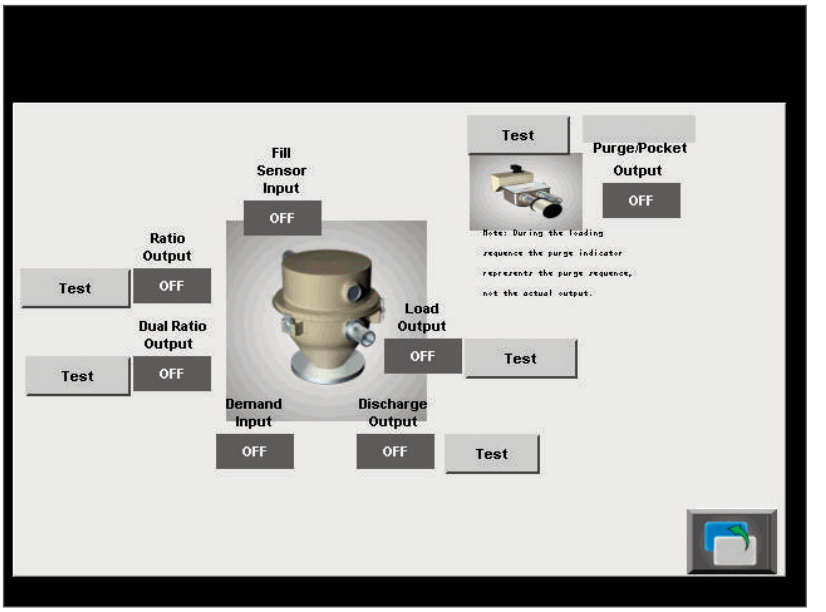
The Maintenance screen displays the current cycle counts of valves. The PM setpoint for each device is shown. The PM setpoint is configured from the PM/Maint Setup screen (accessed from the Setup screen).

- Number of Load Cycles
- Number of Discharge Cycles
- Number of Ratio Cycles
- Number of Purge Cycles on Output Option 1
- Number of Purge Cycles on Output Option 2

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

Test I/O Screen



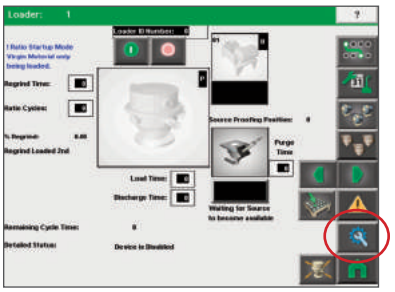


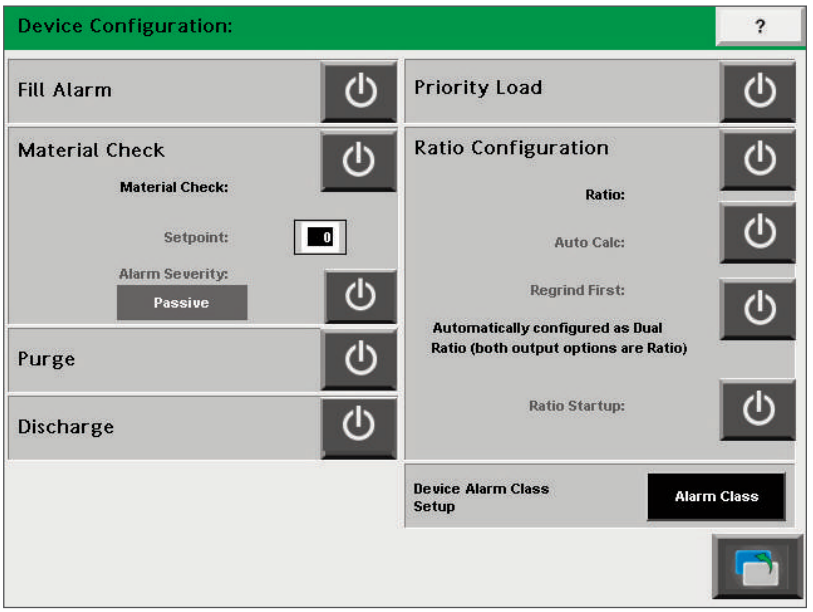
A screen to test the I/O is accessible by pressing the Device Detail button. The loader must be disabled and proper login is required to test I/O.

I/O available to test depends upon I/O configuration and loader configuration. Press the Test button of the output to test. The FLX system will energize the output.

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

Device Configuration Screen





Each loader/receiver is configured individually. Proper login is required.

From the loader screen press the Setup button.

Depending upon I/O configurations, some loader configurations may not be available.

Fill Alarm
Activates a fill alarm if the demand is not satisfied or hopper does not fill before the load time is reached. This option requires an option fill sensor in the receiver. This is a passive alarm; the pump will continue to service the loader.

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 (setpoint). The Alarm can be configured as passive (the pump will continue to service the loader) or active (the loader is automatically disabled and requires an acknowledgement before enabling again).

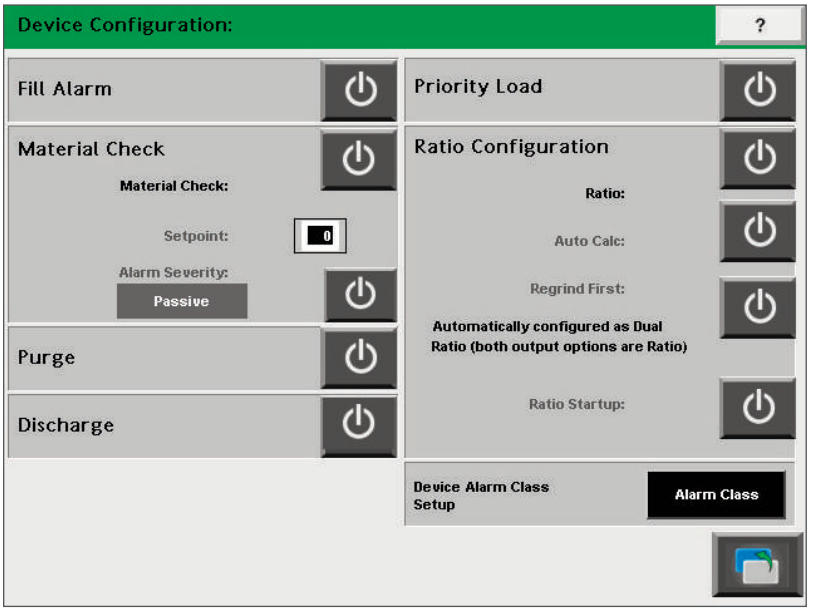
Purge
Purge material from the conveying line at the end of the loading cycle. This function requires the installation of a valve at the base of the drying hopper or vessel and I/O output options required.

Discharge
Enable the discharge output during the discharge cycle. This function requires the installation of a positive discharge valve at the base of the drying hopper or vessel and I/O output options are required.

Priority Load
The loader will be loaded before other loaders.

(continued)

Device Configuration Screen (continued)



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.

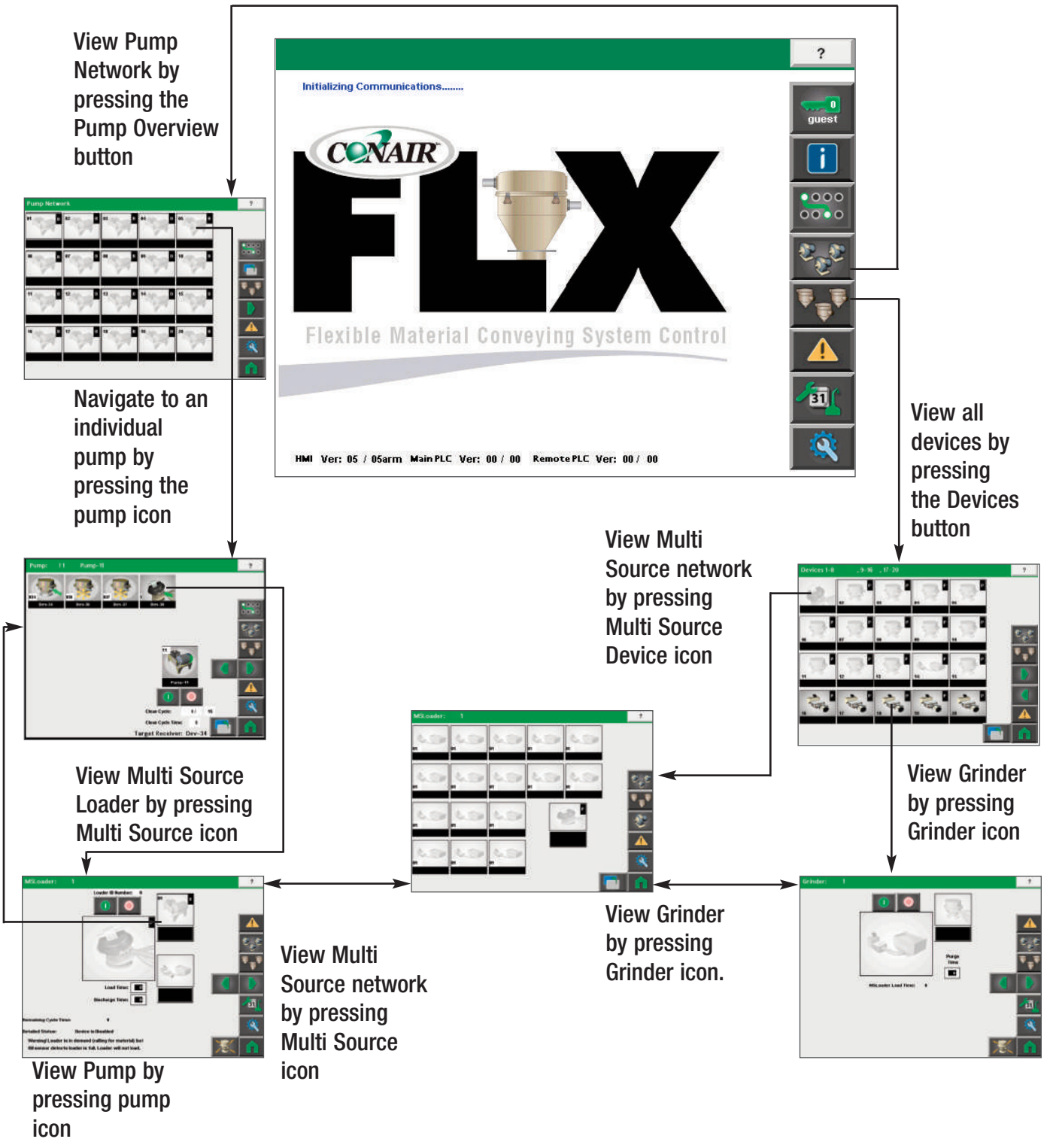
- Auto Calc - The Ratio Cycles may be automatically calculated based upon a user defined Ratio Base. The Ratio Base is configured in the Setup screen.
- Regrind First – If enabled, regrind will be loaded first then the virgin material. If disabled, virgin will be loaded first then regrind.
- Ratio Startup - This feature allows only virgin material to be loaded for a user defined number of load cycles. At the end of the user defined cycles, regrind will be included in the load cycle. The Ratio Start-up Count is configured in the Setup screen.

NOTE: If both output options in the Device Setup are configured for ratio, then the FLX system will treat the ratio as a dual solenoid ratio valve.

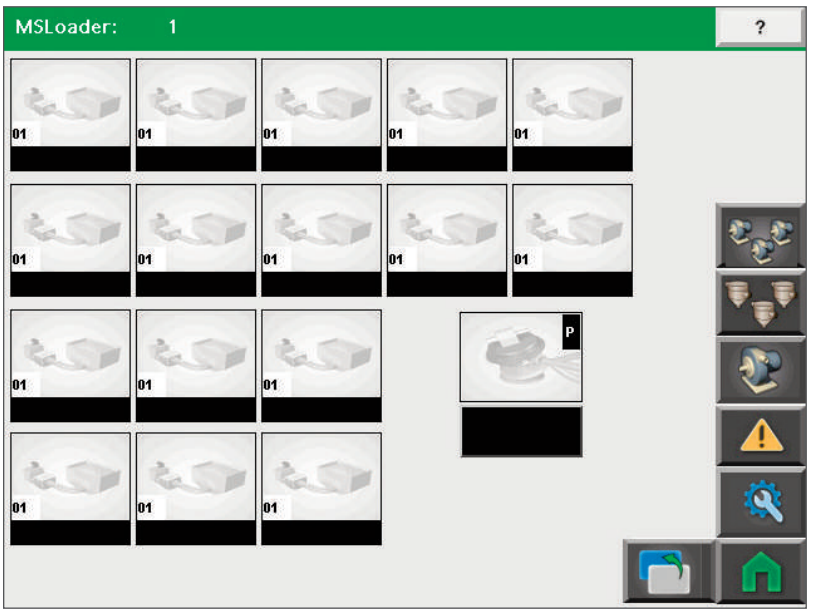
Device Alarm Class Setup

This feature is used in conjunction with Remote Alarm boxes to trigger user specified Remote Alarm box. Each Remote Alarm Box can be configured to alarm for all alarms, only class "A" alarms, or only class "B" alarms. The Device Alarm Class Setup screen is used to enable or disable the class alarm feature for the device and then set the class ("A" or "B"). Disable the alarm for the alarm to be triggered on all Remote Alarm Boxes configured as all alarms ("A" or "B").

Reverse Regrind/Regrind Recovery Navigation



Multi-Source Loader Network Screen



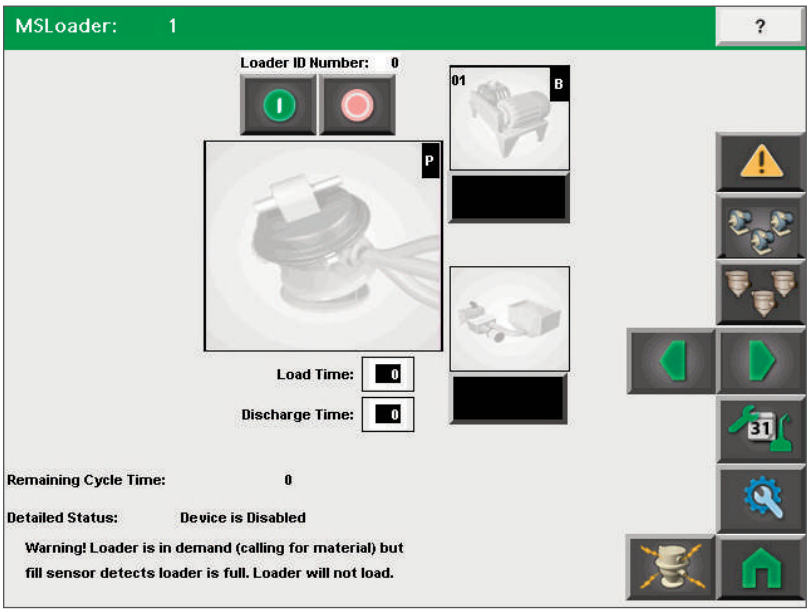
On this screen, the multi-source loader and attached granulators will be shown. Each icon displays the number, name, and the status of the granulator and multi-source loader. The icons display the current status of each piece of equipment. *(See Operation: Icon Descriptions)*

A “P” in the upper right hand corner of the device icon indicates the device is a priority and will be serviced by the pump before the others.

Pressing a granulator icon will open the granulator’s detail screen.

Pressing the Multi-Source Loader icon will open the loader’s detail screen.

Multi-Source Loader Screen



On this screen, the multi-source loader including the number, name, and status is displayed. The status is indicated by the icon. *(See Operation: Icon Descriptions)*

A "P" in the upper right hand corner of the device icon indicates the device is a priority and will be serviced by the pump before the others.

Overview of screen

- The Remaining Cycle Time is visible when the multi-source loader is currently being serviced. The time is the amount of time the device requires to be serviced.
- The Detailed Status displays a descriptive status of the current state of the multi-source loader.

Load Time

The number of seconds (0-300) the multi-source loader receives material.

Discharge Time

The number of seconds (1-300) the multi-source loader 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.

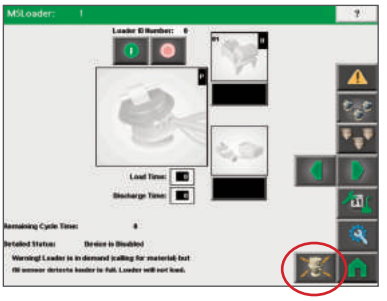
Multi-Source Loader Maintenance Screen

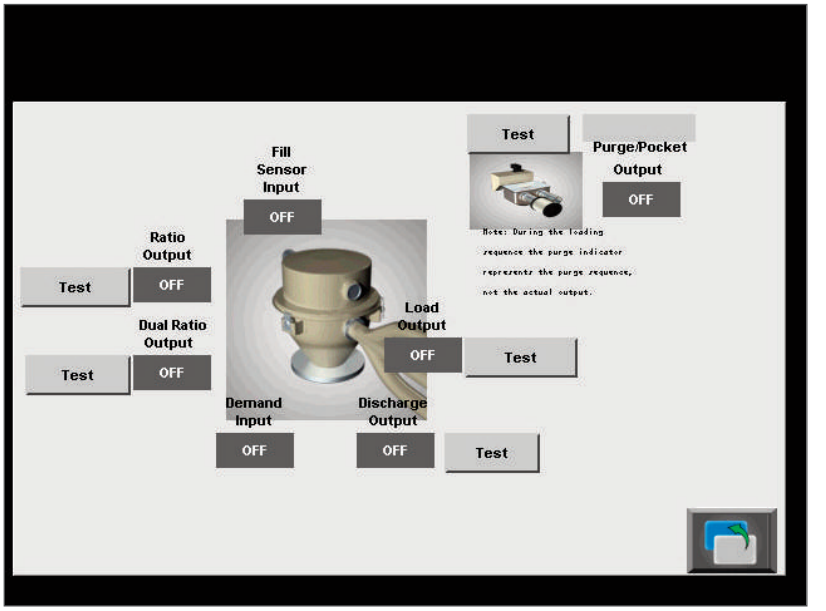
The Maintenance screen displays the current cycle counts of valves. The PM setpoint for each device is shown. The PM setpoint is configured from the PM/Maint Setup screen (accessed from the Setup screen.

- Number of Load Cycles

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

Multi-Source Test I/O Screen



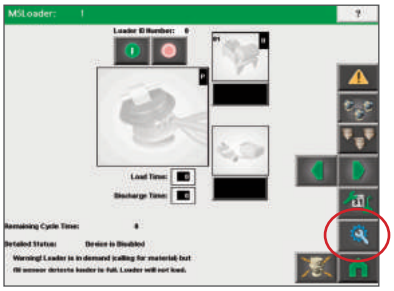


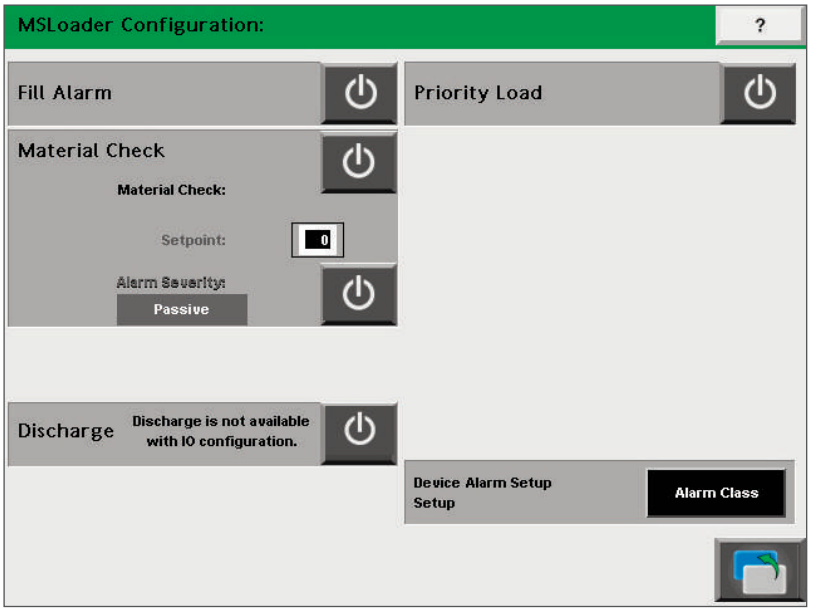
A screen to test the I/O is accessible by pressing the Device Detail button. The loader must be disabled and proper login is required to test I/O.

I/O available to test depends upon I/O configuration and loader configuration. Press the Test button of the output to test. The FLX system will energize the output.

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

Multi-Source Loader Configuration Screen





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

Fill Alarm
Activates a fill alarm if the demand is not satisfied before the multi-source load time is reached. This option requires an optional fill sensor in the receiver. This is a passive alarm; the pump will continue to service the multi-source loader.

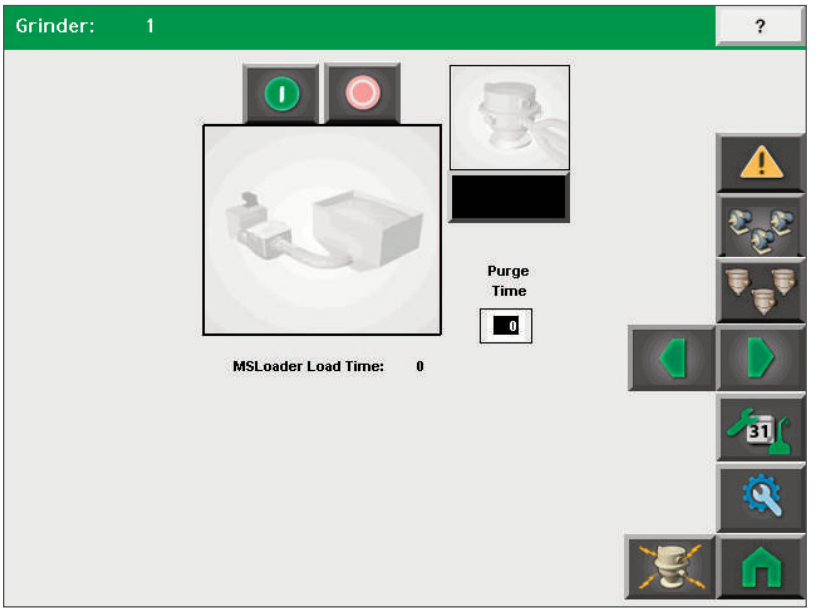
Material Check
A material alarm is activated if the receiver or hopper is not filled by the multi-source loader within the number of tries set by the user (setpoint). The Alarm can be configured as passive (the pump will continue to service the multi-source loader) or active (the multi-source loader is automatically disabled and requires an acknowledgement before enabling again).

Discharge
Enable the discharge output during the discharge cycle. This function requires the installation of a positive discharge valve at the base of the drying hopper or vessel and I/O output options are required.

Priority Load
The multi-source loader will be loaded before other loaders.

Device Alarm Class Setup
This feature is used in conjunction with Remote Alarm boxes to trigger user specified Remote Alarm box. Each Remote Alarm Box can be configured to alarm for all alarms, only class "A" alarms, or only class "B" alarms. The Device Alarm Class Setup screen is used to enable or disable the class alarm feature for the device and then set the class ("A" or "B"). Disable the alarm for the alarm to be triggered on all Remote Alarm Boxes configured as all alarms ("A" or "B").

Granulator (Grinder) Screen



On this screen, the granulator including the number, name, and status is displayed. The status is indicated by the icon. *(See Operation: Icon Descriptions)*

Overview of screen

- The MSLoader Load Time is displayed as a reference. The time is changed from the Multi-Source Loader screen.

Purge Time

When Purge is configured, the Purge time will be visible.

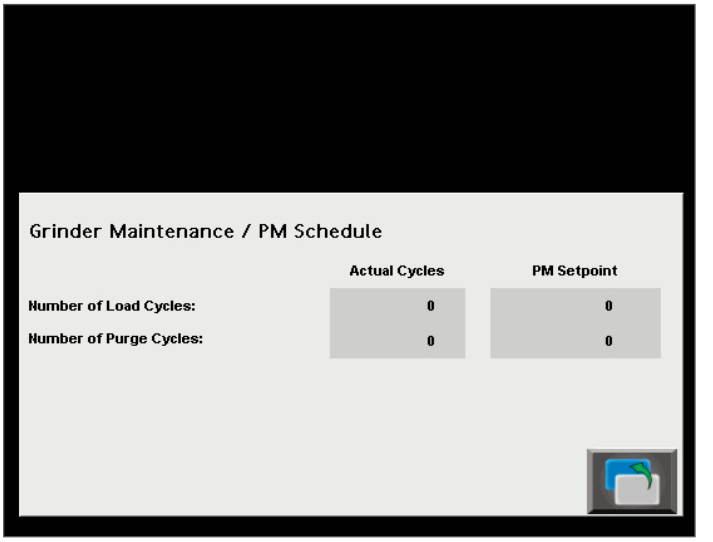
Purge Time is the number of seconds (0-300) that the vacuum continues to pull material through the line after a purge valve closes to the material source. This clears the line of material.

Granulator Maintenance Screen

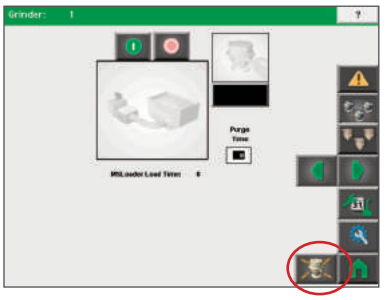
The Maintenance screen displays the current cycle counts of valves. The PM setpoint for each device is shown. The PM setpoint is configured from the PM/Maint Setup screen (accessed from the Setup screen.)

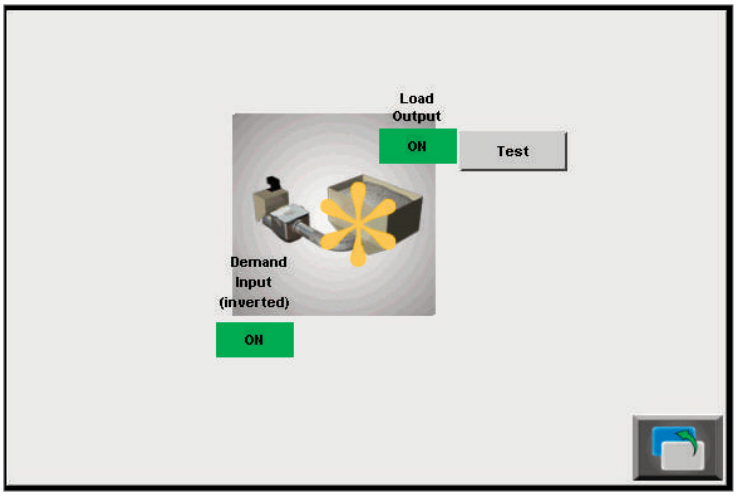
- Number of Load Cycles
- Number of Purge Cycles

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



Grinder Test I/O



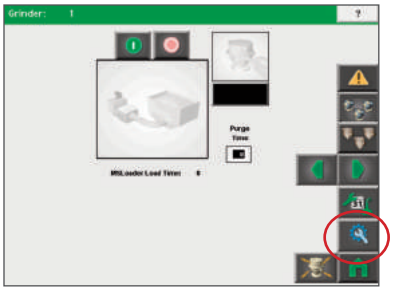


⚠ **CAUTION:** When an output is energized, the valve will activate. The test should be performed by qualified technical personnel.

A screen to test the I/O is accessible by pressing the I/O button. The granulator must be disabled and proper login is required to test I/O.

I/O available to test depends upon I/O configuration and loader configuration. Press the Test button of the output to test. The FLX system will energize the output.

Grinder Configuration Screen



Each granulator is configured individually. Proper login is required.

From the granulator screen press the Setup 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 are required.

FLX Initial Setup

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

1 **Configure I/O.** The I/O should have been configured prior to wiring, but needs to be verified before operation.

2 **Setup Devices.**

3 **Customize Pump Names.**

4 **Customize Source Names (when purging is used).**

5 **Complete PM/Maint Setup.**

6 **Setup Ratio base and Ratio Startup (when ratio is used).**

7 **Setup Passwords.**

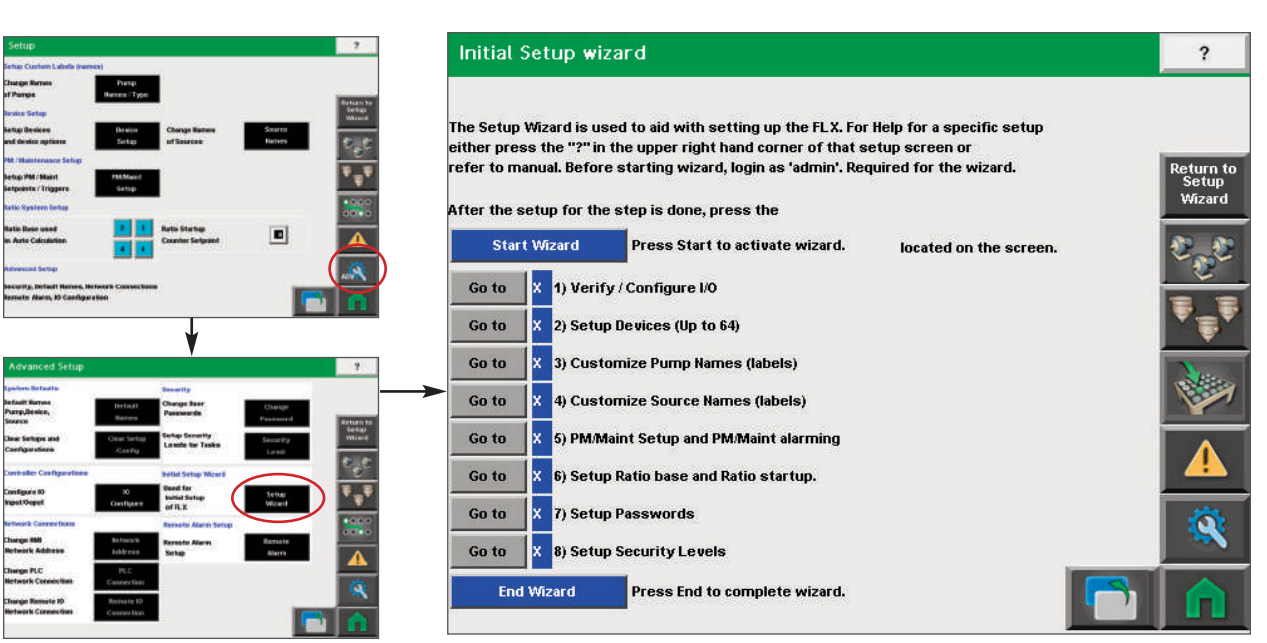
8 **Setup Security Levels.**

The Setup Wizard
The FLX provides an "Initial Setup Wizard". The wizard directs the user through setup screens.

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

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

Using the Setup Wizard



The setup wizard is used for initial setup only.

1 **From the main screen, select Setup**.

2 **From the Setup screen, select Advanced Setup.**

3 **Select Setup Wizard.**

4 **Login as "admin".** The admin login is required to start the wizard and for some setup screens. If the admin login times out, log back in as "admin".

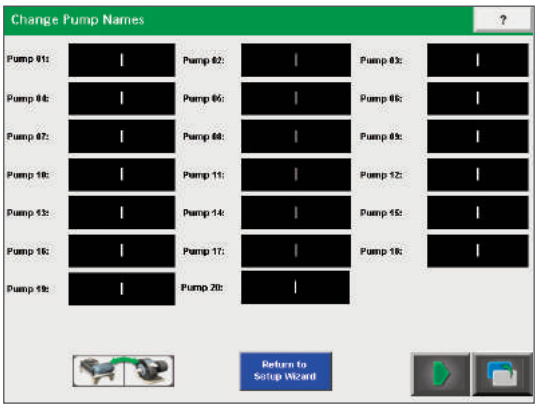
5 **Follow the steps outlined on each screen.** Help is provided on the Setup Wizard and on the individual Setup screens. Help is accessed by pressing the question mark button located in the upper right corner of the screen.

6 **Once all steps are completed, be sure to press "End Wizard".**

✎ **NOTE:**

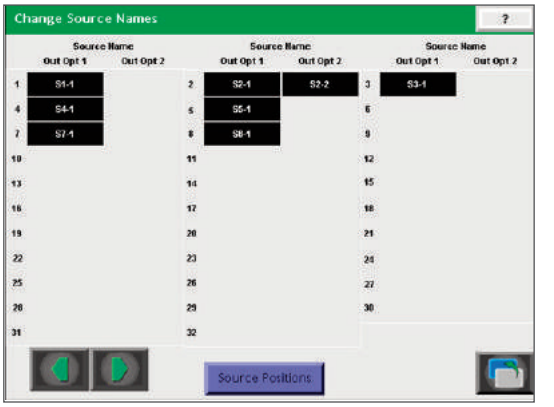
- When the setup for a step is complete be sure to press the Return to Setup Wizard button located on that setup screen. If navigation is made by closing the screen or opening another screen, return to the Setup Wizard via Main Screen => Setup => Advanced Setup and then continue with wizard.
- The setup wizard only guides the user to the screens needed to be setup. The help on that setup screen provides information on how to setup.
- The setup wizard does not configure device time set points or individual configurations. Refer to Operation section for configuring devices and pumps.
- The setup wizard does not include changing network connections or setting up remote alarm boxes. Refer to Appendix for detailed instructions.

FLX Setup



Pump Names

The Pump Names screen is used to customize/change the name of the pump. The number of pumps shown is based upon the I/O configuration.



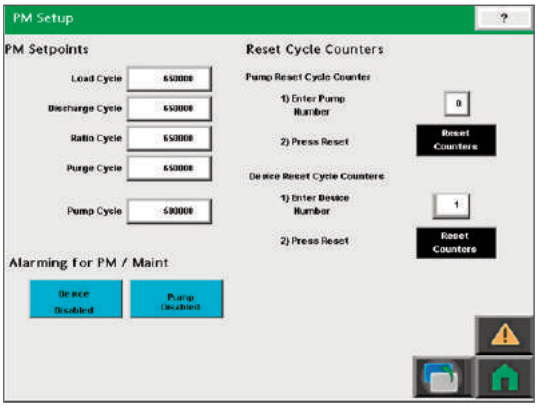
Source Names

The Source Names screen is used to customize/change the name of the source. The number of sources displayed is based upon I/O configurations and if device output options have been configured for either 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 to name the device. Number of devices and output options availability is based upon I/O configurations. In order to setup the device, the device must be disabled.

To setup a device press the device number located in the device column. Follow the steps provided on the pop-up screen.
To change the name of the device press the name of the device in the name column and enter new name.

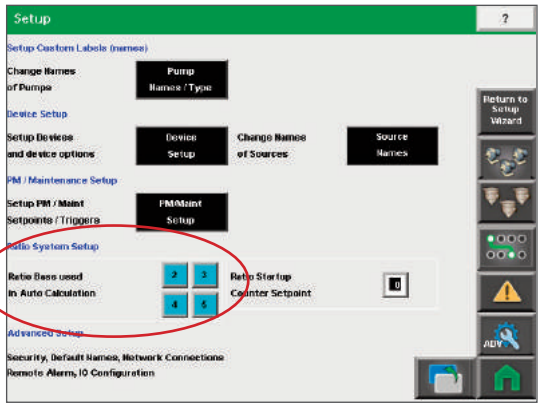


PM/Maint Setup

- The PM 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 Maintenance for either the device or pump by enabling the alarm.
- The device current counters can be reset by following the steps outlined on the screen.

(continued)

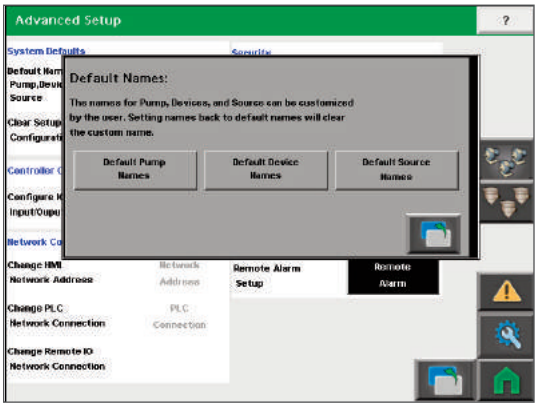
FLX Setup (continued)



Ratio System Setup

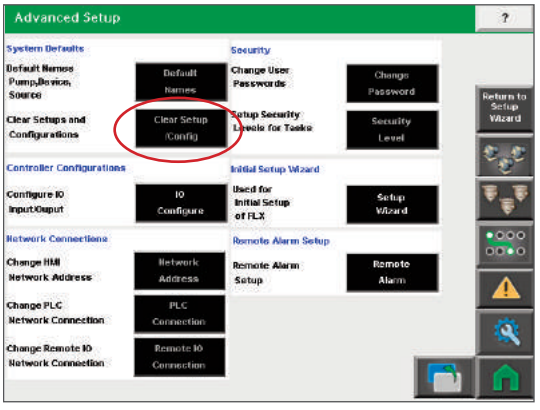
The ratio system setup is viewed and changed from the Setup screen. These values are only used when ratio has been configured on a loader.

- Ratio Base used in Auto Calculation – The FLX is designed to automatically calculate ratio and ratio cycles by adding the regrind time to the load time (virgin material). Then the FLX determines the number of logical ratio cycles to use based upon the lower of the two setpoints (regrind time and load time). A cycle requires a minimum time of 2 seconds. Users can choose to select the "Ratio Base". The base is the number used to divide the ratio into equal cycles. This base 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.



Default Names

The Default Names provides a means to reset the custom names of Pumps, Devices, and Sources to the defaults. If names are set back to defaults customized names will be lost.



Clear Setups and I/O configurations

The Clear Setups and I/O configuration returns data to default 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 following can be independently set to default:

- PM Counter and set PM setpoints
- Device and Pump setups, loading FIFO, and names.
- Remote Alarm setups
- I/O configurations

The procedure requires an authentication code 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.

(continued)

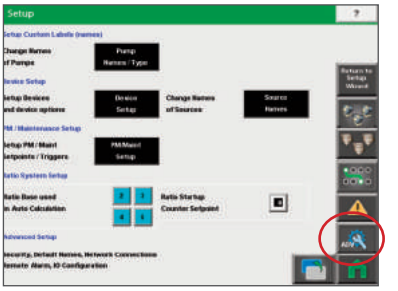
FLX Setup (continued)

Changing Passwords

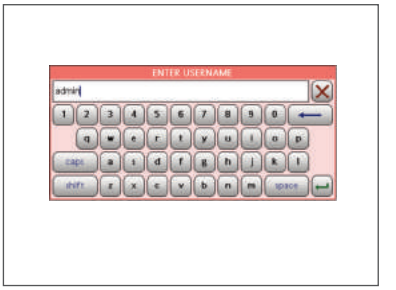
The passwords for the users can be changed. To change the passwords the "admin" login must be used and the password for the user to change must be known.

1 **From the Main screen, select Setup.**

2 **From the Setup screen, select Advanced Setup.**

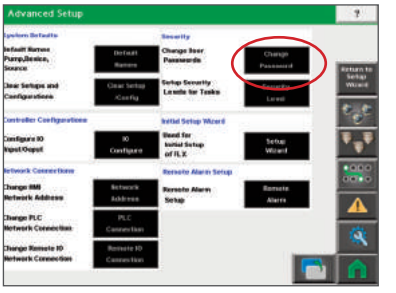


3 **From the Advanced Setup screen, login as admin.**



4 **Select Change Password.**

5 **From the Change Password screen, follow the step-by-step procedure on the screen.**



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

(continued)

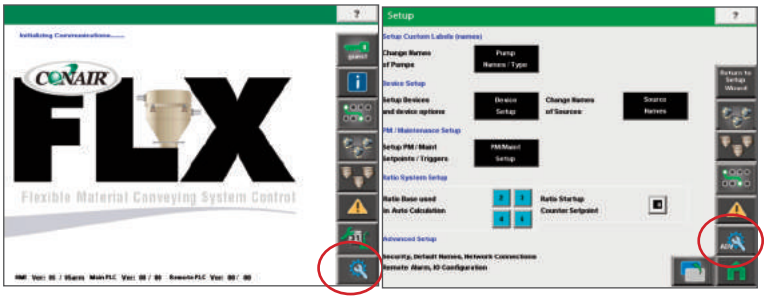
FLX Setup (continued)

Changing Security Level for Tasks/Operations

The security level for tasks/operations can be customized. The "admin" login is required to make these changes.

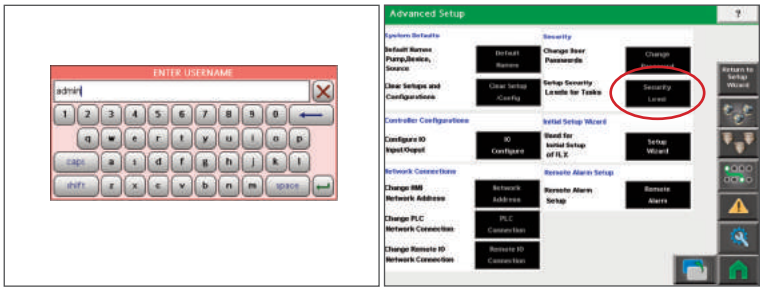
1 From the Main screen, select Setup.

2 From the Setup screen, select Advanced Setup.

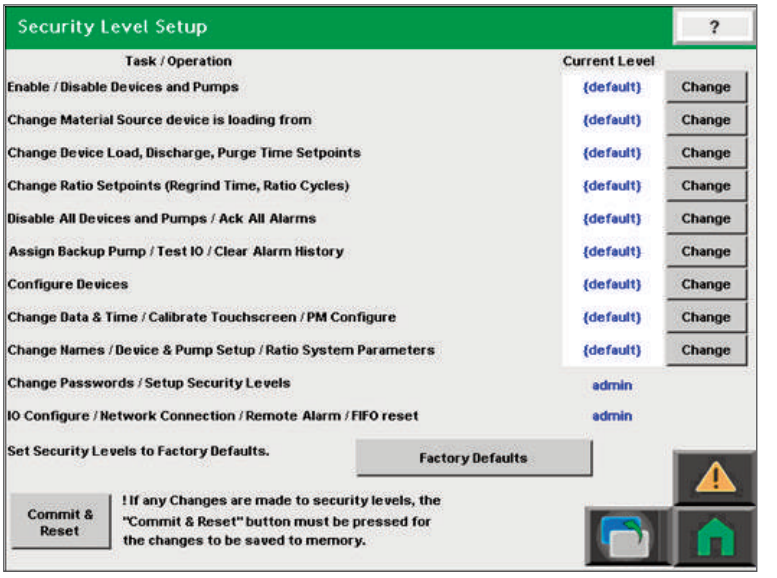


3 From the Advanced Setup screen, login as admin.

4 Select Security Level.



5 From the Security Level setup screen, press the Change button for the task/operation security level to be changed. The current level of security for the task is displayed next to each task/operation.



6 Select the new security level. Press Accept to commit or Cancel to disregard.

7 Repeat steps 5 and 6 for each task/operation that you would like to change.

8 Once complete, press the Commit and Reset button to save the settings memory.

NOTE: The Factory Defaults button will change the security back to Conair defaults.

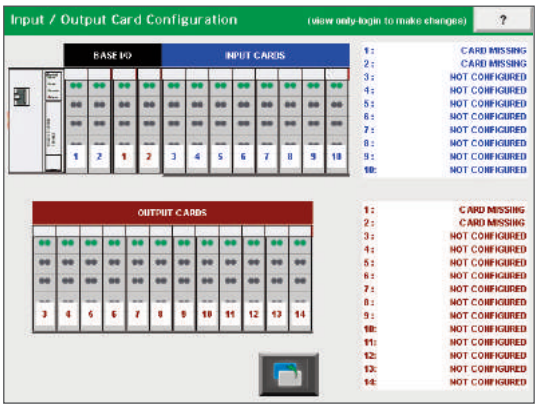
NOTE: The security level settings are stored in the operator interface. If remote operator interfaces are used, the security levels would have to be changed in each remote operator interface.

(continued)

FLX Setup (continued)

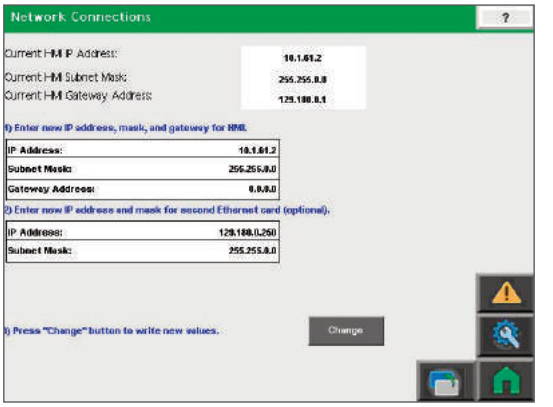
Configure I/O

The I/O of the FLX control will need to be configured prior to wiring loaders, pumps, and valves. The FLX base I/O is not configurable. All additional I/O is configurable to customize the FLX to loading system requirements. The procedure to configure I/O can be found in the Installation section.



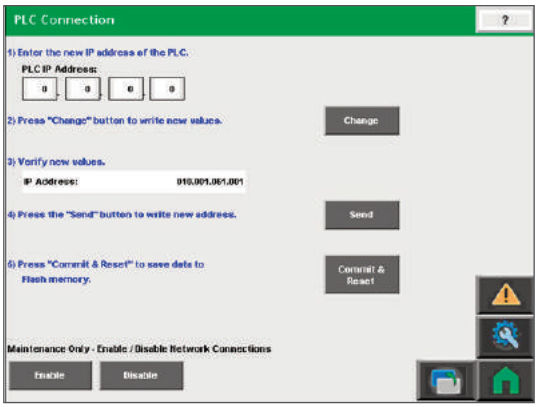
Network Address

The network address of the main and remote operator interface can be customized. *See Installation: Customizing Network Addresses for more information.*



Change PLC Connection

This screen is used to change the PLC connection path network address when network addresses have been changed. *See Installation: Customizing Network Addresses for more information.*



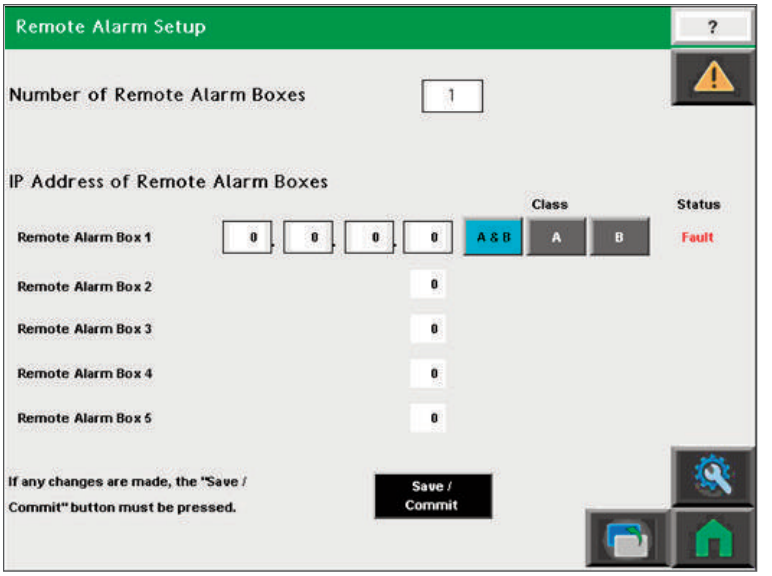
(continued)

FLX Setup (continued)

Remote Alarm

The IP address of the Ethernet Coupler located in the Remote Alarm Box must be configured prior to connecting alarm box to the FLX system's Ethernet network. Refer to Appendix – Customizing Network Addresses for detail procedure.

The Remote Alarm Setup screen is used to pass the Remote Alarm Box IP address to the FLX controller so it know the device(s) to communicate to.



1 **Enter the number of Remote Alarm boxes attached to the FLX system.**

2 **Enter the IP address of the Remote Alarm box.** (IP address is configured in the Remote Alarm Box Ethernet Coupler.)

3 **Select the Alarm Class.** ("A" and "B" will trigger all alarms.)

4 **Press the Save/Commit button.**

The status of the Remote Alarm box will not be valid until the IP address has been saved.

SECTION
5

Maintenance

Preventative maintenance schedule

No specific maintenance schedule is required for the FLX since there are no moving parts. All components of the system are electrical in nature, but like any component in a factory, can be prone to unforeseen breakage.

In the event of breakage, replace the component(s). Do not attempt repair.

- **Monthly, or as often as needed**
  - ❒ **Check that the cables and junction boxes associated with the FLX.** Make sure all cables are intact, undamaged, out of harm's way, etc.
  - ❒ **Correct the mounting integrity of all control boxes as required and re-route the communication cables to avoid high amperage electrical lines and/or moving, hot or sharp objects.**

Warnings and Cautions

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.

WARNING: Voltage hazard

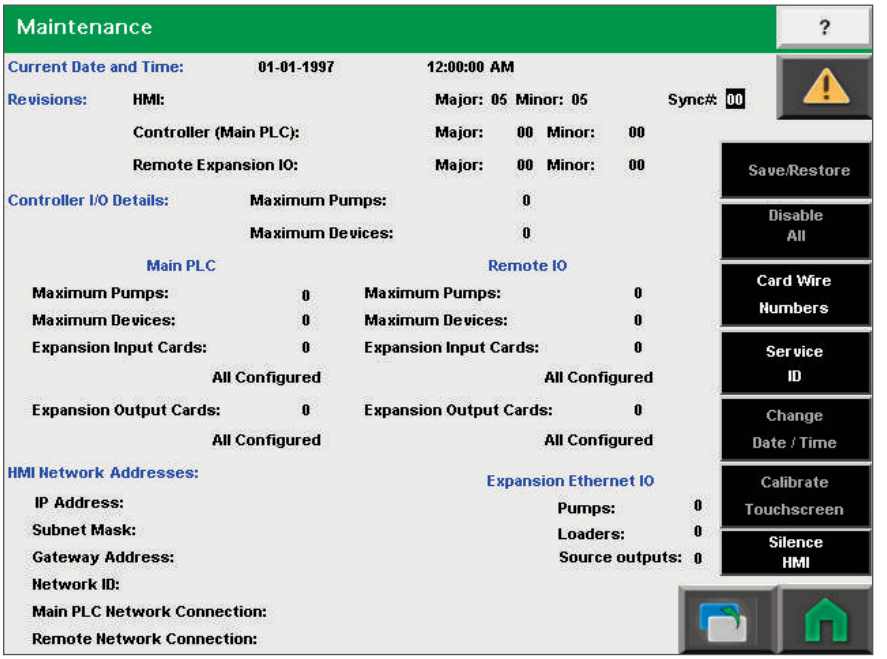
This equipment is powered by electrical current, as specified on the machine serial tag and data plate. Do not operate the equipment at power levels other than what is specified on the machine serial tag and data plate.

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.

Before performing maintenance or repairs on this product, disconnect and lock out electrical power sources to prevent injury from unexpected energization or start-up. Always follow your company's internal lockout/tagout procedure for all maintenance and service.

Maintenance Screen

The Maintenance screen and maintenance screen options are used for diagnostic, troubleshooting, and maintenance operations.

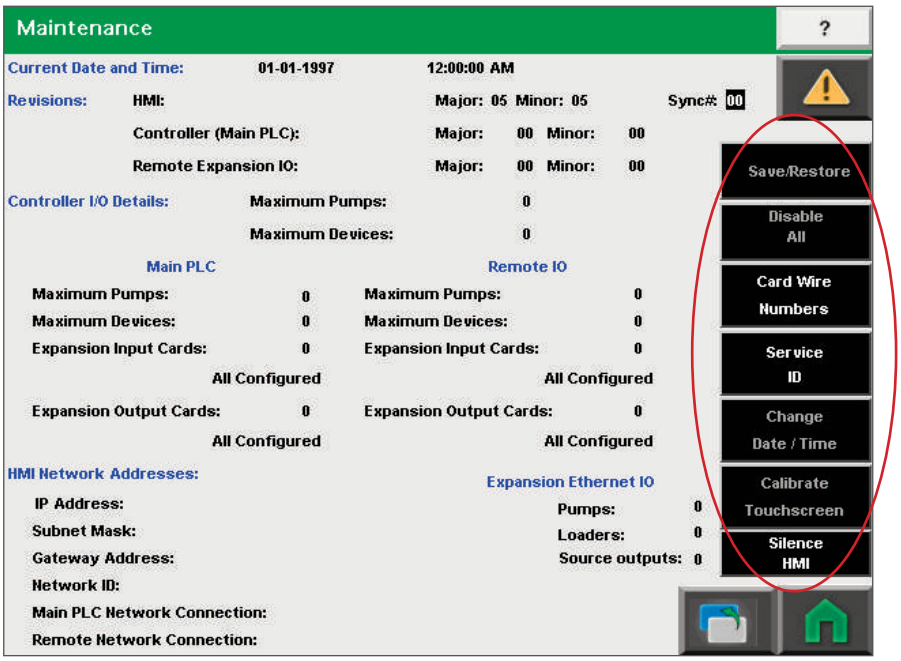


Main screen displays the following:

- Current Date and Time – The date and time are local to operator interface.
- Sync # – Provides a means to silence and acknowledge all Red Lion display alarms from any Red Lion display. Set the Sync # of each display to a unique number from 1-8. When one is silenced, all others will be silenced.
- HMI, Controller (Main PLC), and Remote Expansion I/O major and minor revisions – The major and minor release of the programs are displayed. For the FLX system to function properly the Major Revision of the HMI, Controller (Main PLC), and Remote Expansion I/O must be the same. The minor revision means a change has been made in one program but did not affect the functionality of the other program. The minor revisions for the programs do not have to match.
- Maximum Pumps – The maximum number of pumps available based upon I/O configuration.
- Maximum Devices – The maximum number of devices (loaders, multi-source loaders, granulators) available based upon I/O configuration.
- Main PLC
  - o Maximum Pumps and Maximum devices based upon I/O configuration in Main PLC.
  - o Expansion Inputs and Output Cards – The total number of input and output expansion cards available for configuration.
- Remote I/O (Only available when Remote I/O is configured)
  - o Maximum Pumps and Maximum devices based upon I/O configuration in Remote I/O.
  - o Expansion Inputs and Output Cards – The total number of input and output expansion cards available for configuration.
- HMI IP address, Subnet Mask, Gateway address – The network address of the operator interface.
- HMI Network ID – The Operator Interface Ethernet port's MAC address as 17-character text string.

(continued)

Maintenance Screen (continued)

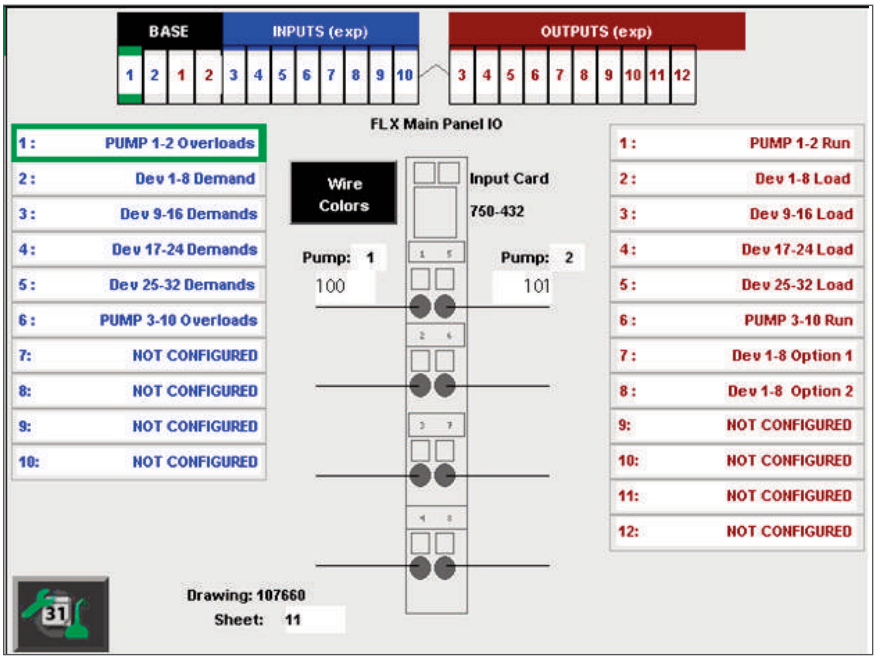


The following options are available from the Maintenance screen:

- Save/Restore –The Save/Restore function provides a means to save and restore all configuration and operation settings to or from a compact flash card.
- Disable All –The disable all function provides a means to disable all the pumps and/or all the loaders. It is useful when shutting down the system for maintenance.
- Card Wire Numbers – Provides on screen wire numbers for I/O cards and drawing numbers. Useful during installation and troubleshooting.
- Service ID – ID tag used as a snapshot of current system I/O configurations. Used by Conair to determine available upgrade options and service calls.
- Change Date/Time – Used to change operator interface date and/or time.
- Calibrate Touch screen – Used for touch screen alignment.
- Silence HMI – The operator interface has an internal alarm and this button is used to silence it.

Card Wire Numbers

The Card Wire Number screen provides on screen wire numbers for I/O cards and drawing numbers. The screen is useful during installation and troubleshooting. The number of I/O cards visible is based upon the cards installed.



To view a cards wire numbers: Press the card number in the rack (located on top) or press the card description located on left side of the screen for input cards and right side of the screen for output cards.

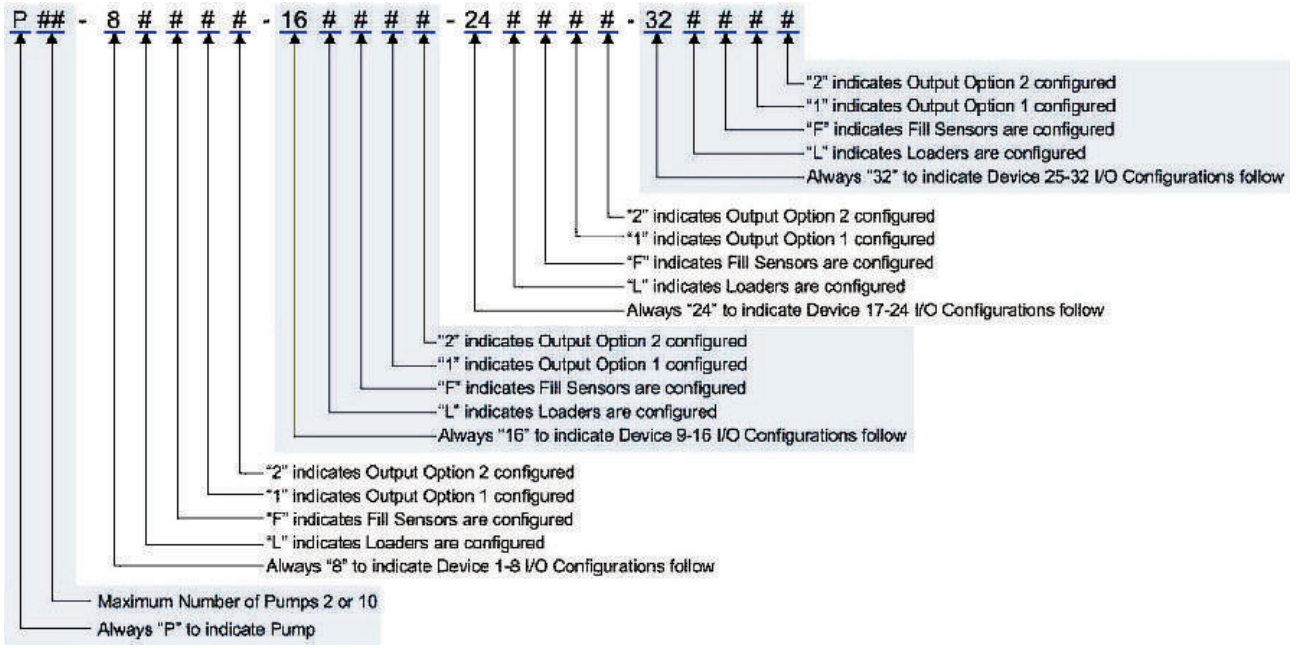
- The Card selected will be highlighted green both in the rack and descriptions.
- The wire numbers for the card will change according to the selection.
- The Sheet number of the drawing set will change.

The Wire colors button can be used to open a screen to reference the colors and use of the conductors used in Conair cable for connection.

NOTE: If a card is not configured and selected, the selection will default to either the base input card or base output card.

Service ID

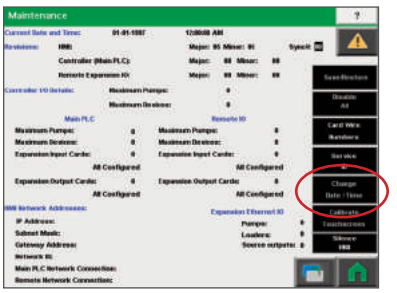
ID tag used as a snapshot of current system I/O configurations. Used by Conair to determine available upgrade options and service calls.

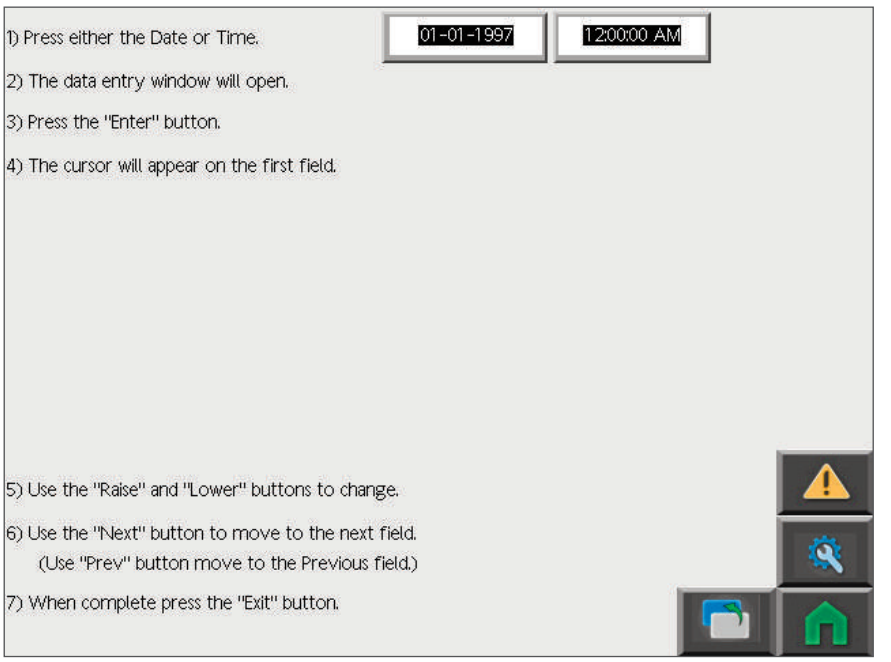


NOTE: If Remote I/O Panel is configured, the service ID will consist of two lines. The first line is for the main PLC and the second line (with prefix "EX") will be for the Remote I/O panel.

Date/Time

The date and time are used locally at each operator interface. The date and time are used for the alarm summary and alarm history. Each operator interface date and time will need to be set.





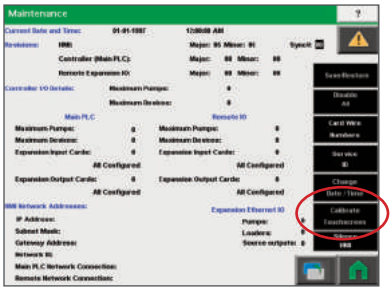
To set date and time:

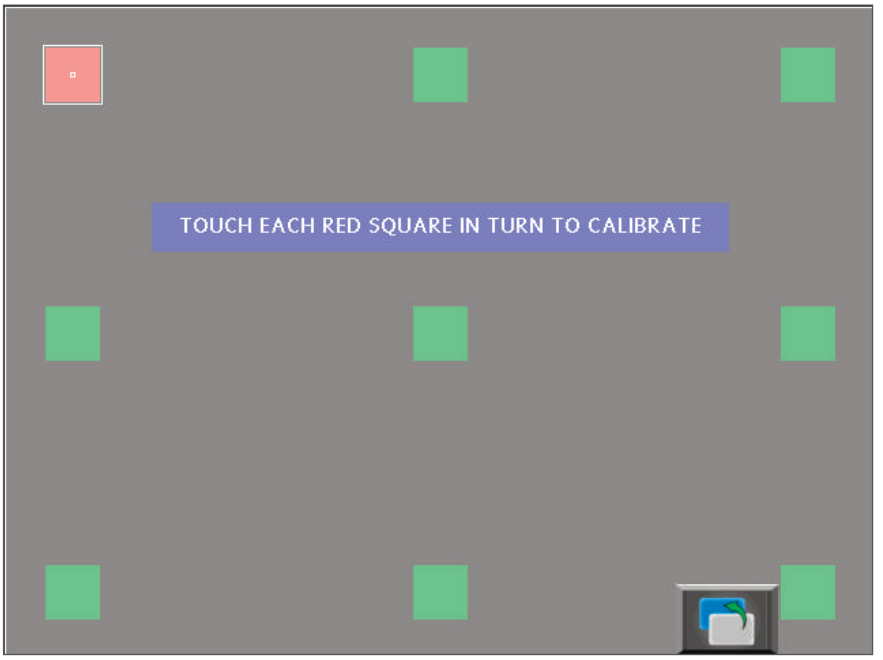
1 From the Maintenance screen, select Change Date/Time.

2 Follow the step by step procedure on the screen.

Calibrate Touch Screen

The Calibrate Touch screen feature allows the user to calibrate the touch screen in event the screen is not accurate to touch.





To calibrate the screen:

1 **From the Maintenance screen, select Calibrate Touchscreen.**

2 **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 any wiring, parts, and assembly diagrams that were shipped with your equipment. These are the best reference for correcting a problem. The diagrams will note any custom features or options not covered in this User Guide.

- ❏ Verify that you have all instructional materials related to the control. Additional details about troubleshooting and repairing specific components are found in these materials.

- ❏ Check to make sure that you have the manuals for other equipment connected in the system. Troubleshooting may require investigating other equipment attached to, or connected with the control.

A Few Words of Caution

⚠ 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 and adjusted 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: 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. Always follow your company's internal lockout/tagout procedure for all maintenance and service.

(Continued)

A Few Words of Caution (continued)

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

The FLX 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 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 and tools 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 FLX. 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.

Operator Interface Alarms

Alarm	Possible cause	Solution
Pump Overload at {pump name}	Indicates a pump overload.	Check pump overload. Check overload wiring.
Material Alarm at {device name}	The number of load cycles exceeds the alarm check value without satisfying the demand.	Check location where material is being loaded from (not empty). Check sensor for proper operation. Check for valves for proper operation. Check for plugged lines.
Fill Alarm at {device name}	The material fails to reach the fill sensor within the cycle time.	Check location where material is being loaded from (not empty). Check sensor for proper operation. Check valves for proper operation. Check for plugged lines.
Demand and Fill at {device name}	The demand sensor (vessel empty) and fill sensor (vessel full) are both ON.	Check sensors for proper operation.
PM/Maint Required at {pump name}	The actual cycle count exceeds the set point. (Pump on/off cycles)	Perform required maintenance and reset counters.
PM/Maint Required at {device name}	The actual cycle count exceeds the set point. (Load, Purge, Ratio, discharge on/off cycles)	Perform required maintenance and reset counters.

(continued)

Operator Interface Alarms (continued)

Alarm	Possible Cause	Solution
Controller not in Run Mode or Comms lost	The operator interface does not detect the controller in run mode.	Verify that the controller is in Run mode. Verify that the network communication addresses are set correctly.
Controller Modules Not Configured	The operator interface cannot determine the controller's I/O configuration.	Verify that the controller is in Run mode. Verify that the network communication addresses are set correctly. Verify that the controller rack is properly assembled.
Remote I/O Not in Run Mode or Comms Lost	The operator interface does not detect the Remote I/O controller in run mode.	Verify that the Remote I/O controller is in Run mode. Verify that the network communication addresses are set correctly.
Remote I/O Modules Not Configured	The operator interface cannot determine the Remote I/O controller's I/O configuration.	Verify that the Remote I/O controller is in Run Mode. Verify that the network communications addresses are set correctly. Verify Remote I/O controller rack is properly assembled.

(Continued)

Understanding the Operator Interface LED Lights

Label	Description	LED Color	States
Power	Power Status	RED	**Solid** - Unit is powered and running an application. **Flashing** - Unit is in the boot loader, no valid configuration is loaded.
CF	Compact Flash Status	YELLOW	**Off** - No Compact Flash card is present. **Steady** - Valid Compact Flash card is present. **Flashing rapidly** - Compact Flash card is being checked. **Flickering** - Unit is writing to the Compact Flash, either because it is storing data, or because the PC connected via the USB port has locked the drive. **Flashing slowly** - Incorrectly formatted Compact Flash card.
Status	Status indicator of Operator Interface	GREEN	**Solid** - Valid configuration is loaded and there are no alarms present. **Flashing** - A tag is in an alarm state.

Ethernet Communication

The Ethernet connector contains two LEDs. A yellow LED in the upper right, and a bi-color green/amber LED in the upper left. The LEDs represent the following statuses:

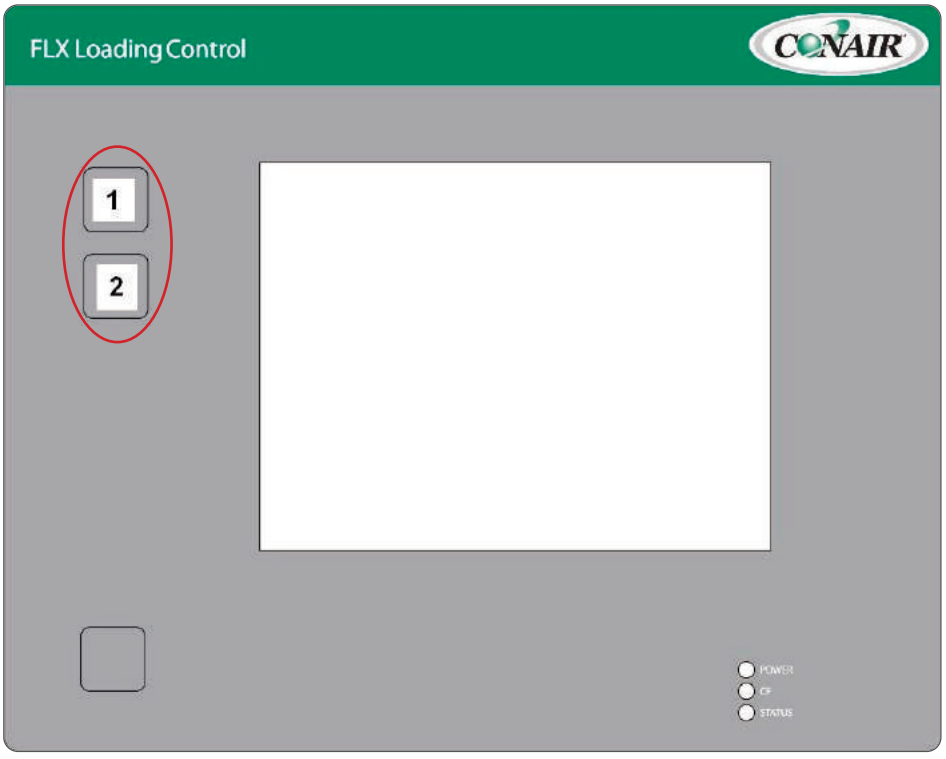
LED Color	Description
Yellow solid	Link established
Yellow flashing	Data being transferred
Green	10 BASE-T Communications
Amber	10 BASE-TX Communications

Reset

If the operator interface has become corrupt it may be necessary to clear the operator interface database. If the database is cleared, the program will have to be downloaded via USB cable or via CompactFlash card.

1 Turn OFF power to the operator interface.

2 Turn ON power to the operator interface. As the unit powers up, simultaneously press and hold hidden keys 1 and 2.



3 The unit will display Clear Database prompt. Touch the left side of the display to clear the database. Touch the right side to continue in normal mode.

Battery Replacement

A battery is used to keep time when the unit is without power. Typical accuracy of the G306A time keeping is less than one minute per month drift. The battery of a G306A unit does not affect the unit's memory, all configurations and data is stored in non-volatile memory.

CAUTION: RISK OF ELECTRIC SHOCK

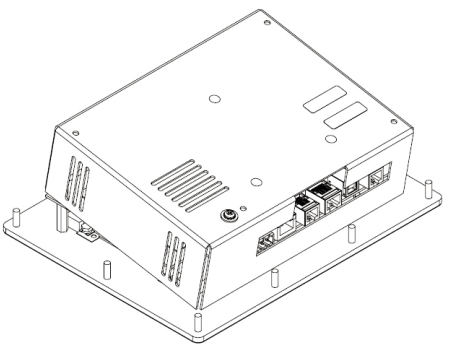
The inverter board, attached to the mounting plate, supplies high voltage to operate the backlight. Touching the inverter board may result in personal injury.

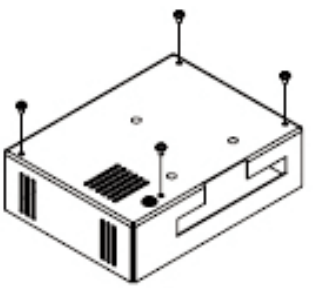
⚠ **IMPORTANT:** The circuit board contains static sensitive components. Before handling the operator interface without the rear cover attached, discharge static charges from you body by touching a grounded bare metal object. Ideally, handle the operator interface at a static controlled clean workstation. Aso, do not touch the surface areas of the circuit board. Dirt, oil, or other contaminants may adversely affect circuit operation.

The battery used by the G306A is a lithium type CR2025.

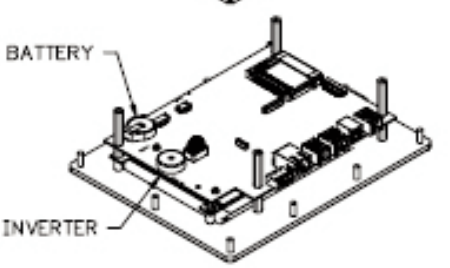
To remove the battery:

1. **Disconnect power from the unit.**
2. **Disconnect all cables connected to the unit.**
3. **Remove the four screws designated by arrows on the rear of the unit to remove the rear cover of the unit.**
4. **Lift on the top side hinge cover to provide clearance for the connectors on the bottom side of the PCB as shown.**

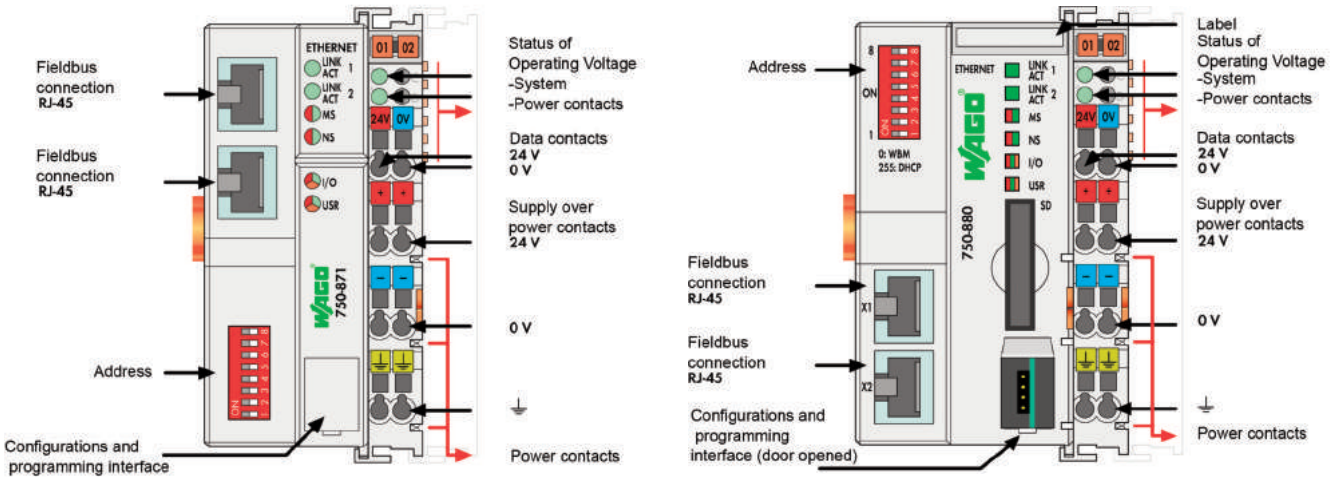




5. **Remove the old battery from the holder and replace with the new battery.**
6. **Replace the rear cover, cables, and re-apply power.**
7. **Using the unit's keypad, enter the correct time and date.**

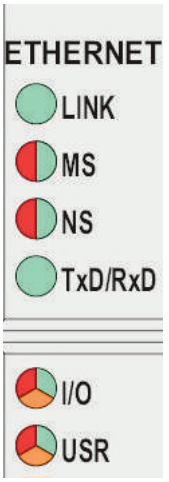


Controller Connections Overview



Controller Connections LEDs

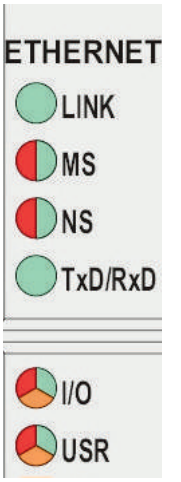
LED	Description	Normal State	Other States
Link	Link to a physical network	GREEN	**OFF-** Not connected to a network ❏ Check cabling.
MS	Indicates the state of the node (Module State)	GREEN	**RED/GREEN FLASHING** - Self test **RED** - Controller indicates a not remediable error ❏ Restart by turning power off and on again. **GREEN FLASHING** - Controller is not yet configured **OFF** - No system supply voltage ❏ Check the supply voltage (24V and 0V).
NS	Indicates the state of the node (Network State)	GREEN	**RED/GREEN FLASHING** - Self test **RED** - Controller indicates a duplicate IP address on the network ❏ Use an IP address that is not used on the network. ❏ Cycle power to controller. **RED FLASHING** - Network connection time out ❏ Restart by turning power off and on again. **GREEN FLASHING** - No connection **OFF** - No system supply voltage ❏ Check the supply voltage (24V and 0V).



(Continued)

Controller Connections LEDs (continued)

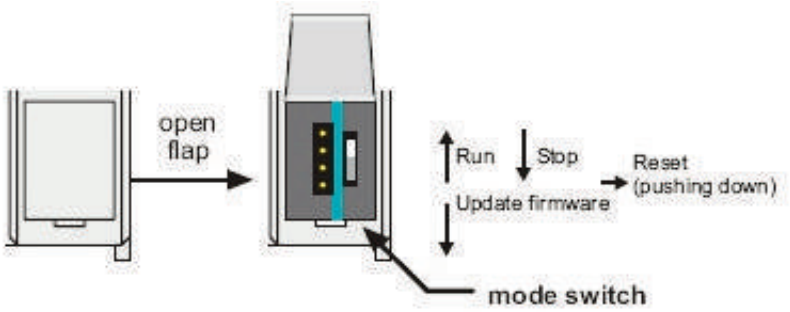
LED	Description	Normal State	Other States
TxD/RxD	Data Exchange over Ethernet	FLASHING GREEN	**OFF-** No data exchange ❏ Check cabling.
I/O	The status of the internal bus	GREEN	**OFF** - No data cycle on the internal bus **RED** - During controller startup ❏ Wait for internal bus to initialize. ❏ Watch for startup signal displayed by LED flashing fast for approximately 1-2 seconds. **RED** - After controller startup - Error, indicated by three consecutive flashing sequences. There is a short pause between each sequential flash. ❏ Evaluate the fault message. ❏ See control manufacturer's instruction manual for more detail.
USR	The status of the program		**GREEN** - Program running and all I/O configured **ORANGE** - Program running but not all I/O configured **RED** - Program not running



Controller Connections Overview

The operating mode switch is located behind a cover flap.

The switch is a push/slide switch with 3 settings and a hold-to-run function.

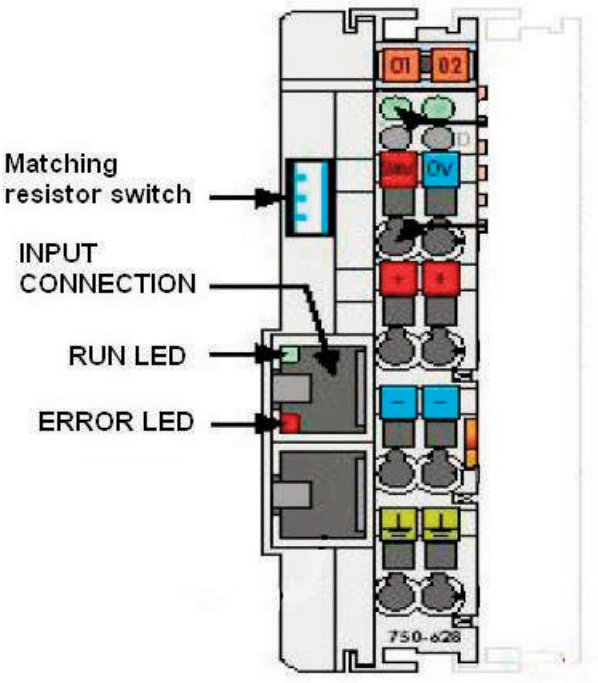


Operating Mode Switch	Function
Top Position (normal operating position)	RUN Mode
Middle Position	STOP Mode
Lower Position	Controller starts the operating system loader
From Middle to Top Position	Firmware and PFC (Programmable Fieldbus Controller) application are executed (activate program processing - RUN)
From Top to Middle Position	Firmware is executed and PFC application is stopped (stop program processing - STOP)
Push Down (i.e. with a small screwdriver	• Hardware is reset. • All outputs and flags are reset; variables are set to 0 or false or to an initial value. • Retain variables and flags are not changed. • The hardware reset can be performed with STOP as well as RUN in any position of the operating mode switch.

✎ **NOTE:** An operating mode (i.e. RUN or STOP) is internally changed at the end of a PLC cycle.

Module Bus Extension (Coupler Mode)

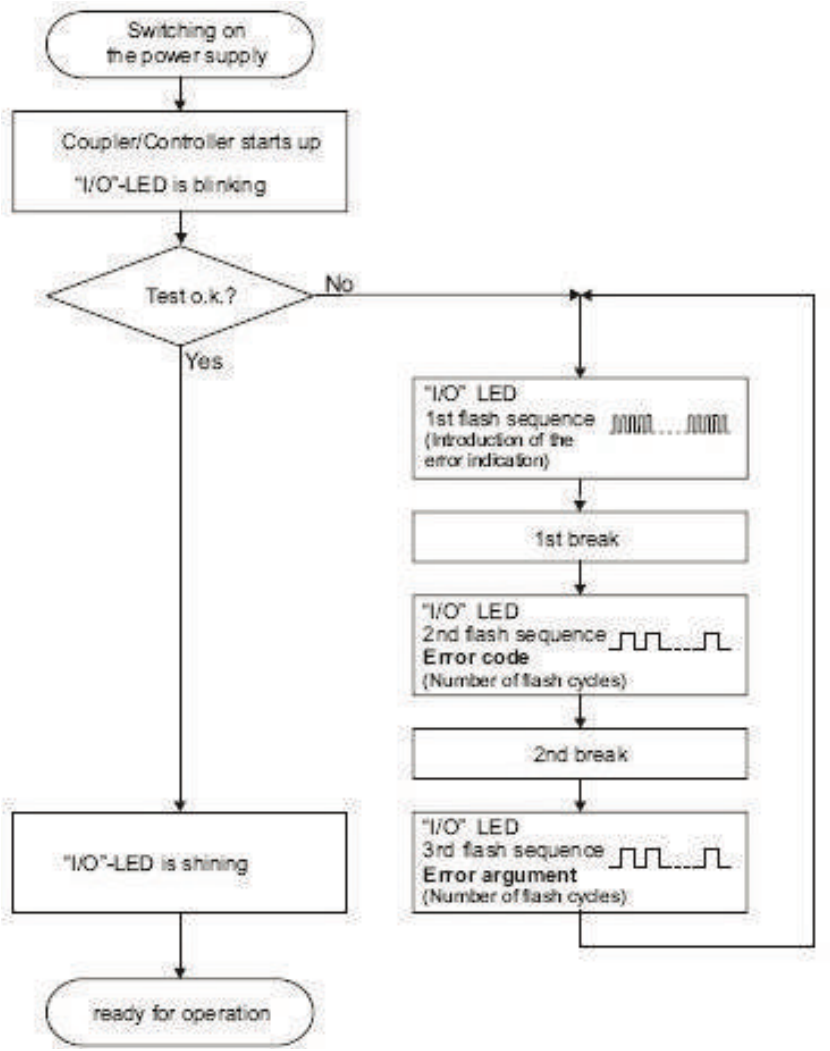
The Bus Extension module is required for output expansion.



The RUN LED must be green.

The Matching resistor switch should be in the LAST (1) position.

FLX Controller Error Codes



Signalling of the LED for indication of the node status.
After clearing a fault, restart the controller by cycling the power.

Fault message of the I/O LED
1st blink sequence: Start of the fault message
2nd blink sequence: Fault code
3rd blink sequence: Fault argument

(Continued)

FLX Controller Error Codes (Continued)

Fault Code 1: "Hardware and configuration fault"

Fault argument	Fault Description	Troubleshooting
1	Overflow of the internal buffer memory for the inline code	Turn off the power supply of the node, reduce number of I/O modules and turn the power supply on again. If the error still exists, exchange the bus coupler.
2	I/O module(s) with unsupported data type	Detect faulty I/O module as follows: Turn off the power supply. Place the end module in the middle of the fieldbus node. Turn the power supply on again. -If the LED is still blinking, turn off the power supply and place the end module in the middle of the first half of the node (towards the coupler). -If the LED doesn't blink, turn off the power supply and place the end module in the middle of the second half of the node (away from the coupler). Turn the power supply on again. Repeat this procedure until the faulty I/O module is detected. Replace the faulty I/O module. Ask for a firmware update for the fieldbus computer.
3	Invalid fieldbus coupler/controller parameter checksum	Turn off the power supply of the node, replace number of I/O modules and turn the power supply on again.

(Continued)

FLX Controller Error Codes (Continued)

Fault Code 1: “Hardware and configuration fault”

Fault argument	Fault Description	Troubleshooting
4	Error occurred when writing to serial EEPROM	Turn off the power supply of the node, exchange fieldbus coupler and turn the power supply on again.
5	Error occurred with read access to serial EEPROM	Turn off the power supply of the node, exchange fieldbus coupler and turn power supply on again.
6	Changed I/O module configuration determined after AUTORESET	Restart the fieldbus coupler by turning the power supply off and on again.
7	Firmware does not run on existing hardware	Turn off the power supply of the node, exchange fieldbus coupler and turn the power supply on again.
8	Time limit exceeded for accessing the serial EEPROM	Turn off the power supply of the node, exchange fieldbus coupler and turn the power supply on again.
9	Bus coupler initialization fault	Turn off the power supply of the node, exchange fieldbus coupler and turn the power supply on again.
10	RTC-Powerfail	Adjust the clock and keep the power to the control supplied for at least 15 minutes for loading of the Goldcaps.

(Continued)

FLX Controller Error Codes (Continued)

Fault Code 1: “Hardware and configuration fault”

Fault argument	Fault Description	Troubleshooting
11	Fault when reading out the time from the RTC	Adjust the clock and keep the power to the control supplied for at least 15 minutes for loading of the Goldcaps.
12	Fault when writing the time in the RTC	Adjust the clock and keep the power to the control supplied for at least 15 minutes for loading of the Goldcaps.
13	Error Clock-Interrupt	Adjust the clock and keep the power to the control supplied for at least 15 minutes for loading of the Goldcaps.
14	Maximum number of Gateway or Mailbox I/O modules exceeded	Turn off the power supply of the node, replace number of Gateway or Mailbox I/O Modules and turn the power supply on again.

FLX Controller Error Codes (Continued)

Fault Code 2: not used

Fault argument	Fault Description	Troubleshooting
--	not used	--

(Continued)

FLX Controller Error Codes (Continued)

Fault Code 3: “Internal bus protocol fault”

Fault argument	Fault Description	Troubleshooting
--	Internal bus communications malfunction; faulty device can’t be detected.	If the fieldbus node comprises internal system supply modules (750-613), make sure first that the power supply of these modules is functioning. This is indicated by the status LEDs. If all I/O modules are connected correctly or if the fieldbus node doesn’t comprise 750-613 modules you can detect the faulty I/O module as follows: turn off the power supply of the node. Place the end module in the middle of the fieldbus node. Turn the power supply on again. --If the LED is still blinking, turn off the power supply and place the end module in the middle of the fist half of the node (towards the coupler). --If the LED doesn’t blink, turn off the power supply and place the end module in the middle of the second half of the node (away from the coupler). Turn the power supply on again. Repeat this procedure until the faulty I/O module is detected. Replace the faulty I/O module. If there is only one I/O module left but the LED is still blinking, then this I/O module or the coupler is defective. Replace defective component.

(Continued)

FLX Controller Error Codes (Continued)

Fault Code 4: “Internal bus physical fault”

Fault argument	Fault Description	Troubleshooting
--	Error in internal bus data communication or interruption of the internal bus at the coupler.	Turn off the power supply of the node. Place an I/O module with process data behind the coupler and note the error argument after the power supply is turned on. If no error argument is given by the I/O LED, replace the coupler. Otherwise detect faulty I/O module as follows: Turn off the power supply. Place the end module in the middle of the fieldbus node. Turn the power supply on again. --If the LED is still blinking, turn off the power supply and place the end module in the middle of the fist half of the node (towards the coupler). --If the LED doesn’t blink, turn off the power supply and place the end module in the middle of the second half of the node (away from the coupler). Turn the power supply on again. Repeat this procedure until the faulty I/O module is detected. Replace the faulty I/O module. If there is only one I/O module left but the LED is still blinking, then this I/O module or the coupler is defective. Replace defective component.
*n	Interruption of the internal bus after the n^{th} process data module.	Turn off the power supply of the node, exchange the $(n+1)^{th}$ process data module and turn the power supply on again.

(Continued)

FLX Controller Error Codes (Continued)

Fault Code 5: "Internal bus initialization fault"

Fault argument	Fault Description	Troubleshooting
n*	Error in register communication during internal bus initialization	Turn off the power supply of the node and replace n^{th} process data module and turn the power supply on again.

FLX Controller Error Codes (Continued)

Fault Code 6: "Fieldbus specific errors"

Fault argument	Fault Description	Troubleshooting
1	Invalid MACID	Turn off the power supply of the node, exchange fieldbus coupler and turn the power supply on again.
2	Ethernet Hardware initialization error	Restart the fieldbus coupler by turning the power supply off and on again. If the error still exists, exchange the bus coupler.
3	TCP/IP initialization error	Restart the fieldbus coupler by turning the power supply off and on again.
4	Network configuration error (no IP address)	Check the settings of BootP server
5	Application protocol initialization error	Restart the fieldbus coupler by turning the power supply off and on again.

(Continued)

FLX Controller Error Codes (Continued)

Fault Code 6: "Fieldbus specific errors"

Fault argument	Fault Description	Troubleshooting
6	Process image is too large	Reduce number of I/O modules
7	Double IP address in network	Use another IP address, which is not yet present in the network.
8	Error when building the process image	Reduce number of I/O modules

FLX Controller Error Codes (Continued)

Fault Code 9: not used

Fault argument	Fault Description	Troubleshooting
--	not used	--

FLX Controller Error Codes (Continued)

Fault Code 10: "PLC program fault"

Fault argument	Fault Description	Troubleshooting
1	Error when implementing the PFC (Programmable Fieldbus Controller) run time system	Restart the fieldbus coupler by turning the power supply off and on again. If the error still exists, please contact the I/O support.

(Continued)

FLX Controller Error Codes (Continued)

Fault Code 10: “PLC program fault”

Fault argument	Fault Description	Troubleshooting
2	Error when generating the PFC (Programmable Fieldbus Controller) inline code	Restart the fieldbus coupler by turning the power supply off and on again. If the error still exists, please contact the I/O support.
3	An IEC task exceeded the maximum running time or the sampling interval of the IEC task could not be kept (Watchdog)	Check the task configuration concerning the adjusted sampling intervals and watchdog times.
4	PFC Web-Visualization initialization error	Restart the fieldbus coupler by turning the power supply off and on again. If the error still exists, please accomplish a reset (origin) in WAGO-I/O-PRO, compile the project again and transfer it to the coupler.

(Continued)

FLX Controller Error Codes (Continued)

Fault Code 11: "Gateway / Mailbox I/O module fault"

Fault argument	Fault Description	Troubleshooting
1	Maximum number of Gateway modules exceeded	Turn off the power supply of the node, reduce the number of Gateway modules and turn the power supply on again.
2	Maximum size of Mailbox exceeded	Reduce the Mailbox size.
3	Maximum size of process image exceeded due to the put Gateway modules	Reduce the data width of the Gateway modules.

✎ **NOTE:** The number of blink pulses (n) indicates the position of the I/O module. I/O modules without data are not counted (e.g. supply modules without diagnosis).

EXAMPLE: The 13th I/O module has been removed.

1. The I/O-LED starts the fault display with the first blink sequence. (approx. 10 Hz)
2. The second blink phase (approx. 1 Hz) follows the first pause. The I/O LED blinks four times and thus signals the fault code 4 (internal bus data fault).
3. The third blink sequence follows the second pause. The I/O LED blinks twelve times. The fault argument 12 means that the internal bus is interrupted after the 12th I/O module.

Restore Operator Interface Program Using CompactFlash Card

The HMI database of the FLX Operator Interface (Red Lion G306K and G306A) can be updated via a CompactFlash card. This can be done for the customer to have a backup of their current application, for upgrades to be performed without the use of any cables and software, or initial load of the operator interface.

The following conditions must be satisfied prior to restoring or upgrading from a CompactFlash card.

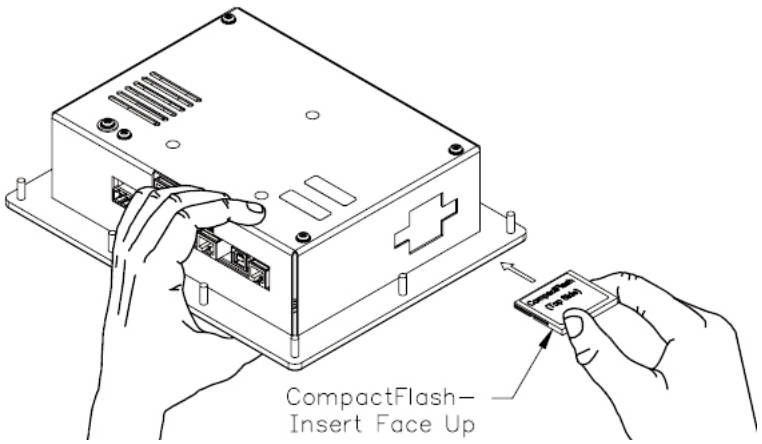
- The unit must have "bin" build of 687 or higher. The "bin" build can be found when the operator interface is initially powered up on Red Lion Controls splash screen.
- Any FLX sent out after 11/01/2009 does have "bin" build 687 or higher. However any FLX that was sent out prior to 11/01/2009 the "bin" build must verified to determine if the operator interface can be upgraded and/or restored via CompactFlash card.
- Note: The "bin" build will be 195 higher than the Crimson 2.0 software build. For example, if the program was initially downloaded with Crimson 2.0 build 492 then "bin" build of the unit will be 687.
- A Compact Flash card formatted to the FAT16 file system using the Red Lion formatting software avalable at the Red Lion web site.
- CompactFlash reader.

1 **Use a CompactFlash reader to copy the following files in the root directory of the CompactFlash card.**

DBASE.cdi
g306.bin
g306.ldr
g306.rom

2 **Turn OFF power to the operator interface. If the operator interface is a remote interface, unplug the network connection to the operator interface** to avoid IP address conflicts when the application runs.

3 **Insert CompactFlash card into the CompactFlash slot of the operator interface. The CompactFlash card slot is located on the side of the unit. Align the pins and gently push the card into the slot until it is firmly in place. Forcing the card in may bend the internal pins.**



(Continued)

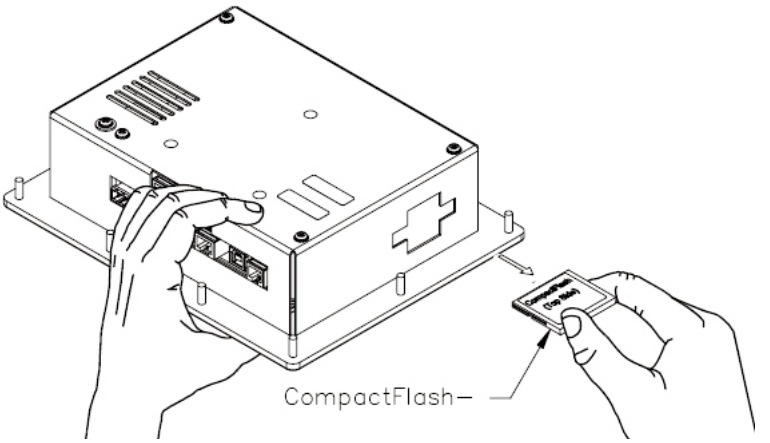
Restore Operator Interface Program Using CompactFlash Card (Continued)

4 Turn power on to the operator interface.

- The operator interface will load the firmware from the CompactFlash card.
- The operator interface will load the application from the CompactFlash card.
- The operator interface will return to its normal operation.

5 Once the application is running, power down the operator interface.

6 Remove the CompactFlash card.



7 Turn power on to the operator interface.

8 The IP addresses will need to be changed if the operator interface is a remote operator interface and/or custom addresses were used. Procedure for changing IP addresses can be found in this User Guide. *See Installation: Changing Network Addresses for Main and Remote Operator Interfaces.*

9 If the network connection was unplugged from the operator interface, plug in the network connection.

Save and Restore FLX Configuration and Settings Via Compact Flash

These steps allow you to save your FLX-128 configuration and settings to a Compact Flash card installed into the Red Lion HMI.

1 **Power off the Red Lion display by removing the power plug on the bottom of the display.**

2 **Insert a Compact Flash card into the CF slot on the side of the display and plug the power cord back in.**

✎ **NOTE:** Conair recommends you save the data to the Compact Flash card twice to make sure that all data is saved.

3 **Press the Create Files button to create the two files needed to store the backup data.** (names.csv and settings.csv located in the root directory of the CF card.)

4 **Press the Save Data button to backup the FLX names and settings.** This replaces any old data and typically takes about 10 seconds.

5 **Press the Check Files button to read the saved data.** The FLX type and the first two device names will be displayed along with the date and time the file was created.

6 **Press the Safely Remove. . . button to remove the Compact Flash. Power off the HMI before reinserting the Compact Flash card.**

To restore the data, press the Check Files button first. Then if the file is correct, press the Restore button.

The Delete Files button will delete both backup files.

FLX-128 backup files are not compatible with older FLX controllers.

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.

Expansion Box IP Addresses

The IP address of each expansion box is set by using the dip switches located on the Wago 750-871 PLC.

This is the layout of the IP addressing for the Ethernet expansion of the FLX conveying system. It doubles the number of pumps from 20 to 40. It also doubles the number of loaders from 64 to 128 and the number of sources from 128 to 256. Each enclosure contains at least one PLC that determines the type of box it is. A unique IP address determines the type of box and the available I/O determines if the box type is valid.

Box Type/Number		IP address
Pump Box 1	Pumps 21-24	10.1.61.201
Pump Box 2	Pumps 25-28	10.1.61.202
Pump Box 3	Pumps 29-32	10.1.61.203
Pump Box 4	Pumps 33-36	10.1.61.204
Pump Box 5	Pumps 37-40	10.1.61.205
8 Loader Box 1	Loader 65-72	10.1.61.211
8 Loader Box 2	Loader 73-80	10.1.61.212
8 Loader Box 3	Loader 81-88	10.1.61.213
8 Loader Box 4	Loader 89-96	10.1.61.214
8 Loader Box 5	Loader 97-104	10.1.61.215
8 Loader Box 6	Loader 105-112	10.1.61.216
8 Loader Box 7	Loader 113-120	10.1.61.217
8 Loader Box 8	Loader 121-128	10.1.61.218
Combo Box 1	Loader 65-72 / Opt1 129-136 Opt2 161-168	10.1.61.221
Combo Box 2	Loader 73-80 / Opt1 137-144 Opt2 169-176	10.1.61.222
Combo Box 3	Loader 81-88 / Opt1 145-152 Opt2 177-184	10.1.61.223
Combo Box 4	Loader 89-96 / Opt1 153-160 Opt2 185-192	10.1.61.224
Combo Box 5	Loader 97-104 / Opt1 193-200 Opt2 225-232	10.1.61.225
Combo Box 6	Loader 105-112 / Opt1 201-208 Opt2 233-240	10.1.61.226
Combo Box 7	Loader 113-120 / Opt1 209-216 Opt2 241-248	10.1.61.227
Combo Box 8	Loader 121-128 / Opt1 217-224 Opt2 249-256	10.1.61.228
Source Box 1	Opt1 129-136 Opt2 161-168	10.1.61.231
Source Box 2	Opt1 137-144 Opt2 169-176	10.1.61.232
Source Box 3	Opt1 145-152 Opt2 177-184	10.1.61.233
Source Box 4	Opt1 153-160 Opt2 185-192	10.1.61.234
Source Box 5	Opt1 193-200 Opt2 225-232	10.1.61.235
Source Box 6	Opt1 201-208 Opt2 233-240	10.1.61.236
Source Box 7	Opt1 209-216 Opt2 241-248	10.1.61.237
Source Box 8	Opt1 217-224 Opt2 249-256	10.1.61.238
16 Loader Box 1	Loader 65-80	10.1.61.241
16 LoaderBox 2	Loader 81-96	10.1.61.242
16 Loader Box 3	Loader 97-112	10.1.61.243
16 Loader Box 4	Loader 113-128	10.1.61.244

NOTE: The 4th octets 221-228 replace both 211-218 and 231-238. So if you add 10.1.61.221 you must not have 10.1.61.211 or 10.1.61.231.

NOTE: Each 16 Loader box replaces 2 of the 8 Loader boxes and any combo boxes associated with these loaders.

NOTE: Each PLC has two Ethernet ports so they can be daisy chained together. The chain length limit is 20 PLC including the main PLCs. Do not connect the last PLC's 2nd port back to the switch. This will cause the N-Tron switch to crash.