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USER GUIDE

UGC061-0117

# FLX-128 Plus

## Central Loading Control Software Rev. 6


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: UGC061-0117

Serial Number(s):

Model Number(s):

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# Introduction

# Purpose of the User Guide

This User Guide describes the Conair FLX-128 Plus and explains step-by-step how to install, operate, maintain, and repair 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 or a situation.

❒ 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 view 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

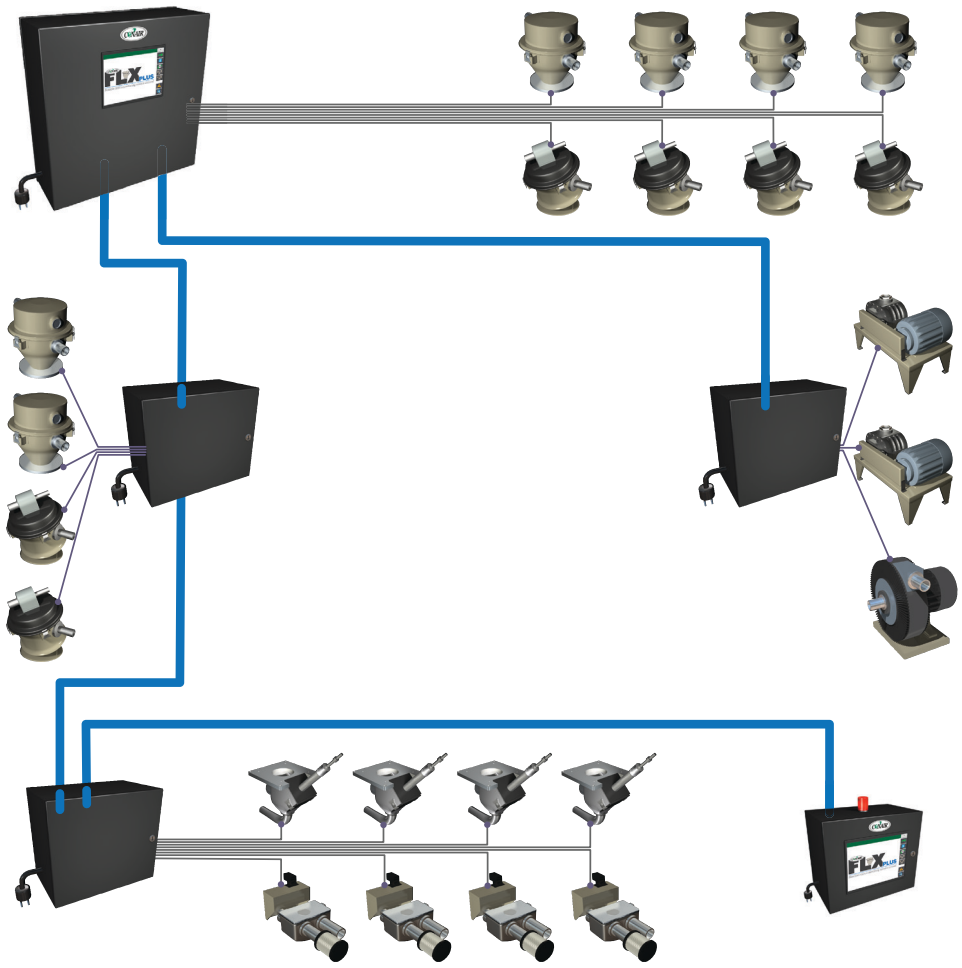
# Description

# What is the FLX-128 Plus Control?

The FLX-128 Plus 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, air operated discharge, MVP, ILP, and R-PRO. A color touch screen provides an intuitive, easy to read and easy to use graphical interface with on board help and diagnostic screens.

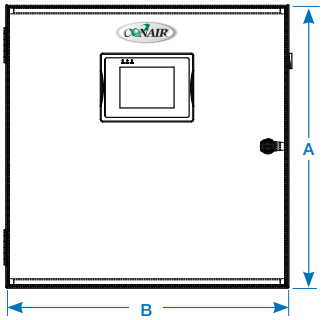
# Typical Applications

- 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.

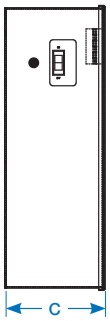


# Specifications:

**Main control panel and Remote I/O**

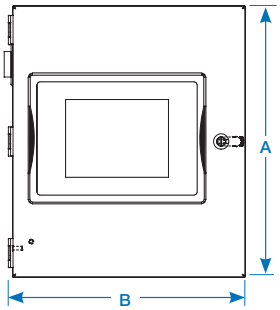



Front View

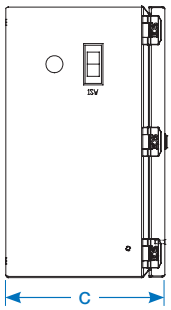



Side View

**Remote HMI and Expansion Panels**




Front View




Side View

| Model | FLX-128 Plus |
|---|---|
| **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 8202 |
| Remote I/O | Wago 750-871 |
| Operator interface | Red Lion (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 | Ratio Valve expansion panel | R-PRO Pump/ VFD expansion panel | R-PRO Valve 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 | - | - | up to 4 | - |
| Valves | up to 64 | up to 64 | - | - | up to 16 | up to 16 | - | up to 8 |

| 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} |

| **Maximum number of expansion panels (per panel type) ‡** | |
|---|---|
| Main control panel | 1 panel maximum (32 loaders and 64 valves each – with or without HMI)* |
| Remote I/O panel | 1 panel maximum (32 loaders and 64 valves each – with or without HMI)* |
| Receiver expansion panel | 8 panels maximum (8 loaders each, or 16 loaders each with no options) |
| Pump expansion panel | 5 panels maximum (4 pumps each) |
| Source valve expanison panel | 8 panels maximum (16 valves each) |
| Receiver/valve combo expansion panel | 8 panels maximum (8 loaders and 16 valves each) |
| Pump/VFD expansion panel | 5 panels maximum (4 pumps each – required for R-PRO) |
| R-PRO valve expansion panel | 8 panels maximum (8 devices and 16 valves each) |

**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. Consult with a Conair representative for the most current information.

SECTION
3

# Installation

# Unpacking the Boxes

The FLX-128 Plus 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-128 Plus, 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-128 Plus components from their 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-128 Plus 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 (main).** 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.

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

❒ 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.

**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 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-128 Plus

**CAUTION:**

Always disconnect and lock out the main power sources before making electrical connections. Electrical connections should be made only by qualified personnel.

Installation of the FLX-128 Plus 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.

**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.



# Wiring Considerations

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

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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-128 Plus 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.

(Continued)

**NOTE:** Conair recommends the use of shielded, twisted, paired, and bundled Ethernet cables.

If fiber optic cable is being used, Conair recommends the use of B9B045 Distribution Plenum Series Belden fiber optic cables.

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.

# Wiring Considerations (continued)

– Avoid running communication cable across power feed lines. If you must run cable across power lines, run the cable at right angles to the line. Keep the cable at least 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 (Main Panel)

**⚠ 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.

The FLX-128 Plus 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.

# Mounting Optional Panels and Enclosures

**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.


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.

# 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 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-128 Plus 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 Plus 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:
   - Providing the proper number of I/O cards to operate the devices in the system (receivers, pumps, etc).
   - 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.

**TIP:** Wiring Instructions are available in the "Setup Wizard" as part of the FLX-128 Plus Control.



Secure over touch screen panel with tape

**DO NOT REMOVE THIS LABEL**
UNTIL THE CONTROL IS READY TO BE USED

# VIEW WIRING INSTRUCTIONS ON THIS SCREEN


INSTRUCTIONS:

1. Mount the control box in the intended location.
2. Thoroughly clean inside of box.
3. Supply 115 VAC power to the control box.
4. Turn on the control.
5. Press the touch screen to select "Set-up Wizard":
   a. Press
   b. Press ADV
   c. Press SETUP WIZARD and follow guidelines.

Conair service support:
800-458-1960

Secure over touch screen panel with tape

# 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-128 Plus 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:
  - 8 Receivers (up to 8 panels may be included),
  - 4 Pumps (up to 5 panels may be included),
  - 16 Source valves (up to 8 panels may be included),
  - Combination Module designed for 8 receivers and 16 source valves (up to 8 panels may be included).
  - 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. 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.

# FLX-128 Plus Initial Setup

Prior to operation the FLX-128 Plus 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.

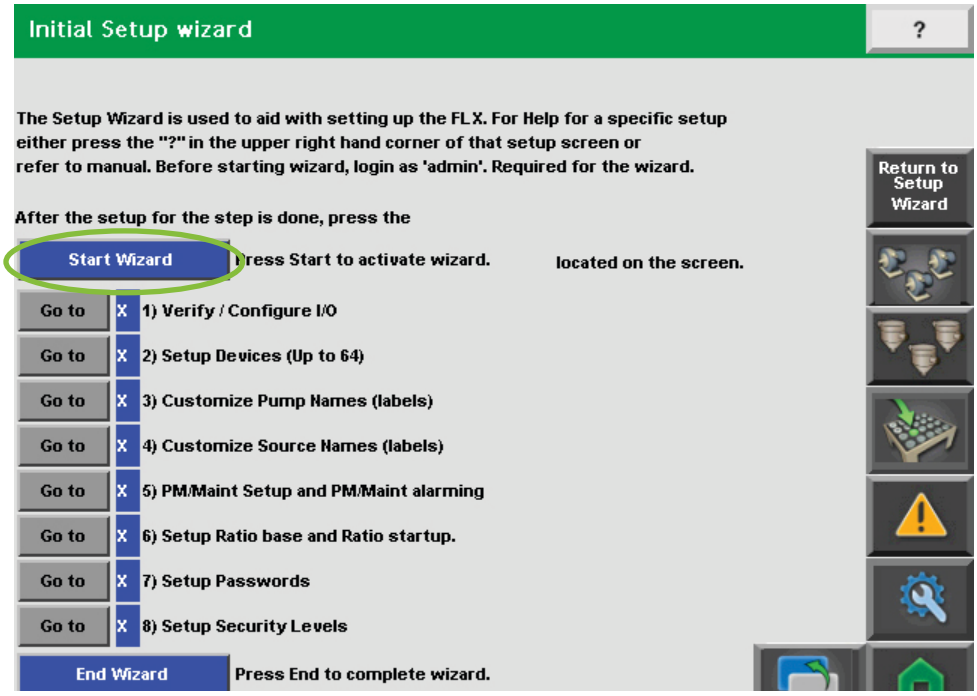


## Using the Setup Wizard



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-128 Plus.**
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.

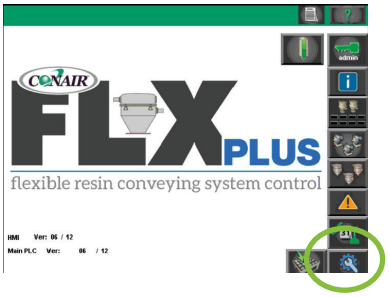



**TIP:** If at any point of the Setup Wizard you are unsure what to do, click on the Help button at the top of the screen. Each screen has a detailed help page to aide in determining what settings to enter.

**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".** *Refer to Using the Setup Wizard in the Operation Section of this manual* for more information.

# 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-128 Plus.**

2 **Wait for the control to initialize.** The control will check the I/O connected during the bootup and initialization process. This will take up to 10 seconds.


3 **From the main screen, select "Setup".**

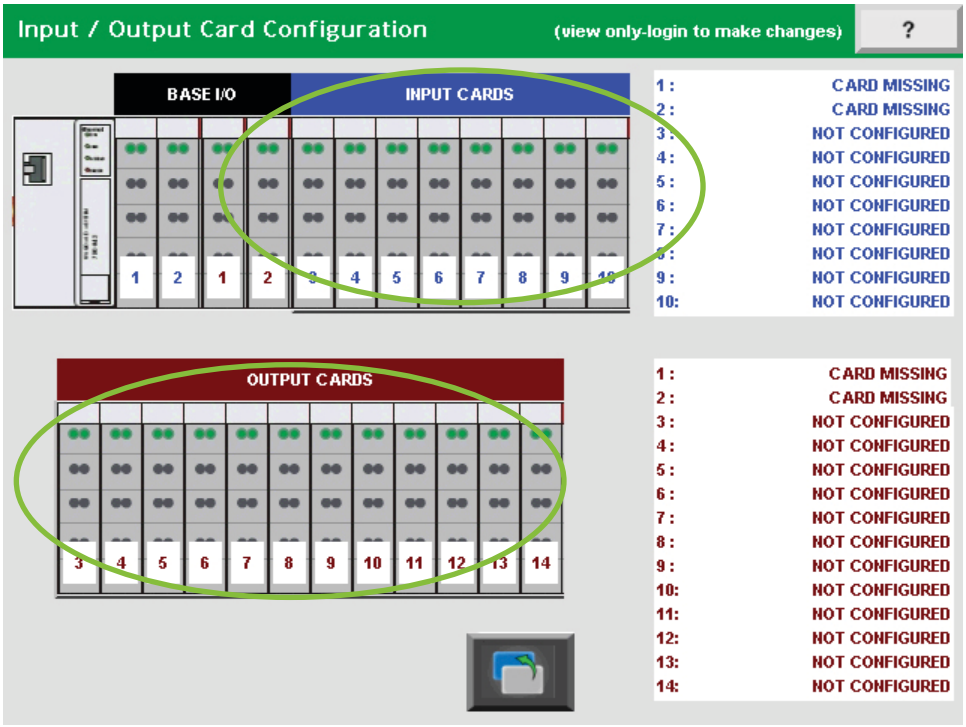
4 **From the Setup screen, select "Advanced Setup".**


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.)

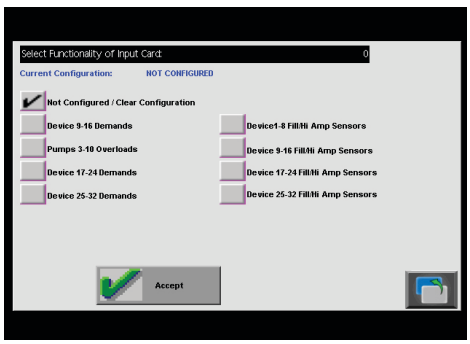

7 **Select "Configure I/O".**

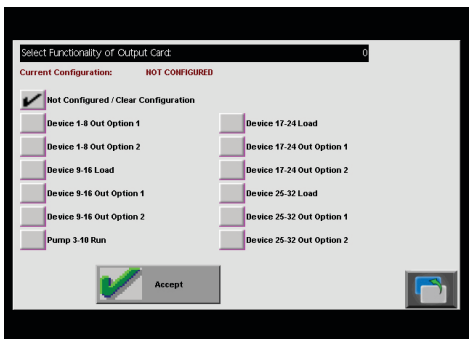
8 **From the Configure I/O screen, press the INPUT or OUTPUT card to be configured.**




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

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




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

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

# Configuring Remote I/O and Expansion I/O Modules

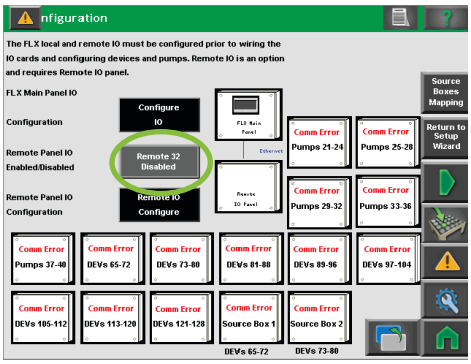
Configure Remote I/O only if the Remote I/O is required for your current system needs and has been included with the FLX-128 Plus system. The Remote I/O of the FLX control will need to be configured prior to wiring loaders, pumps, and valves. The FLX Remote base I/O is not configurable. All additional I/O is configurable to customize the FLX to loading system requirements.

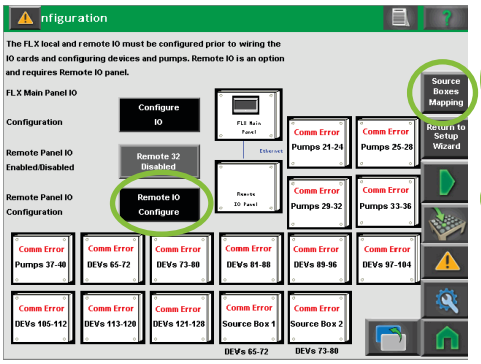
**NOTE:** If you have utilized the setup wizard, you have already configured the remote I/O and expansion modules. *See Installation: Using the Setup Wizard for more information.*

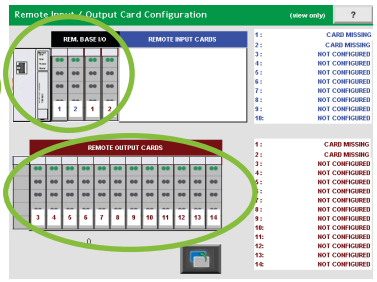


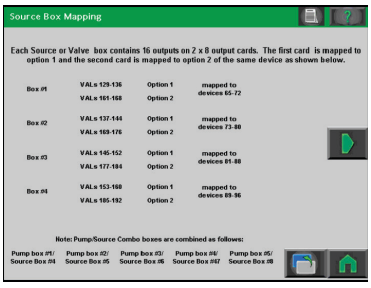



1. **Provide power to the FLX-128 Plus.**
2. **Wait for the control to initialize.** The control will check the I/O connected during the boot-up and initialization process. This will take up to 10 seconds.
3. **From the main screen, select "Setup".**
4. **From the Setup screen, select "Advanced Setup".**
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.**

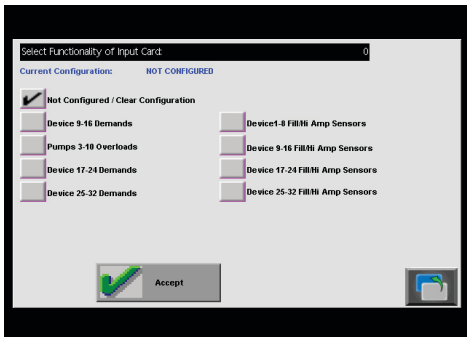


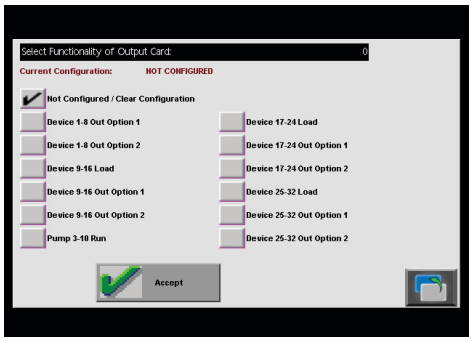




9. **From the I/O Configure screen, press the INPUT or OUTPUT card to be configured.**
10. **From the card configuration screen, select how the card will be configured.**




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

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-128 Plus 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 24 VDC 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-128 Plus 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-128 Plus

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 bootup and initialization process. This will take up to 10 seconds.

# Customizing Network Connections

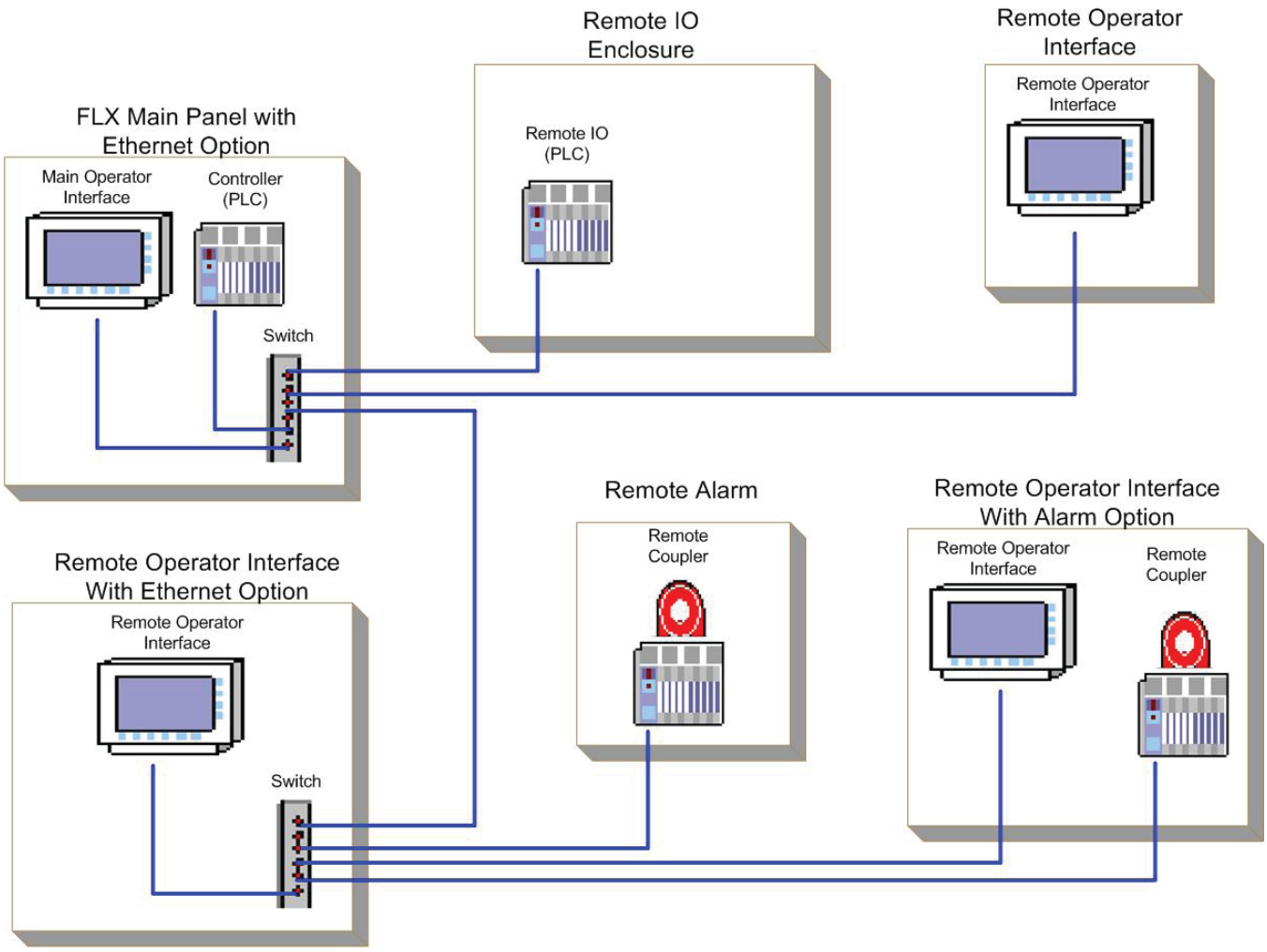
## Overview of FLX-128 Plus System Network

The FLX-128 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-128 Plus system networked:






(Continued)

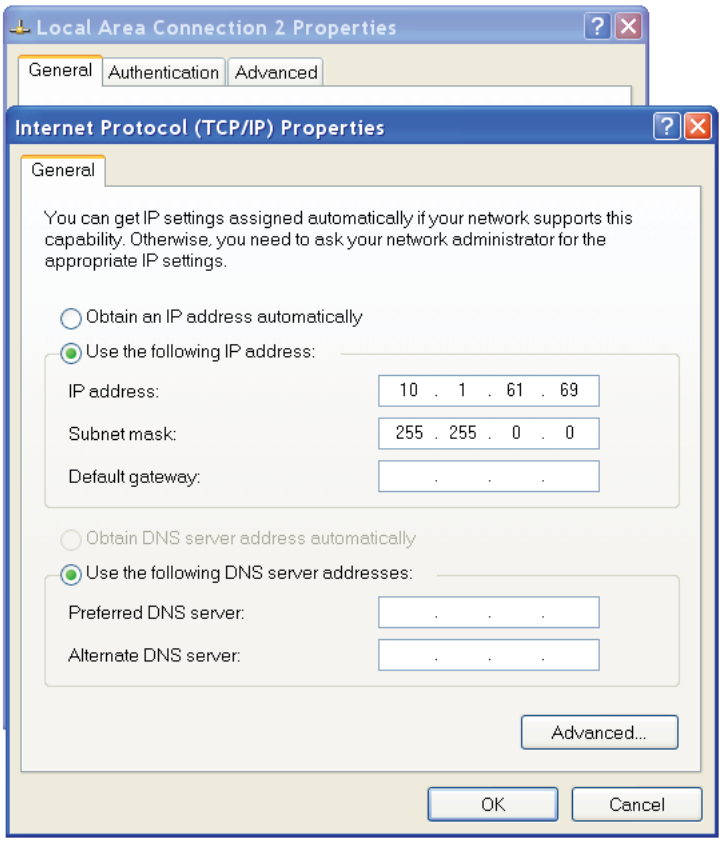
# Customizing Network Connections
## (continued)
## Conair Default Network Addresses

**NOTE:** Conair recommends using a NAT device if more than one system is connected.

| Hardware | IP Address | Subnet Mask | Gateway |
|---|---|---|---|
| Controller (PLC) | 10.1.61.1 | 255.255.0.0 | 0.0.0.0 |
| Main Operator Interface | 10.1.51.2 | 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 |
| Smart Bob | 10.1.61.101 | 255.255.0.0 | 0.0.0.0 |
| ILP Boxes | 10.1.61.131 to 10.1.61.146 | 255.255.0.0 | 0.0.0.0 |
| R-PRO Pumps | 10.1.61.156 to 10.1.61.160 | 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 |

**NOTE:** Depending on your computer's operating system, the method for checking network connections could be different.

# Changing Network Addresses for FLX-128 Plus Controller PLC and/or FLX Remote I/O Controller (Wago 8202)

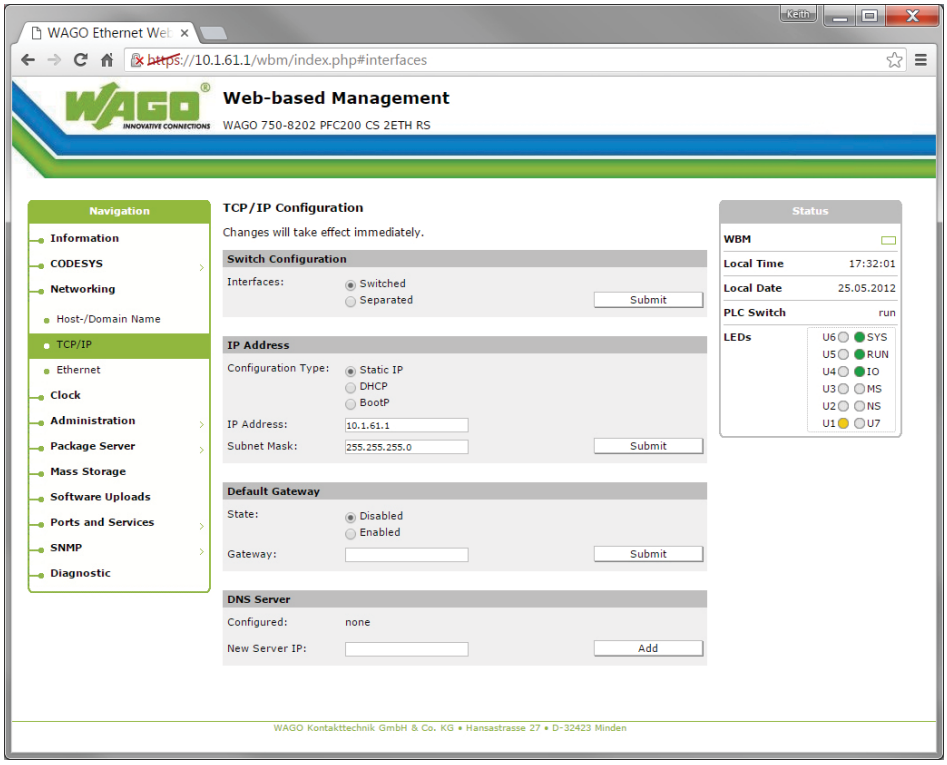



1. **Verify that the PC to be connected is on the same network as the FLX-128 Plus controller.** This can be done by looking at Control Panel - Network Connections - Local Area Connection.
2. **Connect the PC to the FLX system network using an Ethernet cable.** A spare Ethernet port can be found in the main cabinet.
3. **Once the PC is connected, open up an Internet browser on the PC.** Conair recommends using the Chrome browser.
4. **In the address bar type http://{current IP address of FLX controller}.** Example: http://10.1.61.1

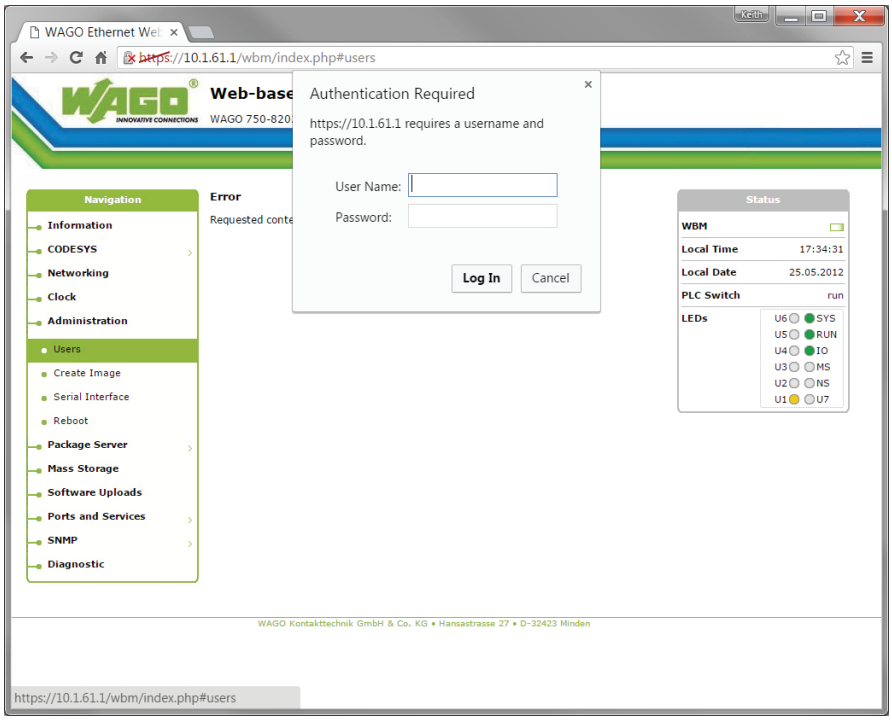
(Continued)

# Changing Network Addresses for FLX-128 Plus Controller PLC and/or FLX Remote I/O Controller (Wago 8202)
**(continued)**

**NOTE:** Conair recommends the use of the Chrome browser for this procedure.




1. **From the Navigation menu, select TCP/IP.**
2. **When prompted for User name enter "user" and password "user".**
3. **Enter the new network addresses (IP-Address, Subnet Mask, Gateway).**
4. **Once the new addresses are entered, press the Submit button.**
5. **When prompted for User name enter "user" and password "user".**
6. **Close the web browser.**
7. **Cycle power to the FLX-128 Plus controller** (The TCP/IP parameters are stored in an EEPROM and changes will take effect after the next software or hardware reset.)

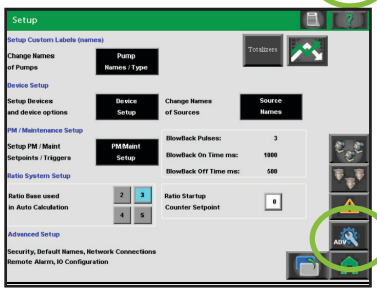



**NOTE:** The operator interface communication path to controller (PLC) will have to be changed in all operator interfaces.

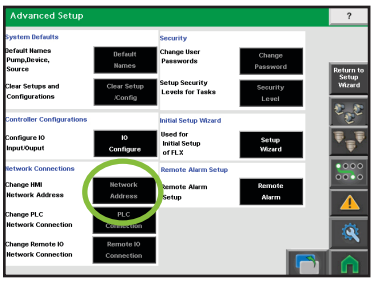

# Changing Network Addresses for Main and Remote Operator Interfaces

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

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



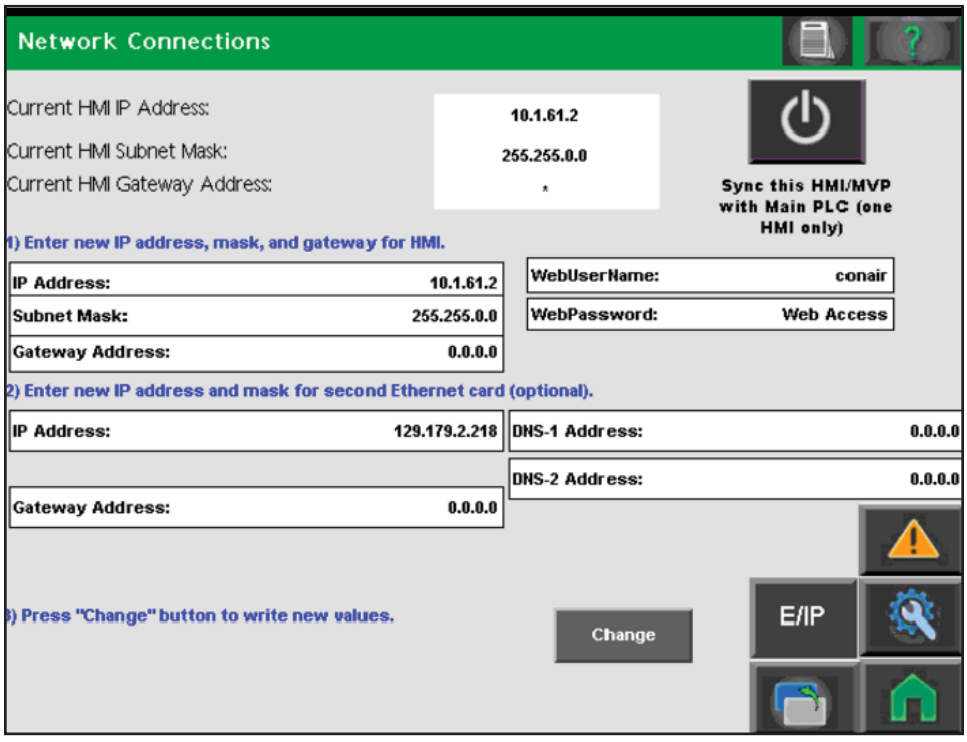

**2** From the Setup screen, press the Advanced Setup button.




**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.

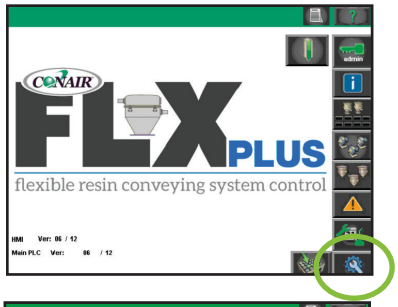


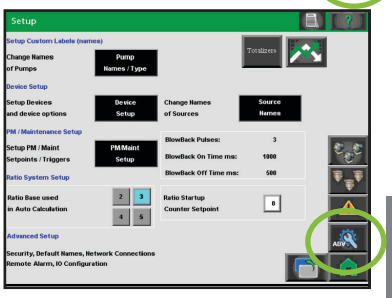
# Changing Operator Interface Communication Path to Remote I/O Controller (PLC)

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.

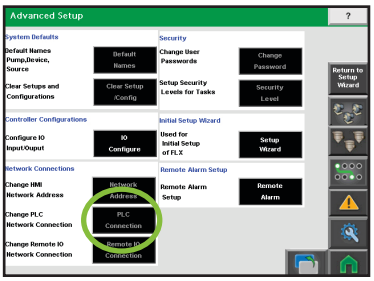
**2** From the Setup screen, press the Advanced Setup button.



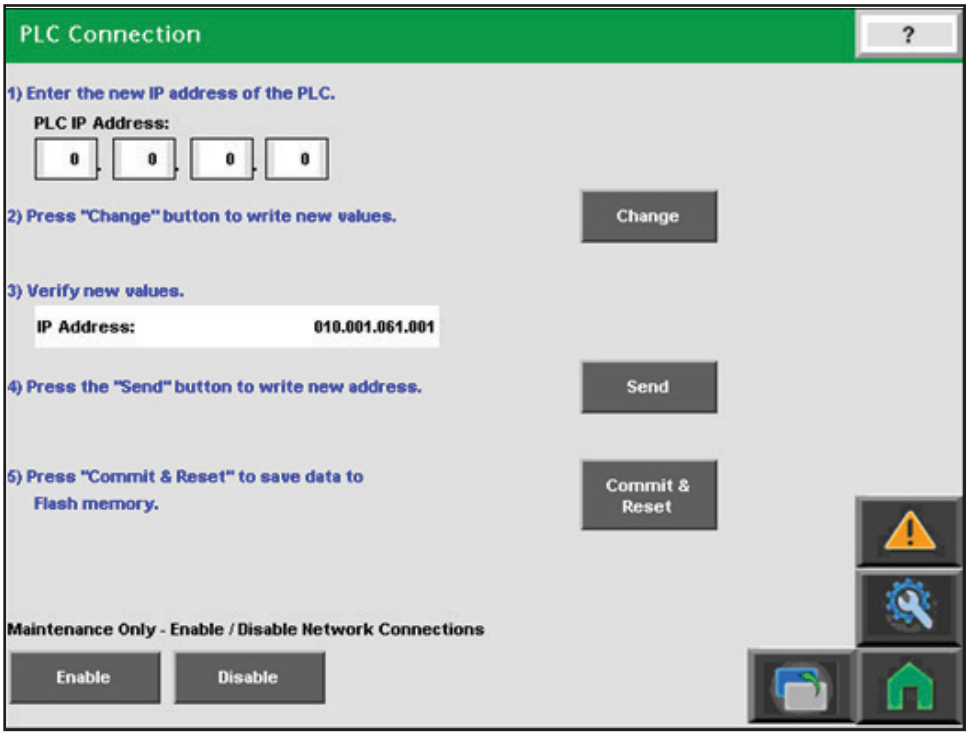




**3** Login as admin then press the Remote I/O Connection button.

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

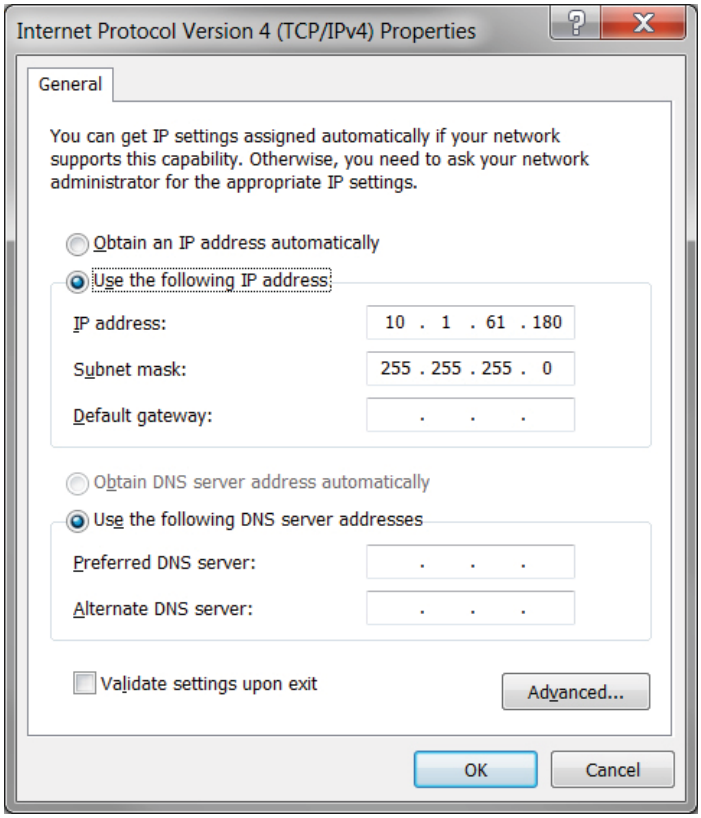



**NOTE:** The operator interface communication path to controller (PLC) will have to be changed in all operator interfaces.

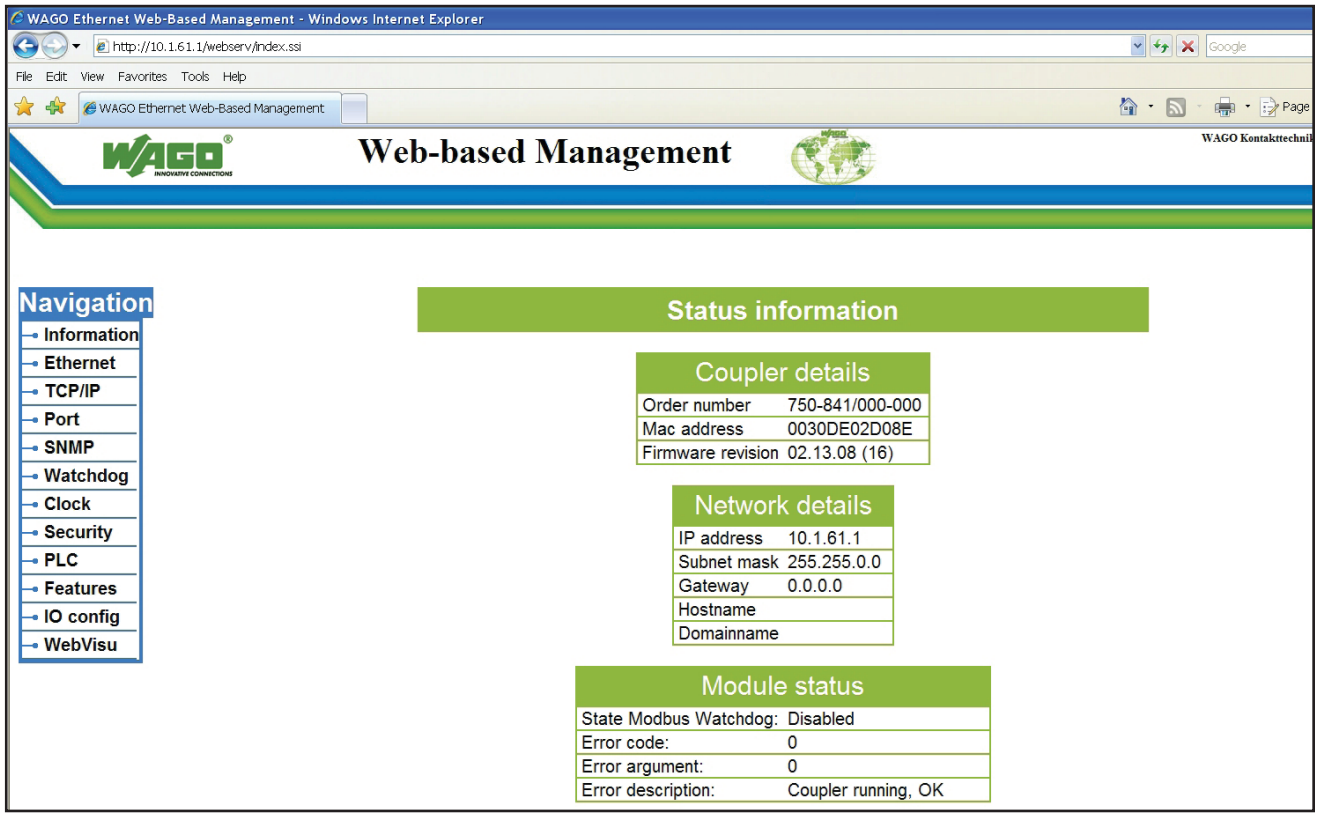


**NOTE:** Depending on your computer's operating system, the method for checking network connections could be different.

# Changing Network Addresses for Remote Alarms (Wago 352)




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 your web browser on the PC.** Chrome is the recommended web browser. Some features do not work on other browsers and buttons may not show up at all.
4. **In the address bar type http://{current IP address of FLX controller}.** Example: http://10.1.61.1



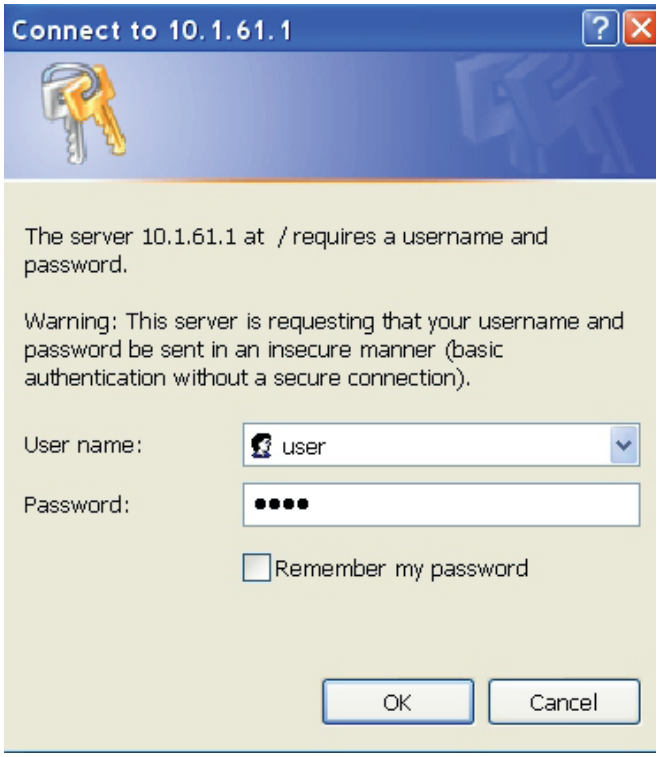



(Continued)

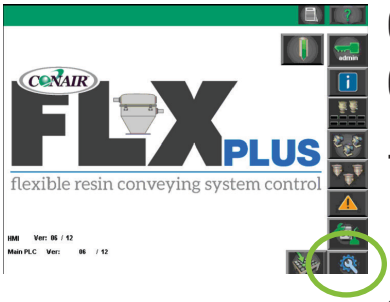
# Changing Network Addresses for Remote Alarms (Wago 352) (continued)

1. **From the Navigation menu, select TCP/IP.**
2. **When prompted for User name enter "user" and password "user".**
3. **Enter the new network addresses (IP-Address, Subnet Mask, Gateway).**
4. **Once the new addresses are entered, press the Submit button.**
5. **When prompted for User name enter "user" and password "user".**
6. **Close the web browser.**
7. **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.

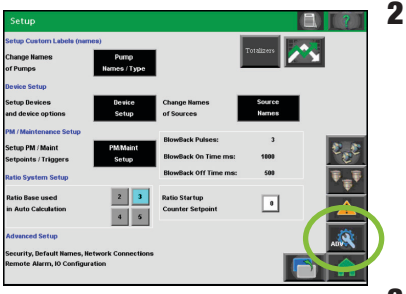



| Configuration Data | |
|---|---|
| IP-Address | 10.1.61.1 |
| Subnet Mask | 255.255.0.0 |
| Gateway | 0.0.0.0 |
| Hostname | |
| Domain name | |
| DNS-Server1 | 0.0.0.0 |
| DNS-Server2 | 0.0.0.0 |
| (S)NTP-Server | 0.0.0.0 |
| SNTP Update Time (sec, max. 65535) | 3600 |

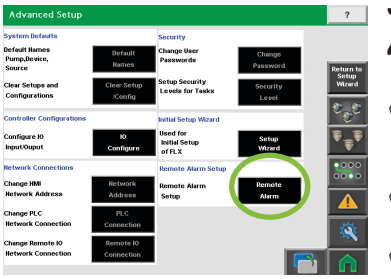



# Changing Operator Interface Communication Path for Remote Alarms

**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.

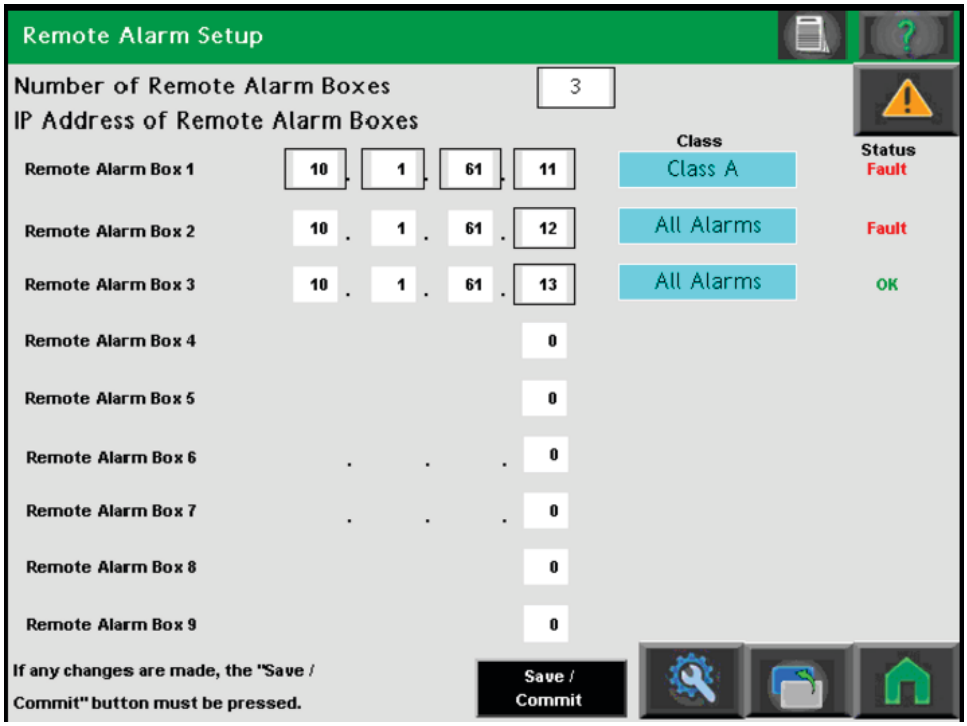
**NOTE:** The 1st, 2nd, 3rd octets are set in Remote Alarm box 1. Remote Alarm boxes 2 through 5 will use the first three octets which were configured for Remote Alarm box 1.

**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* for more information.

**NOTE:** Supports alarms A through H (8 alarms).

**NOTE:** The blue Class A box is selectable and allows you to set the alarm settings for the various boxes.



# Backup/Restore PLC Program

The FLX-128 Plus controller (Wago 8202) 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-128 Plus Controller (PLC) / Remote I/O Controller (PLC) (for WAGO 871 PLCs Only):

✎ **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-128 Plus Controller/PLC via Ethernet.**
2. **Once connected, open a web browser (Conair recommends using Chrome) 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.

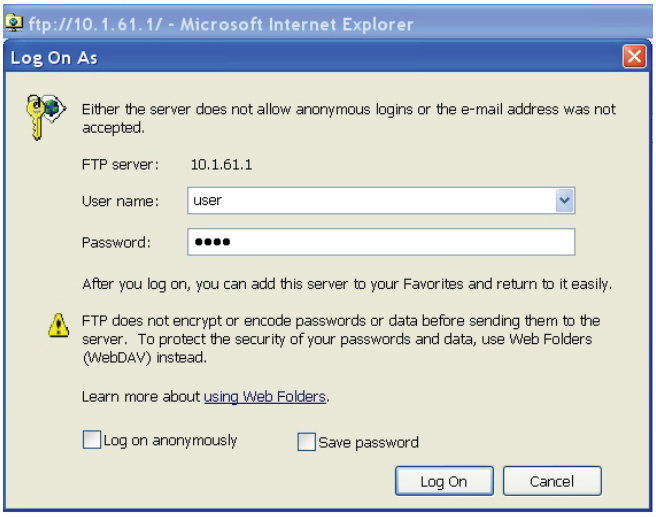
✎ **NOTE:** If IP address has been customized or multiple FLX systems are used, then enter that IP address in replacement of the 10.1.61.1

3. **When prompted for user name and password, enter "user" as username and "user" as password.**
4. **Once the FTP site opens, select Page from the web browser 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. Be sure to wait at least 5 minutes for files to copy.

✎ **NOTE:** Depending on your computer's operating system, the method for opening a connection to an FTP could be different.

(Continued)

# Backup/Restore PLC Program (continued)




**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) (For WAGO 871 PLC Only):

**1** **Connect to the FLX Controller/PLC 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.**


**3** **Once connected, open a web browser (Conair recommends using Chrome) 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

✎ **NOTE:** Depending on your computer's operating system, the method for opening a connection to an FTP could be different.

**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 the web browser 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.

(Continued)

# Backup/Restore PLC Program (continued)

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-128 Plus Program and Settings Backup to SD Card

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.

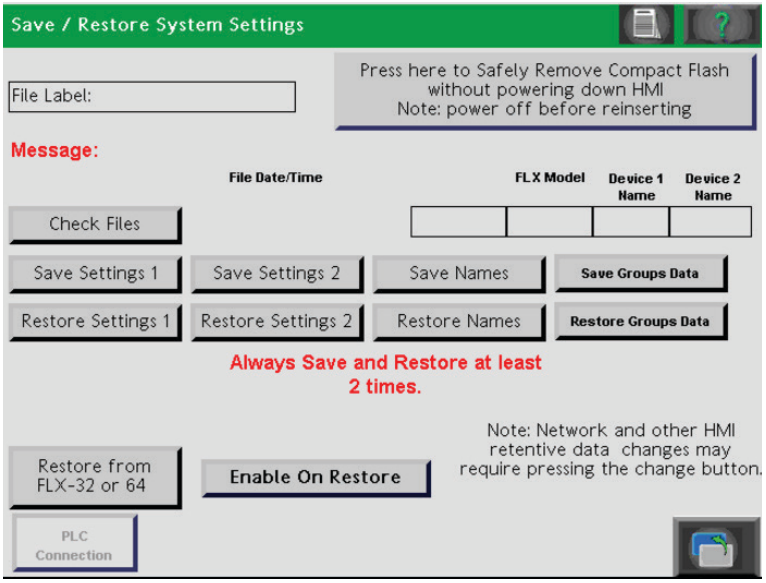


The main program and all settings of the FLX system reside in the WAGO PLC located in the main enclosure box. The program and settings can be backed up to a SD card if the main PLC is a model 8202. Once backed up, the program and settings can be restored easily through an Ethernet connection.

Contact Conair for a backup file and instructions.

# Backup/Restore System Retentive Data to the CF Card in Red Lion

The groups button was moved and replaced with the navigation graphic. A new simplified screen now automatically creates the files needed. It also saves and restores two more files than the last version. The settings 2 file contains the new features of the FLX-128 Plus. The Groups data contains the custom navigation settings.



SECTION
4

# Operation

# Navigating the FLX-128 Plus Control Panel

## The Home screen

The Home screen appears on the touch screen upon energizing the FLX-128 Plus 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.


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

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:


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.

An **Info 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-128 Plus 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-128 Plus 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.

Customers who want to customize the receiver screens now have the opportunity to create groupings of receivers with custom screen and button names. This feature is activated from the purchased options screen. The main selection button is named ‘Groups’ by default but this name can be modified from the purchased options screen also.

Modifying the receiver lists and group button names is restricted to the admin password level and higher. *See Custom Button Setup in this chapter* for more information.

For more information about adding the email option or any other options to your FLX-128 Plus, 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-128 Plus Control Panel

Below is a screen from the FLX-128 Plus 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**
Alphanumeric characters display the name of the current screen.

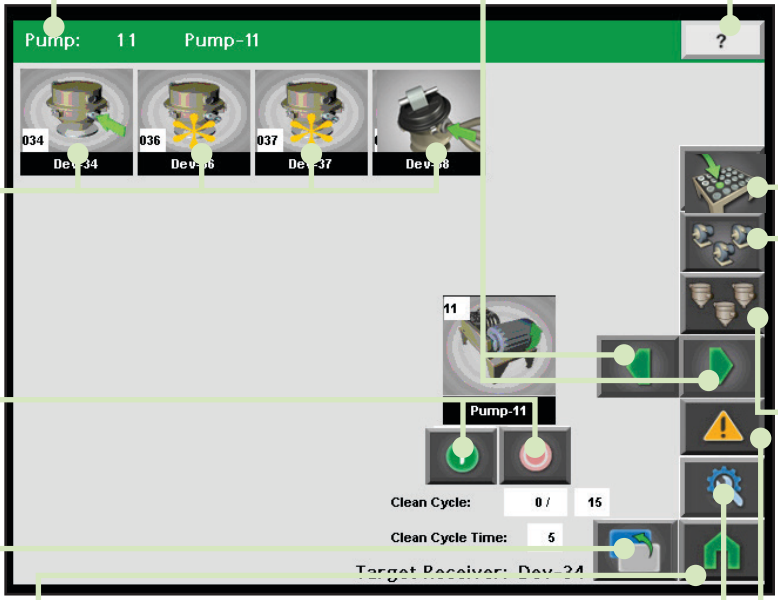
**Previous/Next Buttons**
Go to the previous or next screen.

**Help**
Displays an explanation of the current screen.

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

**Start and Stop**
Press to start and stop the currently selected device.

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




**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

**Home Button**
Goes back to the home screen.

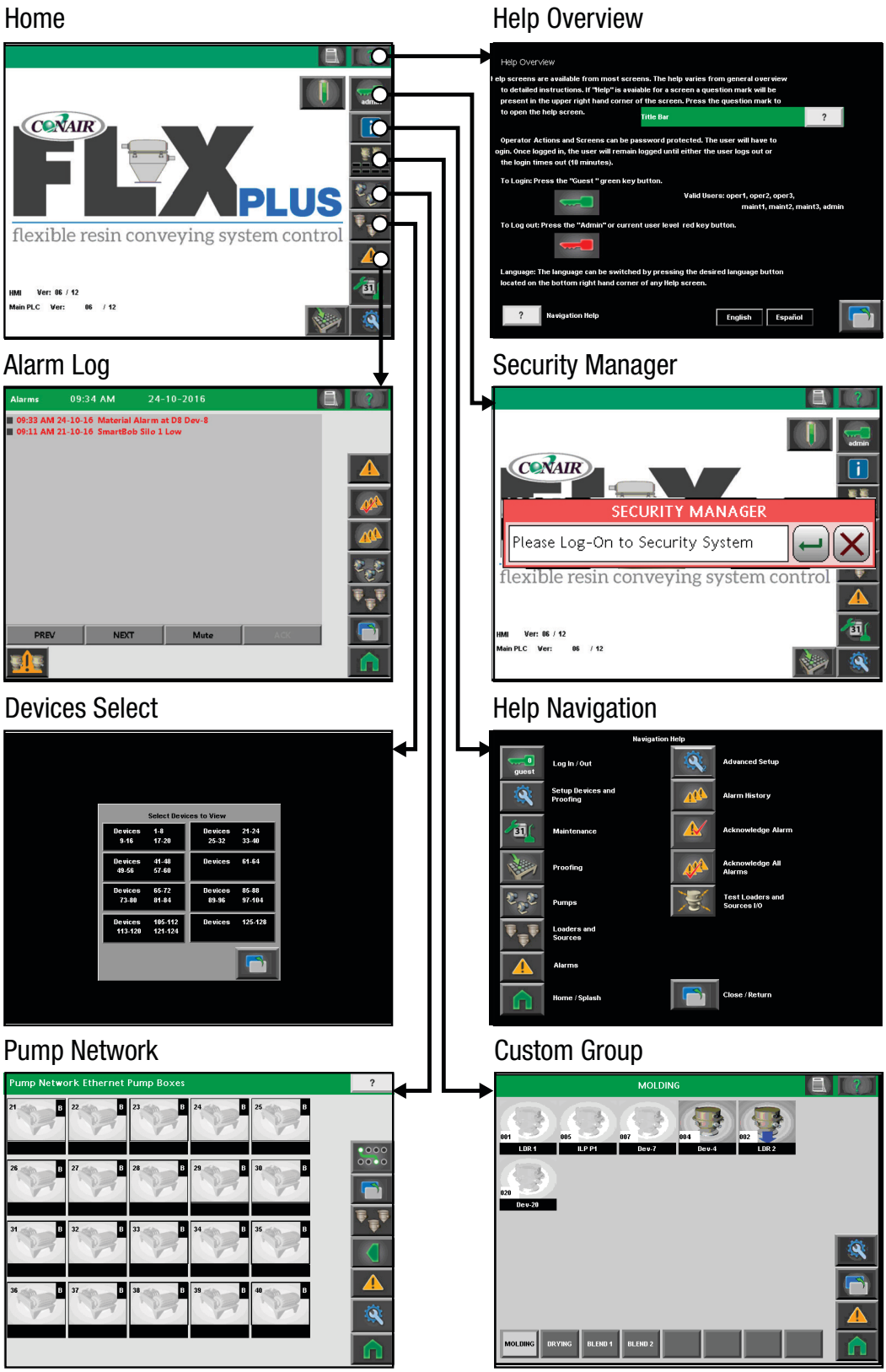
**Setup Button**
Go to the setup screen.

**Alarms Button**
Go to the alarms area

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

# Control Function Flow Charts

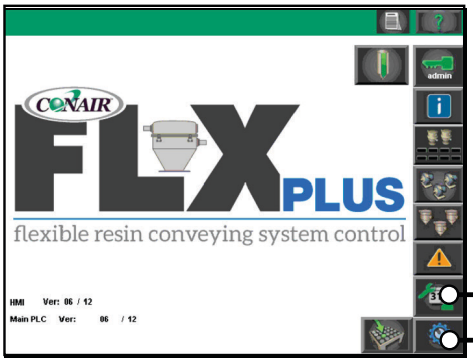
## Home



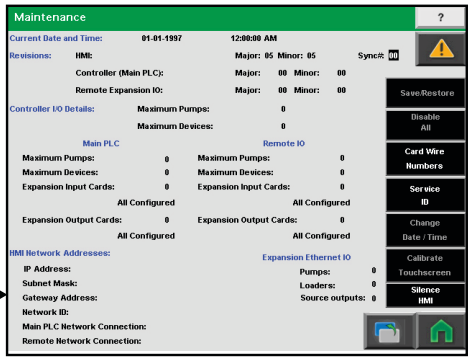

(Continued)

# Control Function Flow Charts (continued)

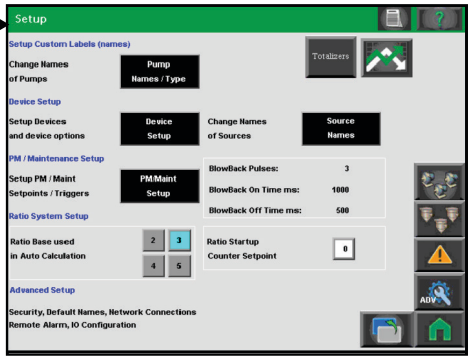
## Home




## Maintenance




## Setup

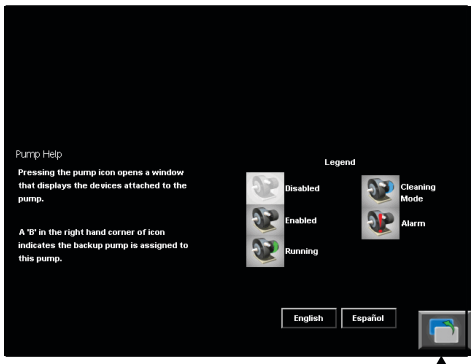



(Continued)

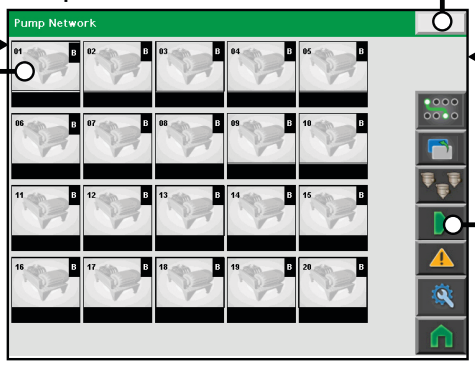
# Control Function Flow Charts (continued)

## Pump

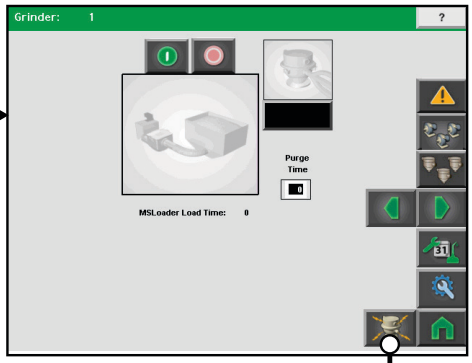
### Pump Network Help



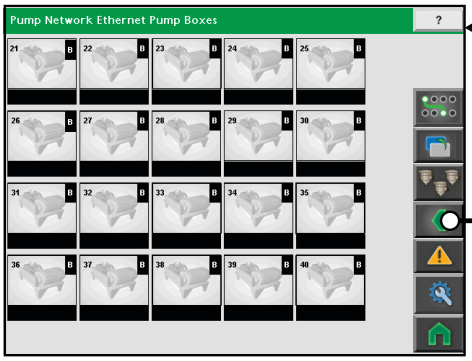

### Pump Network



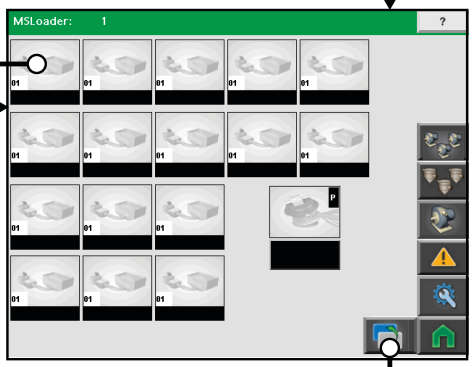

### Individual Device Attached to Receiver



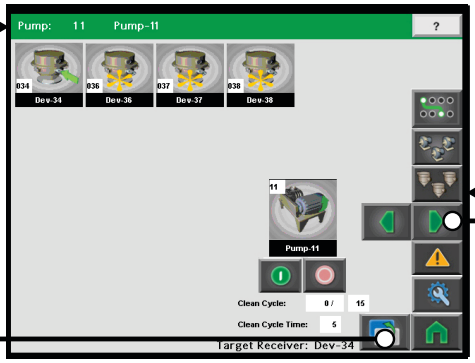

### Pump Network (21-40)



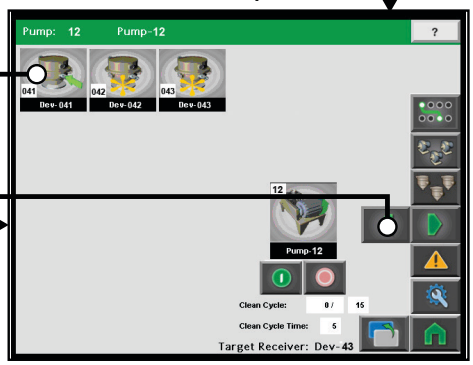

### Receiver Attached to Pump




### Individual Pump




### Next Individual Pump

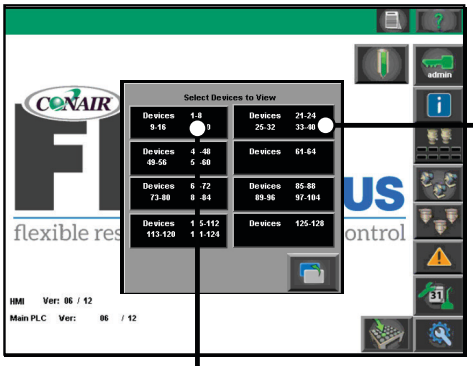



(Continued)

# Control Function Flow Charts (continued)

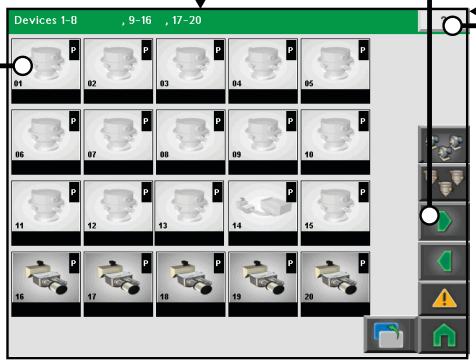
## Device

### Devices Select



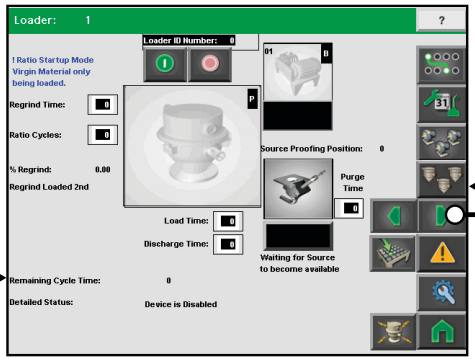

### Next Device Group Page


### Device Group

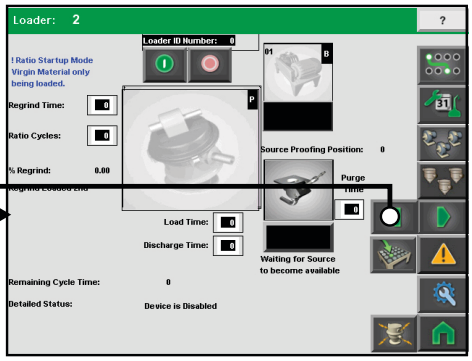



### Device Select Help


### Individual Device




### Next Individual Device

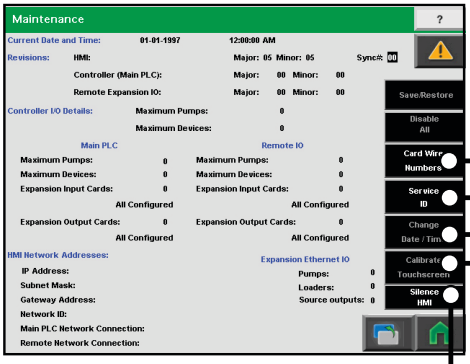



(Continued)

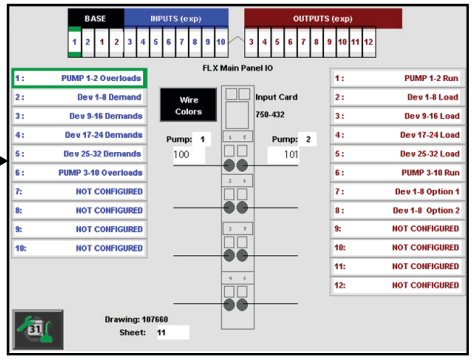
# Control Function Flow Charts (continued)

## Maintenance

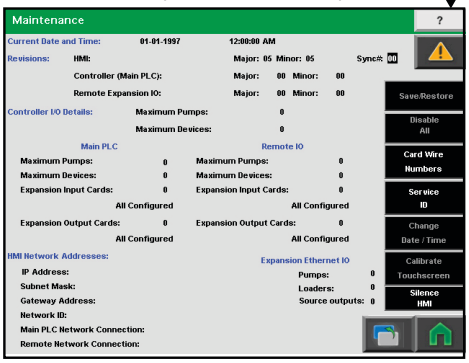
### Maintenance



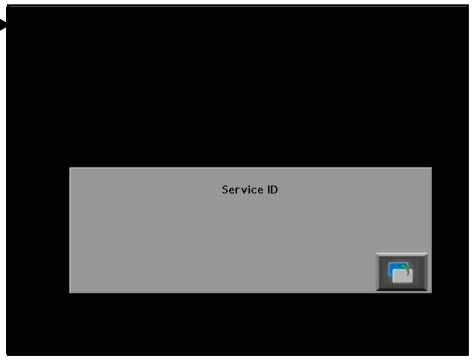

### Cable/Wire Numbers



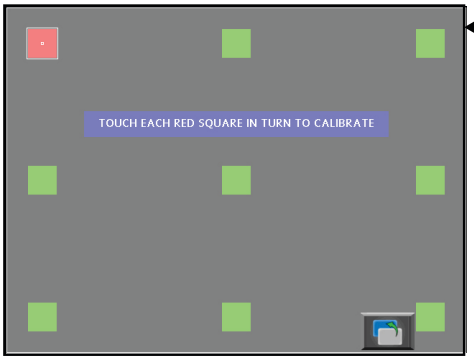

### Silence HMI (Internal Alarm)



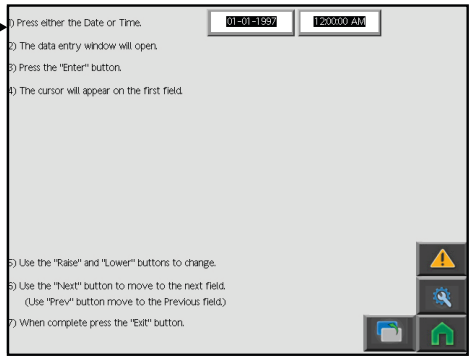

### Service ID




### Touch Calibration




### Change Date and Time

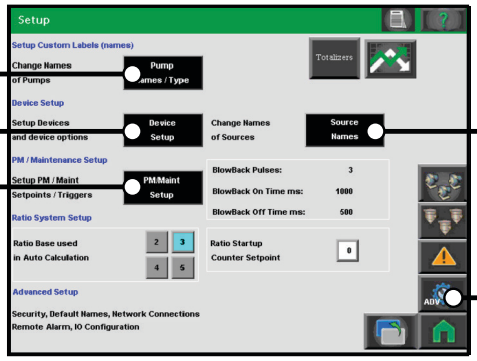




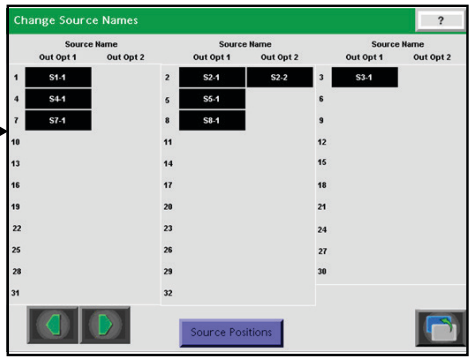

(Continued)

# Control Function Flow Charts (continued)
## Setup

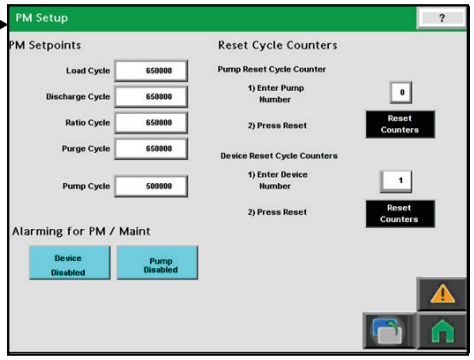
### Setup



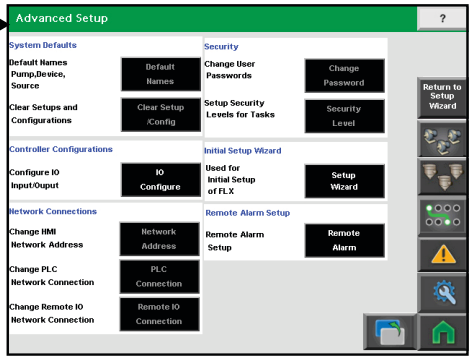

### Source Names



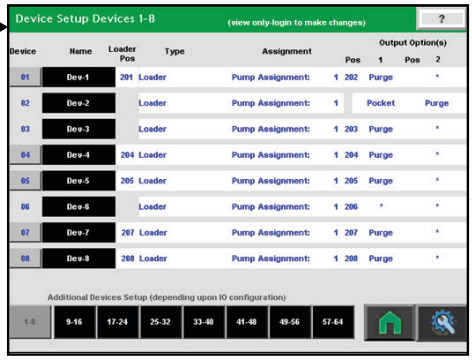

### PM/Maintenance Setup



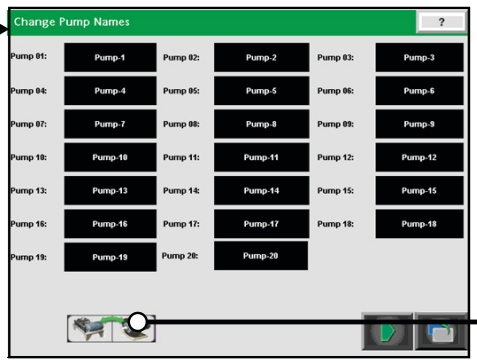

### Advanced Setup



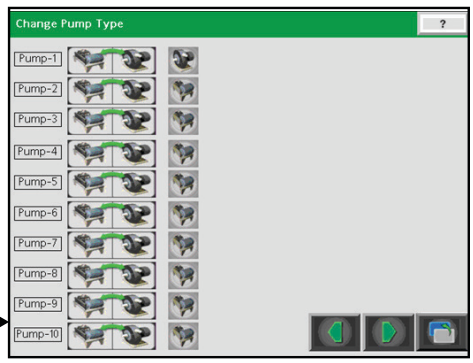

### Devices Setup




### Pump Names




### Pump Types

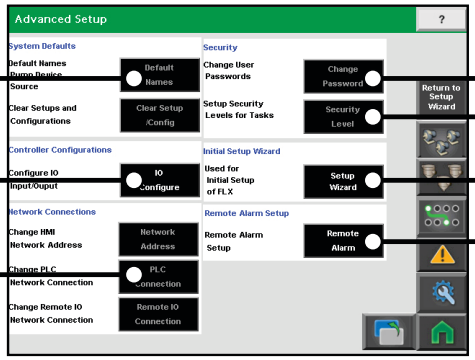



(Continued)

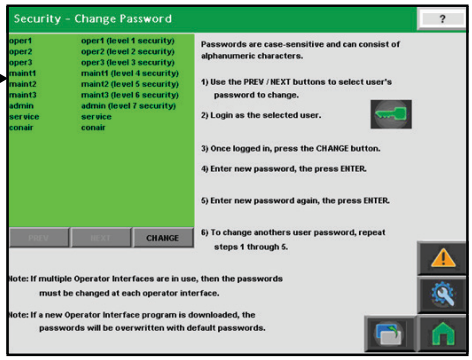
# Control Function Flow Charts (continued)

## Advanced

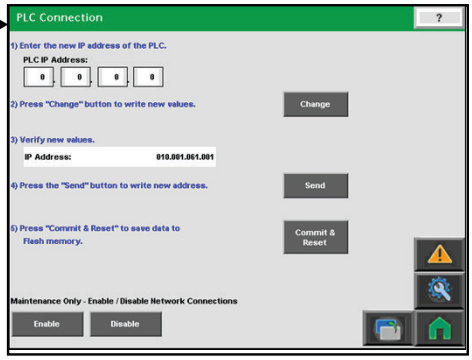
### Advanced Setup



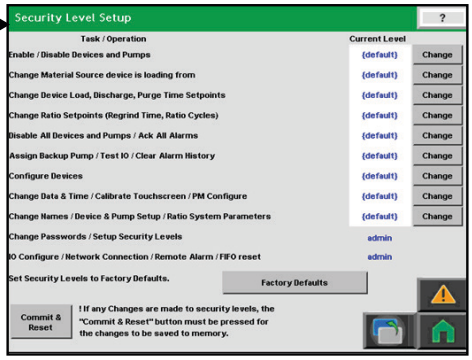

### Change Password



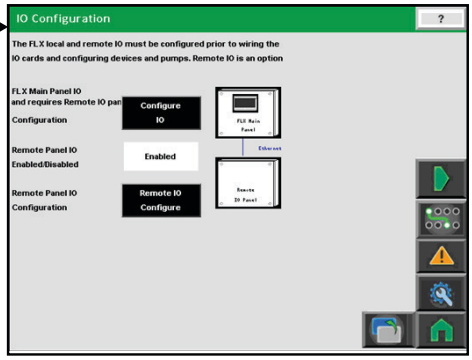

### PLC Connection



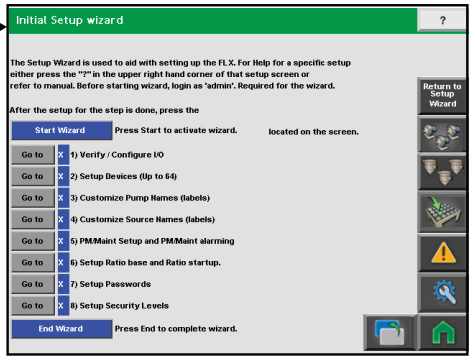

### Security Level



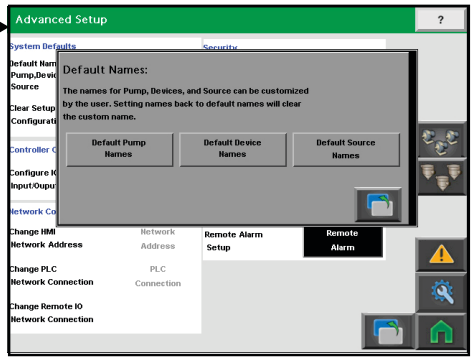

### I/O Configuration



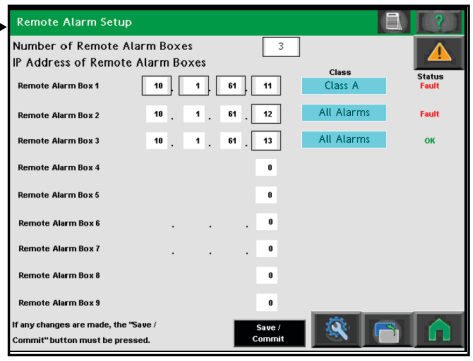

### Setup Wizard




### Default Names



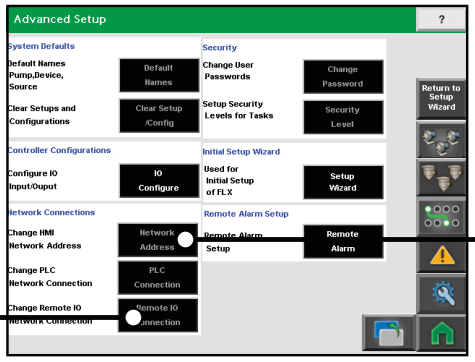

### Remote Alarm



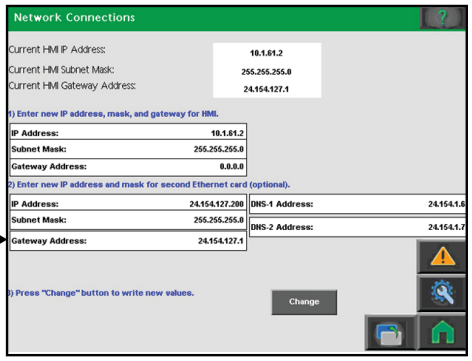

(Continued)

# Control Function Flow Charts (continued)

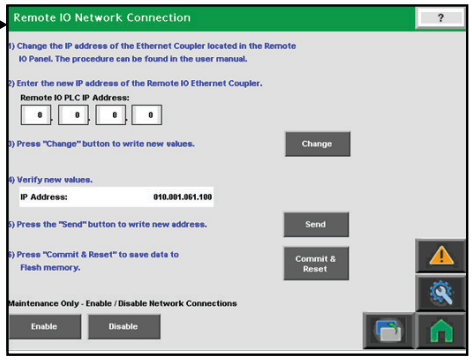
## Advanced Setup




## Network Address

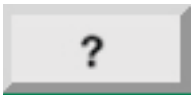



## Remote I/O Connection




(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.

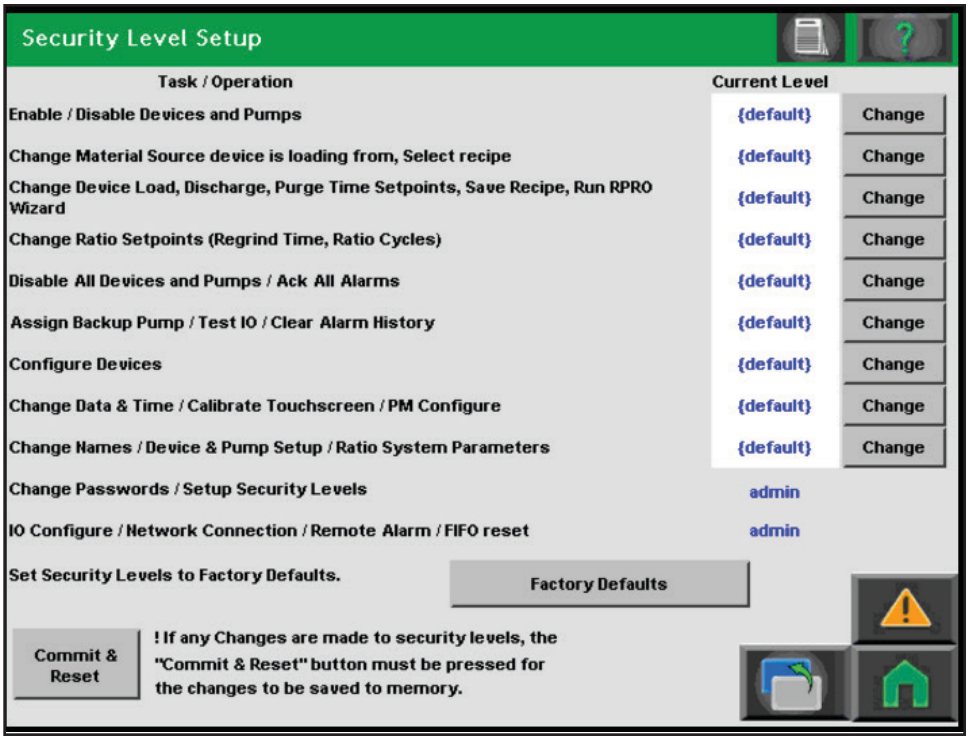

# Languages
## Available languages


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.

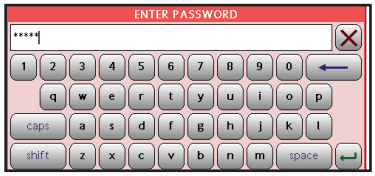
### User names and default passwords




**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.

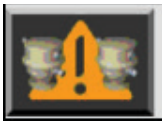

NEXT - The next button is used to select the next alarm when multiple alarms are displayed.


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

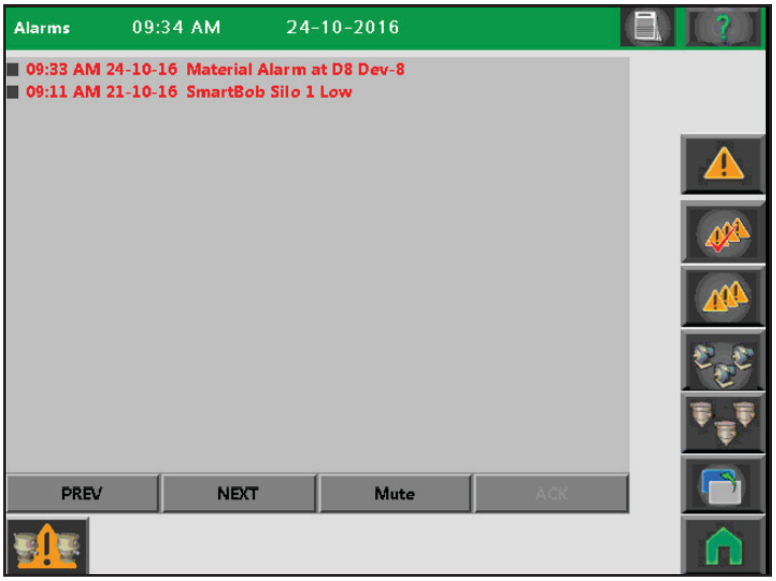

ACK (acknowledge) - The acknowledge button is used to acknowledge the highlighted alarm. The audible alarm will be silenced. The alarm indication will continue to flash and be visible until the alarm condition is resolved.

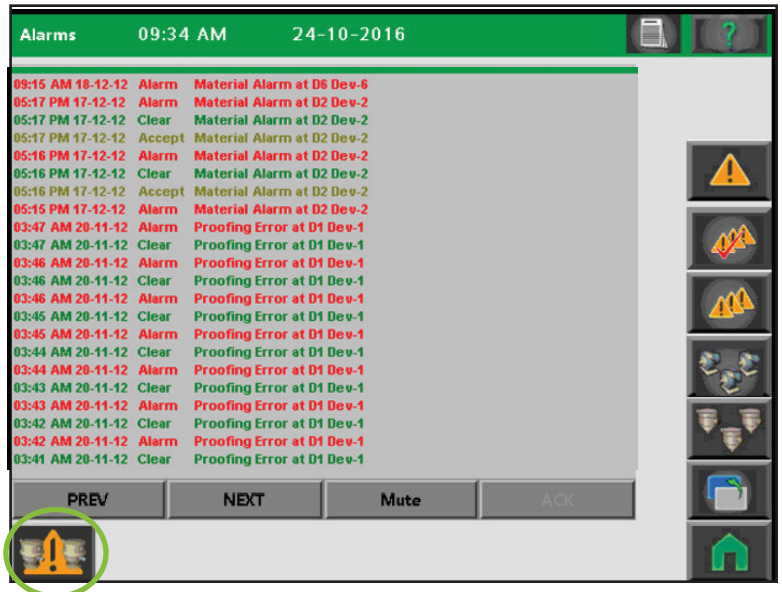
Acknowledge All - The acknowledge all button is used to acknowledge all the alarms on the list.

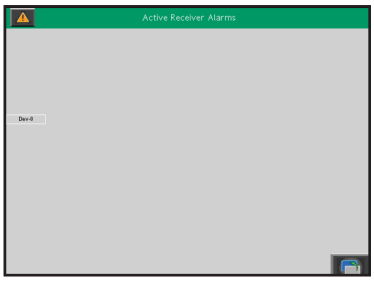
Alarm History - The alarm history button is used to view all alarms in the history. From the alarm history page, individual, or all alarms can be cleared from the history by pressing the CLEAR button.



Device Alarm - This button takes you to a separate screen that just shows active recent alarms.



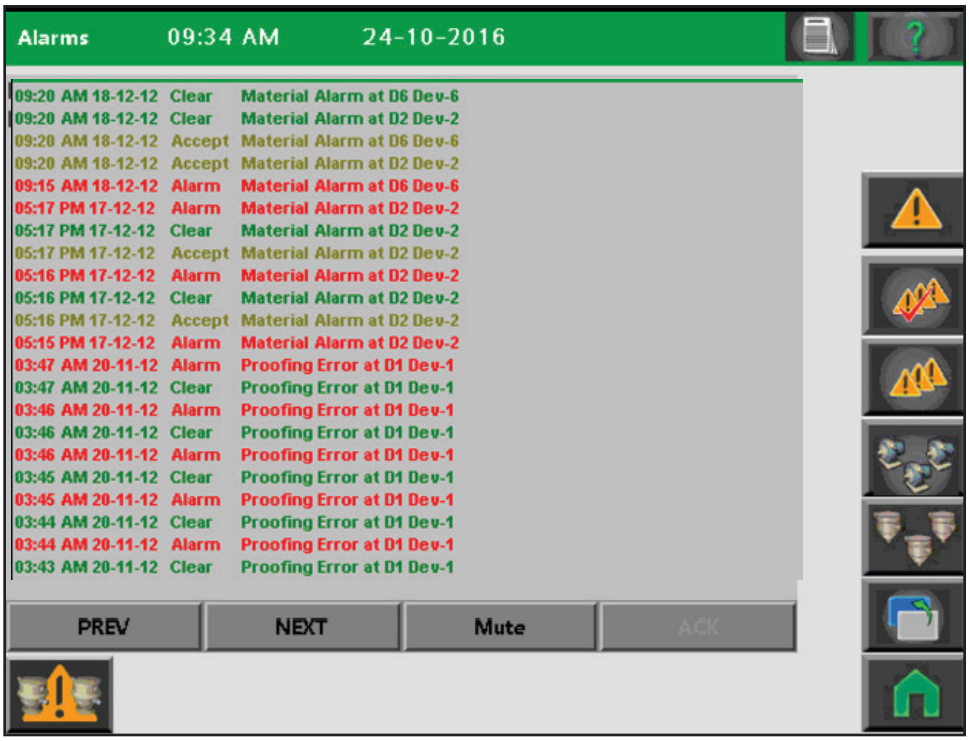




(Continued)

# Alarms (continued)

## Alarm Legend




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


### 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

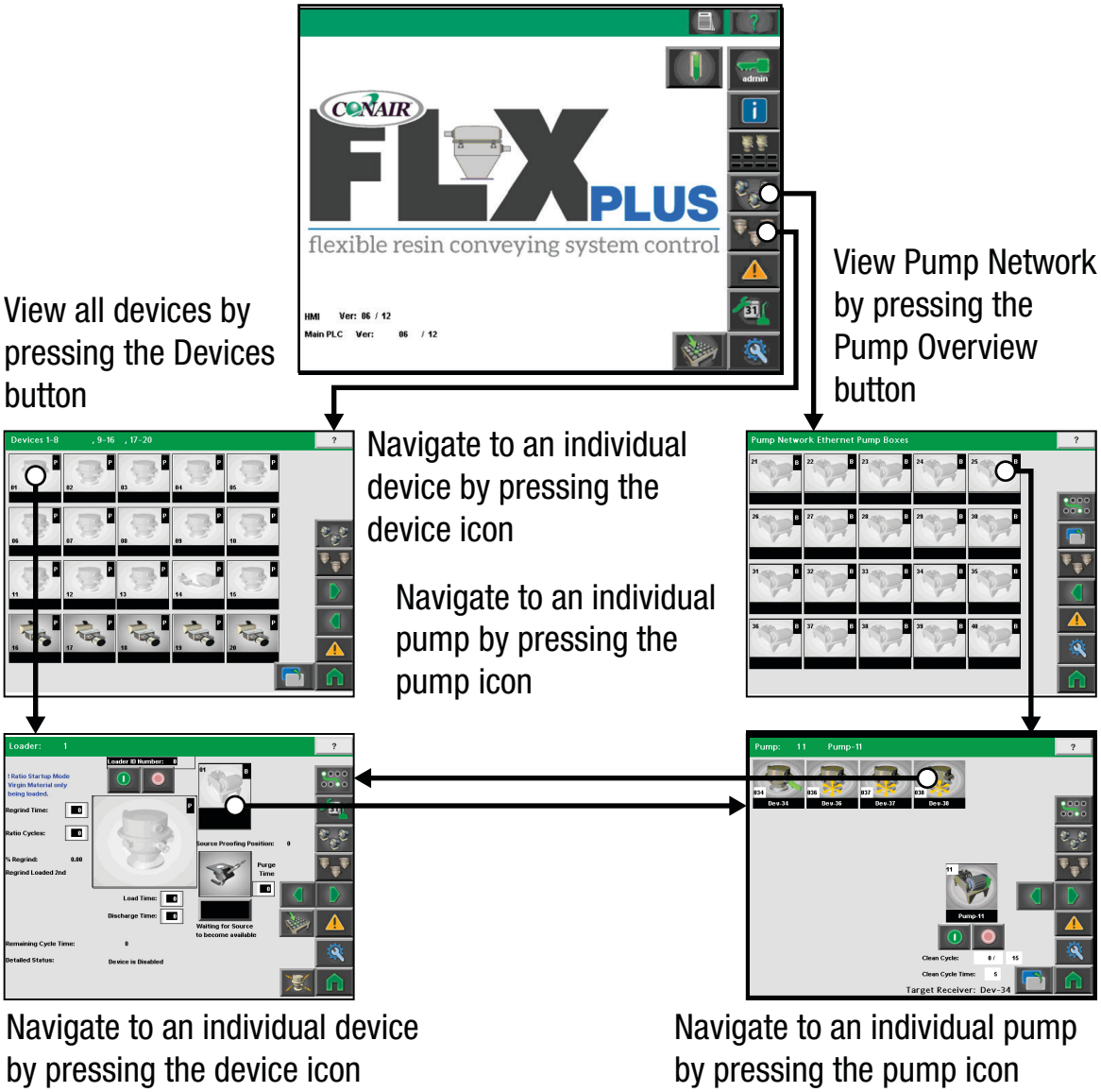
Active alarms are represented on the screen by red text. These alarms are still active, and have not yet been acknowledged. These alarms will remain red until they are acknowledged.


### 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.

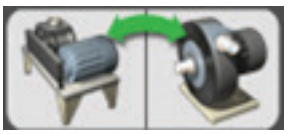
# Typical Navigation

The FLX-128 Plus 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.

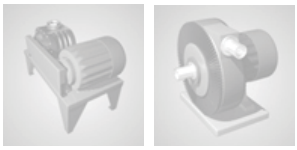


## Pump Icons

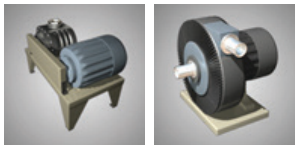
A choice of two icons may be selected for pump representation to align the icon to the actual type of pump being employed, by pressing this button on the pump set-up screen:

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

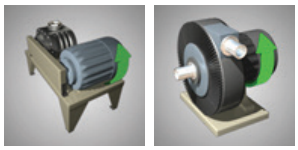
## Pump Icon Function Description



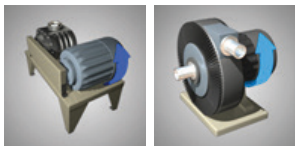
Faded: The pump is disabled. No vacuum can be provided to any of the attached receivers.



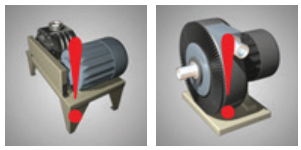
Full Color (with no symbols): The pump is enabled and ready to provide vacuum to any of the attached receivers when there is a demand.



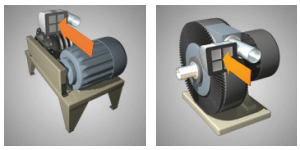
Green Arrow symbol: The pump is running and providing vacuum to one of the attached receivers. Material is being conveyed.



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.

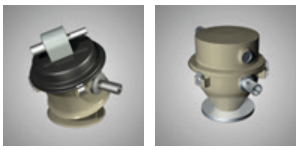
## Receiver Icon Function Description

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

(Continued)

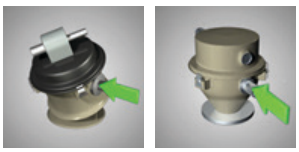
# Icon Descriptions (continued)

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



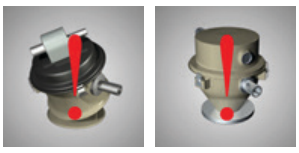
Yellow Asterisk: The receiver is demanding material, but the pump is currently providing vacuum for another receiver at this time, so it waits.

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

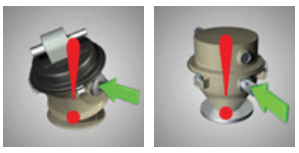


Blue Arrow: The receiver has completed its load cycle and is now discharging the material from the receiver.

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



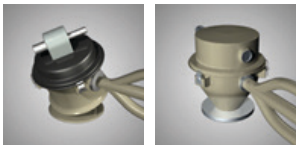
Red Alarm /Green Arrow: The receiver is in a fault condition but continues to receive vacuum from the pump.



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.

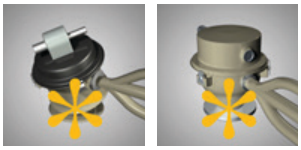
## Multi-Source Receiver Icon Function Description

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

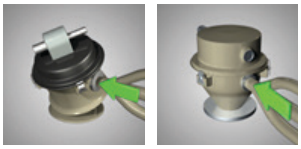
Full color (with no symbols): The multi-source receiver is enabled, but is not conveying material because there is no demand for it to convey material away from any of its multiple sources.

(Continued)

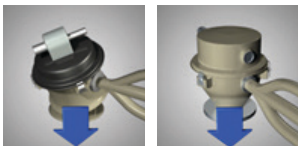
# Icon Descriptions (continued)



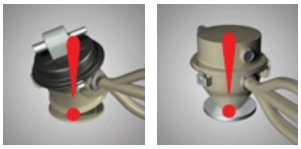
Yellow Asterisk: There is a demand from one or more of the multiple sources connected to this multi-source receiver. The receiver is calling for vacuum, but its assigned pump is servicing another receiver at this time.



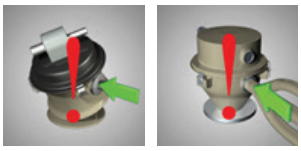
Green Arrow: The pump is currently servicing this multisource receiver. Material should be conveying to the multisource receiver from one of its multiple sources.



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.

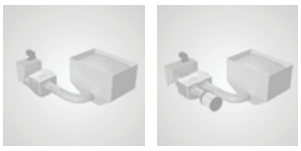
## Granulator/Off-loading Valve Icon

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 multisource 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.

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



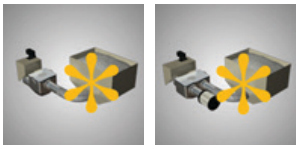
Faded: The Granulator/Off-loading Valve is disabled and will not allow material off-loading to the Receiver it is connected to.

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.

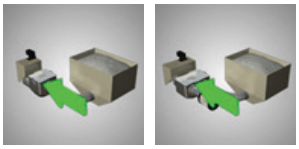
(Continued)

# Icon Descriptions (continued)

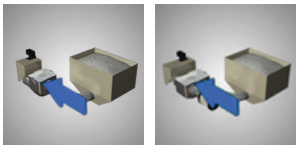
Yellow Asterisk: The demand signal for this Granulator/Off-loading Valve is calling for material to be off-loaded, but its Multi-source receiver or the pump providing vacuum are currently busy.



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



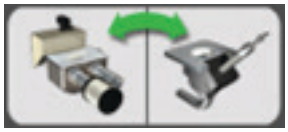
Blue Arrow: The Granulator/Off-loading Valve has completed the loading portion of its cycle and is now purging the conveying line clean (purge valve style only).



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).

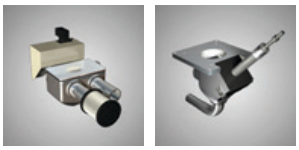
Purge Valves (left) are typically installed on a material conveying line, wherever needed, and include two inlets on one end: One for incoming material and one for purging air. The purge valve uses the control system's purge signal to switch from material conveying to line purging.

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.

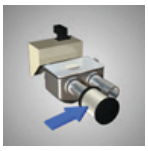
Full color: The Source Valve is enabled, but is not conveying material because there is no demand for it to convey material away from any of its multiple sources.



(Continued)

# Icon Descriptions (continued)


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

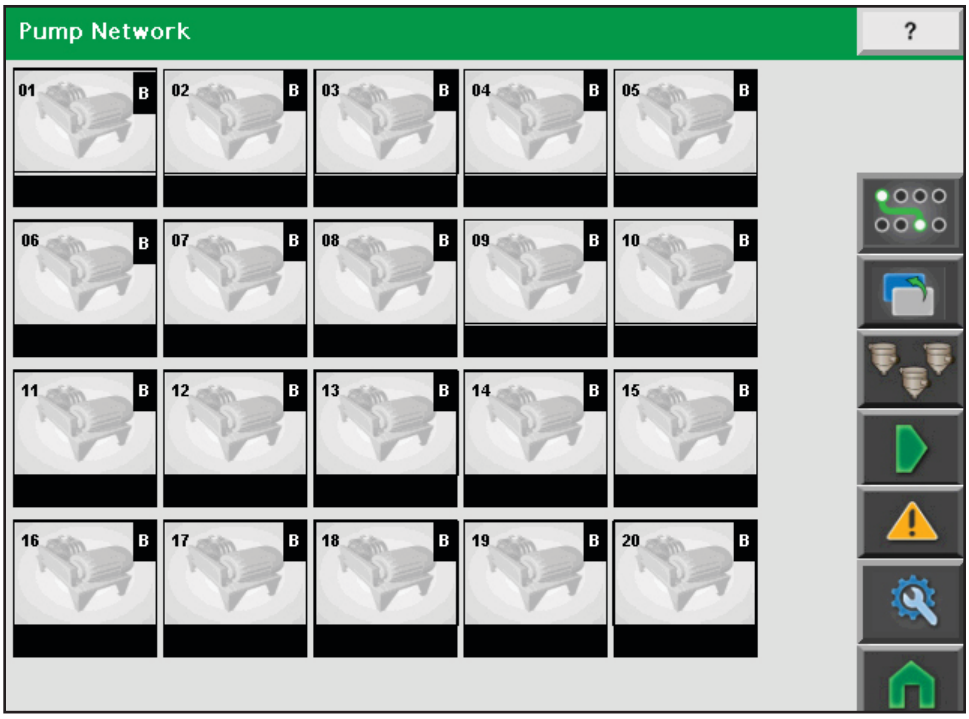
Receivers in the system may be configured to include ratio valves on their material inlets. In addition to typical vacuum conveying adjustments for these receivers, the user may also set regrind percentage and other parameters so that regrind can be loaded alternately with virgin materials.


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.


ILP and R-PRO valves: These valves are specific to the setup for the ILP and the R-PRO systems. We recommend naming them so that you recognise them as part of the system. (R-PRO or ILP).

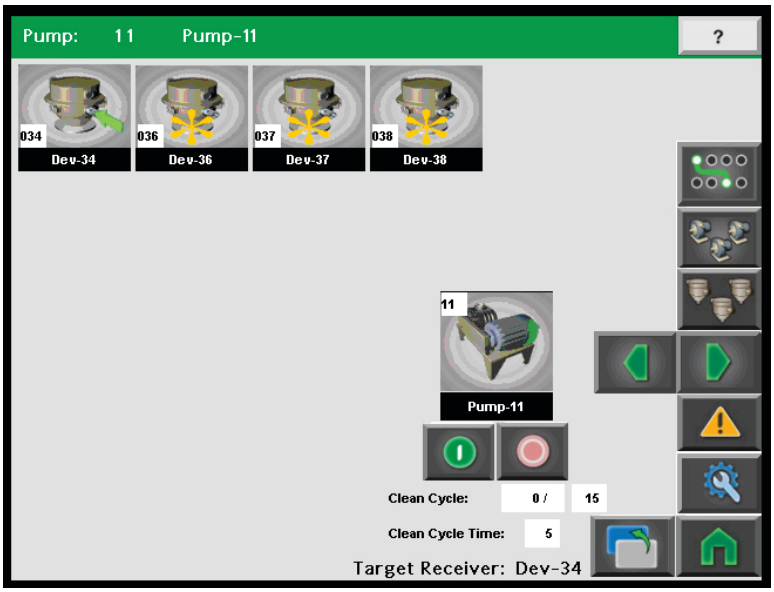
# Pump Network Screen




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.)

(Continued)

# Pump Screen (continued)

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.

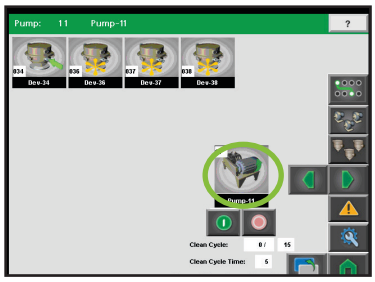
“Clean Cycle” is the number of individual load cycles the pump completes before the pump automatically stops temporarily to let the dust collector empty.

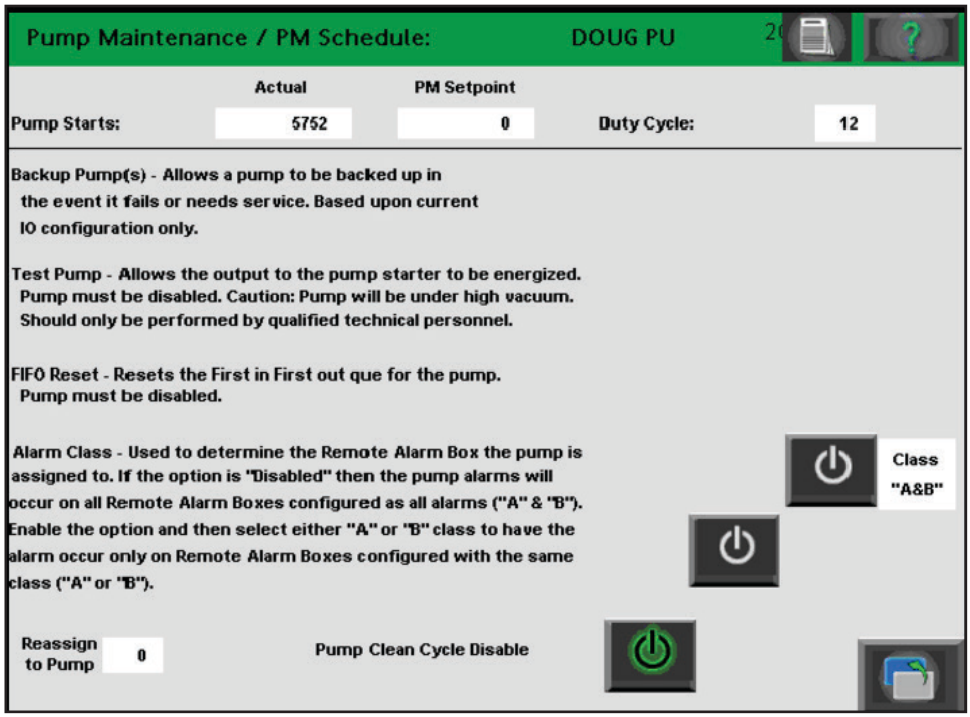
“Clean Cycle Time” is the number of seconds the pump temporarily stops at the end of a load cycle or when the Clean Cycle is triggered.

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.




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

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

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.

## Test Pump

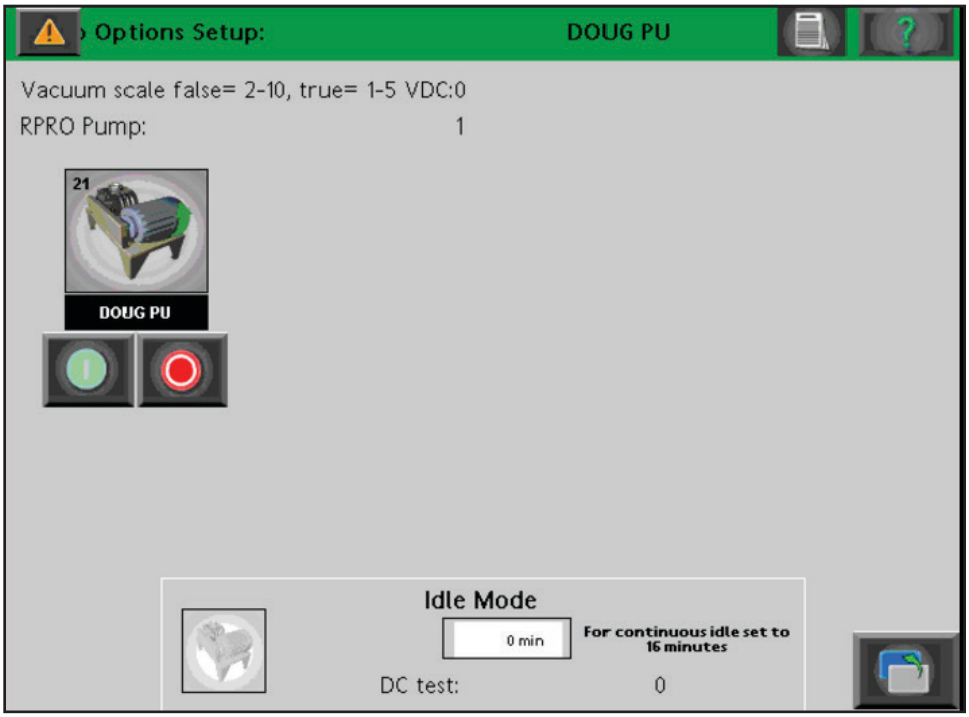
**CAUTION:**

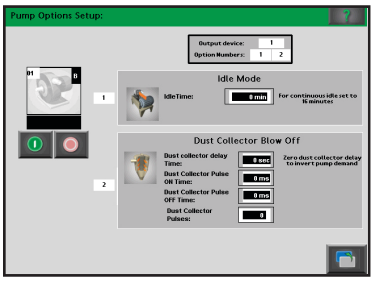
Pump will be under high vacuum when tested. The pump test should be performed by qualified technical personnel to prevent pump or system damage.

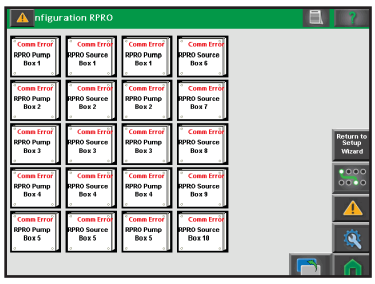
This feature allows the output to the pump starter to be energized.

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.**

# Pump Options Setup Screen




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.

# 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

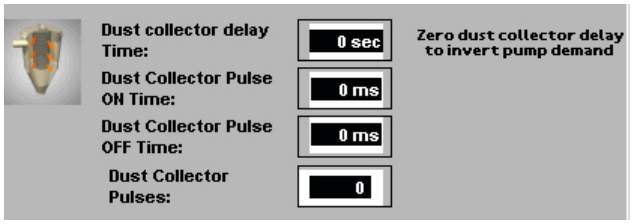
This feature allows the dust collector to "blow off" collected dust.

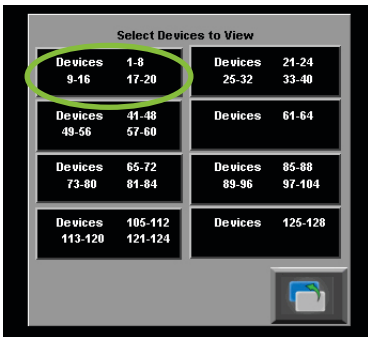
1 **Disable the pump.** 

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

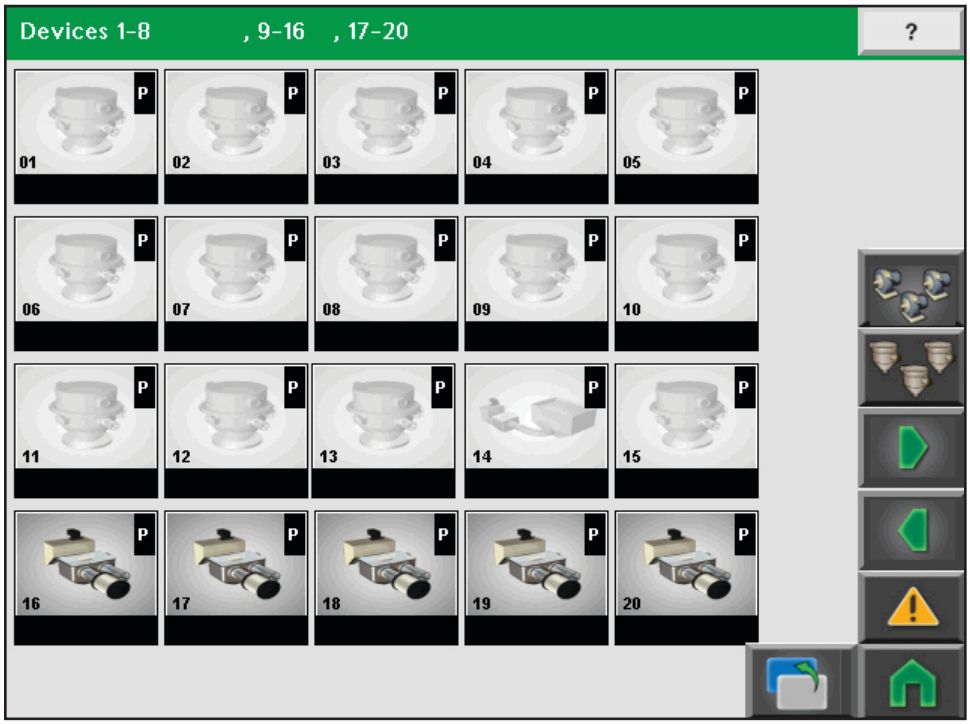
3 **Use the pop up number pad to enter the number of seconds you would like the Dust Collector to blow off. Press the Enter button to accept the setting.** You may also set the pulse on and off times and the number of pulses.

4 **Enable the pump.** 






# Devices Screen

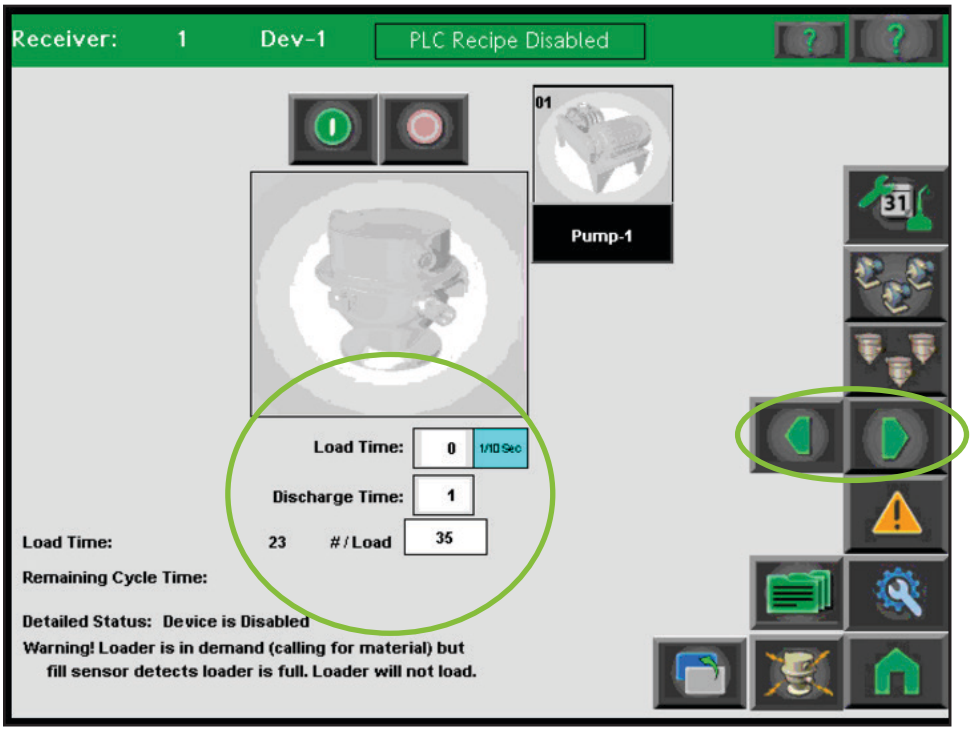


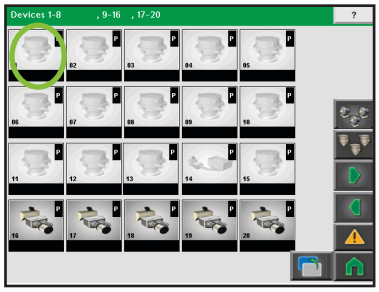

On this screen, all the devices including their number, name, and status are shown. The loader status icons display their current status. (See Operation: Icon Descriptions for more information.)

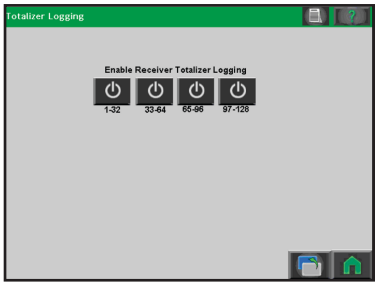
Pressing the device icon opens a window that displays the individual device detail.

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.

**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.

## Load Time

The number of seconds (0-300) the receiver loads material. A button beside the load time input by default reads sec, but if you press the word sec, it turns blue and changes to 1/10 sec.

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

## Discharge Time

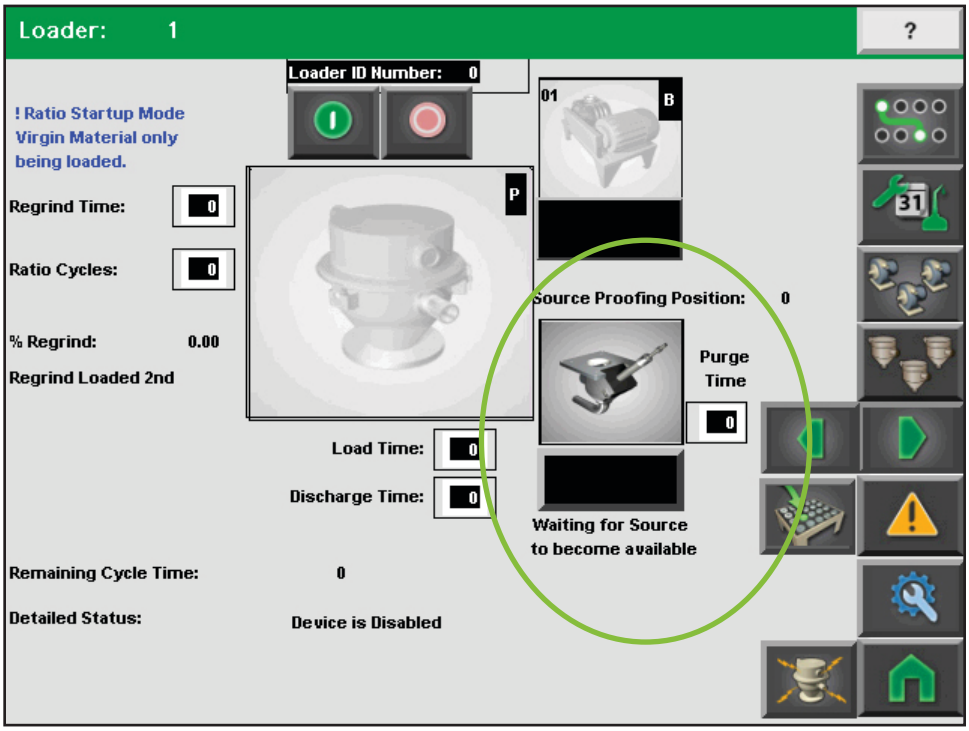
The number of seconds (1-300) the receiver will discharge material into a vessel before the next load cycle begins. If the time is left at 0, the program will automatically set it to 1.

## Totalizer

???

(Continued)

# Individual Devices 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):

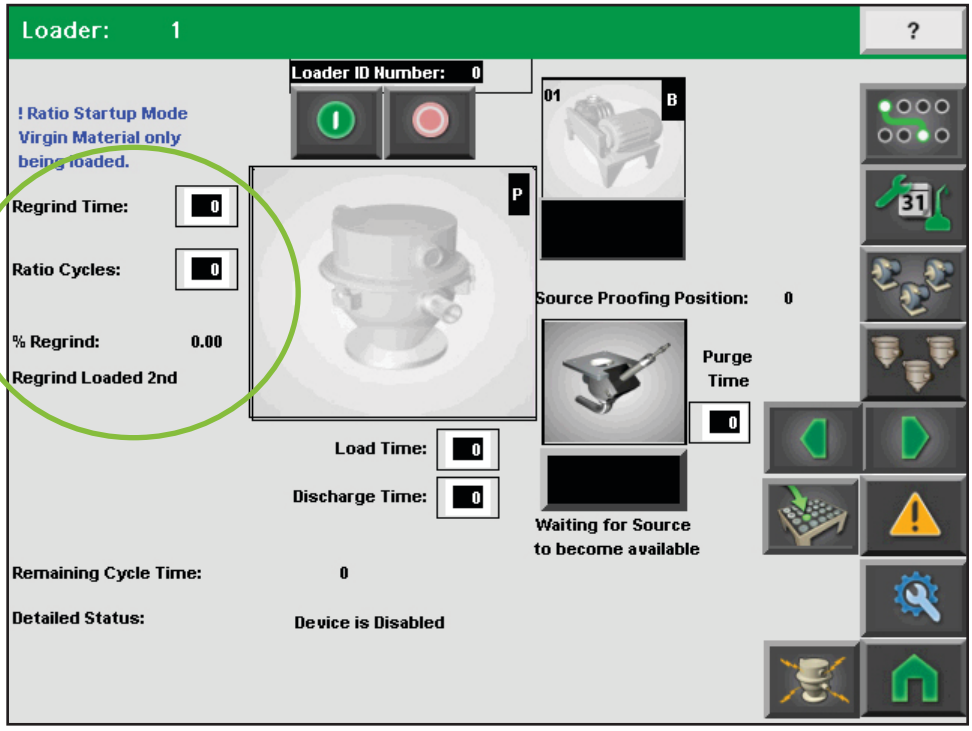
1. Disable the loader
2. Press either source the valve icon or the source valve name. If no source has been selected, the source valve name will display unassigned.
3. The source selection screen will open. View additional sources (if available) by pressing the Next arrow.
4. Select the new source. The 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:** 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-128 Plus system will control the valve based upon its type.

**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.

(Continued)

# Individual Devices 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.

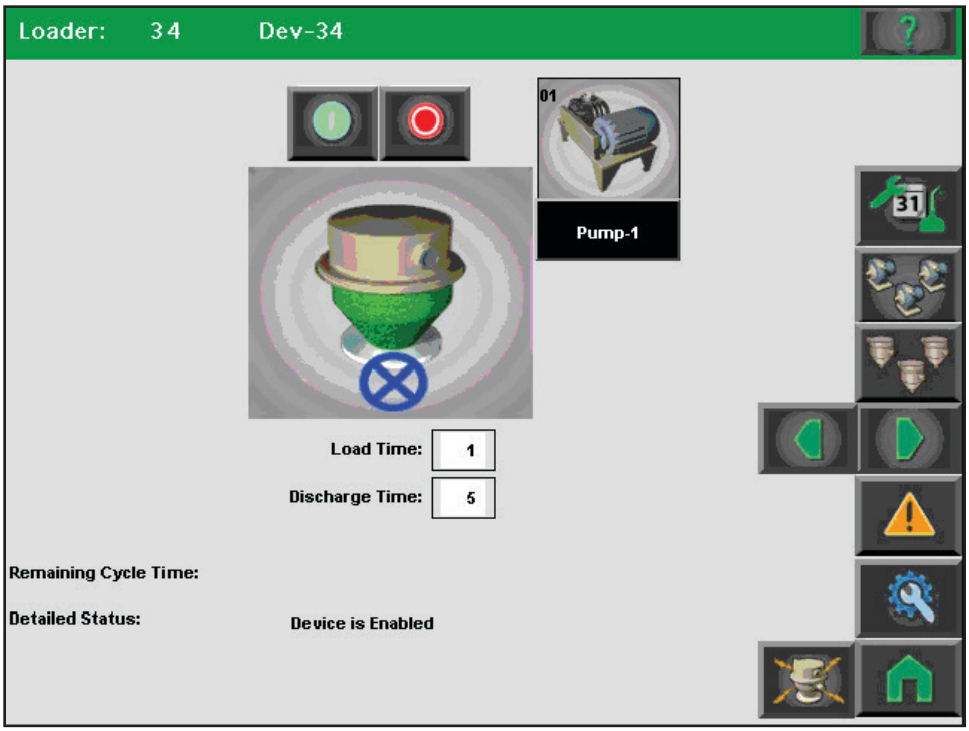
% Regrind is the percentage of regrind to use for each load cycle. Display only. Regrind Loaded 1st or Virgin loaded 1st is configurable from the Loader Configuration screen.

The FLX-128 Plus 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.

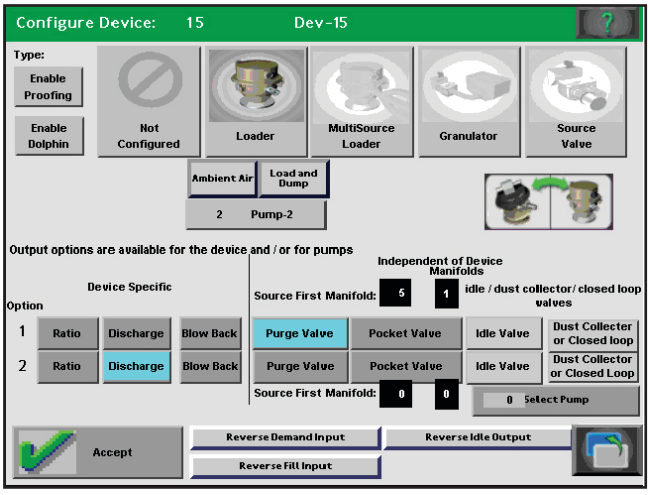
**NOTE:** The Ratio Cycles may be automatically calculated based upon a user defined Ratio Base. The auto calc is enabled in the Loader Configuration screen. The Ratio Base is configured in the Setup screen.

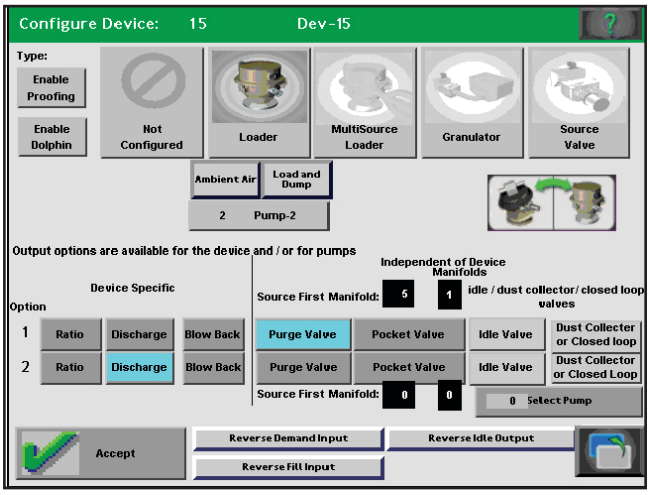
# FLX-128 Load and Hold

The FLX-128 Plus now supports Load and Hold. This means the FLX will fill a bin and wait to dump the material until it receives a remote demand signal. The demand is wired into the normal loader demand input and is indicated on the loader screen by the load and hold graphic. His indicates the loader is full and waiting for the input signal to dump.



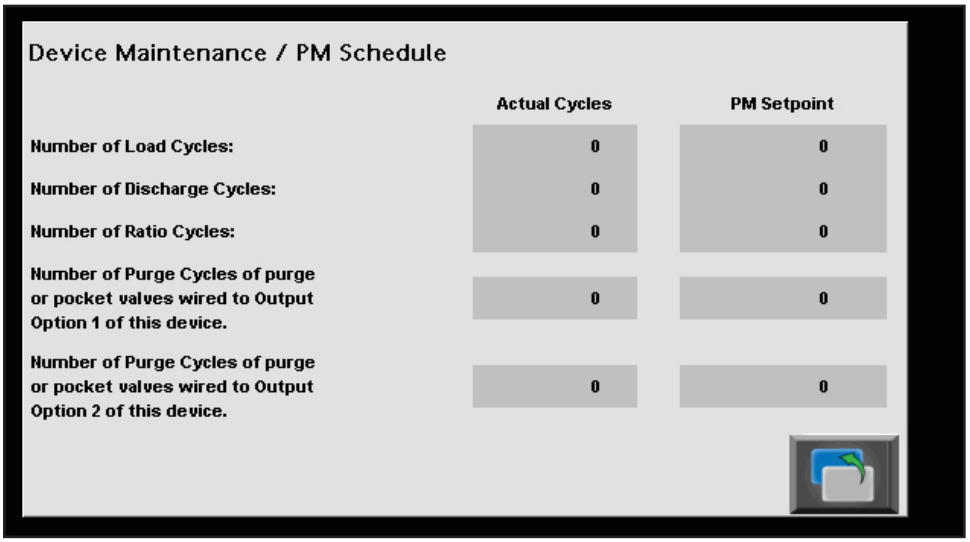

To configure a loader as Load and Hold, press the Load and Dump button on the device configuration screen. The text will change to Load and Hold. Please note that a positive discharge valve is required and a fill sensor is recommended.

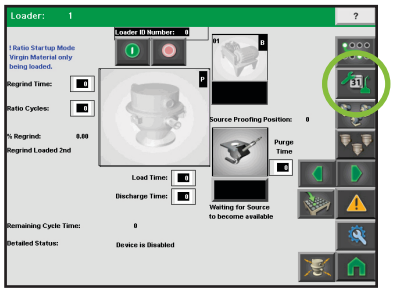



A warning message will flash if positive discharge is not selected.

# Loader Maintenance Screen



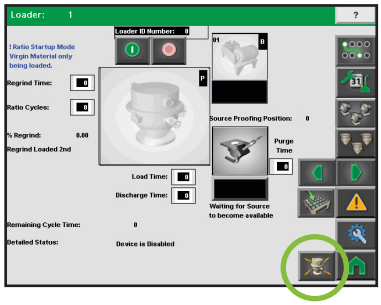



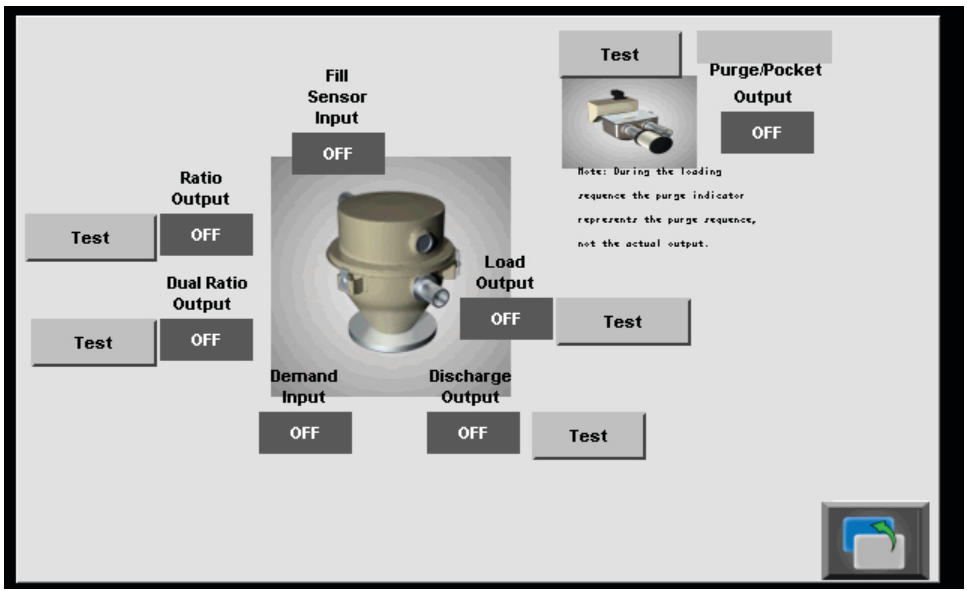

The Maintenance screen displays the current cycle counts of valves. The PM setpoint for each device is shown. The PM setpoint is configured from the PM/Maint Setup screen (accessed from the Setup screen).

- 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



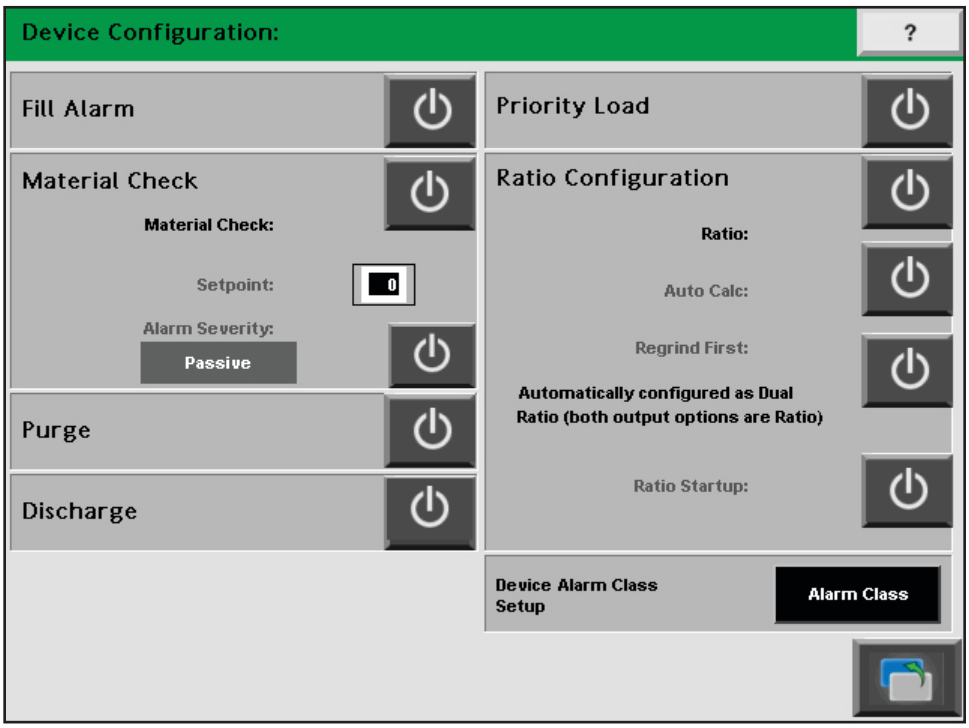

A screen to test the I/O is accessible by pressing the Device Detail button. The loader must be disabled and proper login is required to test I/O.

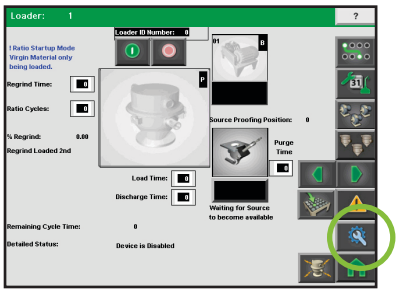
I/O available to test depends upon I/O configuration and loader configuration. Press the Test button of the output to test. The FLX-128 Plus system will energize the output.

### ⚠ 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

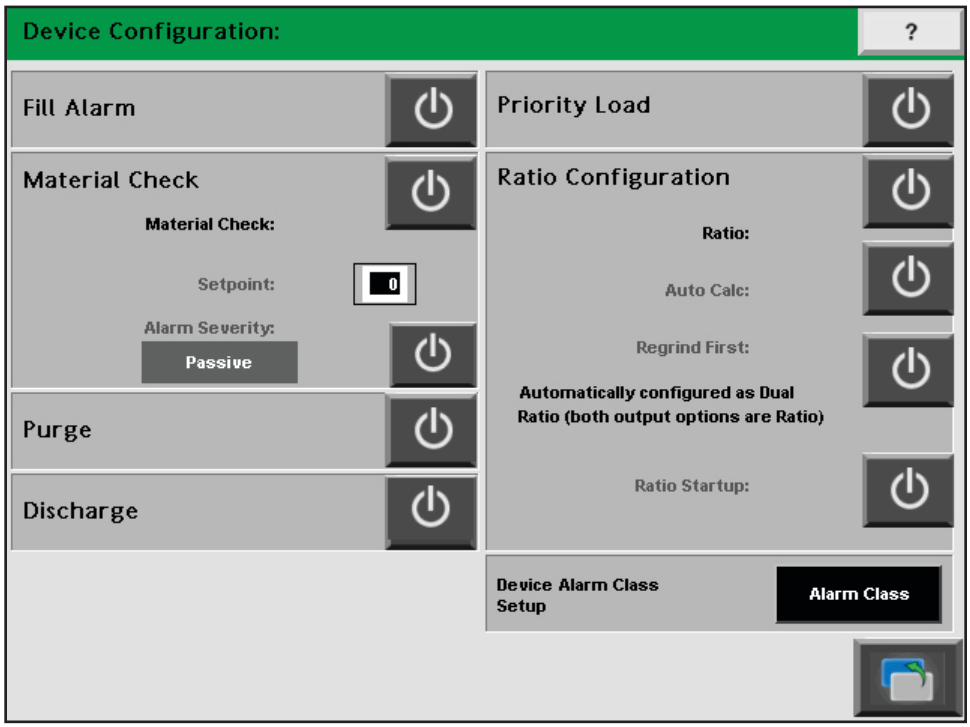
Enable the discharge output during the discharge cycle. This function requires the installation of a positive discharge valve at the base of the drying hopper or vessel and I/O output options are required.

## Priority Load

The loader will be loaded before other loaders.

(Continued)

# Device Configuration Screen (continued)




**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.

## Ratio

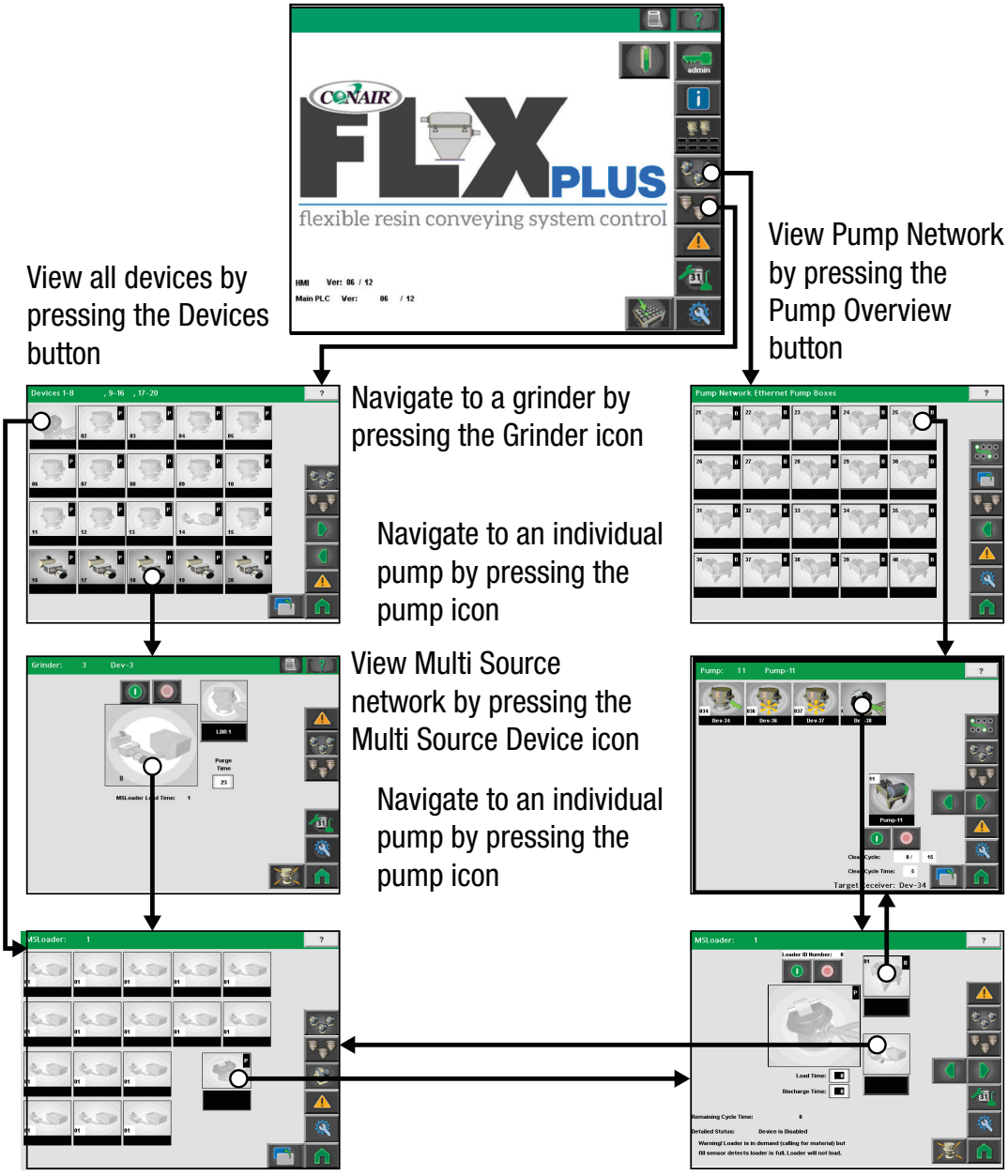
This feature allows control of more than one material into one vacuum receiver. This function requires an optional ratio valve at the material inlet of the receiver.

- 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.

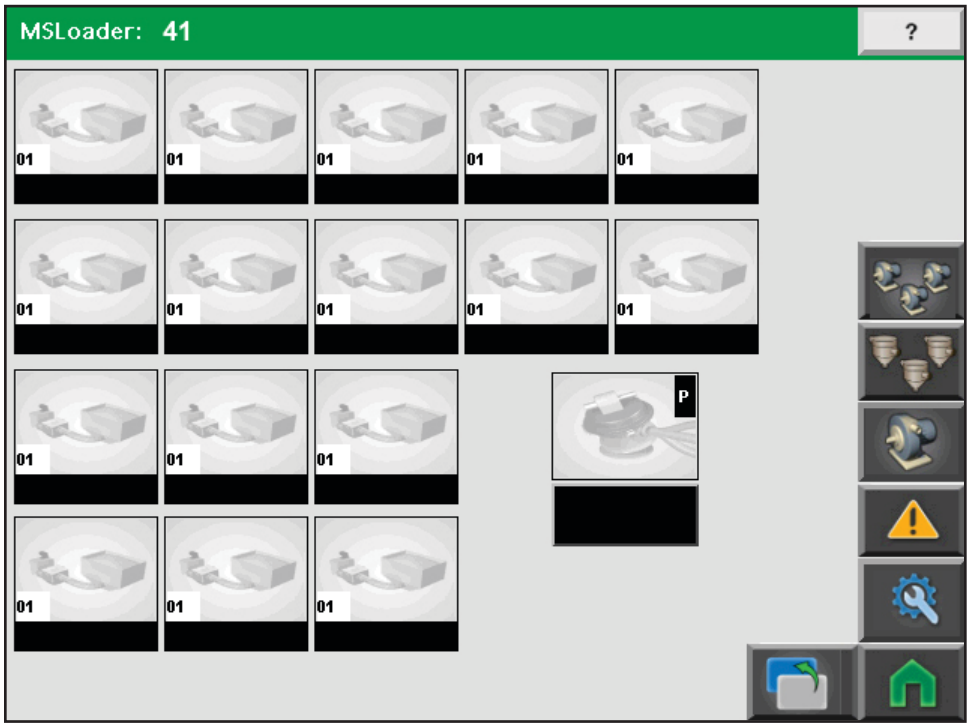
## Device Alarm Class Setup

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



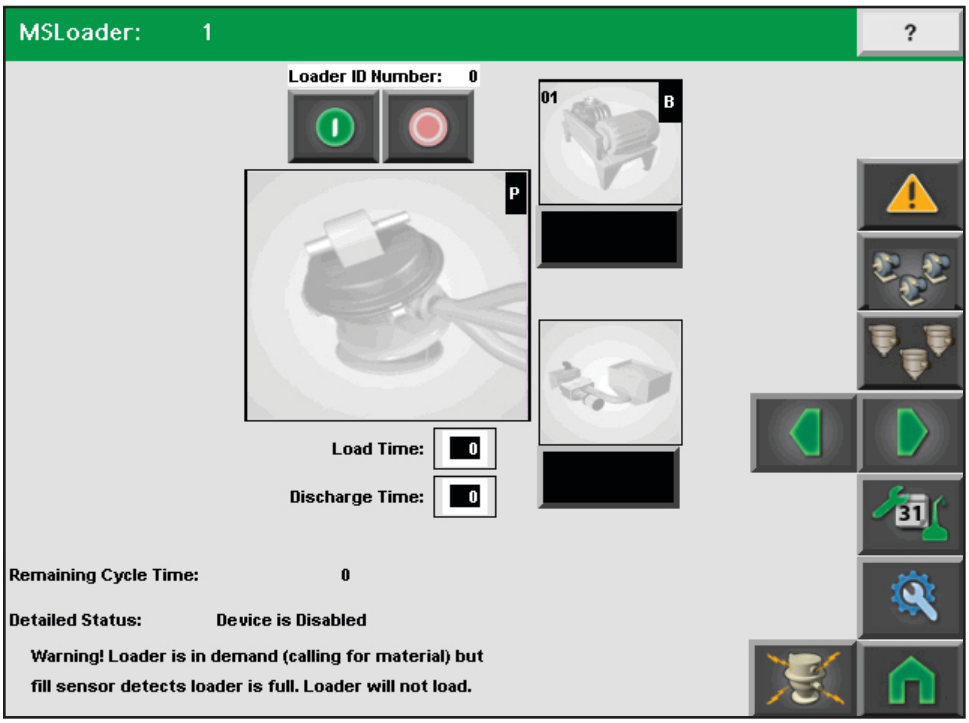

On this screen, the multi-source loader and attached granulators will be shown. Each icon displays the number, name, and the status of the granulator and multi-source loader. The icons display the current status of each piece of equipment. (*See Operation: Icon Descriptions*)

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.

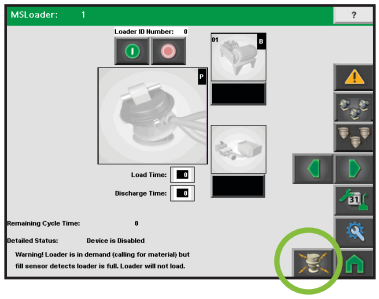
## Multi-Source Loader Maintenance Screen

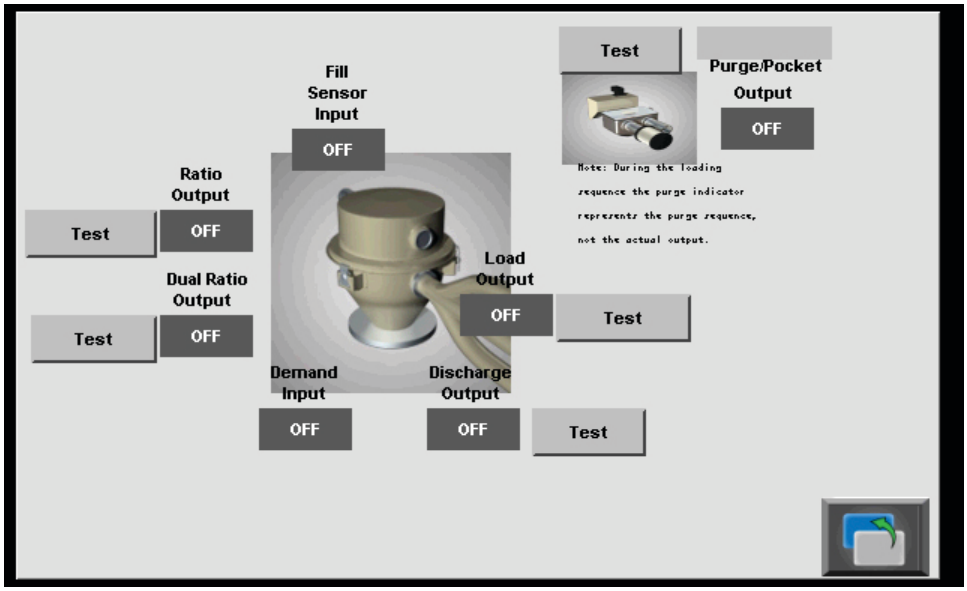
The Maintenance screen displays the current cycle counts of valves. The PM setpoint for each device is shown. The PM setpoint is configured from the PM/Maint Setup screen (accessed from the Setup screen.

- 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



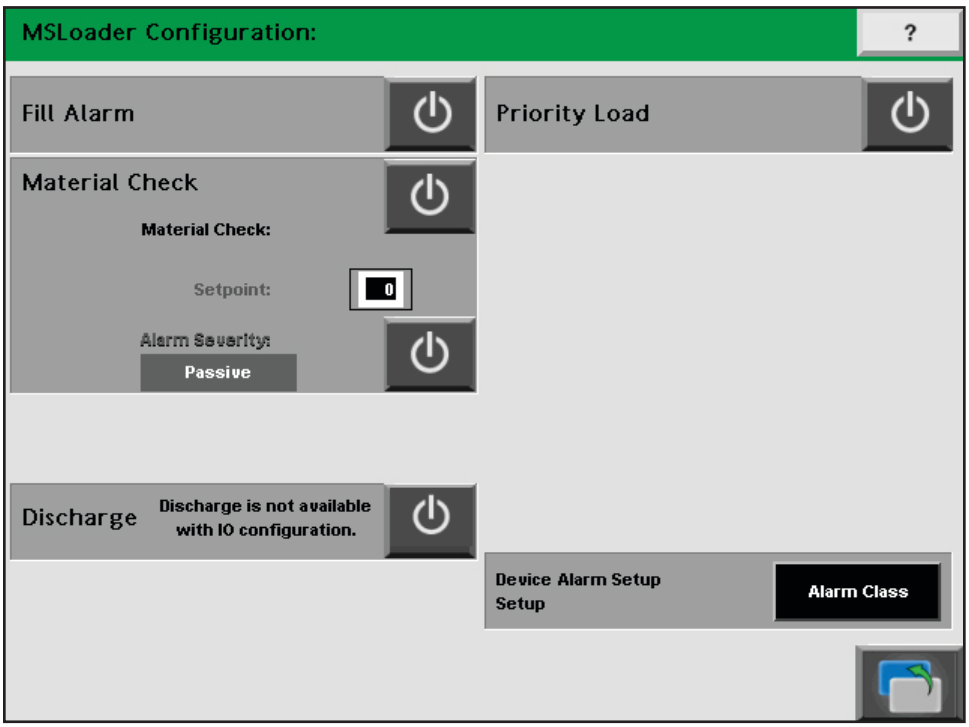

A screen to test the I/O is accessible by pressing the Device Detail button. The loader must be disabled and proper login is required to test I/O.

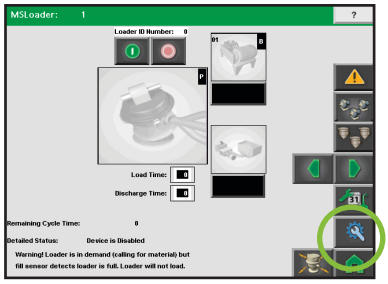
I/O available to test depends upon I/O configuration and loader configuration. Press the Test button of the output to test. The FLX system will energize the output.

### ⚠ 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.

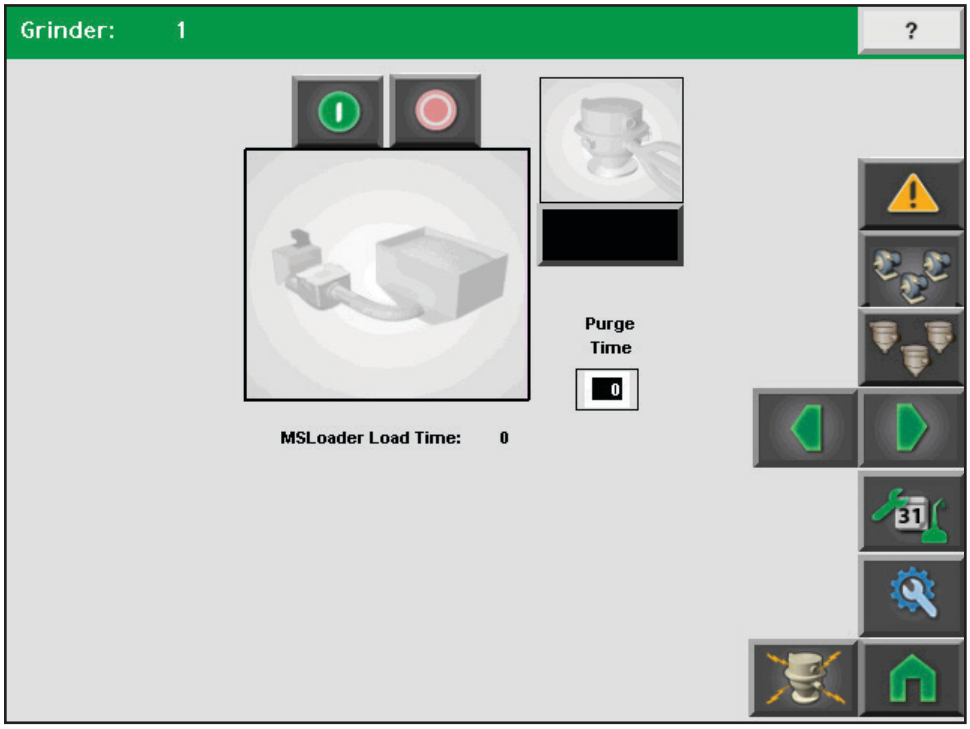
(Continued)

# Multi-Source Loader Configuration Screen (continued)

## 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, or only for a specific class of 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” through “H”). Disable the alarm for the alarm to be triggered on all Remote Alarm Boxes configured as all alarms (“A” through “H”).

# 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

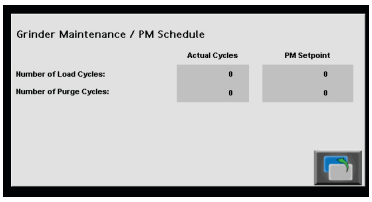
When Purge is configured, the Purge time will be visible.

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.

(Continued)

# Granulator (Grinder) Screen (continued)

## Granulator Maintenance Screen

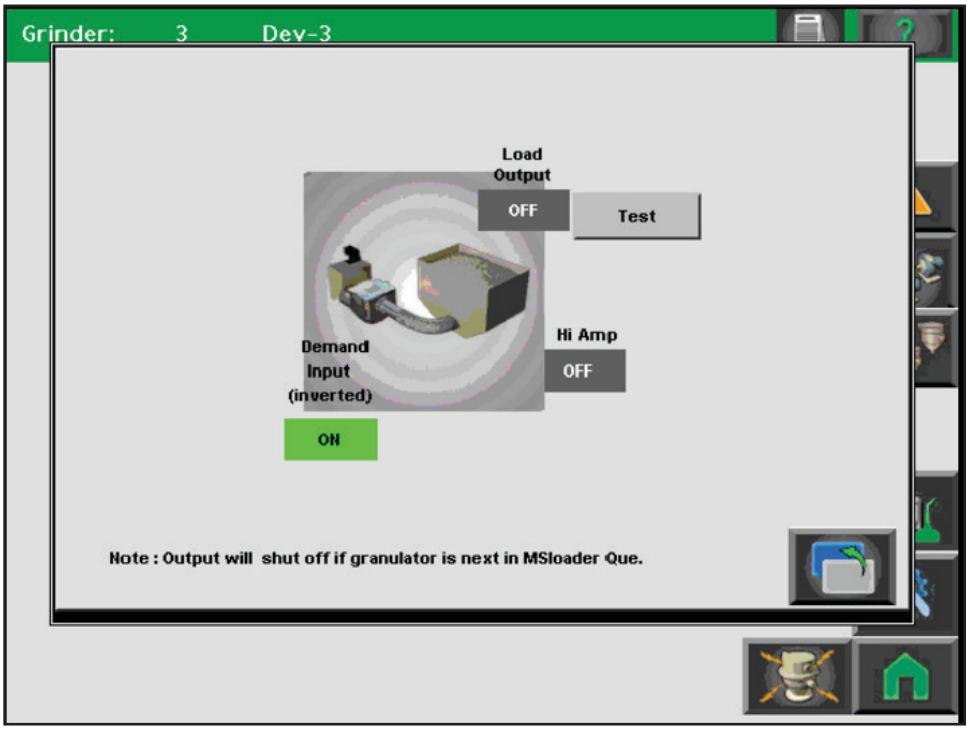



The Maintenance screen displays the current cycle counts of valves. The PM setpoint for each device is shown. The PM setpoint is configured from the PM/Maint Setup screen (accessed from the Setup screen.)

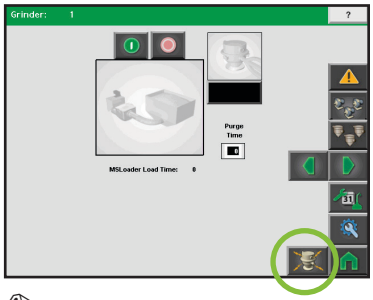
- Number of Load Cycles
- Number of Purge Cycles

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




**NOTE:** This button appears when testing is complete.

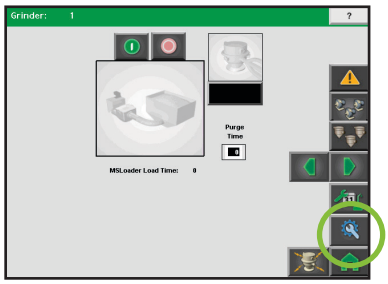



**NOTE:** When an output is energized, the valve will activate. The test should be performed by qualified technical personnel.

A screen to test the I/O is accessible by pressing the I/O button. The granulator and multi-source 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.

# 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

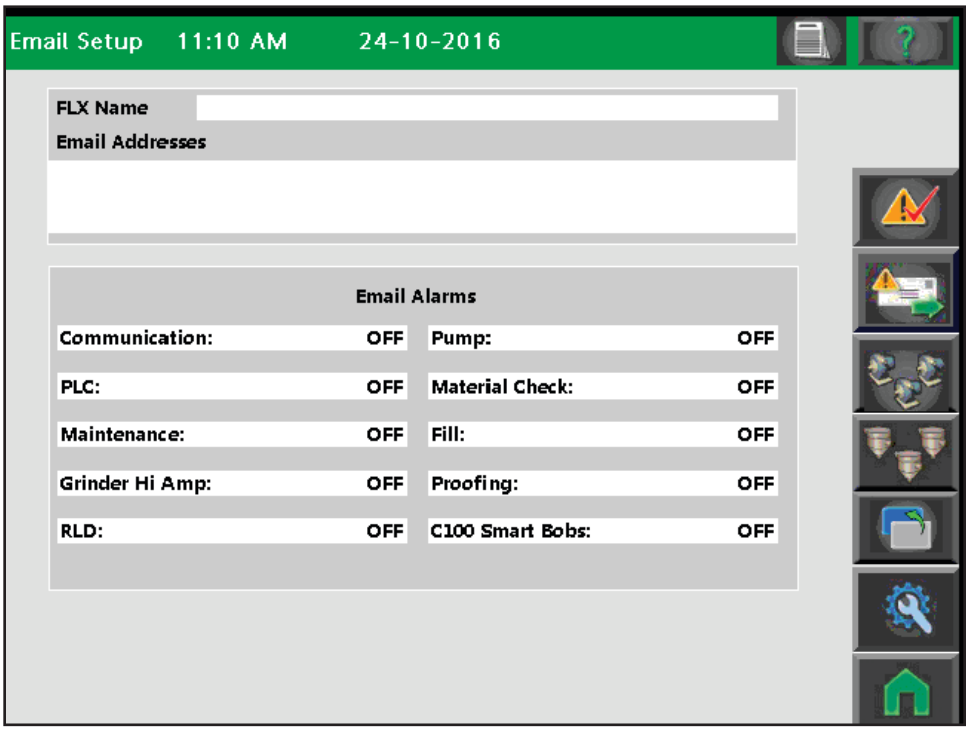
Purge material from the conveying line at the end of the loading cycle. This function requires the installation of a valve at the base of the vessel and I/O output options are required.

# FLX-128 Plus Email Feature

The FLX-128 Plus can send out Alarm messages as emails or text messages when this option is purchased. The option includes an extra Ethernet card and requires activation by Conair service personal. It also requires a fixed IP address for the second card and access to a DNS server to connect to the Internet. This function resides in the HMI so the HMI must be on for this feature to work. This also means that multiple HMIs could be setup to email different addresses based on different types of alarms.

## Setup

After activation and installation of the second Ethernet card and connection to the DNS server go to the Network Connections page of the FLX-128 Plus and enter the IP, Subnet Mask, Gateway, and at least 1 DNS server IP address.




## Testing

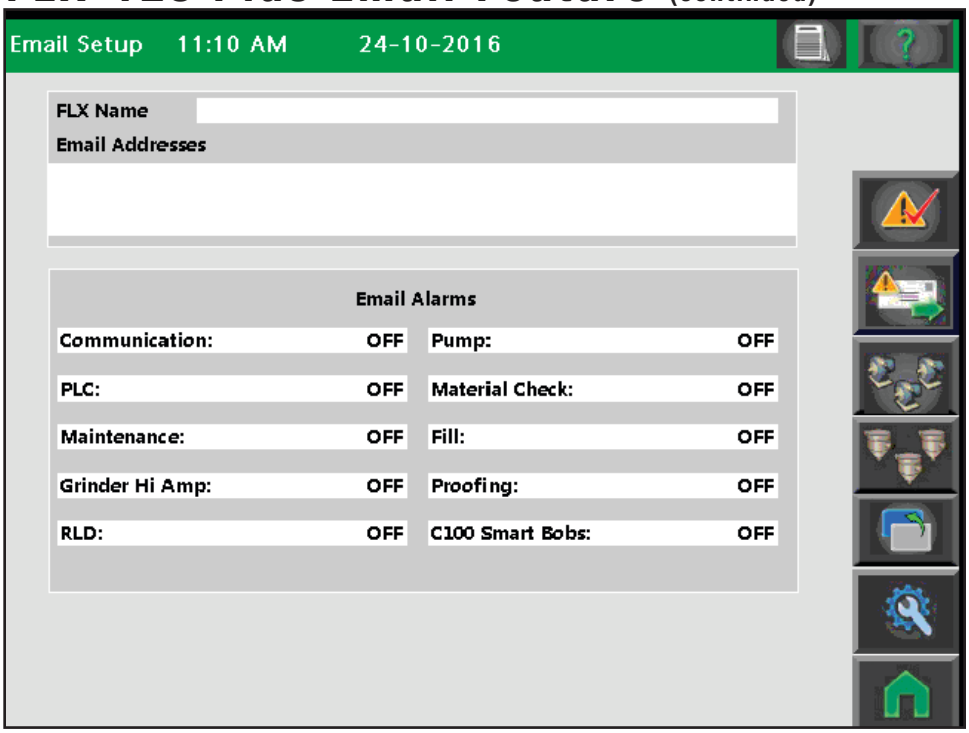
Now go to the Alarm screen by pressing the Alarm button.

The Email Alarms button should be present at the top left hand corner of the Alarm screen.

Press the Email Alarms button to open the Email Setup screen and enter an email address.

(Continued)

# FLX-128 Plus Email Feature (continued)

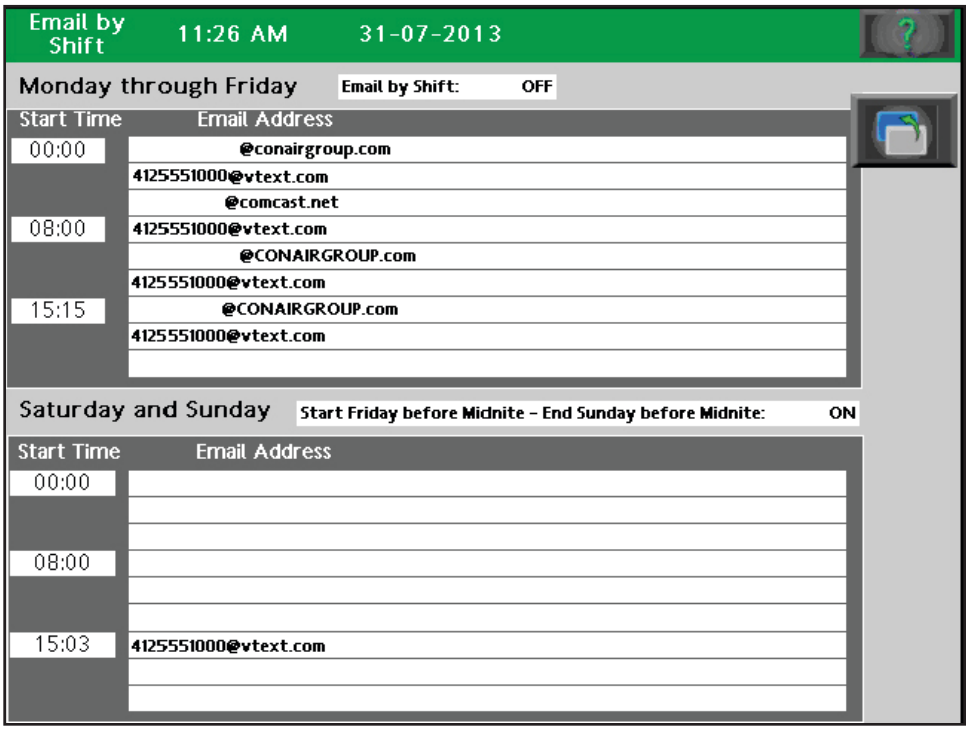



Press the Send Email Alarm Test/Acknowledge button to send a message to the shown email address. This button is also handy to send an email to anyone on the email list acknowledging that an alarm has been corrected.

The button will disappear until the Alarm Acknowledge button has been pressed. Press on the Email Alarm Types to enable one or more Alarm types that will be send when they occur.

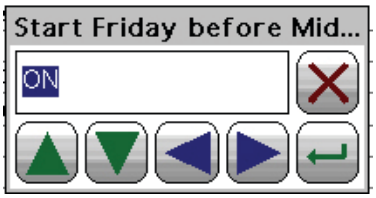
## Email by Shift

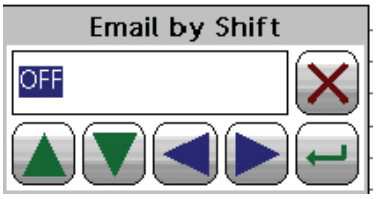
Press the blue Setup wrench to setup and activate the Email by Shift Screen.




(Continued)

# FLX-128 Plus Email Feature (continued)




Up to 3 start times can be entered for each weekday and weekend. Press the 'Start Friday before Midnight – End Sunday before Midnight' text if your weekend shifts start and end early.

Activate the 'Email by Shift' feature by changing the text to ON. You can temporarily use this function to set multiple numbers in the email address and then shut it off so the number remain static.

✎ **NOTE:** When this feature is activated it will write to the Email Address on the previous page overwriting any addresses entered before.

## Sending Text Messages

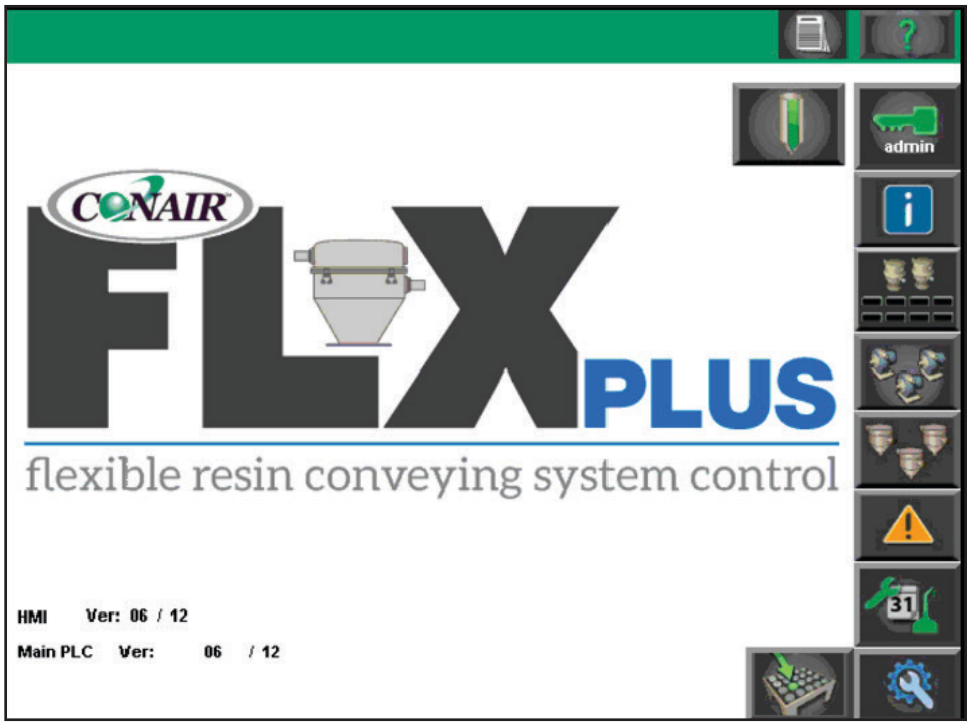
If you know the phone number and cell phone carrier of the person you want to send a text message to, you can enter the area code and phone number (without punctuation) followed by the appropriate @ address.

| | |
|---|---|
| Alltel | @message.alltel.com |
| Nextel | @messaging.nextel.com |
| Sprint | @messaging.sprintpcs.com |
| T-mobile | @tmomail.net |
| Voice Stream | @voicestream.net |
| Verizon | @vtext.com |

For any carrier you can use @teleflip.com.

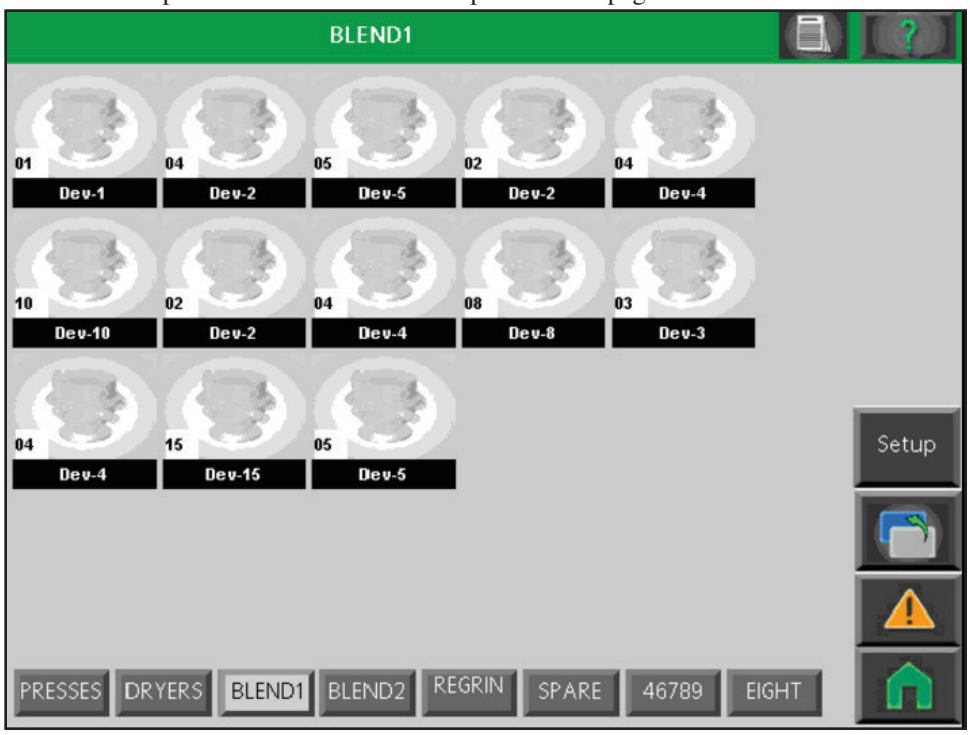
# Custom Button Setup on the FLX-128 Plus

Customers who want to customize the receiver screens now have the opportunity to create groupings of receivers with custom screen and button names. This feature is activated from the purchased options screen. The main selection button is named ‘Groups’ by default but this name can be modified from the purchased options screen also.




Modifying the receiver lists and group button names is restricted to the admin password level and higher.

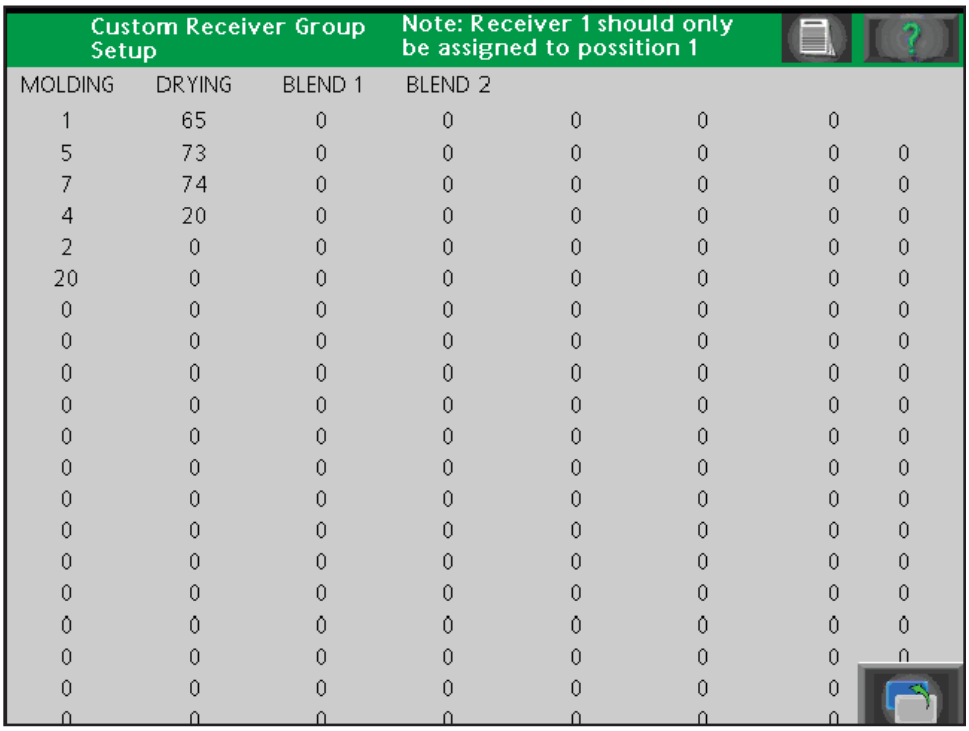
Press the Groups button to access the ‘Groups’ selection page.




(Continued)

# Custom Button Setup on the FLX-128 Plus (continued)

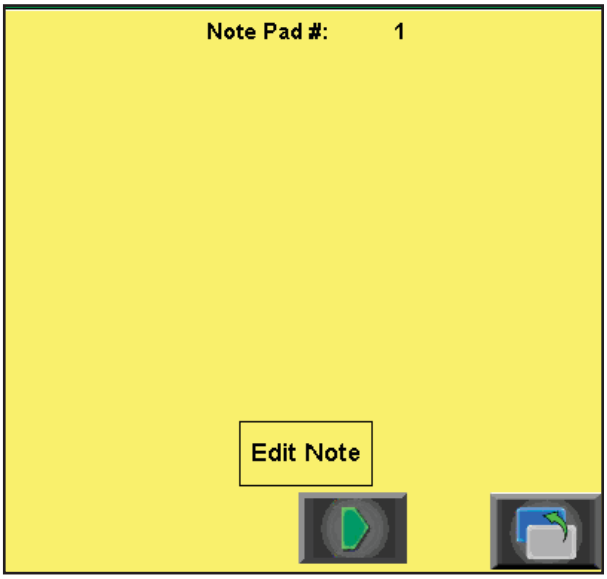
The current group name will be displayed on the title line of the screen. Custom button names will be displayed on 8 buttons along the bottom of the page. The receivers and the buttons names are defined on the Custom Settings screen. Press the Setup Button to access this screen (must be logged in).




Press the top of each column to create each group name and press the numbers to change the 0's to the receiver number you want to display in each group. Please note that if receiver 1 is placed in any position but at the 1st position in each group the receiver will not be displayed. Any receiver can be displayed in any group and may also be displayed in multiple groups. Note also that the eighth group can only display 17 receivers instead 20.

Note Pad Button

The notepad is perfect for saving notes and comments about setup and operation.



# FLX-128 Plus Smart Bob Network Setup

The Red Lion HMI on the FLX-128 Plus can be configured to monitor a Smart Bob RS-485 network. The Smart Bob 2-wire 485 Network consists of from 1 to 120 Smart Bobs, one C100MB controller, and a Modbus gateway.

## Wiring – Communication

The C100MB controller is daisy changed to the Smart Bobs using shielded twisted pair wire over distances of up to 4,000 ft. No termination resister is required on the C100MB and the last Smart Bob on the chain should have its termination resister switched on. All other Smart Bobs should have their termination resistors switched off. The wires are connected to the C100MB at the SB 485 and the wires at the Smart Bobs are connected to the RS485 connector. All '+'s are connected together, all '-'s are connected together and all shield wires are connected together.

The C100MB is connected to the B&B MESR901 Modbus gateway using shielded twisted pair wire over distances of up to 4,000 feet. No termination resister is required on either the C100MB or the MES gateway. Connect the (-) to 'A' and the (+) to 'B' between the C100MB and the MES gateway.

Connect an Ethernet cable between the MES and the Ethernet switch in the FLX-128 Plus.

## Wiring – Power

The C100MB can be powered by either a 24VDC or 24VAC power supply.

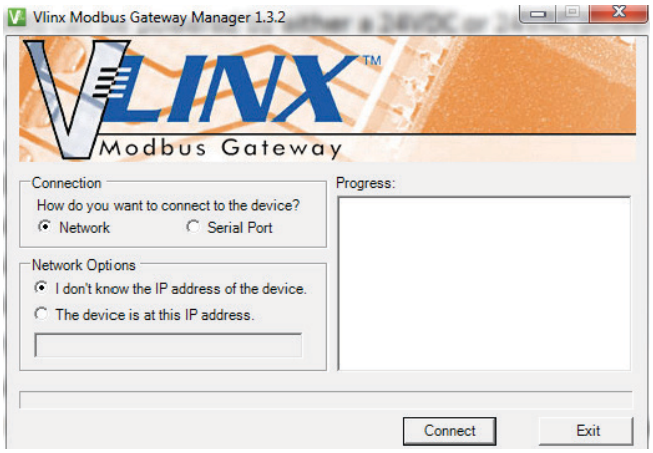
The MESR901 is powered using a 24VDC power supply.

The Smart Bob is powered by 120VAC.

## Software Settings

The C100MB uses the following settings:

- Measurement Format – Product %
- Modbus Mode – RTU
- Baud Rate - 19,200
- Parity – Even
- Modbus ID # 247 – not shown or editable
- Enable all Smart Bobs on the 485 network

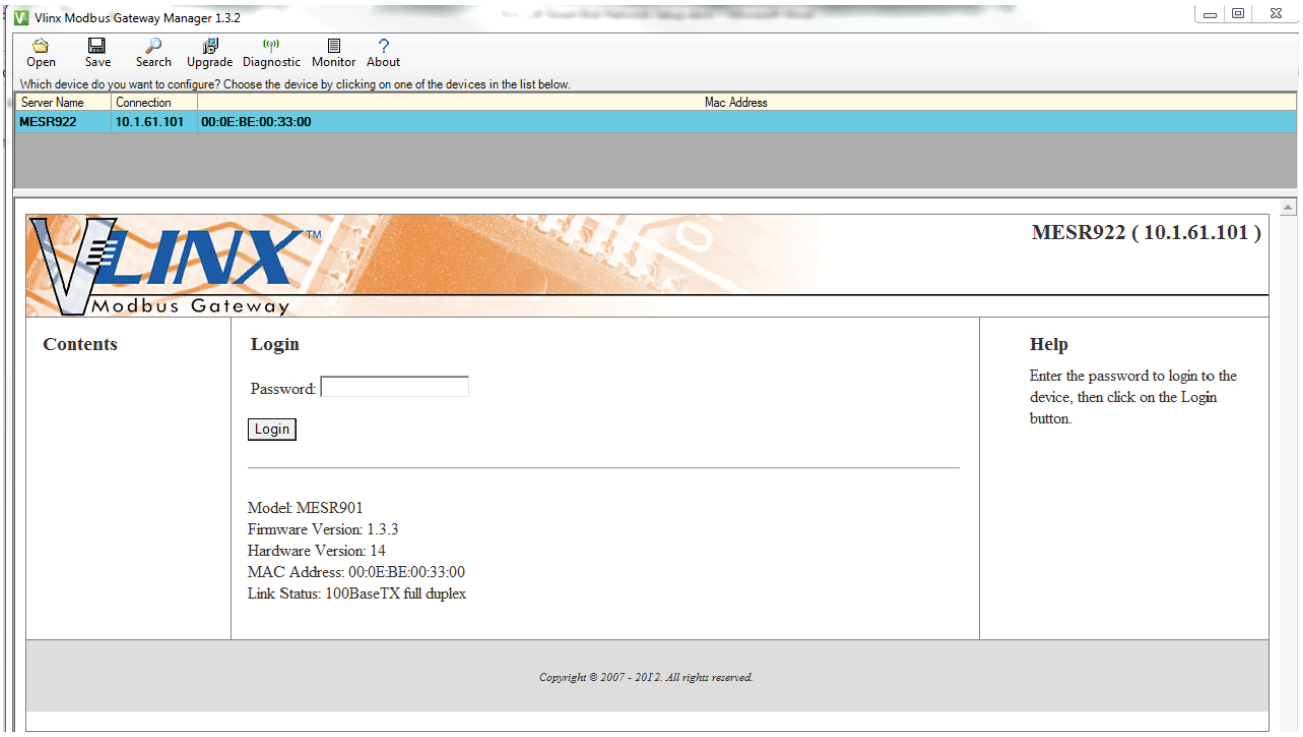



The MES Modbus gateway is setup through the Vlinx Modbus Gateway Manager software. The setup file is included in the FLX-128 Plus Released folder on the Conair W: drive. The MES is considered the Master on the 485 network with the C100MB as the slave. Use the following procedure to setup the MES gateway.

1. **Change your PCs IP address to be on the 169.254.102.xxx network.** Connect to the FLX switch with an Ethernet cable and start the Vlinx software.
2. **Press Connect and wait for the software to complete its scan.** The following screen should appear.

(Continued)

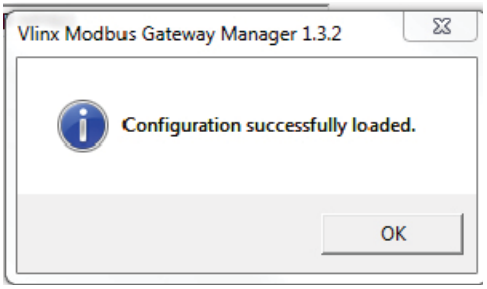
# FLX-128 Plus Smart Bob Network Setup (continued)



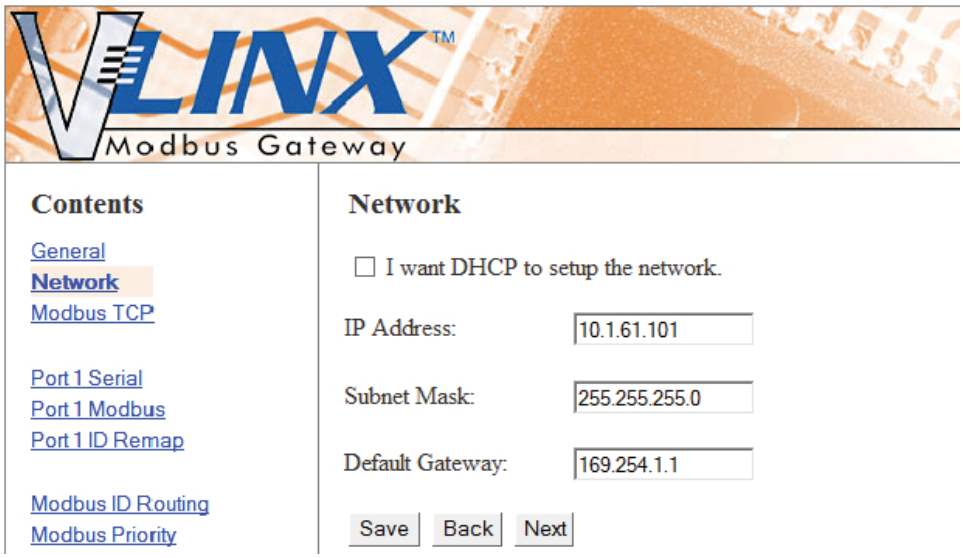

**3** **Press the login button.** By default no password is required.

**4** **Press the open icon and select the FLX configuration file.** You should see the following message.

**5** **Press OK.** This file automatically configures all the setting in the MES if the FLX is on the default network.




**NOTE:** To change the default settings press the network tab under contents if you need to change the IP address of the MES to match the FLX-128 Plus device network.



# FLX-128 Plus Smart Bob Network Setup (continued)

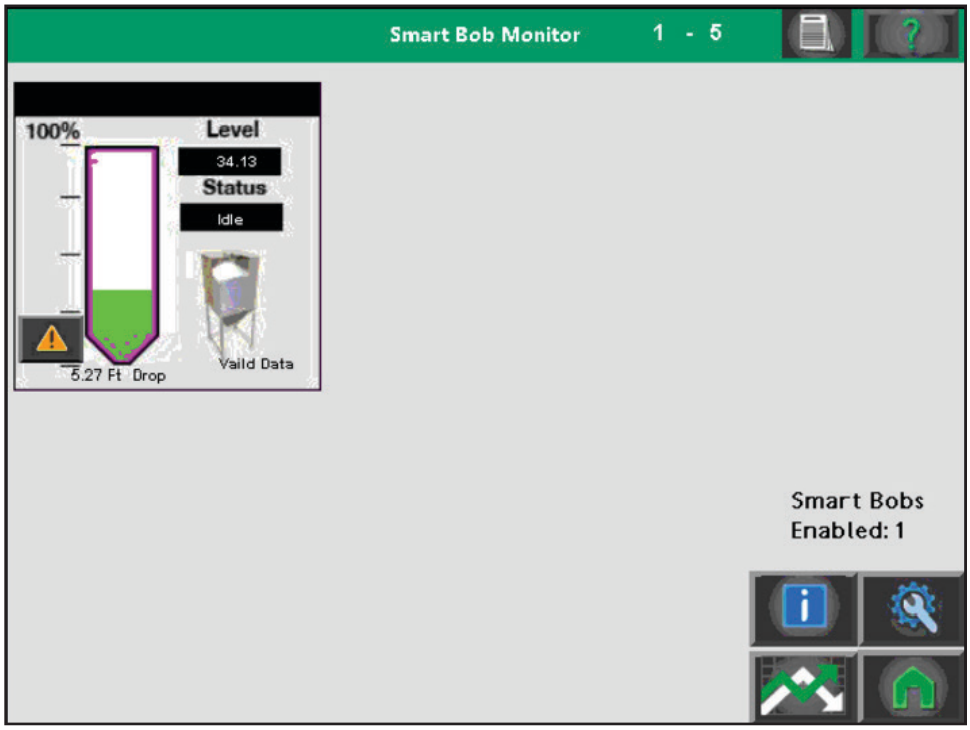
**6** **Press the Save tab under contents and press the Save button to load the settings into the MES.** The MES is now ready. To run the Vlinx software again you must change your PC's address to the same network as the MES's new IP address.

## FLX-128 Plus setup

The Smart Bob feature in FLX-128 Plus must be enabled to monitor the Smart Bob network. This feature is enabled by logging into the FLX at the Conair level, going to the first Settings page and pressing the 'Purchased Options' button then enabling the 'Show C-100 Smart Bob' option.

If the non-default IP address has been set in the MES Modbus Gateway, go to the settings page of the Smart Bob set of screens and enter the new IP address and press confirm.

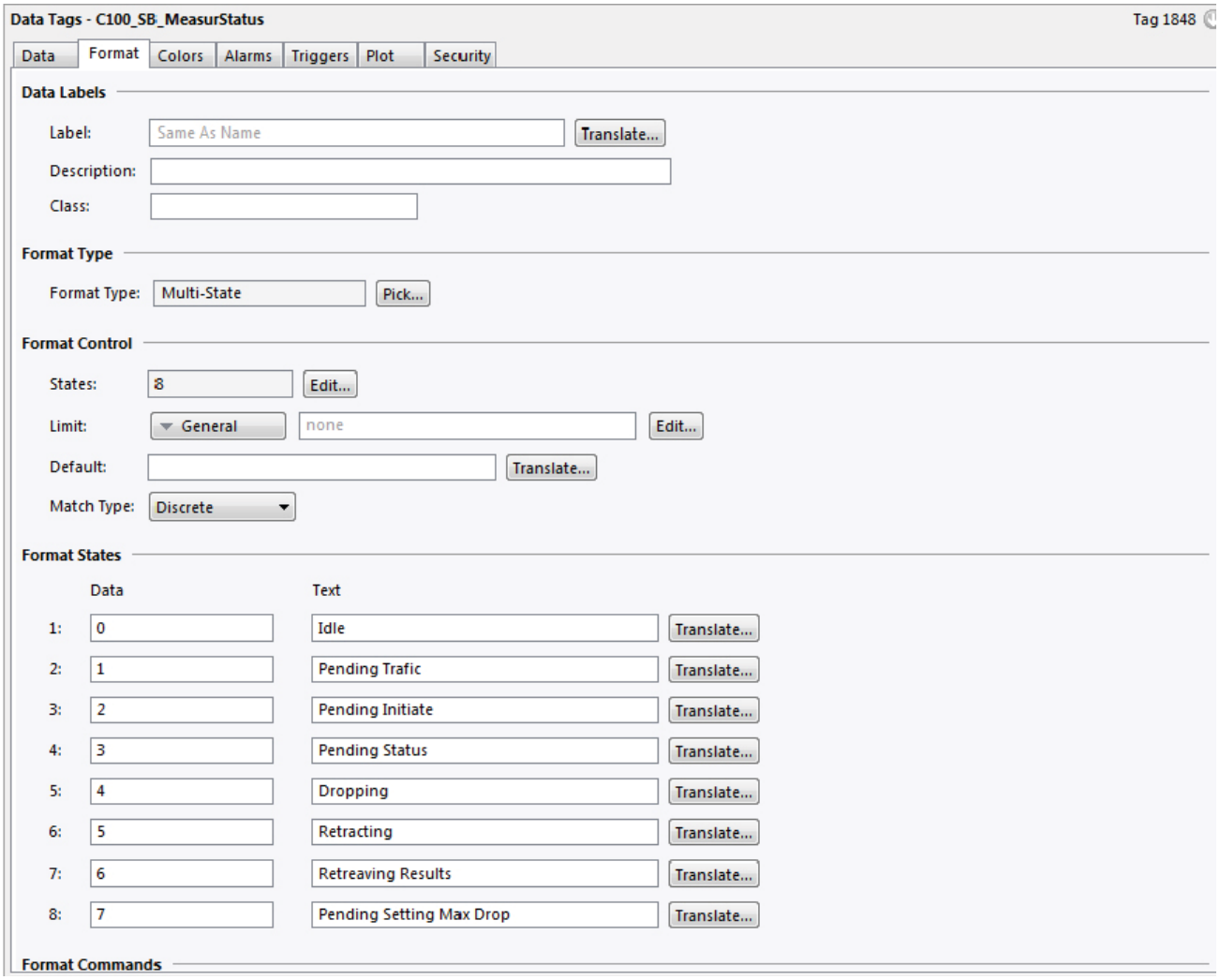
The Smart Bob Monitor page should look like the following:



# FLX-128 Plus to Smart Bob Interface

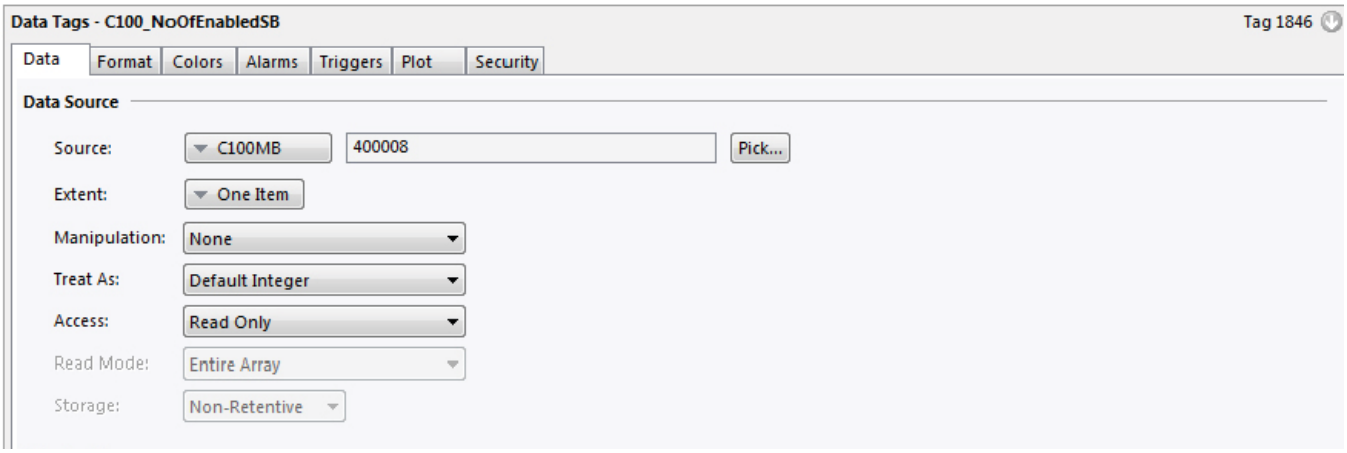
The FLX-128 Plus talks to the Binmaster C100MB controller through an Ethernet to RS485 converter. The manual for the C100MB can be found at http://www.binmaster.com/literature?type=&language=&category=&product=3245&Submit=

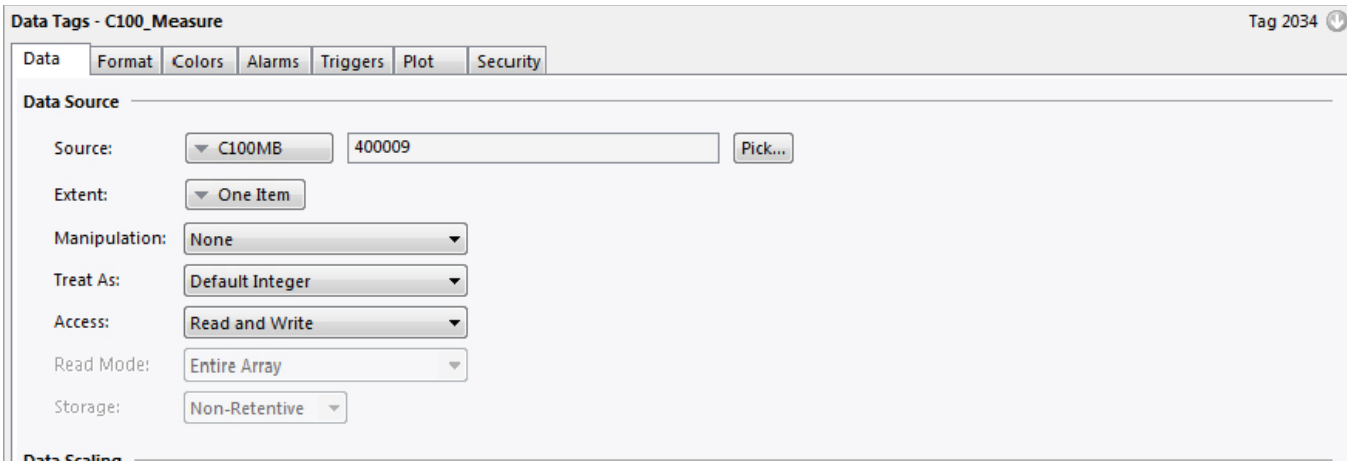
One C100MB controller can monitor up to 120 Smart Bobs. The following screens show which Modbus registers are used for this interface.

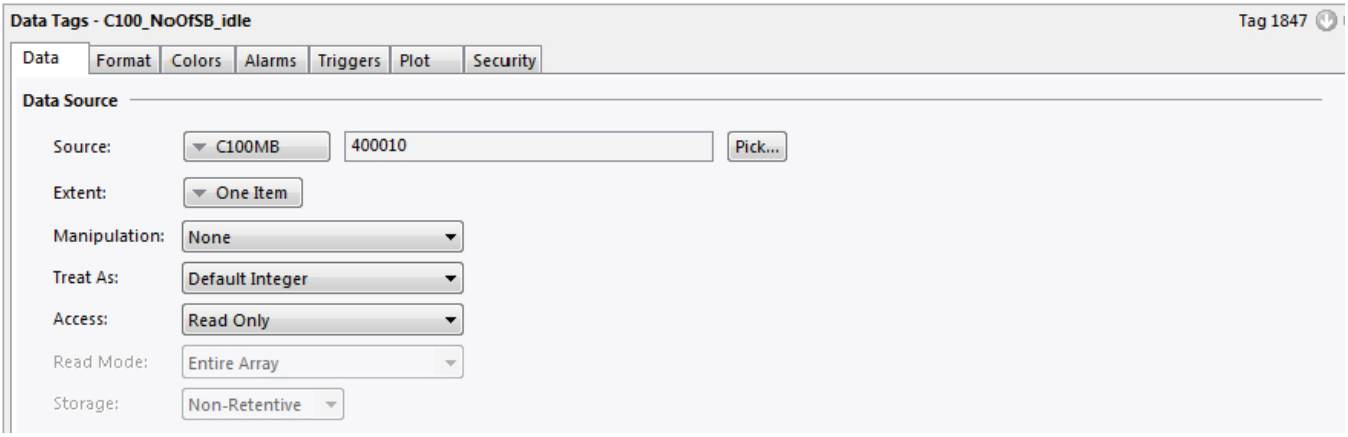




(Continued)

# FLX-128 Plus to Smart Bob Interface
**(continued)**



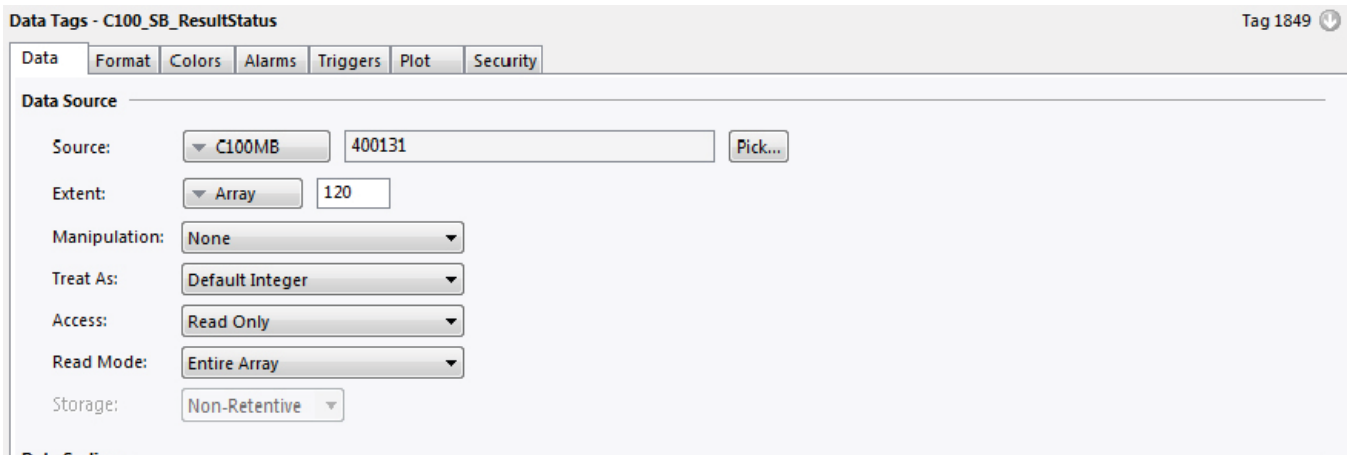



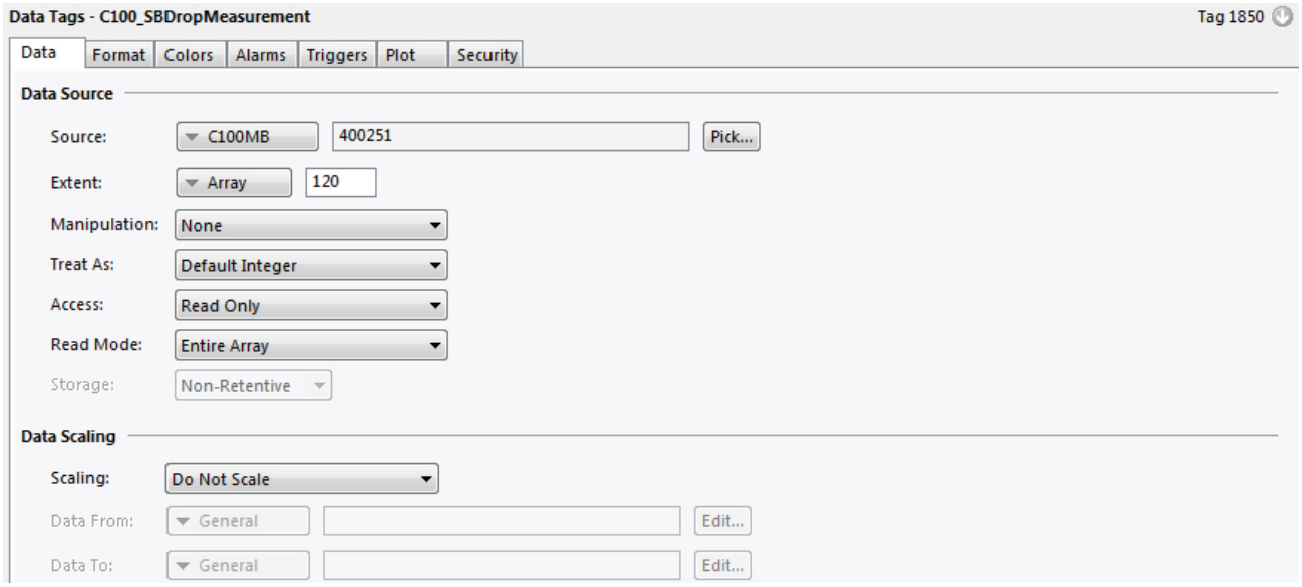



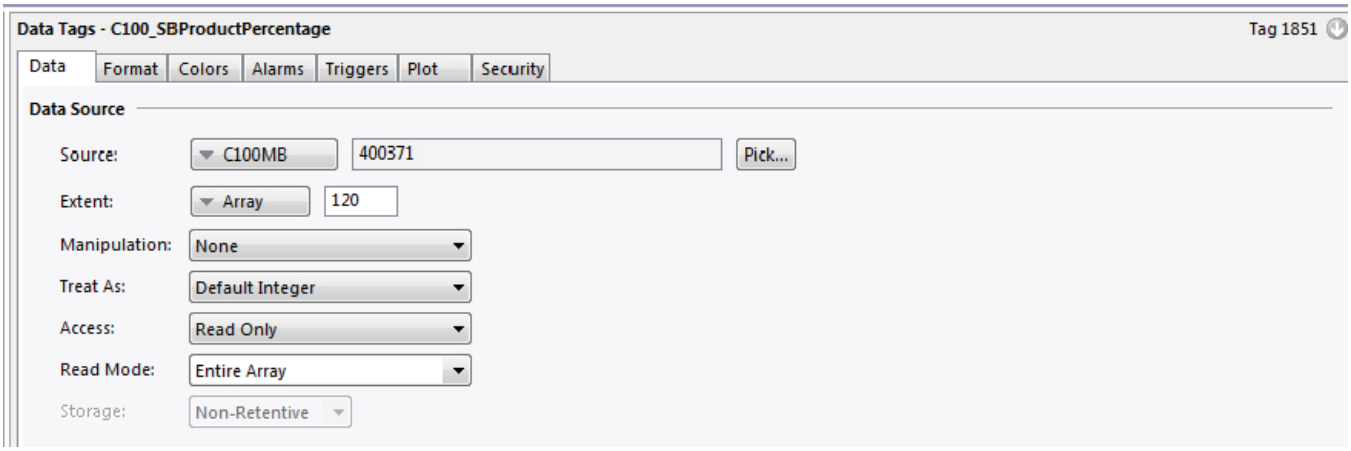



(Continued)

# FLX-128 Plus to Smart Bob Interface
**(continued)**

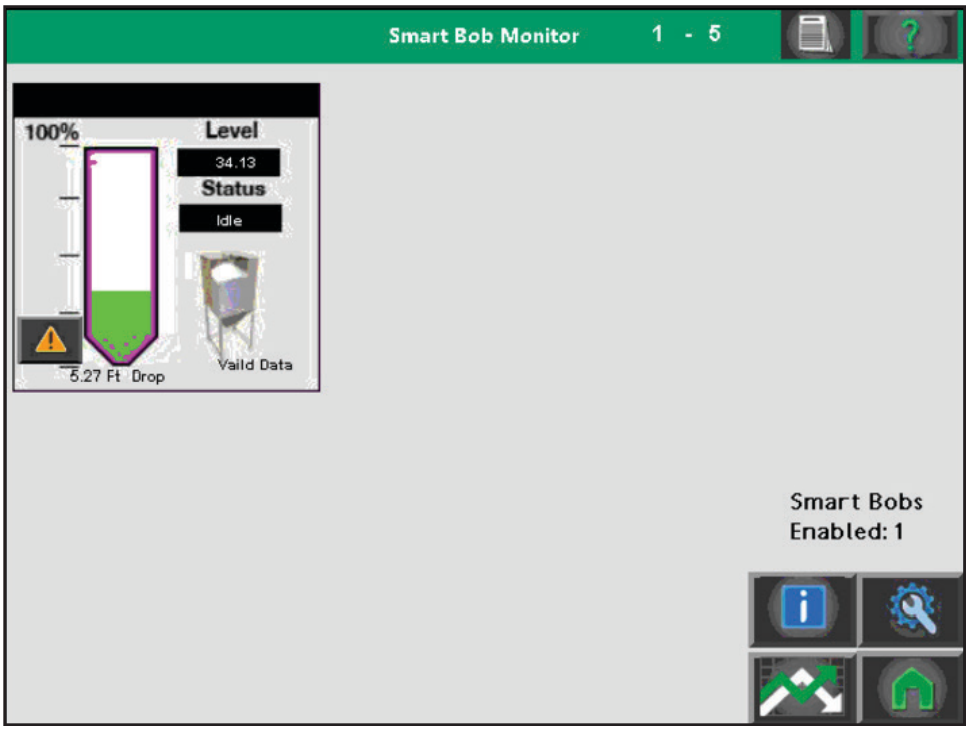


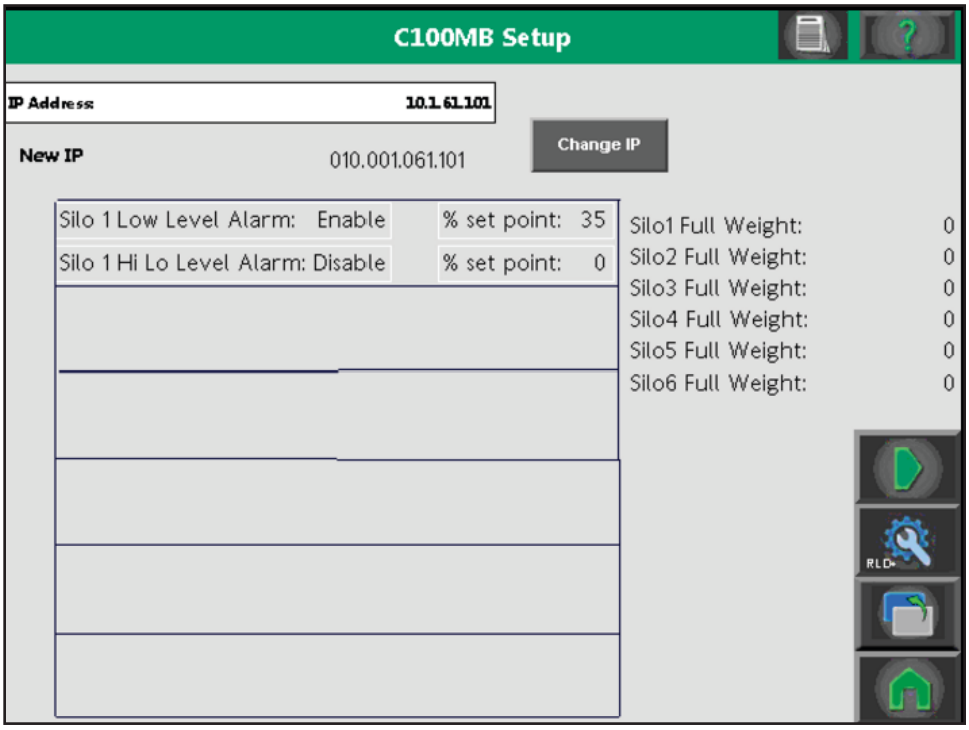



# Smart Bob Alarm Setup

The Smart Bob can be set to Alarm and email when the level measured is below or above the desired points.




After logging in at the admin level, press the blue wrench on the Smart Bob main screen.




Any Smart Bob in the system will be displayed in the table. Set the set point first then enable the alarm by pressing on the Disable text and pressing the up arrow then the ender button to enable the alarm. If email is desired make sure to enable the Smart Bob emailing feature.

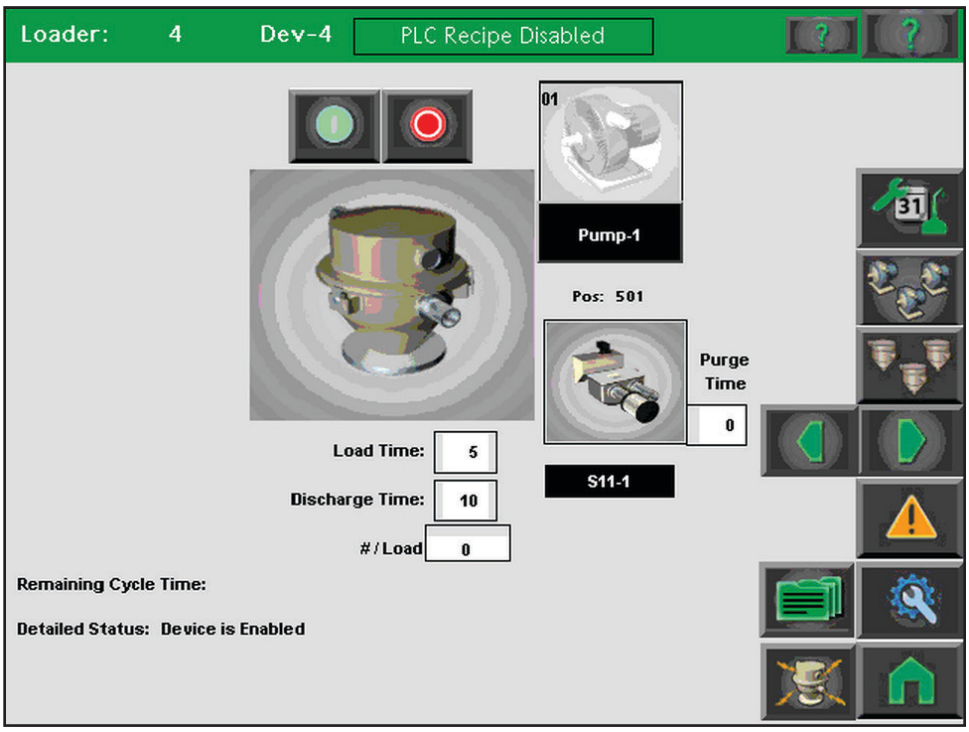
# FLX-128 Plus Recipes

The FLX-128 Plus plus now support recipes. Recipes can be stored in either the PLC or on a Compact Flash (CF) card in the HMI.

## PLC Recipes

Recipes stored in the main PLC of the FLX-128 Plus support 2-Step control. 2-Step control gives the user the option to select one recipe for the load and dump portions of the load cycle and a different recipe for the purge portion of the load cycle. This feature is helpful with the R-PRO valve and pump control to eliminate the need for additional valves. The PLC can hold up to 10 recipes for each loader but only the active recipe is saved with the original Save/Restore Setting routine. PLC recipes must also be saved individually to the CF for a complete backup of the FLX.

The PLC recipe button is located on the loader detail screen.



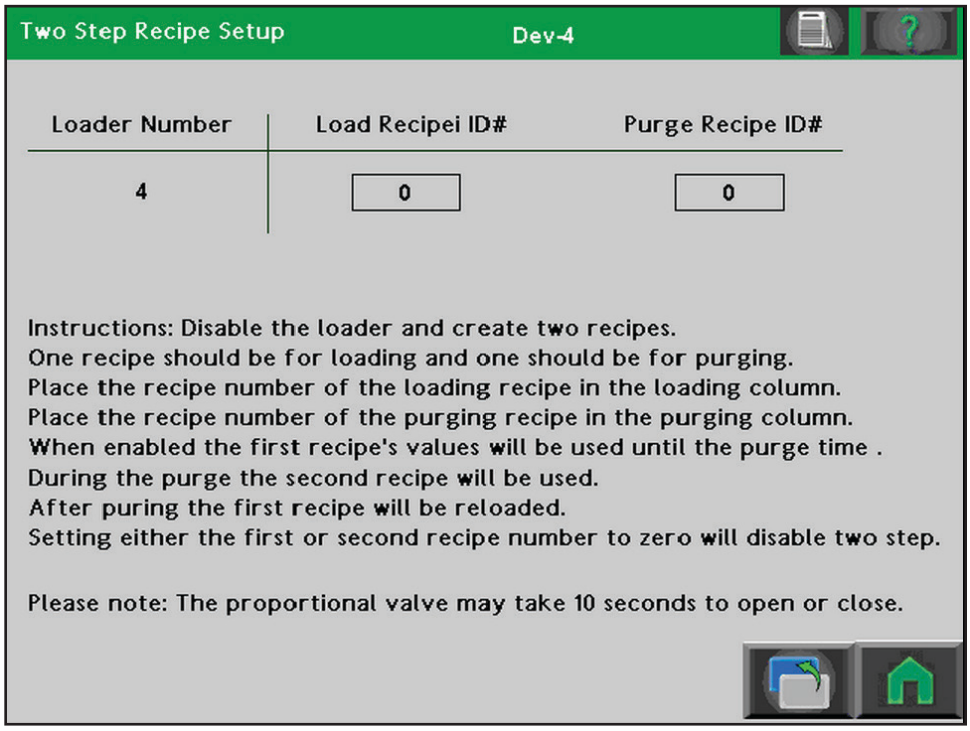

Create a PLC Recipe by changing the 'PLC Recipe Disabled' button to 'Edit PLC Recipe'. Enter the PLC Recipe ID #, modify the recipe setting, if desired, and change the button to 'Save PLC Recipe'. The text will change to 'PLC recipe Enabled'.

To load any of the PLC saved recipes make sure the button text says 'PLC recipe Enabled' then enter the desired recipe ID #. If the recipe exists the recipe setting will replace the current loader settings. If the recipe does not exist, the current setting can be modified and then saved as above.


The 2-Step recipe screen is accessed from the green recipe 2-step button on the recipe save/restore screen. Press the green recipe button on the loader detail screen to access the recipe save/restore screen. To access the 2-Step Recipe Setup screen press the Step Recipe button . Follow the instruction on the 2-Step recipe setup page to enable the 2-Step feature.

(Continued)

# FLX-128 Plus Recipes (continued)




When restoring a FLX, PLC recipes should be restored from the CF card then saved to the PLC. Follow the restore instructions on the 'CF Card Recipe' screen then change the 'PLC Recipe Disable' button to 'PLC Save Recipe' to restore the recipe to the PLC. Change the button back to 'PLC Recipe Disabled' to restore the next recipe.

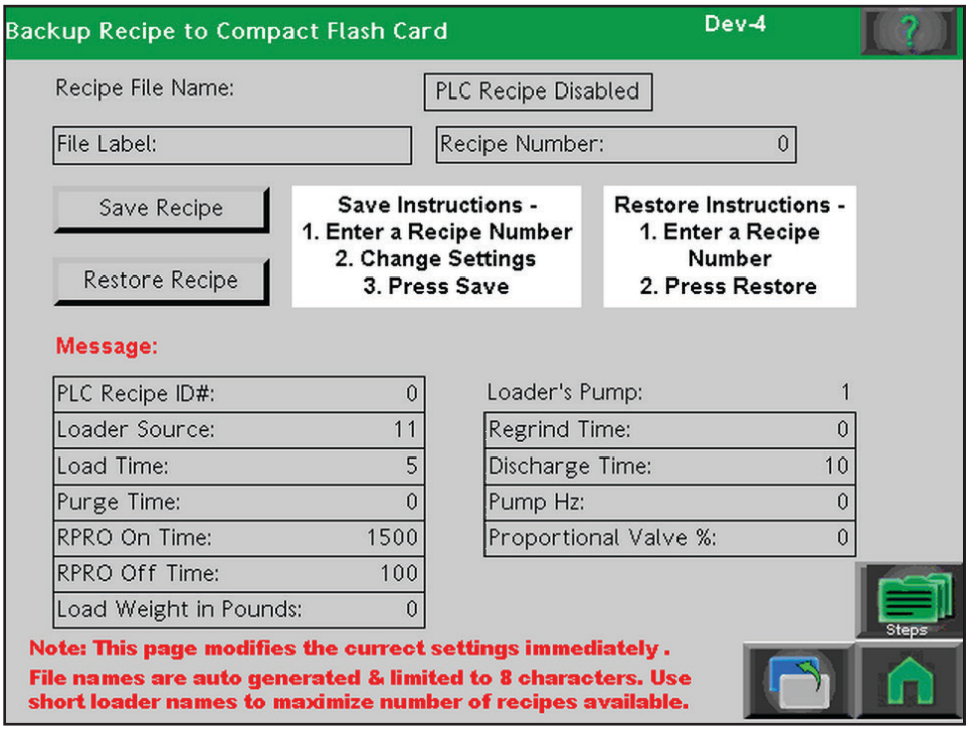
## CF card Recipes

Recipes stored in the CF card of the HMI are reloaded manually when needed. They should be off loaded to a PC for safe storage. Recipe file names are automatically generated. Up to 1000 recipes (0 through 999) for each loader can be saved to the CF card in a HMI. Using loader names of 5 characters or less insures you can use all 1000 recipes. Every loader's name's character length greater than 5 reduces the number of recipes for that loader by a factor of 10, so a loader name of 7 characters can only have 10 recipes. Changing a loader's name after saving recipes will make earlier recipes un-restorable.

Press the green recipe button on the loader detail screen to access the recipe save/restore screen.

(Continued)

# FLX-128 Plus Recipes (continued)



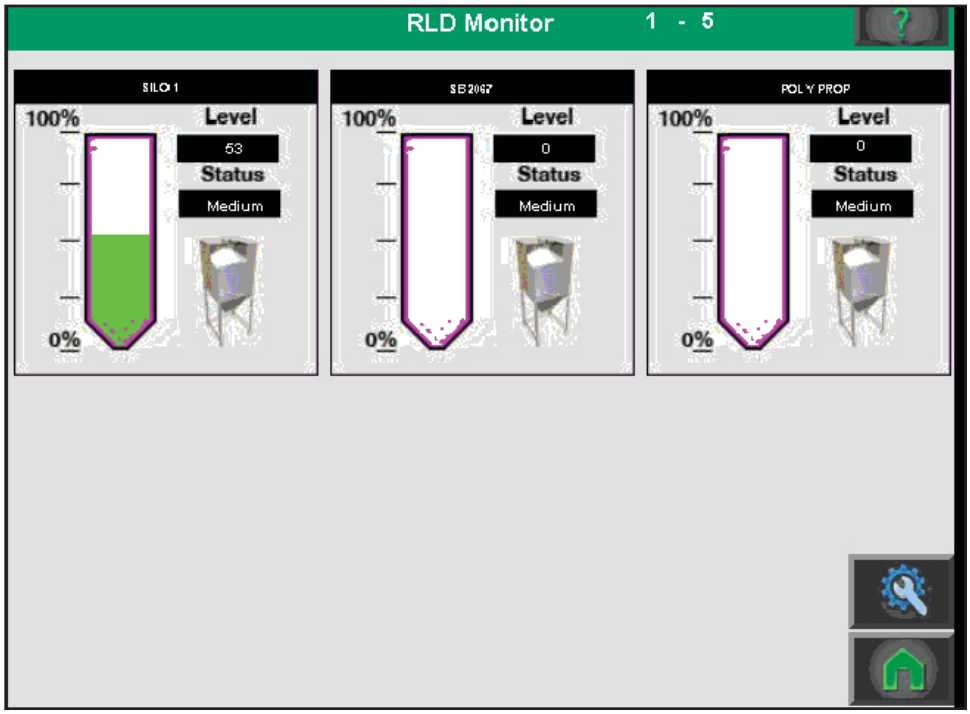

When restoring a FLX-128 Plus, PLC recipes should be restored from the CF card then saved to the PLC. Follow the restore instructions on the screen then change the 'PLC Recipe Disable' button to 'PLC Save Recipe' to restore the recipe to the PLC. Change the button back to 'Disabled' to restore the next recipe.



(Continued)

# Silo Level Monitoring through the FLX-128 Plus

## Original RLD monitoring




The default IP address for the original RLD is 10.1.60.1. This can be changed by pressing the blue wrench. The original RLD has a limited number of Ethernet Connections so connections to the FLX-128 Plus HMI should be limited to 1. Make sure the subnet mask of the FLX device network is expanded to include the 10.1.60.xxx network if the default IP addresses are used.

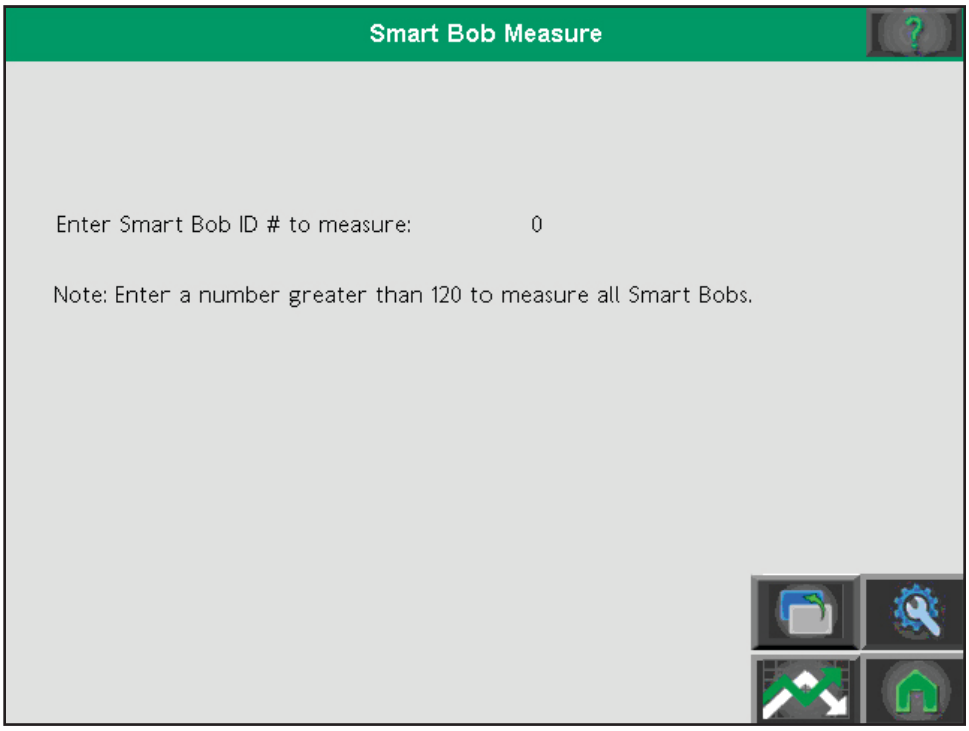
When more than 5 vessels are enabled in either the original RLD or the C-100, a gray navigation button will appear to access the higher vessels.

**Triggering a Smart Bob Measurement from the FLX-128 Plus**

Each Smart Bob can be triggered to take a measurement remotely through the FLX-128 Plus. Press the information button on the main Smart Bob screen of the FLX.

(Continued)

# Silo Level Monitoring through the FLX-128 Plus (continued)




From this screen enter a number into the entry field. A number greater than 120 will cause all enabled Smart Bobs on the network to take a measurement.

The trend button accesses the historical trending of the first 12 vessel levels.

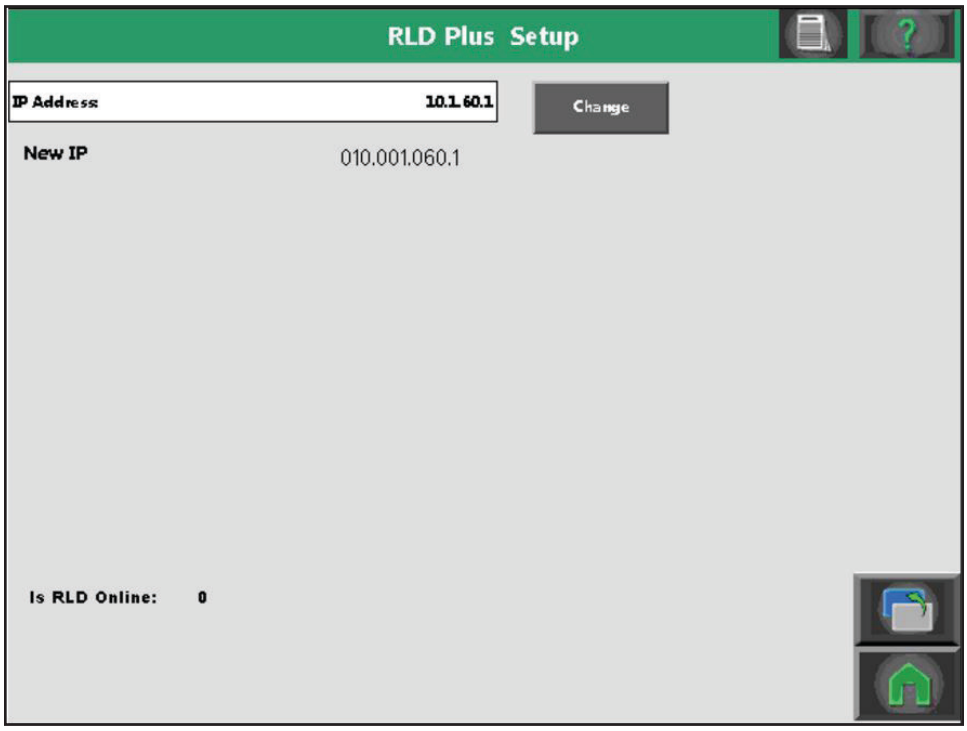
## Addition of the RLD Plus to the Smart Bob C-100

Addition of the RLD Plus to the C-100 will enable discrete alarming of high and low levels and overpressure monitoring to all enabled vessels. These alarms will show up graphically on the main Smart Bob screen beside the 0-100 % scale and on top of the 3D vessel graphic. Each position indicates the type of alarm. The High level alarm will show up on the top of the 0-100 % scale while the low level alarm will show up at the bottom. The over pressure truck fill alarm will appear on top of the 3D hopper graphic. Each alarm will also be logged in the HMI alarm log where it can also be acknowledged.


The default IP address of the RLD Plus (10.1.61.10) can be changed from the RLD Plus Setup screen.

(Continued)

## Silo Level Monitoring through the FLX-128 Plus (continued)



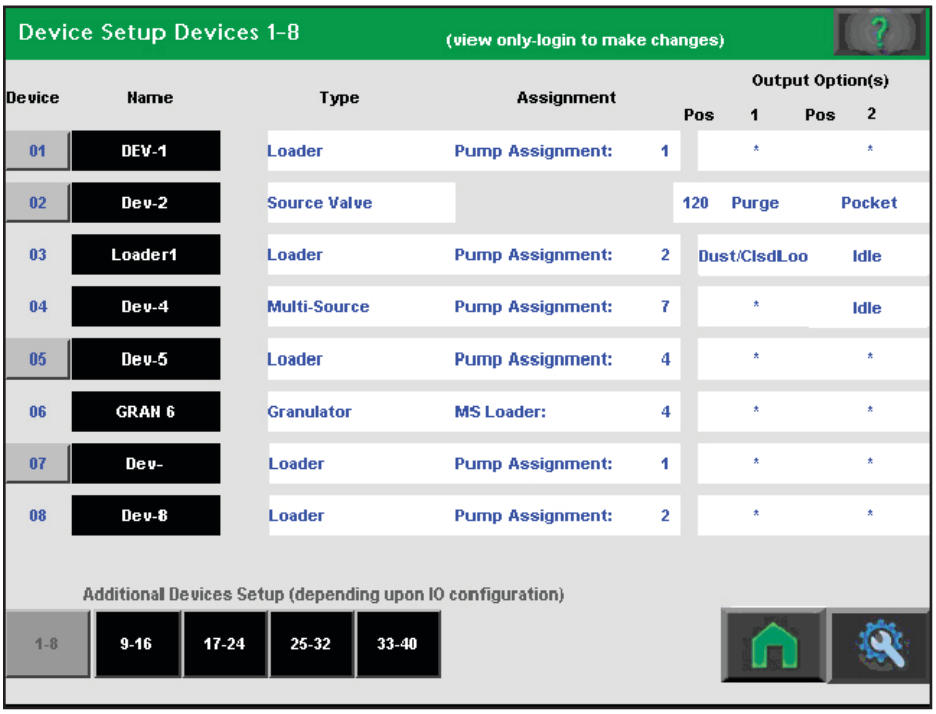

## Idle Mode, Dust Collector and Closed Loop Pump Control

The FLX-128 Plus can control up to two optional valves that can be configured for idle mode, dust collector or closed loop control in addition to the original purge and pocket independent options. These same optional valves can also be configured as dependent valve for positive discharge, ratio and the new blowback feature. The dust collector and closed loop control should not be configured for the same pump.

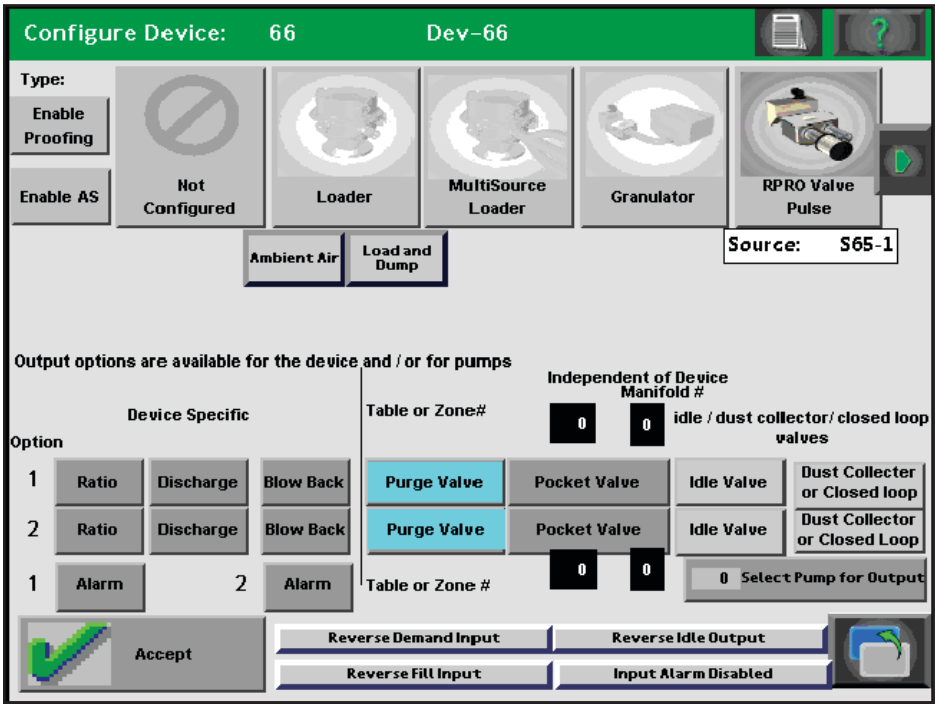
As independent valves, these valves are wired to any unused output option cards, but if 2 valves are required for a pump, they must be paired from the same device's options (1+2). For ease of wiring, two valve output options have been included in the pump combo expansion boxes. The option cards are first assigned to a pump and then configured the options on the device configuration page.

(Continued)

# Idle Mode, Dust Collector and Closed Loop Pump Control (continued)




**1** **Press the Device Button to bring up the Configure Device Screen.**

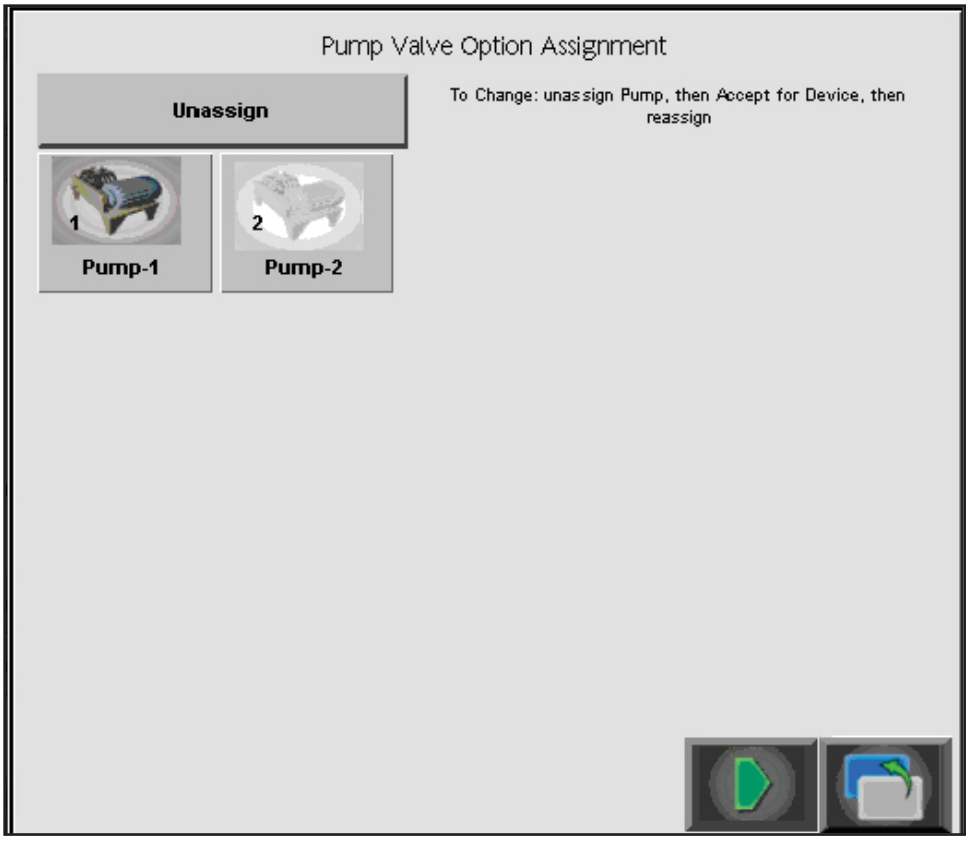


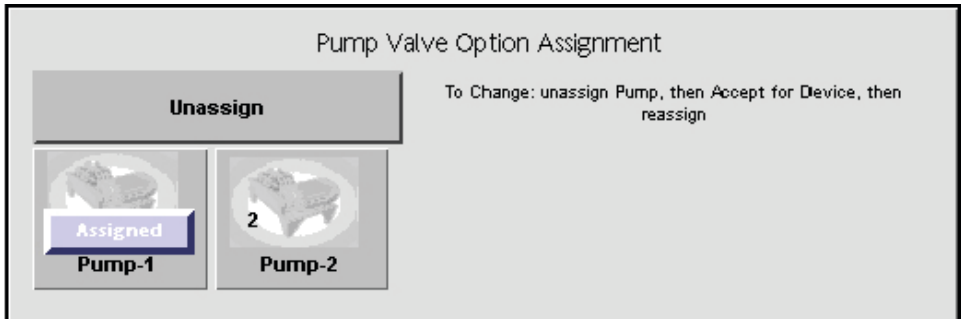

**2** **Press the 'Select Pump' button to bring up the Pump Valve Option Assignment screen** and select the pump you want to assign the output to. The ILP green arrow only shows up when the ILP option is enabled from the purchased option screen. Once assigned a pump must be unassigned before another device's output options can be used.

Once assigned the valve output buttons will darken and become selectable.


(Continued)

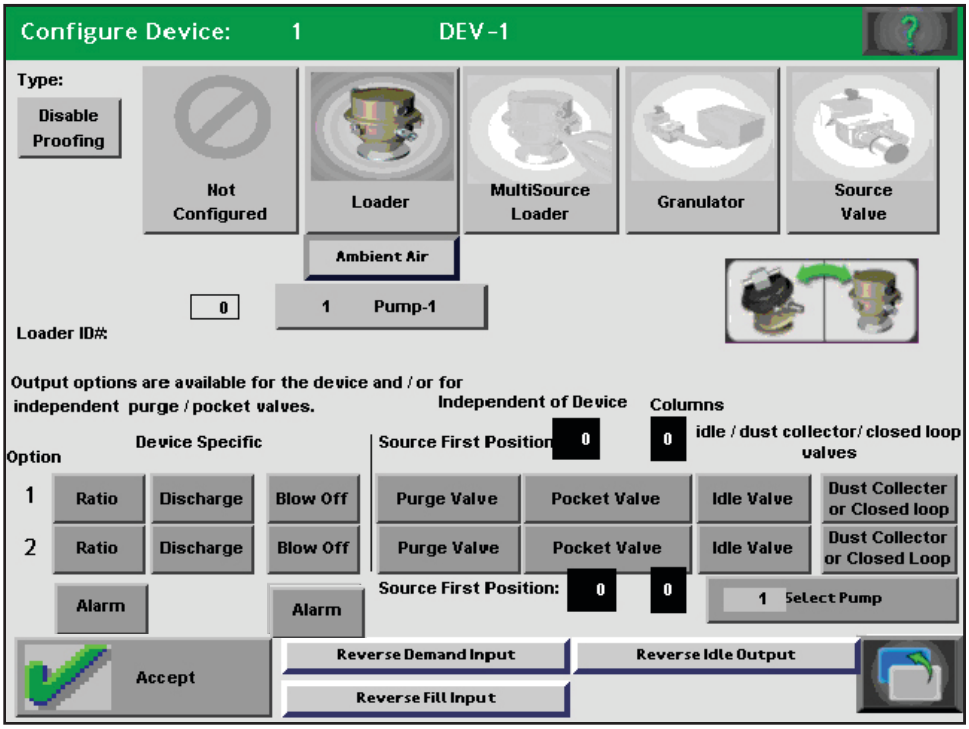
# Idle Mode, Dust Collector and Closed Loop Pump Control (continued)



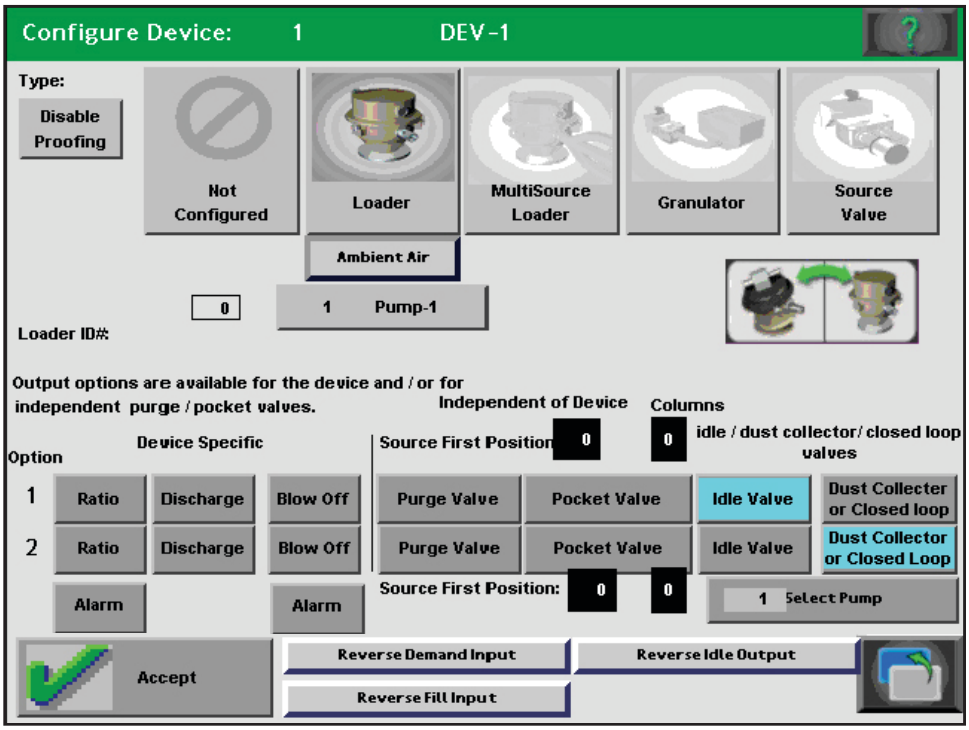




(Continued)

# Idle Mode, Dust Collector and Closed Loop Pump Control (continued)



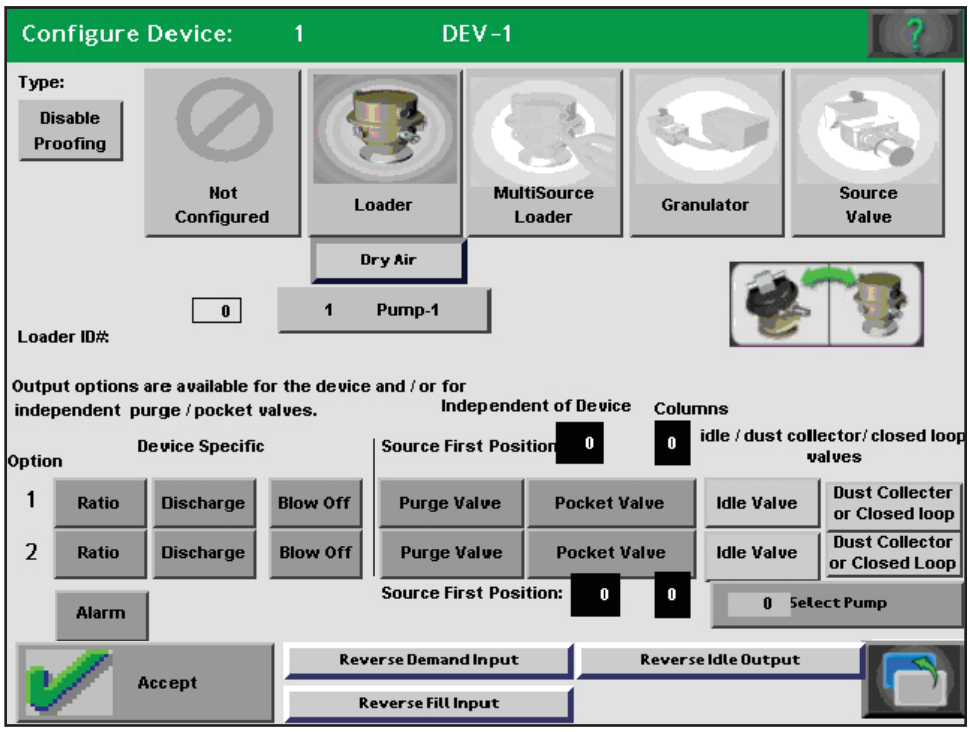

**3** Press the 'Idle Valve' and/or 'Dust Collector or Closed Loop' button.



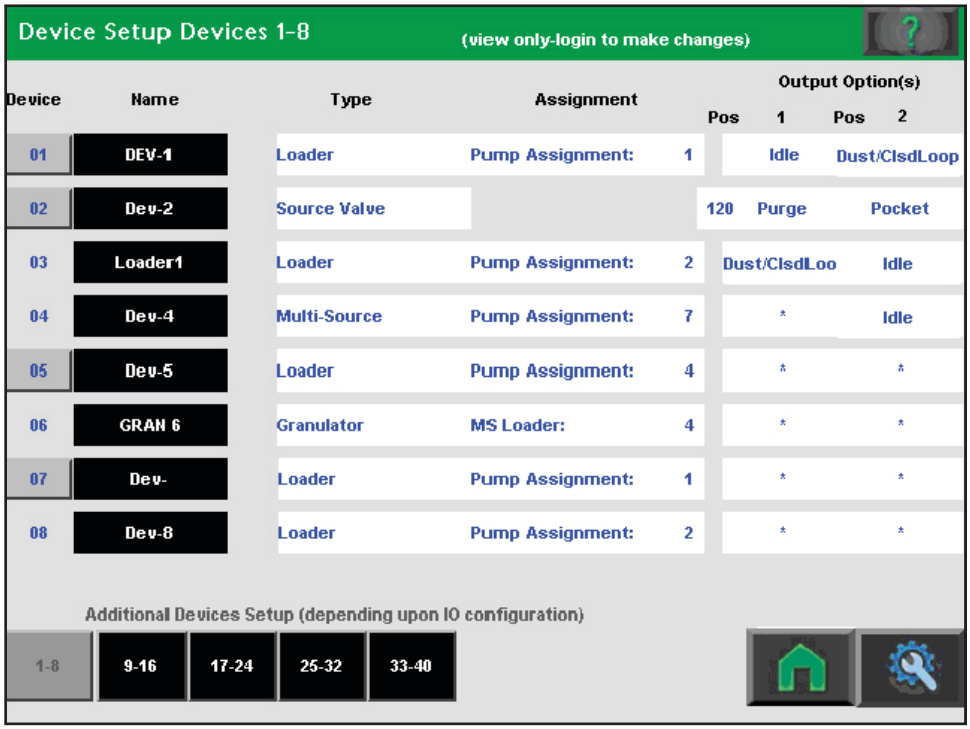

**4** For Closed Loop Control of a loader, switch the 'Ambient Air' button to 'Dry Air'.


(Continued)

# Idle Mode, Dust Collector and Closed Loop Pump Control (continued)



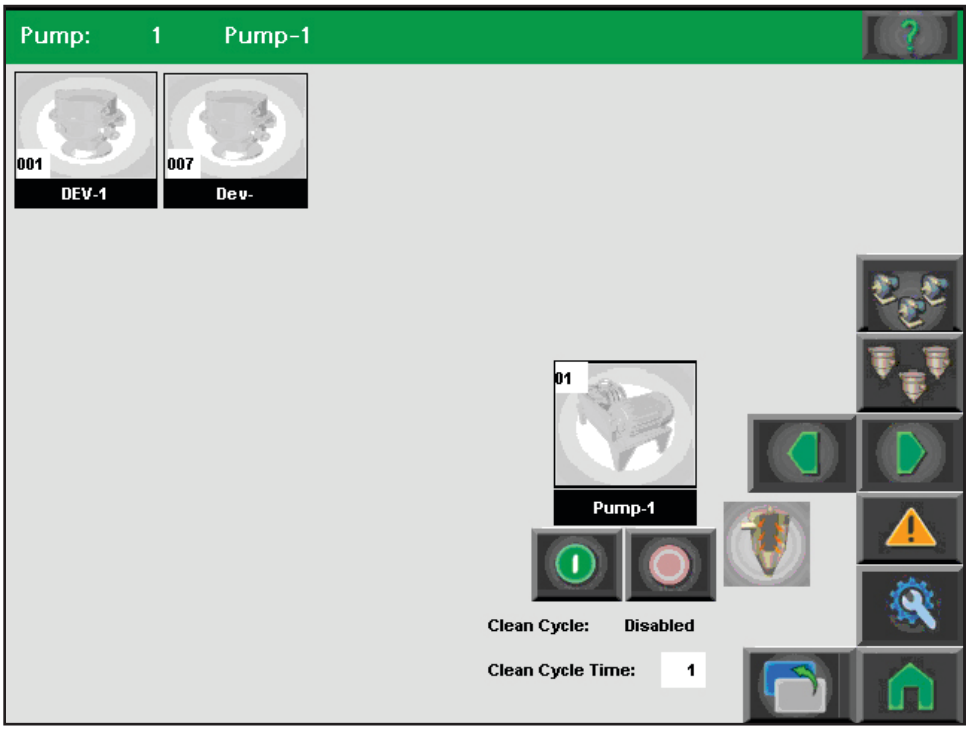

**5** Once accepted, the Device Setup page will show the options.



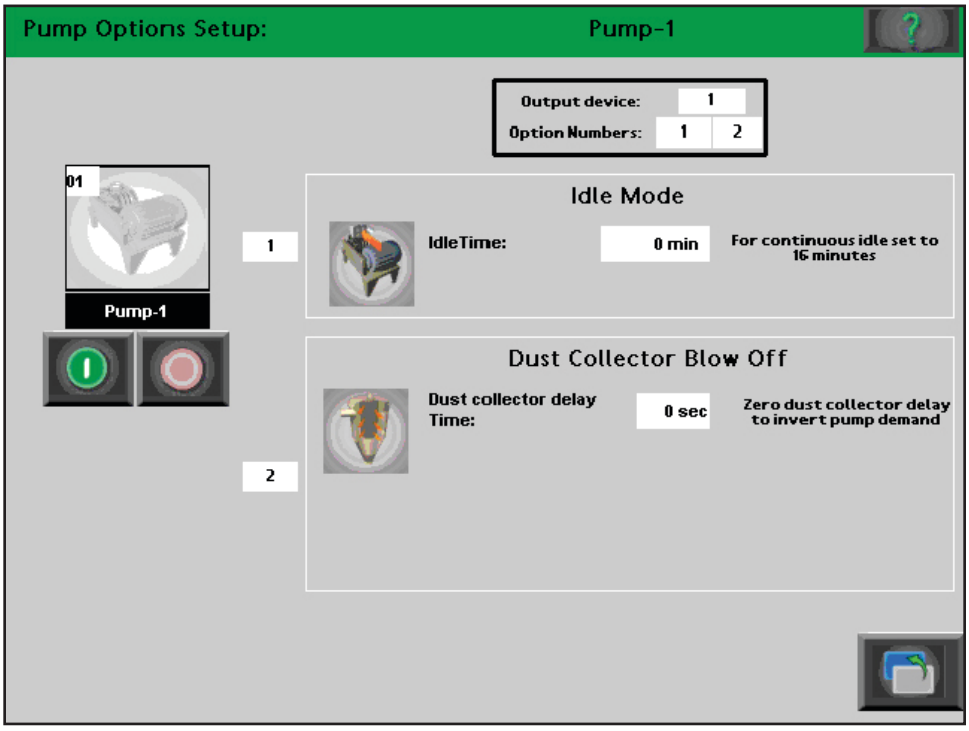

**NOTE:** The dust collector icon is displayed on the pump output screen and the pump Options Setup screens until a loader with the Dry Air option enabled is loaded. At that time the Dust Collector icon will disappear and the pump will operate in closed loop mode for any loader configured for Dry Air control. This will disable any dust collect functions previously setup for this pump.

(Continued)

# Idle Mode, Dust Collector and Closed Loop Pump Control (continued)



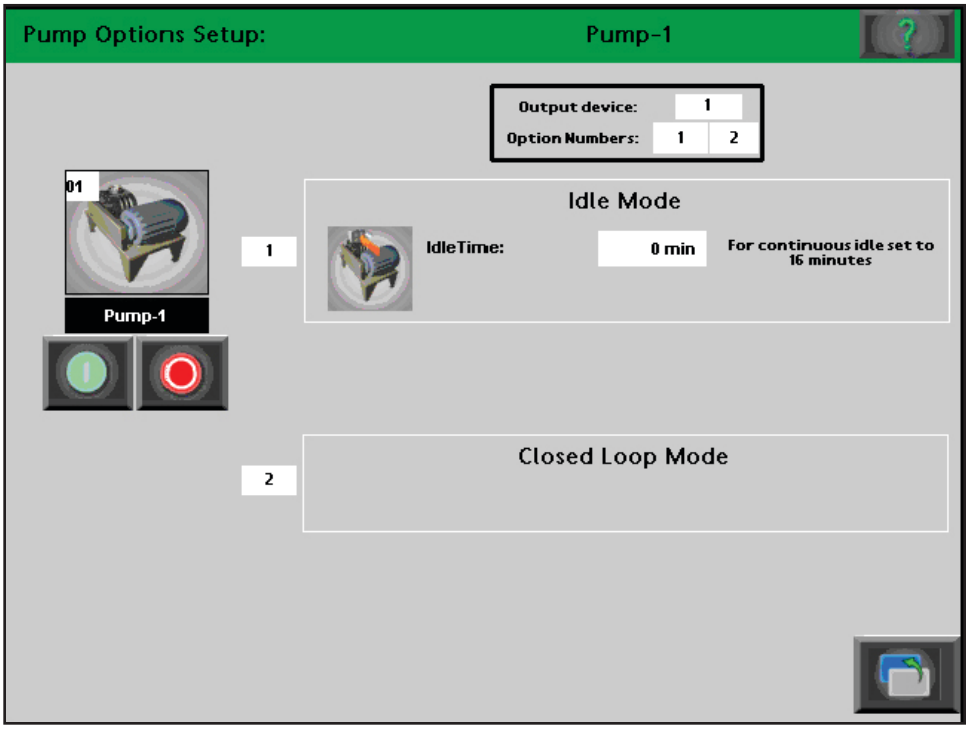

**6** **Pressing the Setup Wrench from the pump screen allows you to complete the pump option setup.**




After the first Dry Air Loader has been loaded the Pump Option Setup screen will look like the following.

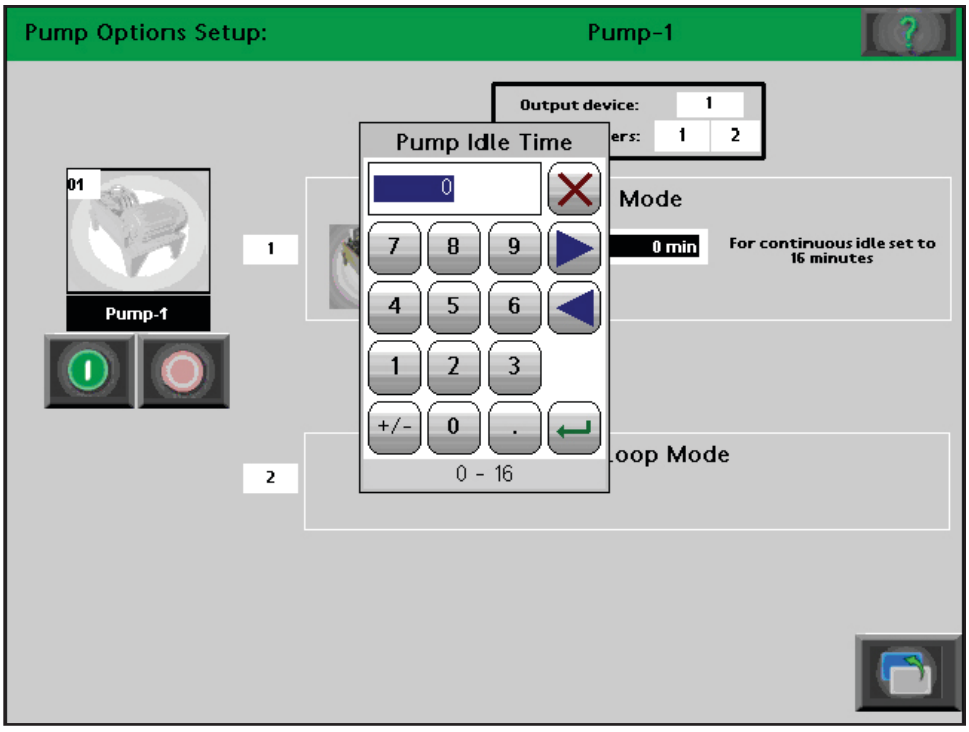
(Continued)

# Idle Mode, Dust Collector and Closed Loop Pump Control (continued)




**NOTE:** The pump must be disabled before the settings can be changed.

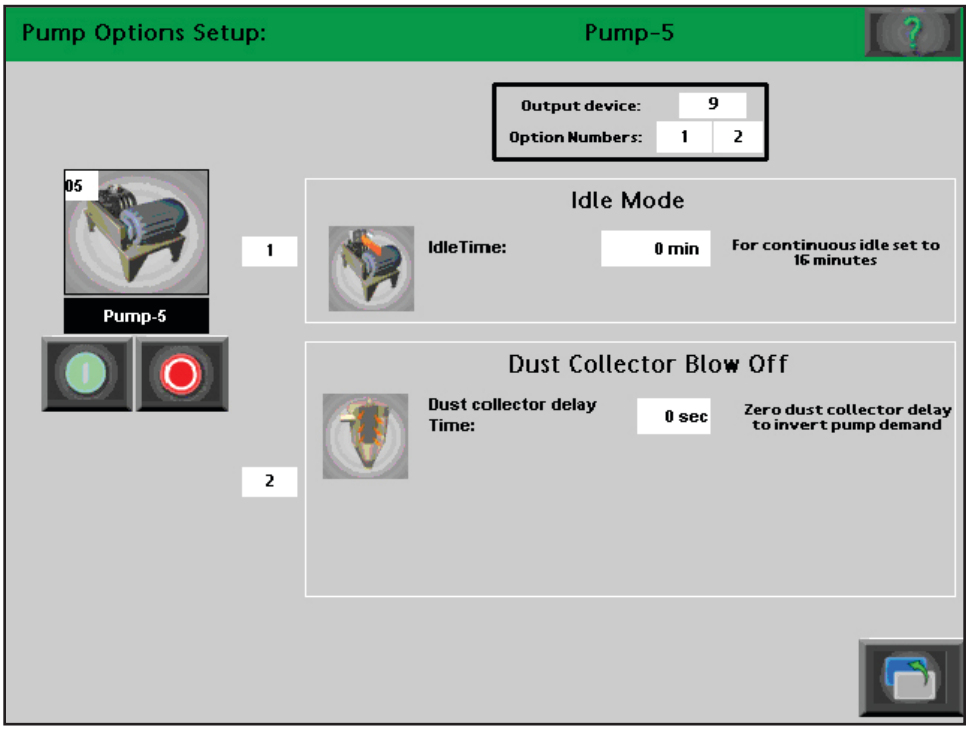
Change the idle mode time from 0 to 15 seconds to adjust the pump for automatic shut off or set it to 16 minutes to allow the pump to idle continuously.



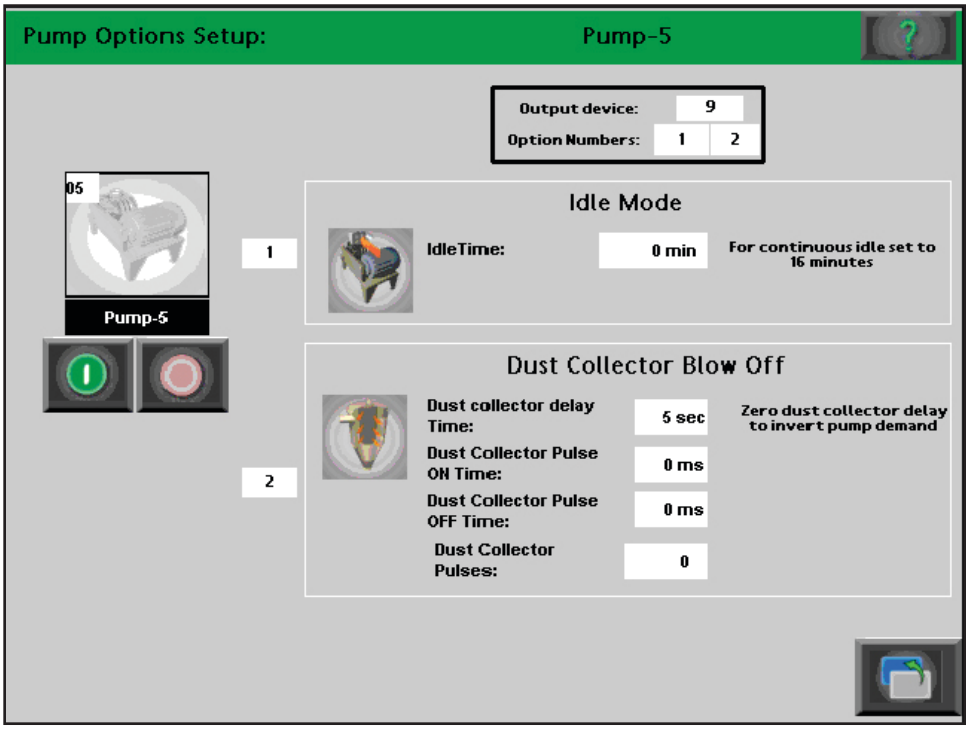

By zeroing the dust collector delay, the valve follows the demand signal (off when in demand, on when no demand).

(Continued)

# Idle Mode, Dust Collector and Closed Loop Pump Control (continued)



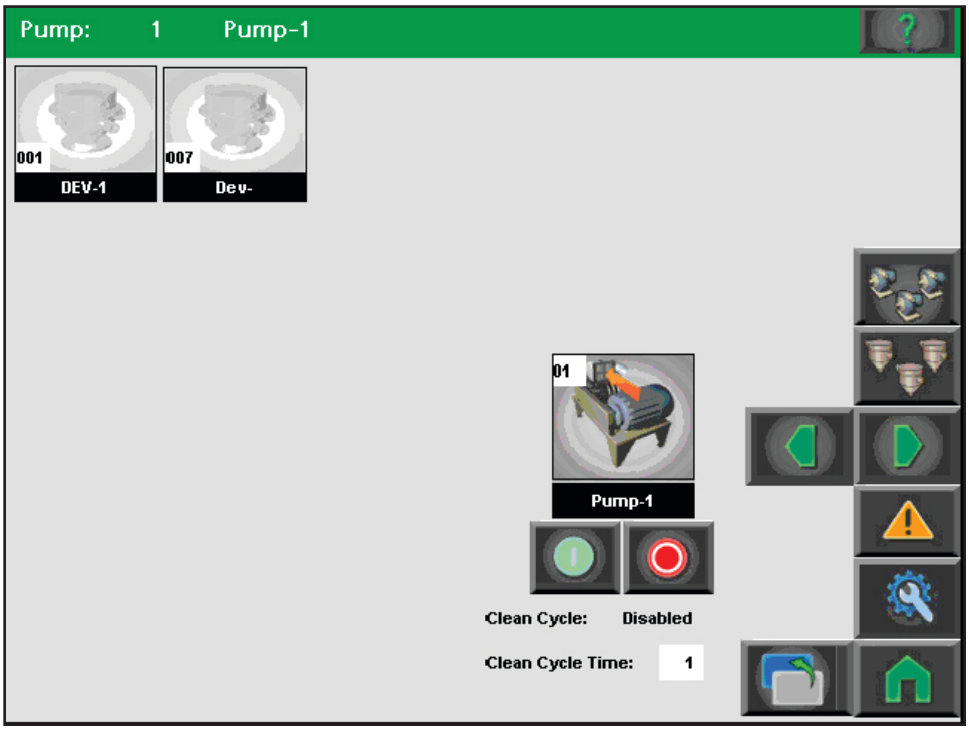

Entering any delay time will allow you to enter pulse times and pulses.




The orange arrow on the pump graphic indicates Idle mode is active and will remain on until the timer times out or the pump is disabled.

(Continued)

# Idle Mode, Dust Collector and Closed Loop Pump Control (continued)




# Loader and Pump Box Configuration

| 16 Loader Box | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Loaders** | **Address** | **sw#1** | **sw#2** | **sw#3** | **sw#4** | **sw#5** | **sw#6** | **sw#7** | **sw#8** |
| 65-80 | 10.1.61.241 | on | off | off | off | on | on | on | on |
| 81-96 | 10.1.61.242 | off | on | off | off | on | on | on | on |
| 97-112 | 10.1.61.243 | on | on | off | off | on | on | on | on |
| 113-128 | 10.1.61.244 | off | off | on | off | on | on | on | on |

| 16 Loader/ valves Box | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Loaders/Valves** | **Address** | **sw#1** | **sw#2** | **sw#3** | **sw#4** | **sw#5** | **sw#6** | **sw#7** | **sw#8** |
| 65-80 / 129-44 and 161-176 | 10.1.61.245 | on | off | on | off | on | on | on | on |
| 81-96 / 145-160 and 177-192 | 10.1.61.246 | off | on | on | off | on | on | on | on |
| 97-112 / 193-208 and 225-240 | 10.1.61.247 | on | on | on | off | on | on | on | on |
| 113-128 / 209-224 and 241-256 | 10.1.61.248 | off | off | off | on | on | on | on | on |

| 4 Pump Box | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Pumps** | **Address** | **sw#1** | **sw#2** | **sw#3** | **sw#4** | **sw#5** | **sw#6** | **sw#7** | **sw#8** |
| 21-24 | 10.1.61.201 | on | off | off | on | off | off | on | on |
| 25-28 | 10.1.61.202 | off | on | off | on | off | off | on | on |
| 29-32 | 10.1.61.203 | on | on | off | on | off | off | on | on |
| 33-36 | 10.1.61.204 | off | off | on | on | off | off | on | on |
| 37-40 | 10.1.61.205 | on | off | on | on | off | off | on | on |

(Continued)

# Loader and Pump Box Configuration

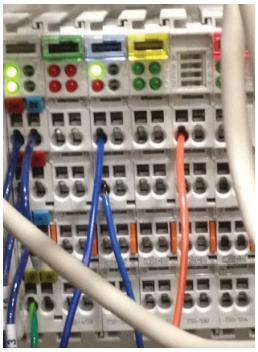
**(continued)**

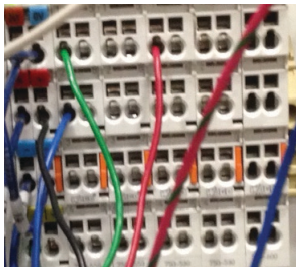
| 4 Pumps/valves Box | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Pumps/valves** | **Address** | **sw#1** | **sw#2** | **sw#3** | **sw#4** | **sw#5** | **sw#6** | **sw#7** | **sw#8** |
| 21-24 / 253-260 and 285-292 | 10.1.61.206 | off | on | on | on | off | off | on | on |
| 25-28 / 293-200 and 225-232 | 10.1.61.207 | on | on | on | on | off | off | on | on |
| 29-32 / 201-208 and 233-240 | 10.1.61.208 | off | off | off | off | on | off | on | on |
| 29-32 / 201-208 and 233-240 | 10.1.61.209 | on | off | off | off | on | off | on | on |
| 37-40 / 217-225 and 249-256 | 10.1.61.210 | off | on | off | off | on | off | on | on |

| 5 R-PRO Pump Boxes | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **R-PRO Pump Box** | **Address** | **sw#1** | **sw#2** | **sw#3** | **sw#4** | **sw#5** | **sw#6** | **sw#7** | **sw#8** |
| 1 | 10.1.61.156 | off | off | on | on | on | off | off | on |
| 2 | 10.1.61.157 | on | off | on | on | on | off | off | on |
| 3 | 10.1.61.158 | off | on | on | on | on | off | off | on |
| 4 | 10.1.61.159 | on | on | on | on | on | off | off | on |
| 5 | 10.1.61.160 | off | off | off | off | off | on | off | on |

| 10 R-PRO Source Boxes | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **R-PRO Source Box** | **Address** | **sw#1** | **sw#2** | **sw#3** | **sw#4** | **sw#5** | **sw#6** | **sw#7** | **sw#8** |
| 1 | 10.1.61.161 | on | off | off | off | off | on | off | on |
| 2 | 10.1.61.162 | off | on | off | off | off | on | off | on |
| 3 | 10.1.61.163 | on | on | off | off | off | on | off | on |
| 4 | 10.1.61.164 | off | off | on | off | off | on | off | on |
| 5 | 10.1.61.165 | on | off | on | off | off | on | off | on |
| 6 | 10.1.61.166 | off | on | on | off | off | on | off | on |
| 7 | 10.1.61.167 | on | on | on | off | off | on | off | on |
| 8 | 10.1.61.168 | off | off | off | on | off | on | off | on |
| 9 | 10.1.61.169 | on | off | off | on | off | on | off | on |
| 10 | 10.1.61.170 | off | on | off | on | off | on | off | on |

| 16 ILP Boxes | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **ILP Box** | **Address** | **sw#1** | **sw#2** | **sw#3** | **sw#4** | **sw#5** | **sw#6** | **sw#7** | **sw#8** |
| 1 | 10.1.61.131 | on | on | off | off | off | off | off | on |
| 2 | 10.1.61.132 | off | off | on | off | off | off | off | on |
| 3 | 10.1.61.133 | on | off | on | off | off | off | off | on |
| 4 | 10.1.61.134 | off | on | on | off | off | off | off | on |
| 5 | 10.1.61.135 | on | on | on | off | off | off | off | on |
| 6 | 10.1.61.136 | off | off | off | on | off | off | off | on |
| 7 | 10.1.61.137 | on | off | off | on | off | off | off | on |
| 8 | 10.1.61.138 | off | on | off | on | off | off | off | on |
| 9 | 10.1.61.139 | on | on | off | on | off | off | off | on |
| 10 | 10.1.61.140 | off | off | on | on | off | off | off | on |
| 11 | 10.1.61.141 | on | off | on | on | off | off | off | on |
| 12 | 10.1.61.142 | off | on | on | on | off | off | off | on |
| 13 | 10.1.61.143 | on | on | on | on | off | off | off | on |
| 14 | 10.1.61.144 | off | off | off | off | on | off | off | on |
| 15 | 10.1.61.145 | on | off | off | off | on | off | off | on |
| 16 | 10.1.61.146 | off | on | off | off | on | off | off | on |





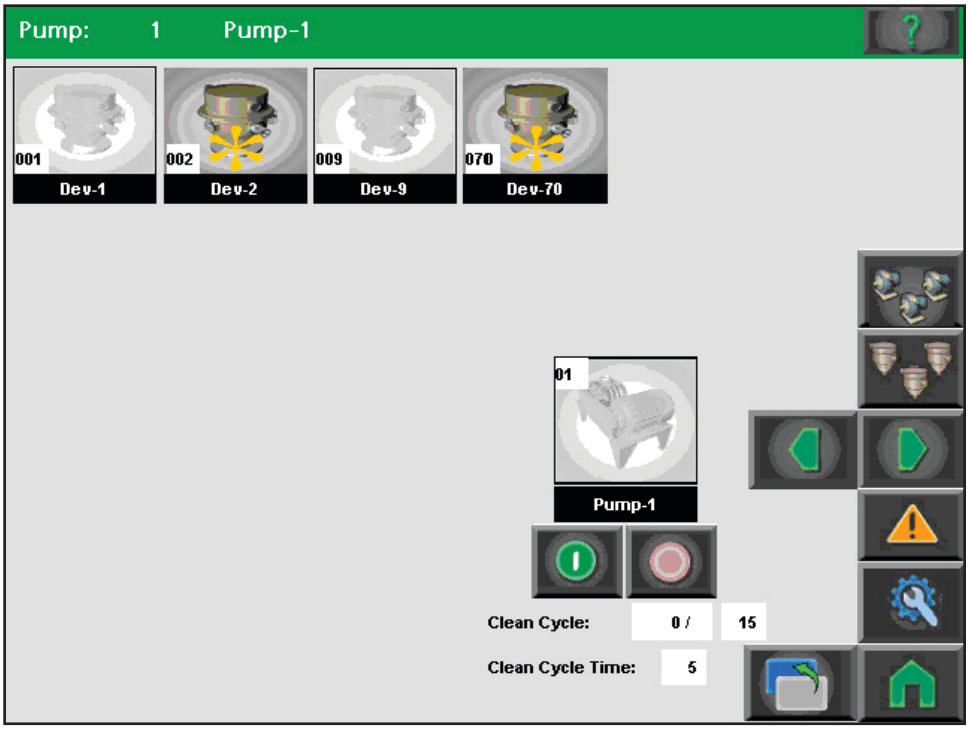
# Moving All Loaders from One Pump to Another on the FLX-128 Plus

The original backup feature allowed one of two predefined backup pump to be assigned to a primary pump so that if an overload condition occurred it work automatically use the backup pump for the same loaders.

This method is still available in the FLX-128 Plus but a new way is also included that involves using any primary pump as a backup to any other primary pump. This feature was improved upon in revision 5_17 so make sure you have this revision or newer in the HMI. The following example shows how it is done.

1 **Log in as administrator and disable the current primary pump.** You might also want to disable the second primary pump at this time but it is not required.

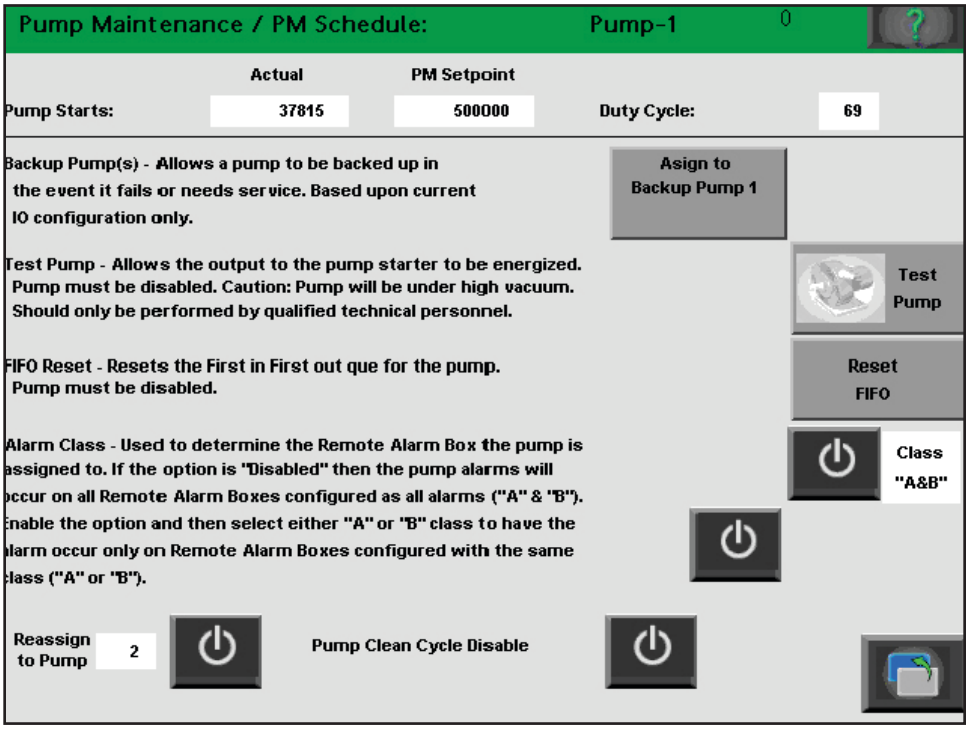
2 Press the grayed out pump icon.

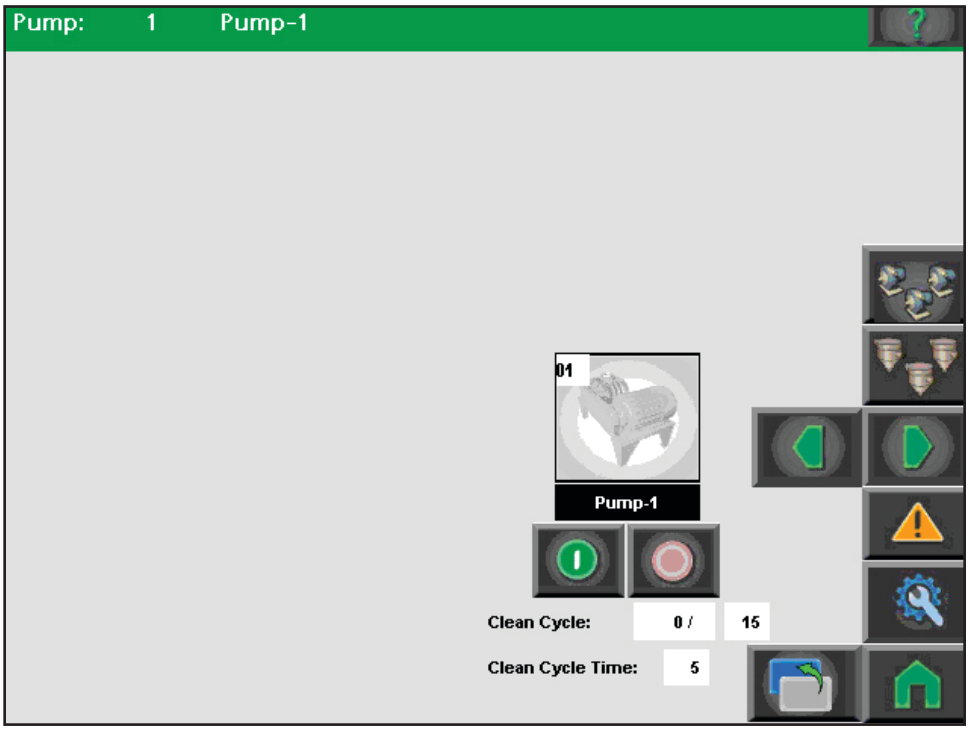



3 **To add all the loader from pump 1 to pump 2, type a 2 in the white block beside 'Reassign to Pump' and press the start button.** All the loaders assigned to pump #1 will be removed from pump #1 and added to pump #2.

(Continued)

# Moving All Loaders from One Pump to Another on the FLX-128 Plus (continued)

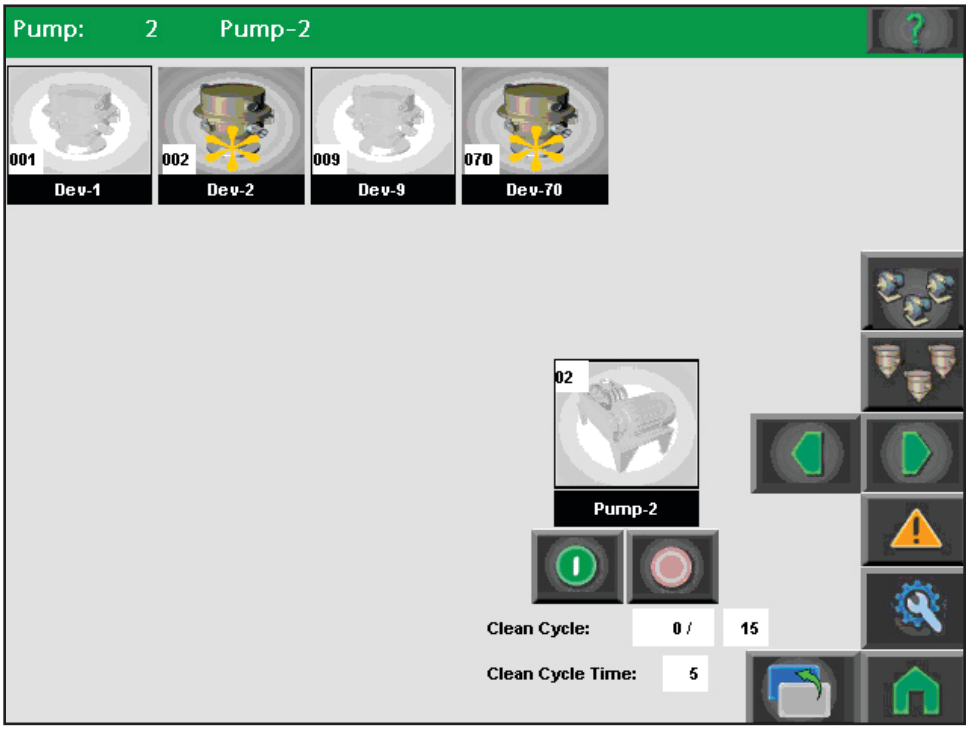





(Continued)

# Moving All Loaders from One Pump to Another on the FLX-128 Plus (continued)

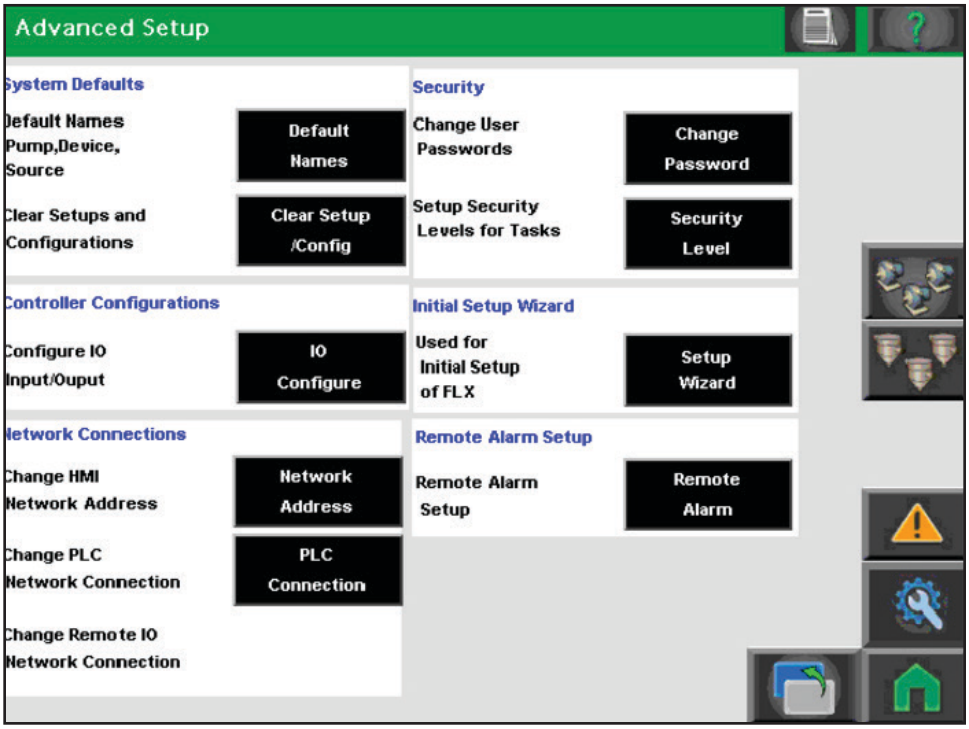



**NOTE:** If pump 2 already has loaders assigned to it they will remain assigned.

# Remote Access of FLX-128 Plus Screens Using the Optional 2nd Ethernet Card

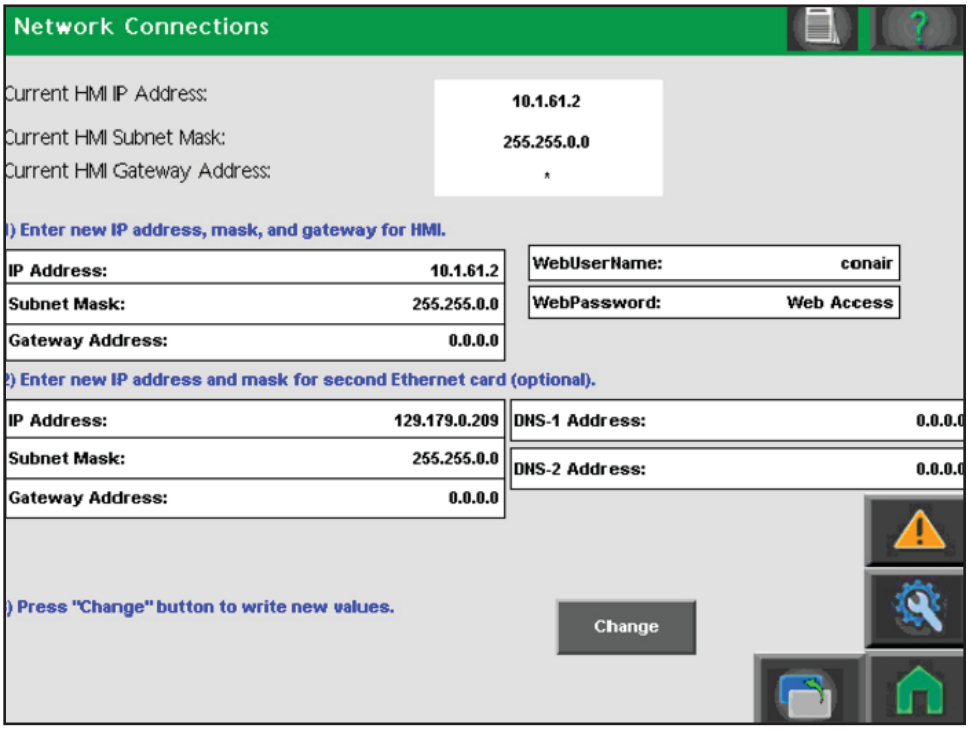
Installing a second Ethernet card in one or more HMIs on the FLX-128 Plus system allows remote access of all screens and functions of the FLX system. The second card can be connected directly into the corporate network using settings provided by the network administrator. Or it may be connected to a wireless switch or access point. Do not connect the corporate network to any other point on the FLX equipment side network because it will add significant traffic both networks and may cause latency issues.

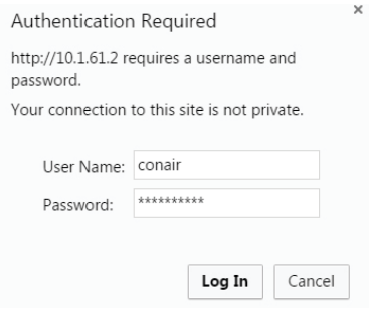
The settings are set from the Network Address page found from the Advanced Setup page of the FLX.




(Continued)

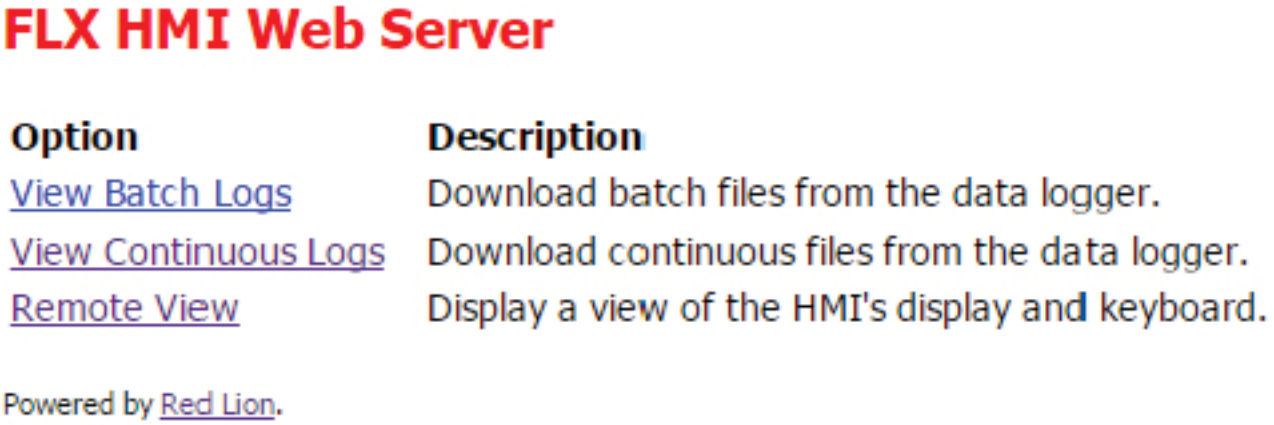
# Remote Access of FLX-128 Plus Screens Using the Optional 2nd Ethernet Card
**(continued)**




The subnet mask for the second card should always match the first subnet mask. This page also allows you to change the user name and password used to log onto the FLX-128 Plus system from the corporate network.

The latest revisions of Windows Internet Explorer does not work well with the FLX. Please use Chrome as the internet browser. To remotely view the HMI screens, start Chrome and type the second card's IP address from a PC connected to the same network. You will be asked for a user name and password. Enter it now.




Now choose the Remote View and the current HMI screen will be displayed. Please note that it always seems to take one button press when the screens are first started, then after that, some button delays maybe be seen depending on the speed of the connection. Also note that the screen seen remotely is the same as the screen seen locally and the last button or setting received will be acted on.

# FLX-128 Plus ILP Setup and Operation

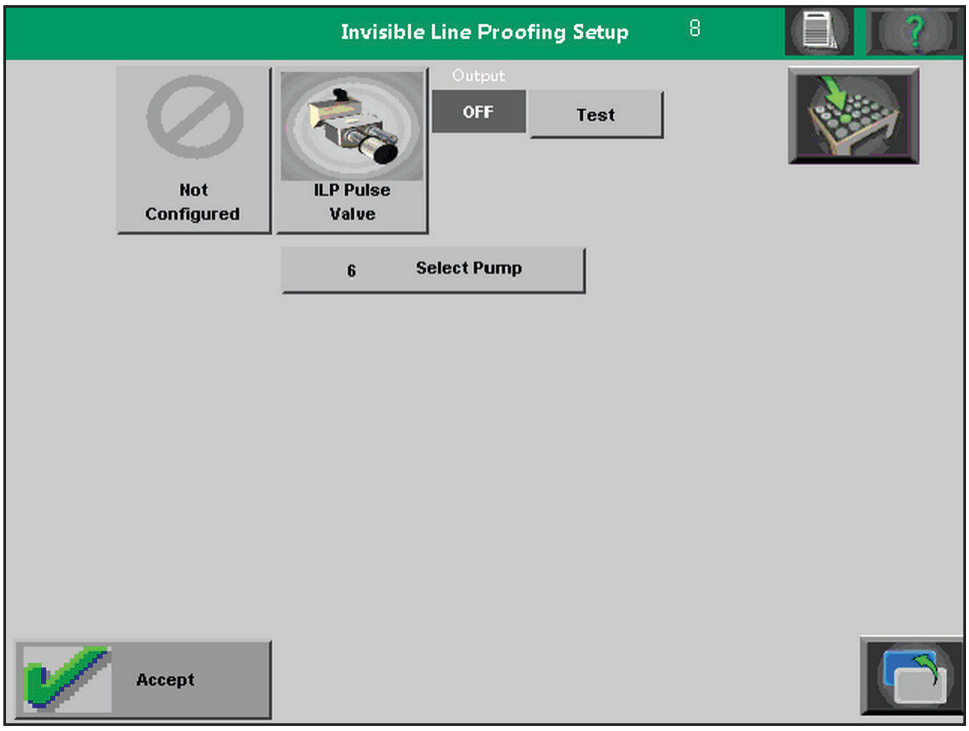
Invisible Line Proofing (ILP) occurs automatically when a loader is assigned to a pump with an ILP valve and the selected source is located on an ILP table. The ILP valve prevents loading of the incorrect material until the source's input has been made.

## Enabling ILP

Log in to at the Conair Level and go to the advanced setup screen. Press the purchased options button and enable ILP and give it a timeout time in 1/10 seconds. Two seconds is a good starting point. This means the FLX-128 Plus will wait 2.0 seconds before it alarms if the correct input has not been seen. This is also the delay been pumps trying to access the same zone of sources. There is only a very small delay when the correct input is seen. The other important things that must be present for proofing to take place is a ILP valve must be assigned to the pump being used and the source valve assigned to the loader must have a zone and position assignment to an ILP input.

## Setup

Each ILP valve is configured from the second of the device configuration pages.

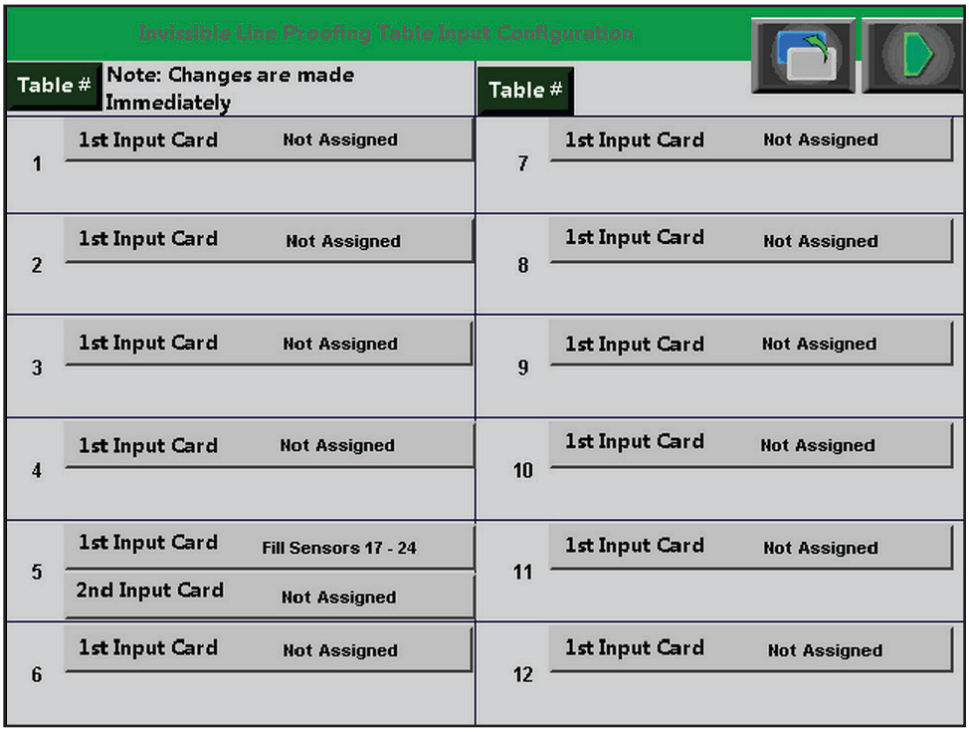



Once the ILP device type is selected, an associated pump can be assigned to the valve.

The proofing table icon button  accesses the ILP Table Input Configuration screen.

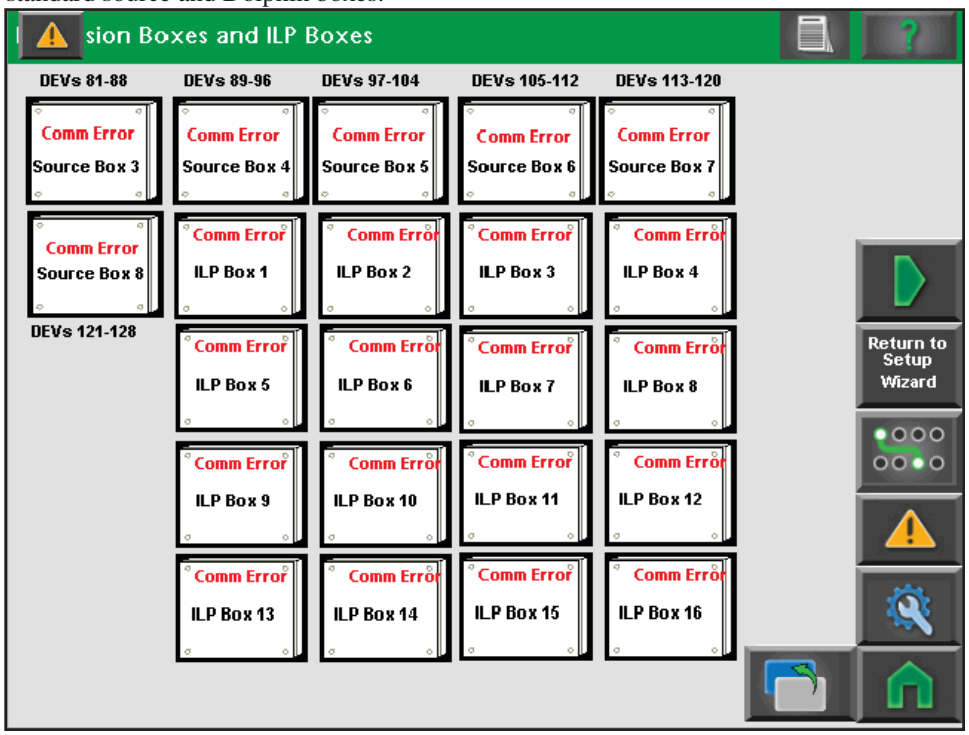
(Continued)

# FLX-128 Plus ILP Setup and Operation
**(continued)**




This is where the fill sensor inputs are assigned to the 16 possible ILP tables. Select the table to be configured and pick an input card from the pull down menu. After the first 8 inputs are assigned to a table, the second 8 inputs can be assigned. If ILP sensor boxes are used, their inputs are automatically assigned to a table based on the boxes IP address. The IP address 131 supports inputs for tables 1 through 4, IP address 132 supports inputs for tables 5 through 8, etc. for all 16 tables.

The status of these boxes can be view from the second Setup IO screen along with the standard source and Dolphin boxes.




(Continued)

# FLX-128 Plus ILP Setup and Operation
**(continued)**

Each source on an ILP table is assigned the table number and the manifold position on the table from the first device configuration screen. These numbers are combined to form one number where the table number is multiplied by 100 and added to the position.
Example: Manifold 3 on ILP table 5 would translate to the number 503.

### Operation
Select a source material from one of the four material selection screens. The manifold position number will be displayed on the screen if it is located on an ILP table. Place the loader hose in the correct manifold and enable the loader. If the hose placement is correct, the material will load. If the hose placement is incorrect or no input is received, an alarm will become active.

# MVP Software Interface

One MVP supports up to 12 manifolds on a RSS Table. Each manifold or pair of manifolds represent a unique source of material defined in the SCS. The FLX-128 Plus supports up to 2 MVPs. The ELS supports up to 8 MVPs. Each MVP is designated by its IP address. An Optional 4" display supports 1 MVP at a time.

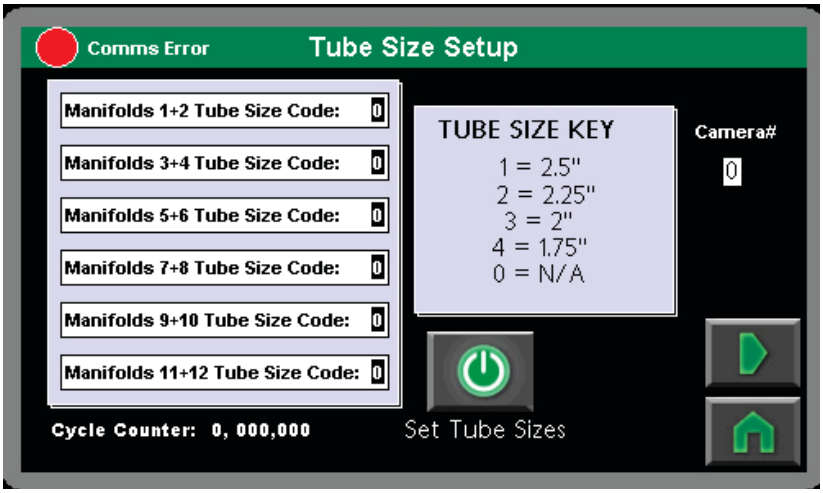
The MVP sends the SCS the ID numbers for any tubes found on the table, codes for short manifolds or unclear tube ID readings, and Camera and Motor status and cycle counts to the SCS.

### Data Exchanged between the MVP and SCS
The SCS sends the MVP the fault status of each receiver found for configured ID numbers and the expected manifold(s) locations on the RSS

### Actions of the SCS triggered by the MVP
Properly placed tubes will load normally when enabled. Cleared tubes will finish loading. Enabled receivers found in the wrong manifolds will alarm and not load. Receivers delayed from the SCS will be enabled when they are placed in the correct manifold. Camera and Motor alarms will inhibit loading

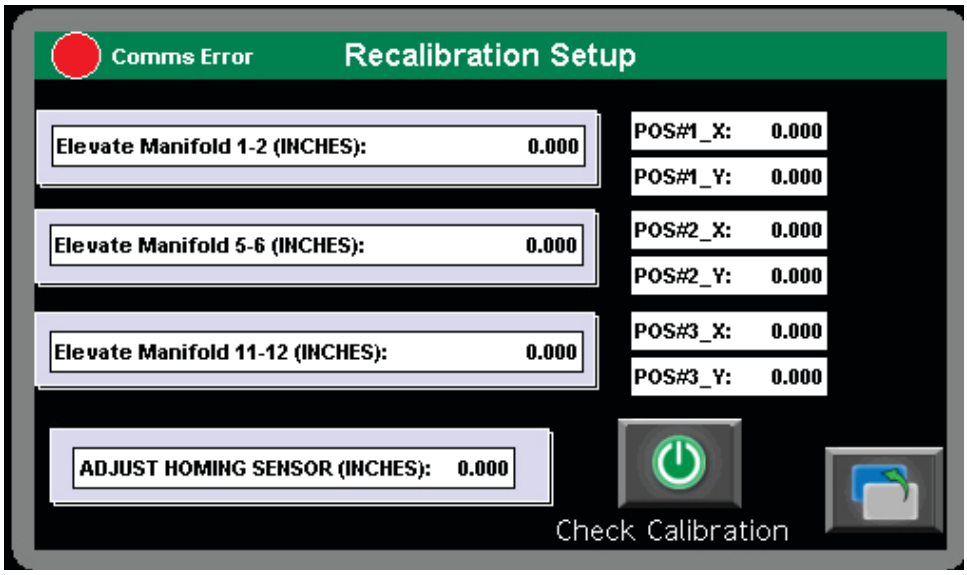
### MVP Override
The FLX-128 Plus allows the MVP proofing to be disabled from the Device Configuration Setup screen. Proofing Override requires a setup level password.

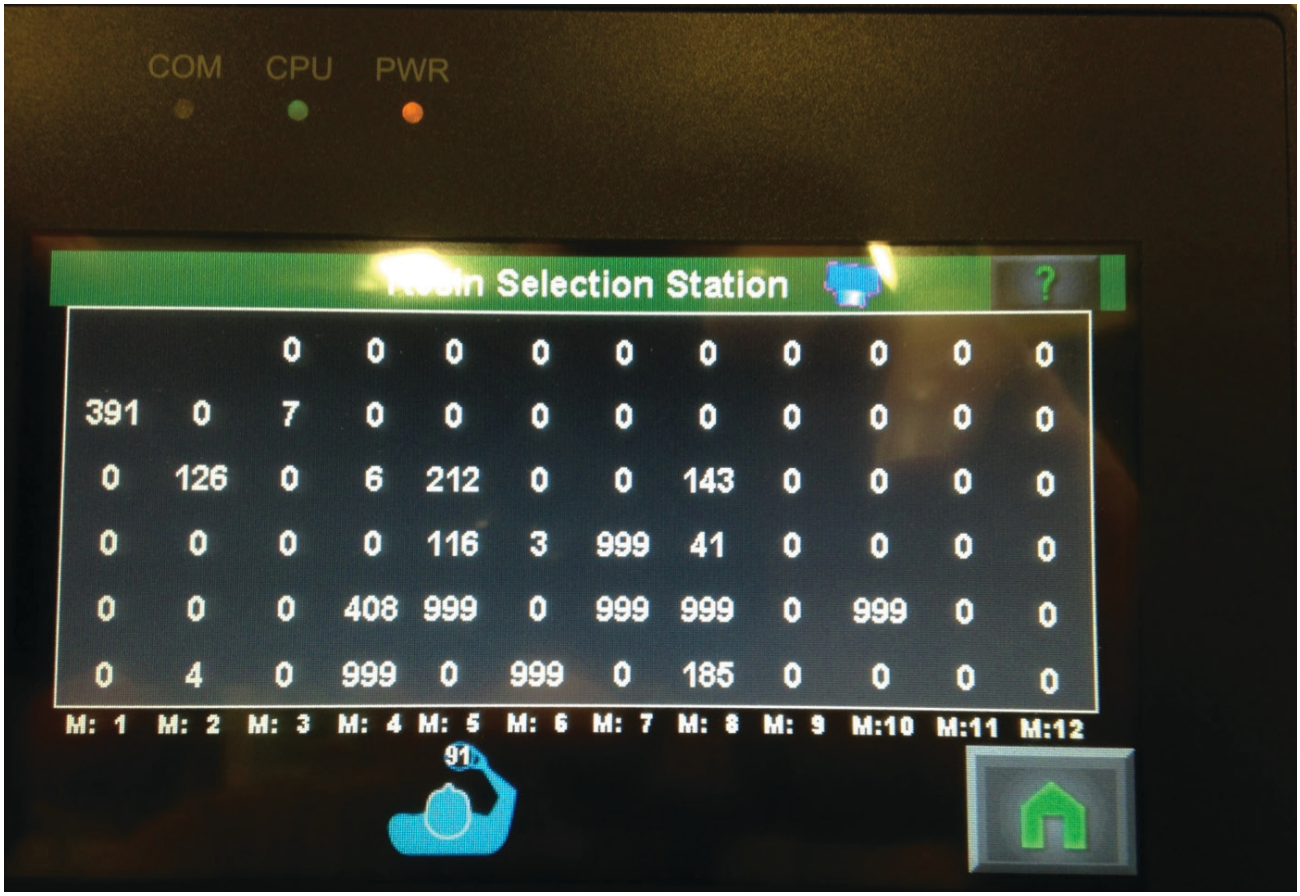
### Optional 4" HMI
Provides local access to tube locations, receiver faults and 'move to' directions. Gives table setup and calibration access Shows status of the MVP. Adds alarming functions – Local alarm enable, alarm description, flashing display, and alarm tone.




(Continued)

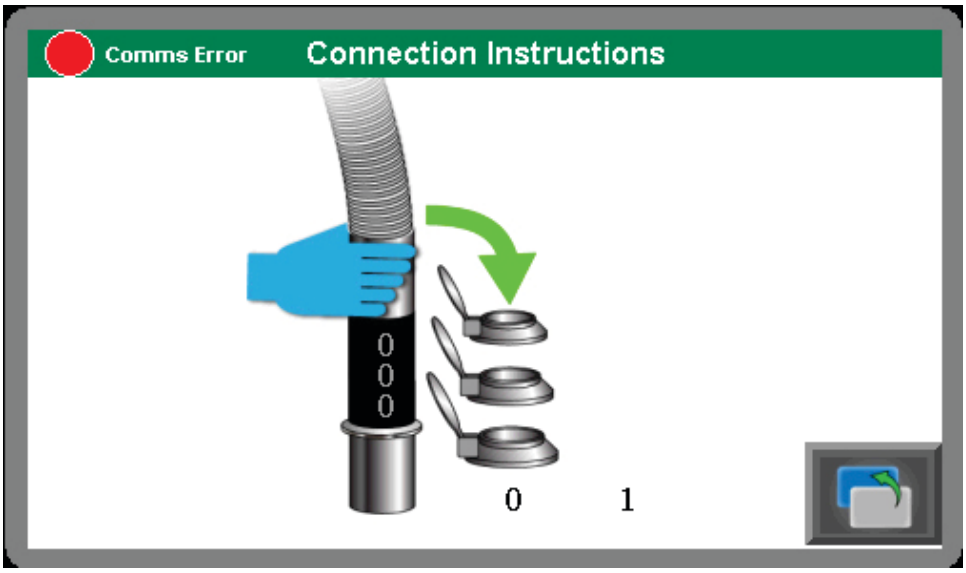
# MVP Software Interface (continued)

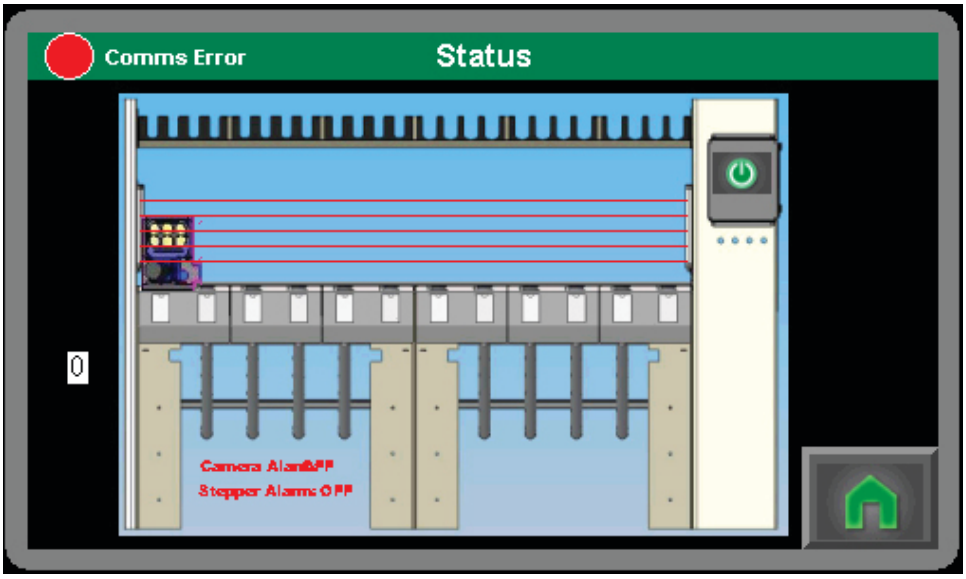


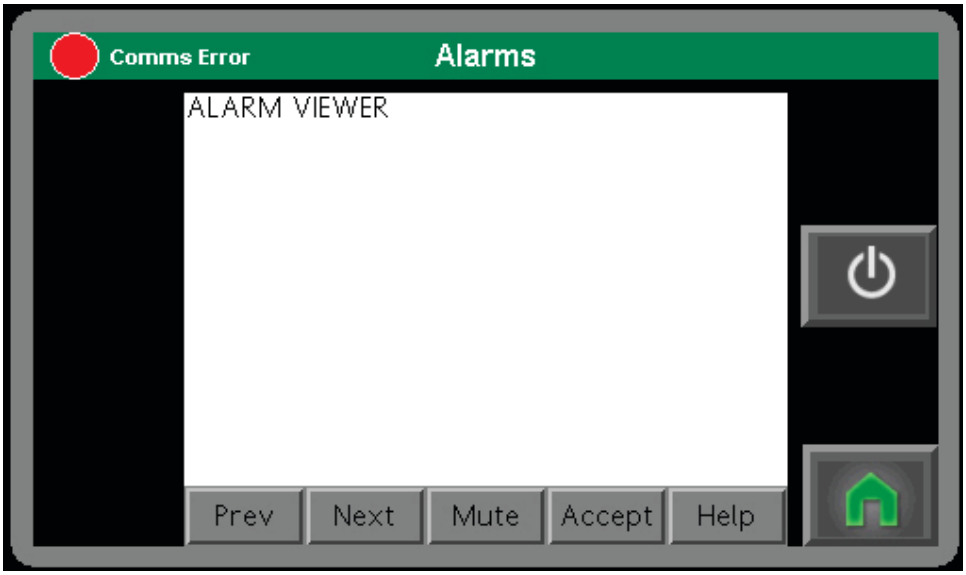




(Continued)

# MVP Software Interface (continued)



# Operating Procedure for MVP

The MVP is a visual proofing system that prevents an incorrect material from being feed to the wrong loader through communication with a FLX-128 Plus. Each loader is given a unique ID number set in the FLX and labeled on each loaders loading tube at the resin selection station. Each source manifold is labeled at the resin table and defined in the FLX by a number that indicates the table number and the manifold position on the resin table.

A 4 inch touch screen is located at each MVP indicating the loader numbers found in each row. A text with Red/White/Green background colors gives a distinct visual clue as to which materials require changing and which are in alarm. White indicates no tube has been found in the indicated position.

FLX-128 Setup for MVP operation:

1. **Attach a loader ID number label to each loader tube at the RSS.** Make a note of these numbers for entry into the FLX.
2. **Make a note of each source material's position on the MVP table.** Note the table number and starting and ending manifold position (numbered from left to right from 1 up to 12 manifolds).
3. **From the FLX-128 Plus device configuration screens, enable proofing for each loader and enter the loader ID number and the source position numbers for each loader and source.**

✎ **NOTE:** proofing can be disabled for the device configuration screens by pressing the disable proofing button.

To change a source the following procedure should be performed to minimize alarming and reduce loader down time.

1. **Disable the loader from the FLX.**
2. **Select a new source from the available materials.**
3. **Press a button on the FLX to delay the enable button for the loader.** The loader will not load until the position has been verified.
4. **Insert the numbered tube in the corresponding source row.** When the MVP verifies that the tube is in the correct position, the loader will be re-enabled and the 4 inch screen will show the position as verified.
   If the MVP checks the positions (when someone breaks the light curtain or on power up) and the tube is in an incorrect position (even if it has not been moved) an alarm will sound.

✎ **NOTE:** Breaking the light curtain will temporary pause all loading starts until the positions are verified.

✎ **NOTE:** If the loader is re-enabled before a tube has been moved from an incorrect position an alarm will sound.

# R-PRO™ Setup and Operating on a FLX-128 Plus

## Overview

The FLX-128 Plus will control any or all of the 20 possible pumps and up to 40 of the 256 source valves on a full FLX system.

R-PRO feedback and control consists of two types of distribution boxes and a device output from the FLX. This gives the FLX the ability to do dense phase vacuum conveying.

The R-PRO Pump distribution boxes monitor the pump's pressure and the VFD's faults and controls the pump speed by adjusting a VFD's Hz. The VFD fault output should be wired to the pump's overload input of the FLX-128 Plus.

The R-PRO Source distribution boxes monitor the material's speed and controls the R-PRO proportional valve and line cleaning valves.

The R-PRO pulse valve is setup as a device and therefore uses one of the possible 128 loader's positions. This pulse valve is assigned to a source that can be used by any loader in the system. Since the FLX uses source sharing, more than one pump can be assigned to the same source.

The system is controlled from the trend screen of any loader using a R-PRO controlled pump and a R-PRO controlled source. Since the pumps and sources may be shared my several loaders, the last settings will be used.

**NOTE:** These instructions are specific to wiring the FLX-128 Plus with an R-PRO system for resin protection.

Contact Conair sales for more information about the R-PRO:
724-584-5500
info@conairgroup.com



## Setup

The R-PRO pump boxes correspond to the matching pump numbers in the FLX-128 Plus. Pump #21's VFD is wired to the first analog output and fault input in the first R-PRO pump box (IP Address 10.1.61.156) with the first box handling the first 4 pumps (21-24). The last box (IP Address 10.1.61.160) handles the last 4 pumps. The pump's pressure transducers are wire to the analog inputs in the same manor.

The R-PRO pulse and proportional valves should be attached to the material source to be controlled. These valves are paired together when the R-PRO pulse valve is configured in the FLX software.

The R-PRO pulse valve is wired to the load output of the device that will be setup in the FLX software.

The proportional valve is wired to the analog output card in the R-PRO source box. R-PRO source box position #1 corresponds to the first analog output of the 1st box (IP address 10.1.161.161). The first 4 position are the analog outputs of the first box. The last box (IP Address 10.1.61.170) corresponds to the last 4 source's positions 36 to 40. These positions are set in the following procedure.

1. **Configure an option card output as a source valve (purge or pocket).**
2. **Configuring an unused device as the R-PRO valve type**.

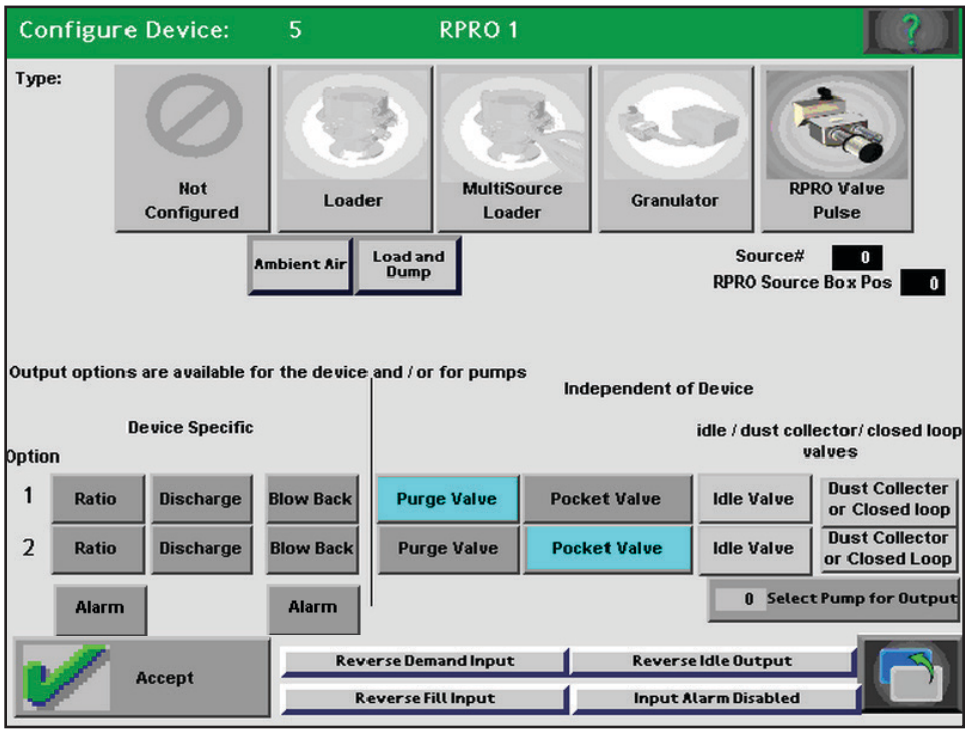
(Continued)

# R-PRO™ Setup and Operating on a FLX-128 Plus (continued)

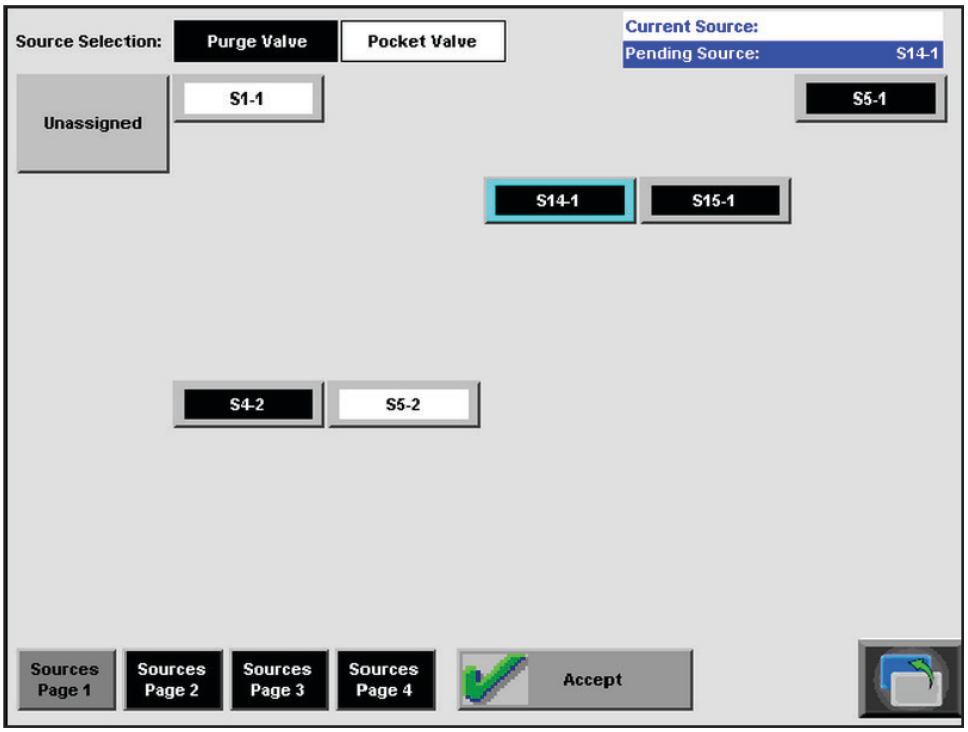
**NOTE:** The analog output signal matches the source position of option 1 in the R-PRO source box.

For example the device's position is assigned the source number selected. If you have a source box 10.1.61.161 and you pick S67-1, the analog output to the proportional valve will be wired to the third analog output card.

**NOTE:** Conair recommends assigning Device 65 as an R-PRO valve and S65-1 as its source. Then wire the R-PRO valve to the first output of the 161 source box and the first analog output to the proportional valve. Wiring up a source valve is optional.



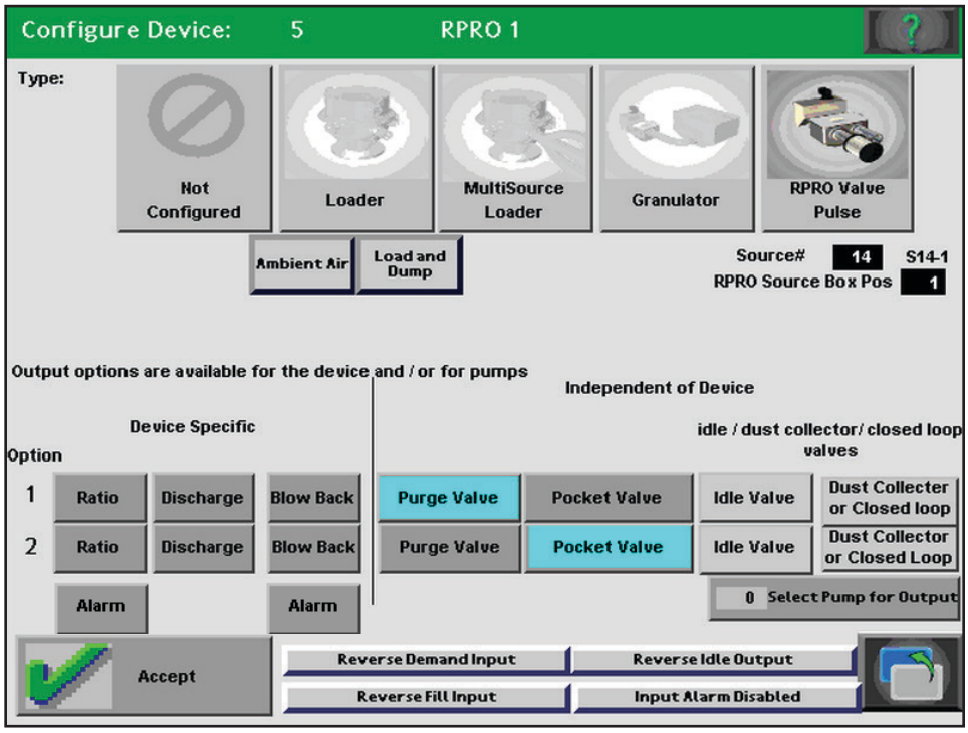

**3** **Assign the R-PRO valve to a source. (select from available sources).**



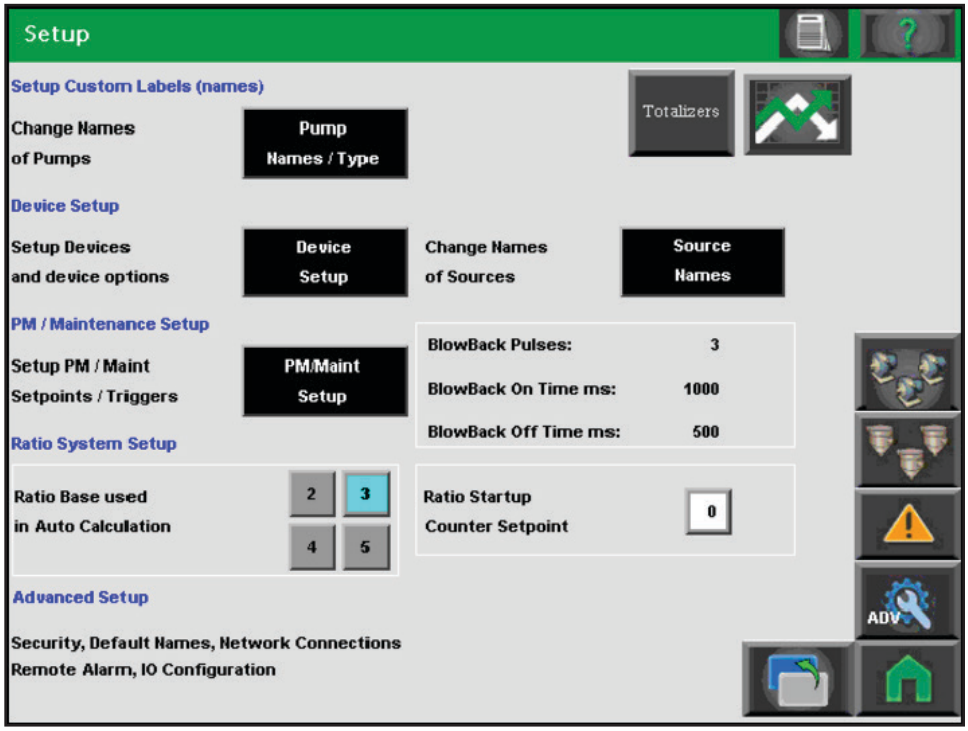

**4** **Assign the R-PRO Source box position (1-40) to the corresponding analog output card.**

(Continued)

# R-PRO™ Setup and Operating on a FLX-128 Plus (continued)

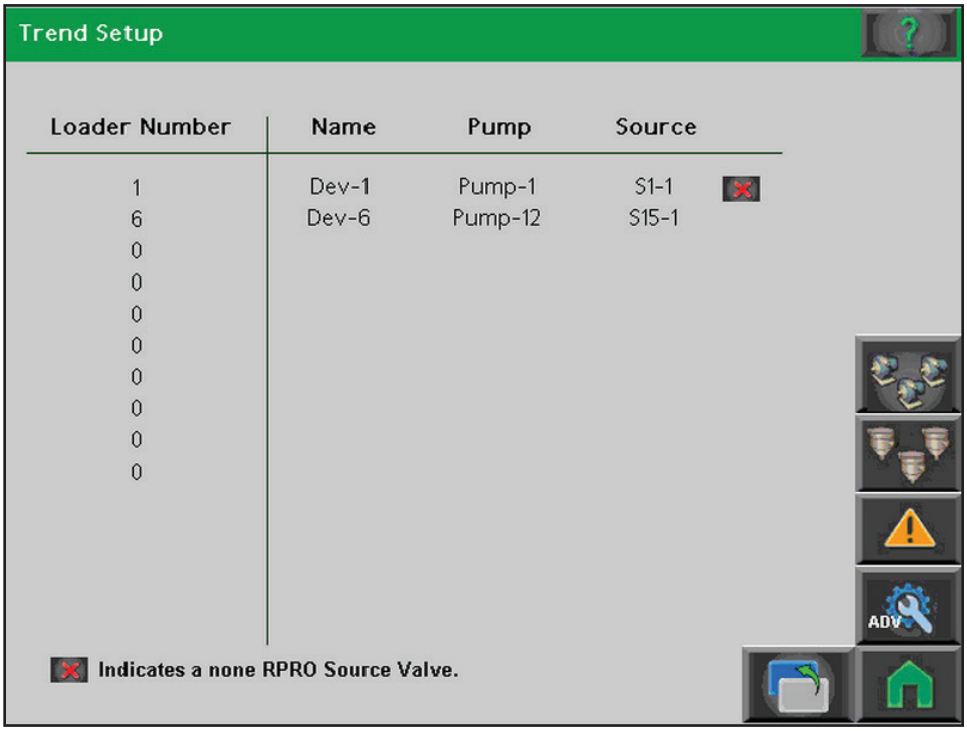



**5** **From the setup screen select the Trend icon button.**




**6** **Fill in the loader number of each loader you want to trend or adjust the pump/ source R-PRO settings.** The red x indicates a non R-PRO source valve has been selected for this loader. (Continued)

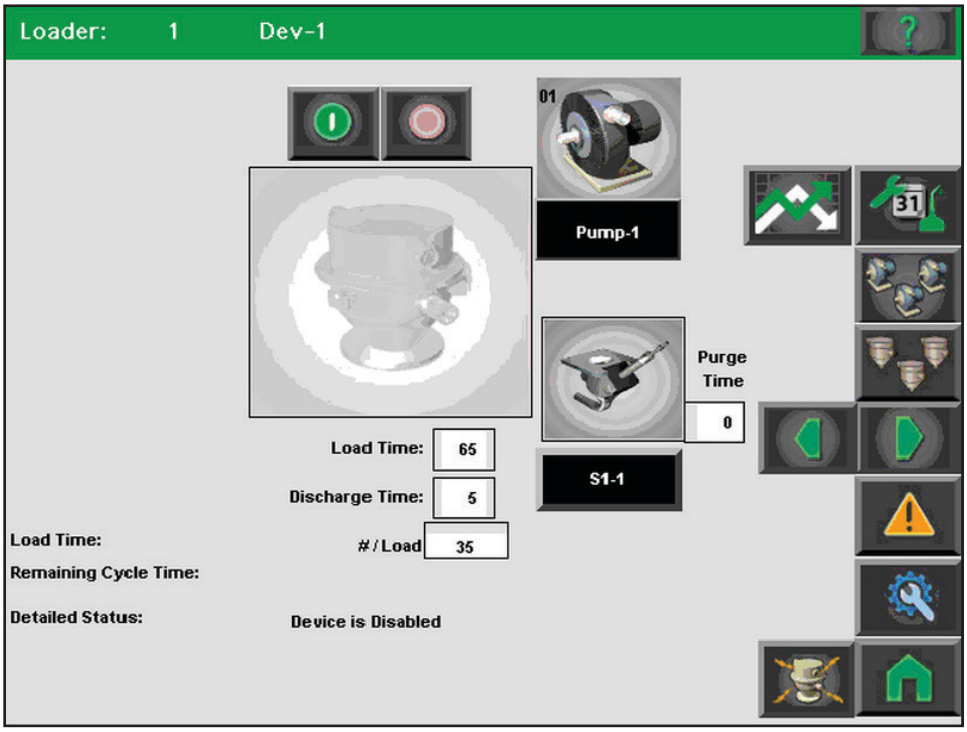
# R-PRO™ Setup and Operating on a FLX-128 Plus (continued)




7 **Open the loader detail/settings screen.**

8 **Enable the purge valve option on a loader** and select the same source as was setup in step 3.

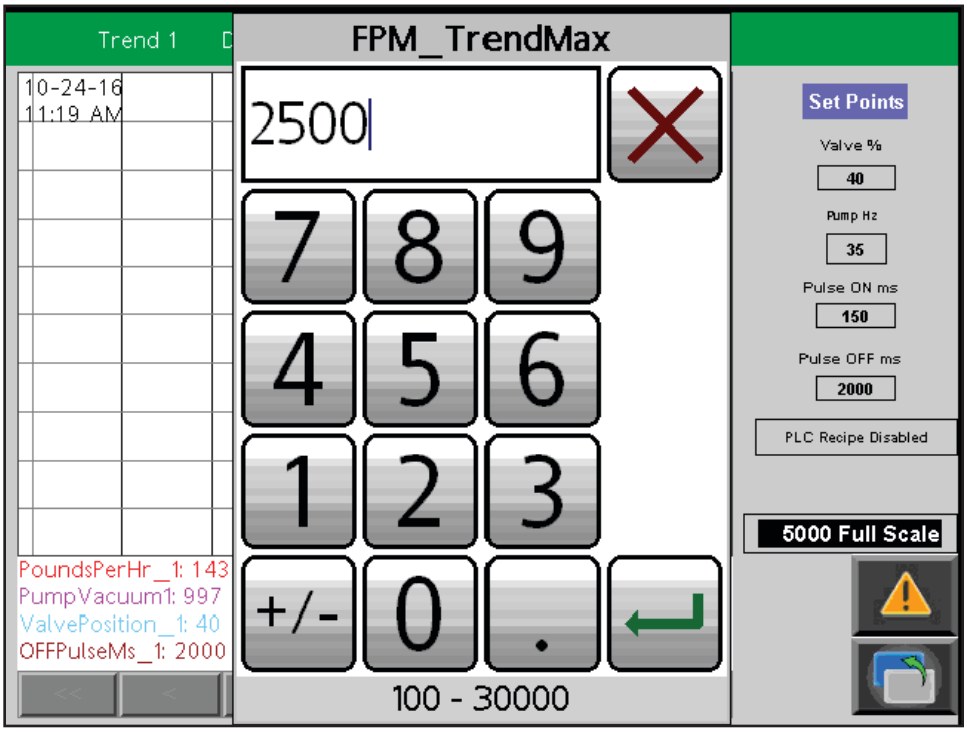
9 **Press the trend button from the loader detail screen.**



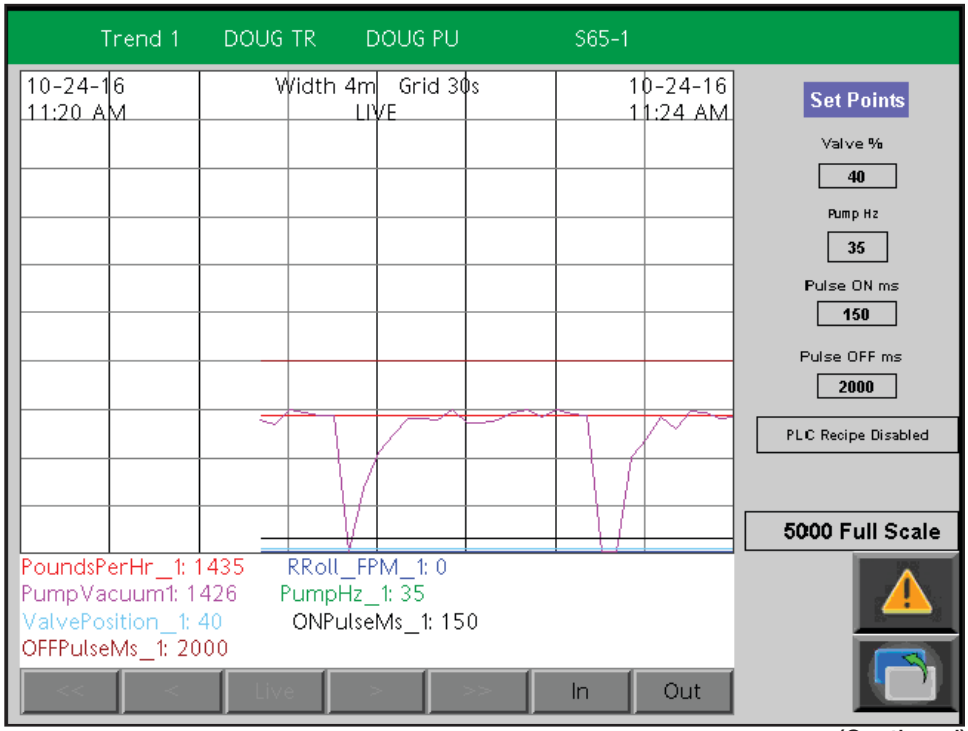

(Continued)

# R-PRO™ Setup and Operating on a FLX-128 Plus (continued)

**10** **Adjust the valve %, pump Hz, pulse ON time and pulse OFF time to the initial settings.**




**11** **Selecting a non R-PRO source will blank out the R-PRO source box set points and display an red x beside the source name.**




(Continued)

# R-PRO™ Setup and Operating on a FLX-128 Plus (continued)

## Operation

After setting the initial setting from the trend screen the loader and pump can be enabled. Return to the trend screen to adjust the material speed and throughput.

The trend scaling is adjusted with the full scale setting at the top of the screen. This scale setting is common throughout all the R-PRO trend screens.

Trending will start when the loader is enabled. Data log files will be created for each loader assigned to a trend. The data will be stored in a file in the Redlion HMI each day and will be overwritten after 7 days. Multiple HMI's will be required to log data from more than 10 loaders. Control can be done by swapping the trend assignments between loaders but the data will contain both loaders.

# Using the Setup Wizard

The FLX-128 Plus provides an "Initial Setup Wizard". The wizard directs the user through setup screens.

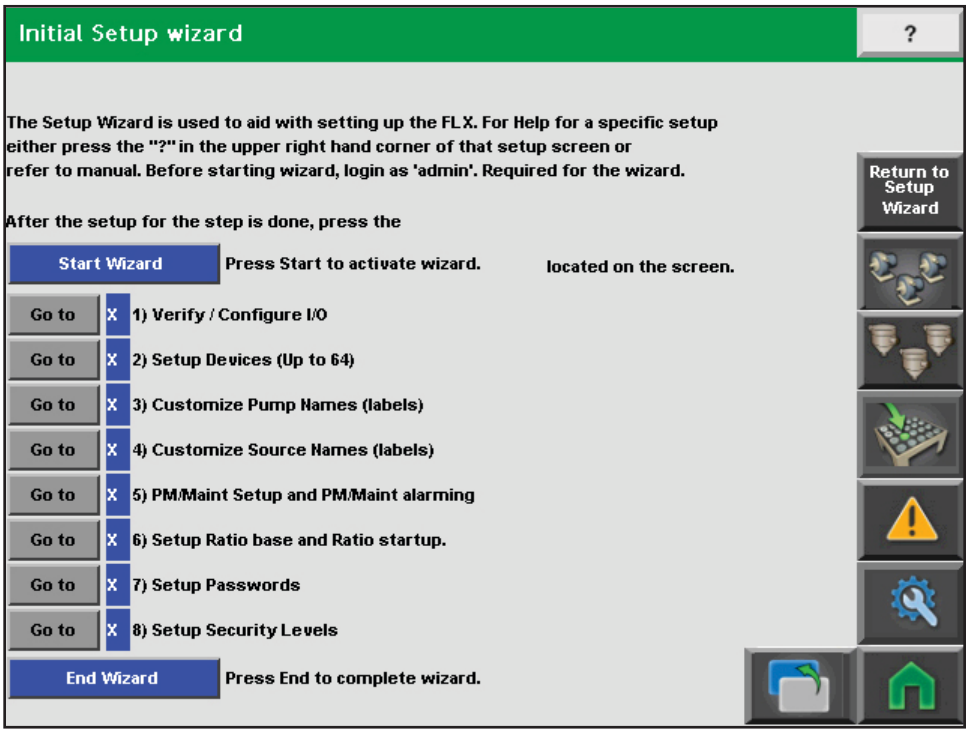
All setup screens are accessible from the Setup screen or Advanced Setup screen.

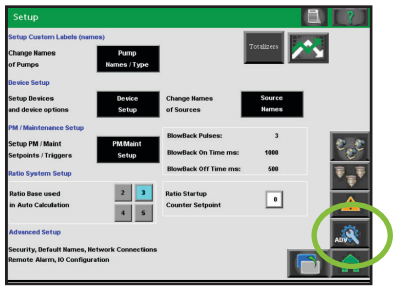
- Setup Screen – accessible from the Main Screen Setup button.
  - Pump Names – Change names of pumps.
  - Source Names – Change names of sources.
  - Device Setup – Setup Devices.
  - PM / Maint Setup – Setup up PM/Maint set point and PM alarms.
  - Ratio System Setup – Setup ratio base and startup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



(Continued)

# Using the Setup Wizard (continued)




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”.

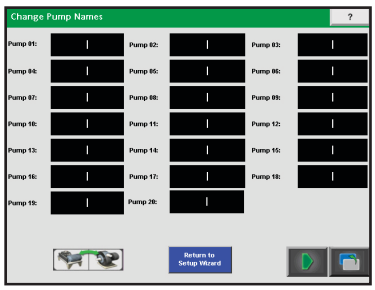
**NOTE:**

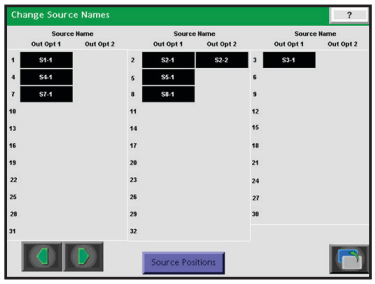
When the setup for a step is complete be sure to press the Return to Setup Wizard button located on that setup screen. If navigation is made by closing the screen or opening another screen, return to the Setup Wizard via Main Screen => Setup => Advanced Setup and then continue with wizard.

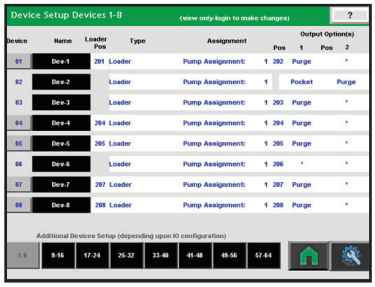
The setup wizard only guides the user to the screens needed to be setup. The help on that setup screen provides information on how to setup.

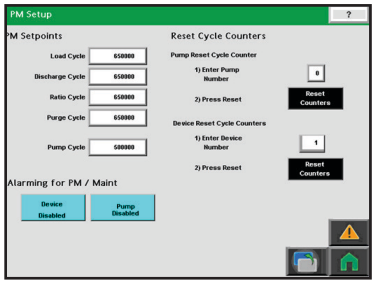
The setup wizard does not configure device time set points or individual configurations. Refer to Operation section for configuring devices and pumps.

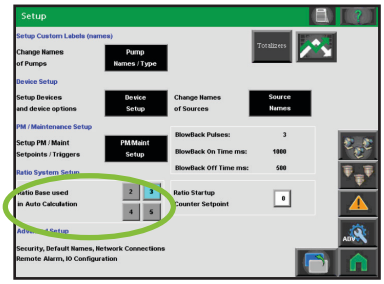
The setup wizard does not include changing network connections or setting up remote alarm boxes. Refer to Appendix for detailed instructions.

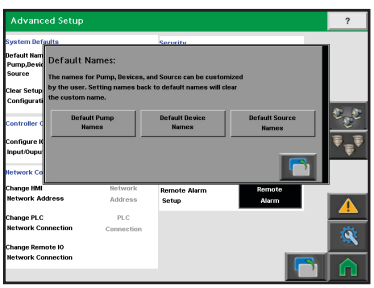



# FLX-128 Plus Setup

## 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.

## 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-128 Plus 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.

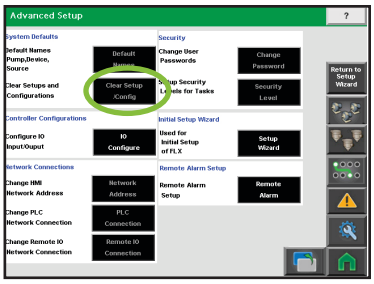
## Default Names

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.

(Continued)

# FLX-128 Plus Setup (continued)

## 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:**

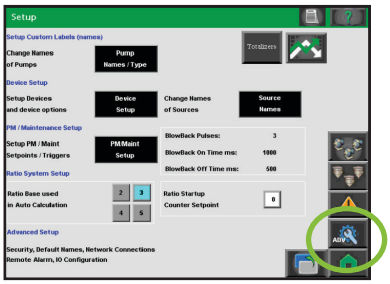
Clearing the database will return the control to its default values. All configuration information would be lost and the system would have to be set up as an initial install.



## 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. **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.
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.**



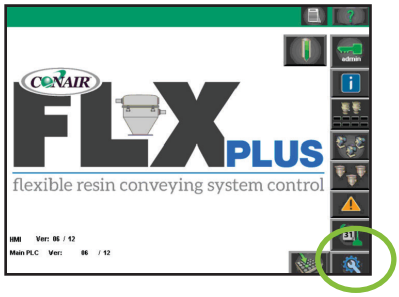


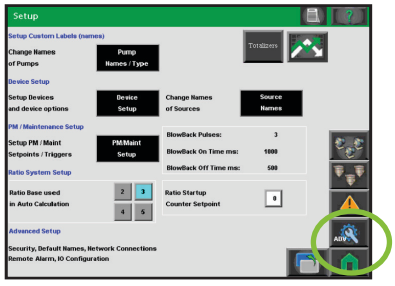
**NOTE:** The passwords are stored in the operator interface. If remote operator interfaces are used, the passwords would have to be changed in each remote operator interface.

## 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.**




(Continued)

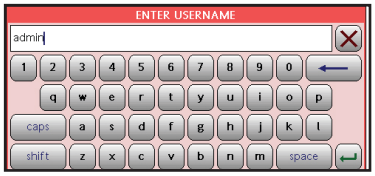
# FLX-128 Plus Setup (continued)

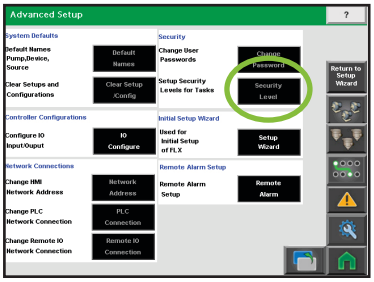
**NOTE:** The Factory Defaults button will change the security back to Conair defaults.

**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.

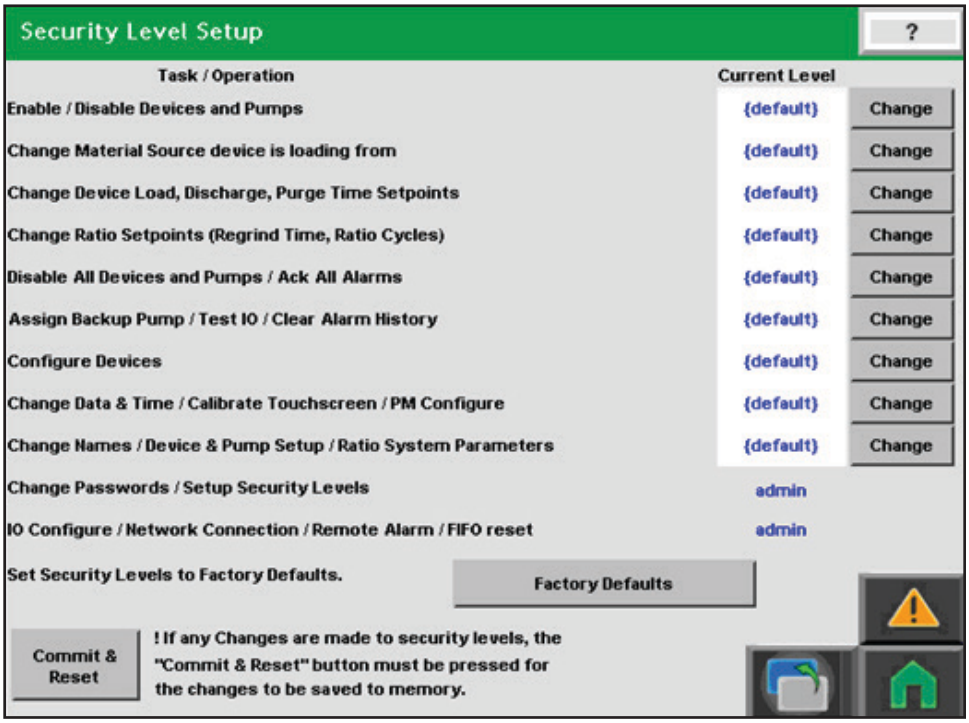
**3** **From the Advanced Setup screen, login as admin.**

**4** **Select Security Level.**



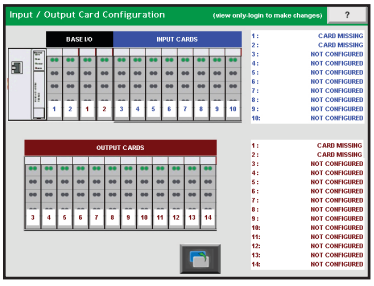

**5** **From the Security Level setup screen, press the Change button for the task/ operation security level to be changed.**
The current level of security for the task is displayed next to each task/operation.

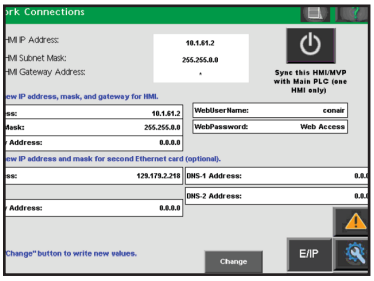



**6** **Select the new security level. Press Accept to commit or Cancel to disregard.**

**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.**




## Configure I/O

The I/O of the FLX-128 Plus 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.

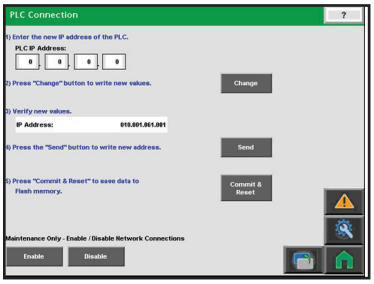


(Continued)

# FLX-128 Plus Setup (continued)

## 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.

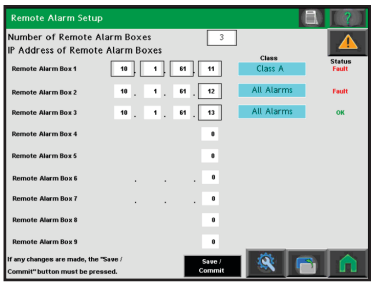



## Remote Alarm

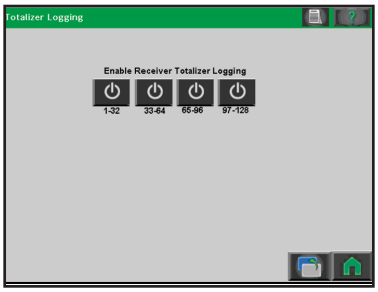
The IP address of the Ethernet Coupler located in the Remote Alarm Box must be configured prior to connecting alarm box to the FLX-128 Plus system's Ethernet network. Refer to Appendix – Customizing Network Addresses for detail procedure.

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.

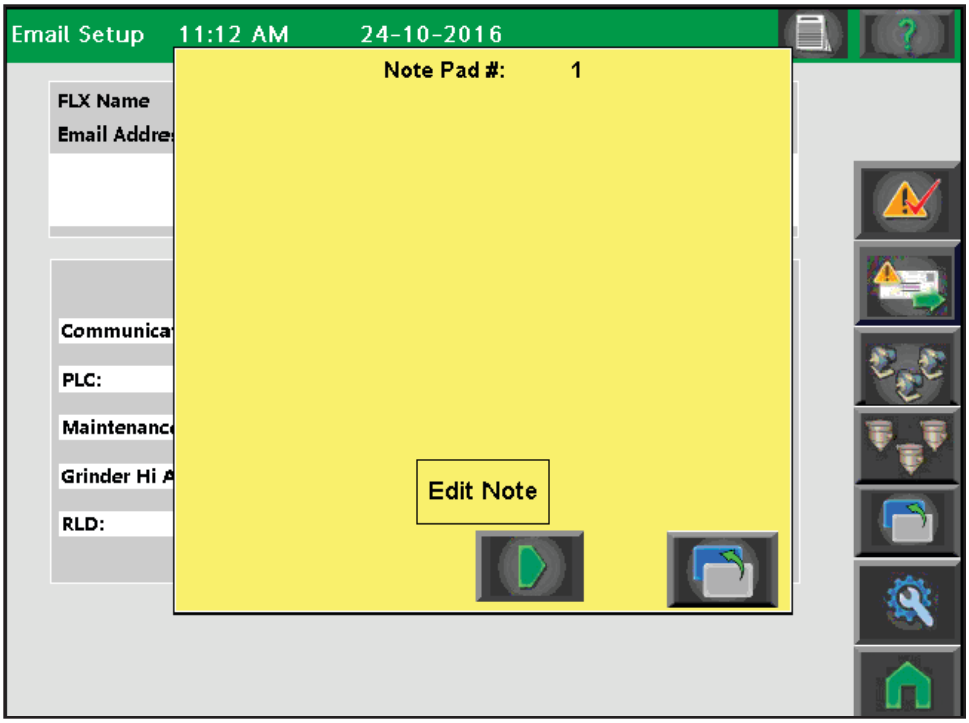



The status of the Remote Alarm box will not be valid until the IP address has been saved.




# Note Pad Feature

Pressing the little notepad button from any of the screens will give you a popup notepad. There are 10 available note pads, which will save and are available from any screen. This is for recording any system notes, application notes, etc.



SECTION
5

# Maintenance

# Preventative Maintenance Schedule

No specific maintenance schedule is required for the FLX-128 Plus 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 necessary**
  - ❒ **Check that the cables and junction boxes associated with the FLX.** Make sure all cables are intact, undamaged, out of harm's way, etc.

# Warnings and Cautions

**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**

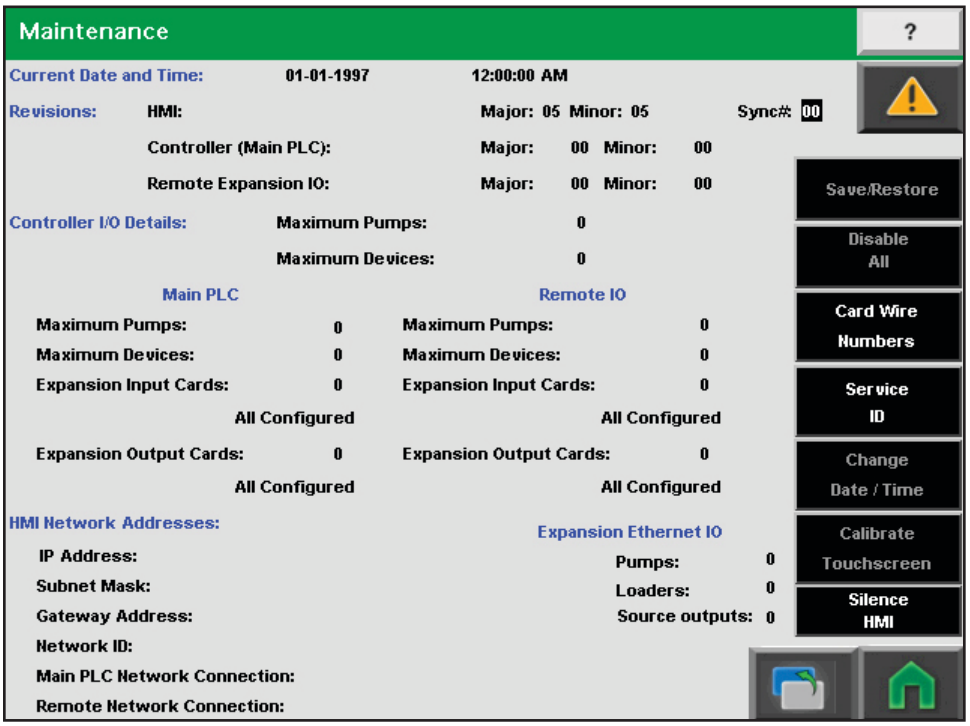
This equipment is powered by electrical current, as specified on the machine serial tag and data plate. Do not operate the equipment at power levels other than what is specified on the machine serial tag and data plate.

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.

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.

# Maintenance Screen

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



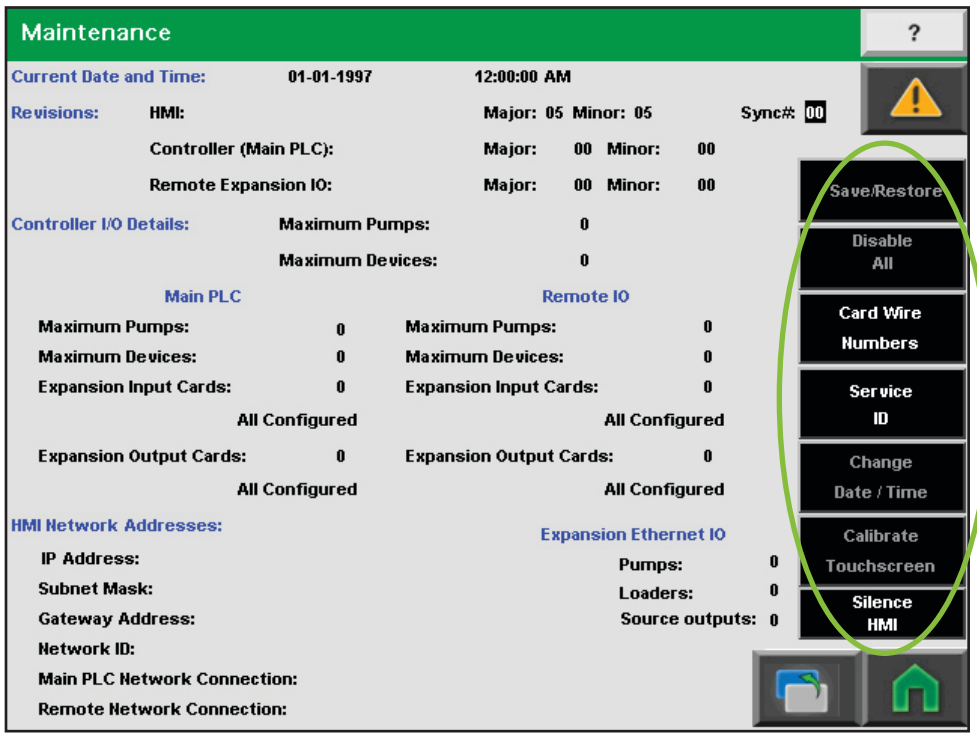

Main screen displays the following:

- 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
  - Maximum Pumps and Maximum devices based upon I/O configuration in Main PLC.
  - 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)
  - Maximum Pumps and Maximum devices based upon I/O configuration in Remote I/O.
  - Expansion Inputs and Output Cards – The total number of input and output expansion cards available for configuration.

(Continued)

# Maintenance Screen (continued)

- 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.

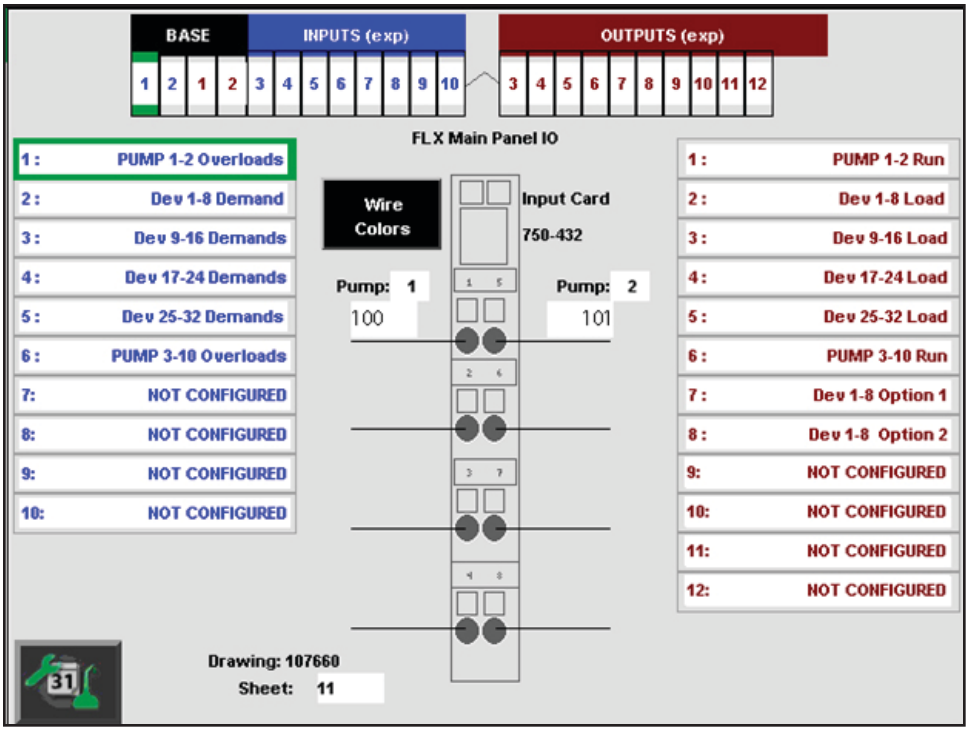



The following options are available from the Maintenance screen:

- 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.

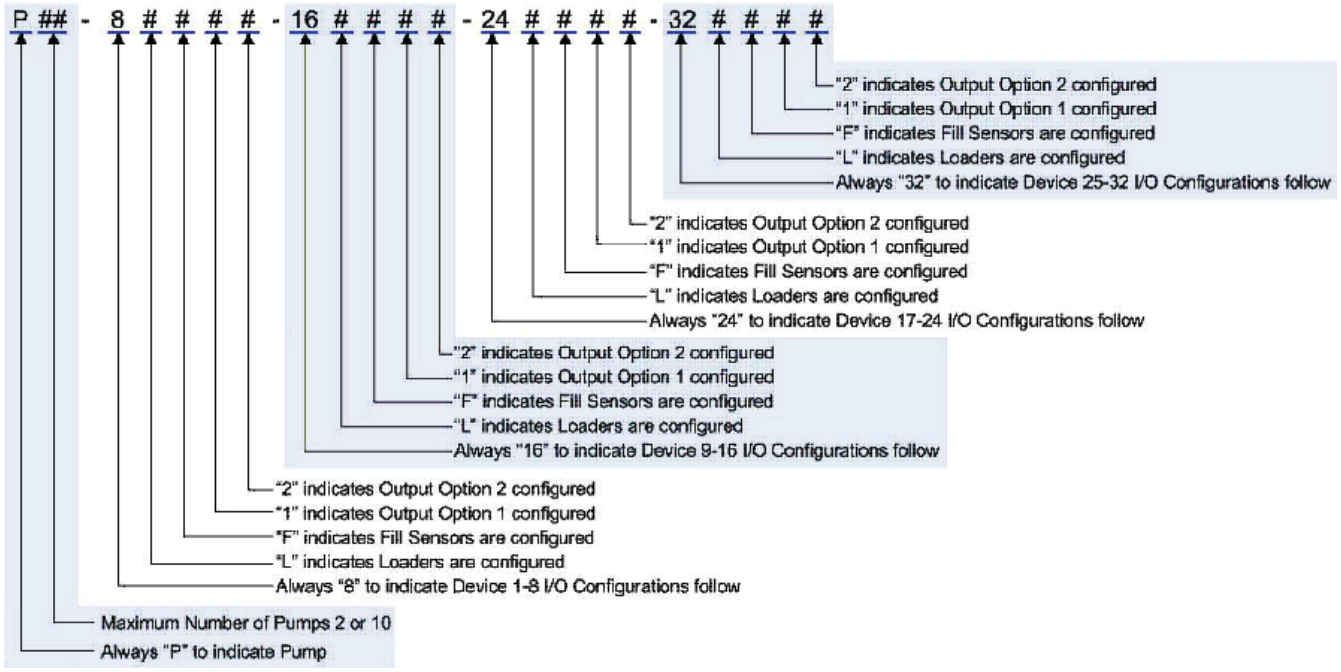
The Wire colors button can be used to open a screen to reference the colors and use of the conductors used in Conair cable for connection.

**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

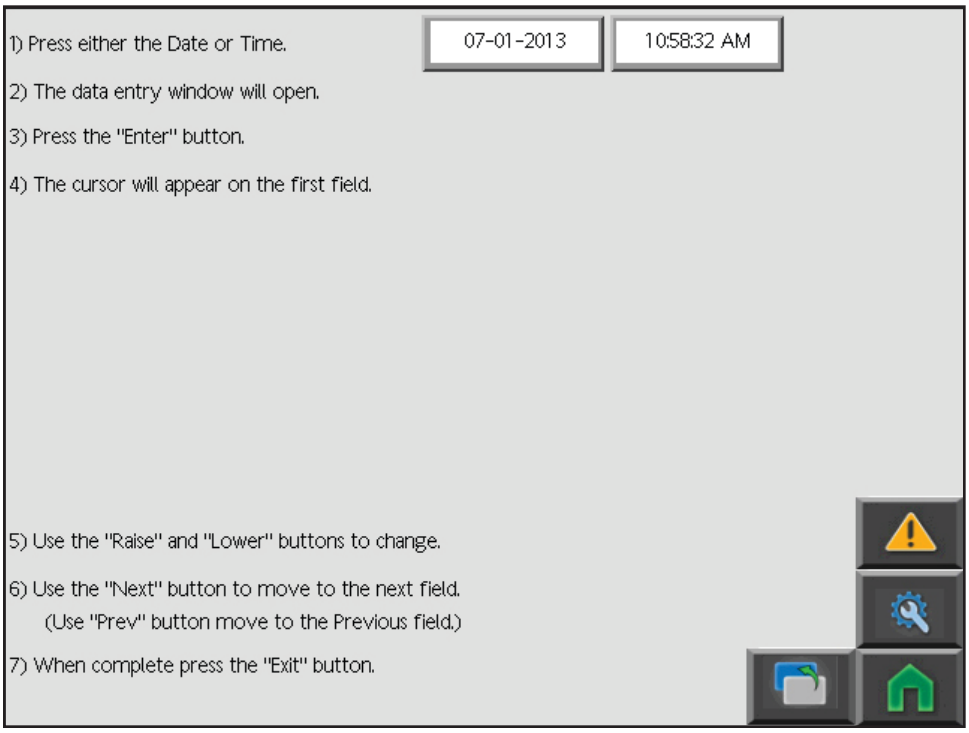
ID tag used as a snapshot of current system I/O configurations. Used by Conair to determine available upgrade options and service calls.

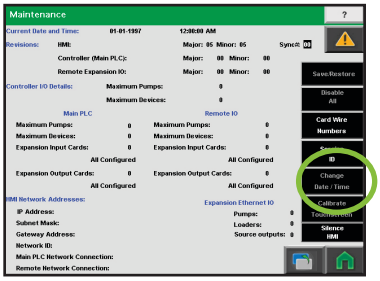

**NOTE:** If Remote I/O Panel is configured, the service ID will consist of two lines. The first line is for the main PLC and the second line (with prefix "EX") will be for the Remote I/O panel.



# 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.



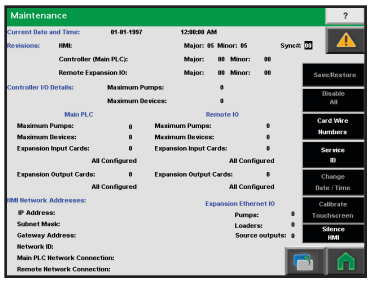



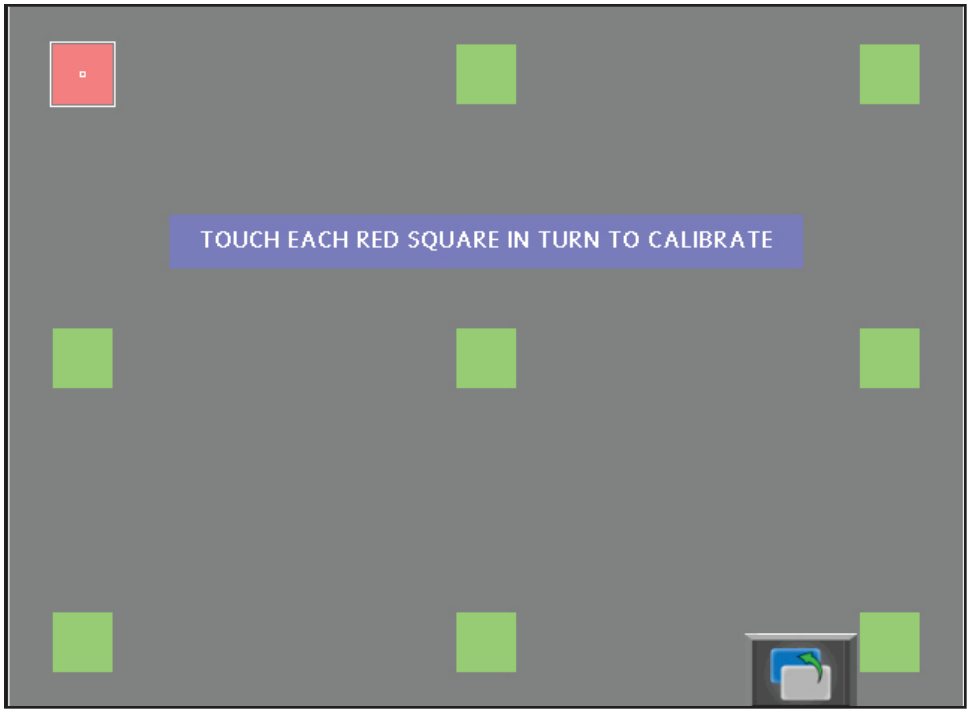

To set date and time:

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 W Series Dryer.** Additional details about troubleshooting and repairing specific components are found in these materials.
- ❒ **Check that you have manual 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.

### ⚠ WARNING: Electrical hazard

The FLX-128 Plus 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.<br><br>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).<br><br>Check sensor for proper operation.<br><br>Check for valves for proper operation.<br><br>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).<br><br>Check sensor for proper operation.<br><br>Check valves for proper operation.<br><br>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.<br><br>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.<br><br>Verify that the network communication addresses are set correctly.<br><br>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.<br><br>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.<br><br>Verify that the network communications addresses are set correctly.<br><br>Verify Remote I/O controller rack is properly assembled. |
| **ILP Proofing Alarm** | Tube in wrong position<br><br>Sensor failed<br><br>Line is blocked or loader | Check hose connection<br><br>Check sensor operation<br><br>Check for leaks at the table of the manifold. |

(Continued)

## Operator Interface Alarms (continued)

| Alarm | Possible Cause | Solution |
|---|---|---|
| **RPROVFD fault** | VFD speed control voltage too low. | Check output and wiring from analog output card to VFD. Reset fault at VFD. |
| | VFD was powered on before the RPRO pumpbox. | Check output and wiring from analog output card to VFD. Reset fault at VFD. |

## Smart Bob Alarms

| Alarm | Possible Cause | Solution |
|---|---|---|
| **No Data** | Power, wiring, or IP address problems | Make sure the C100 and Gateway are powered on and the wiring is correct.<br><br>Make sure the IP address in the FLX matches the Gateways IP address. |
| **Comm Error** | Power, wiring, or IP address problems. | Make sure the C100 and Gateway are powered on and the wiring is correct.<br><br>Make sure the IP address in the FLX matches the Gateways IP address. |
| **Bob Stuck** | Material is preventing proper operation. | Check functionality |
| **Did Not Drop** | Material is preventing proper operation. | Check functionality |

# Understanding the Operator Interface LED Lights


| Label | Description | LED Color | States |
|---|---|---|---|
| Power | Power Status | RED | **Solid** - Unit is powered and running an application.<br>**Flashing** - Unit is in the boot loader, no valid configuration is loaded. |
| CF | Compact Flash Status | YELLOW | **Off** - No Compact Flash card is present.<br>**Steady** - Valid Compact Flash card is present.<br>**Flashing rapidly** - Compact Flash card is being checked.<br>**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.<br>**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.<br>**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:

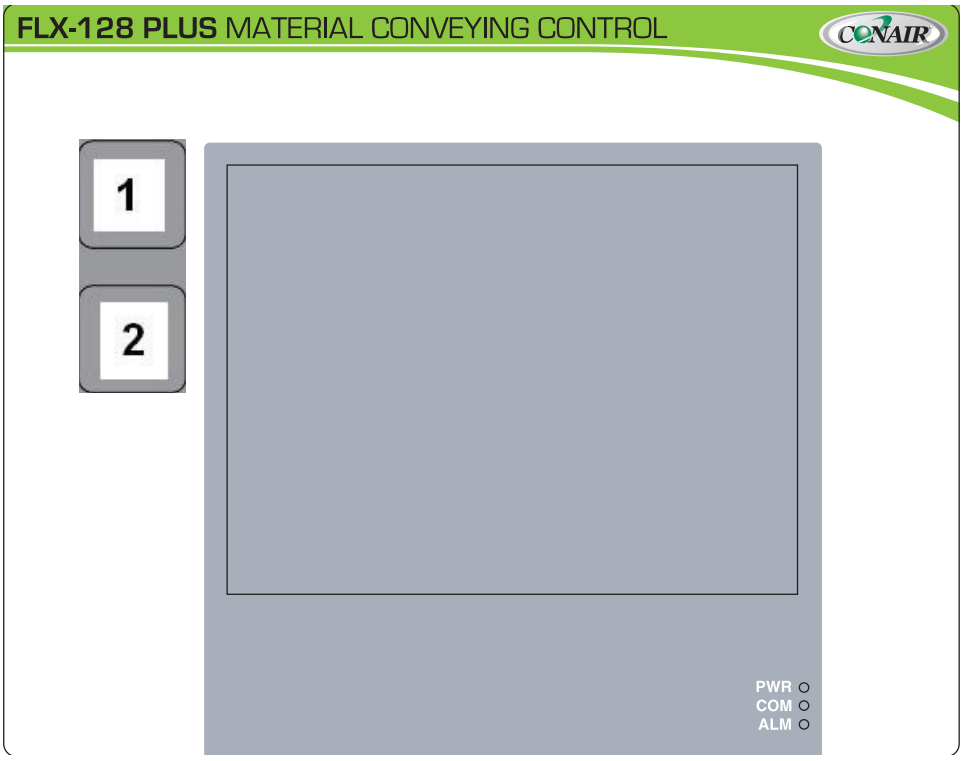
| LED Color | Description |
|---|---|
| Yellow solid | Link established |
| Yellow flashing | Data being transferred |
| Green | 10 BASE-T Communications |
| Amber | 10 BASE-TX Communications |

# 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.

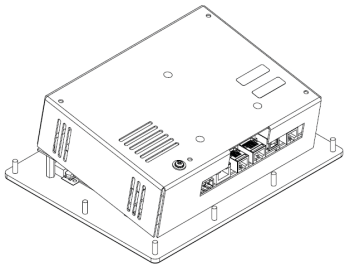
# Battery Replacement

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 nonvolatile 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.

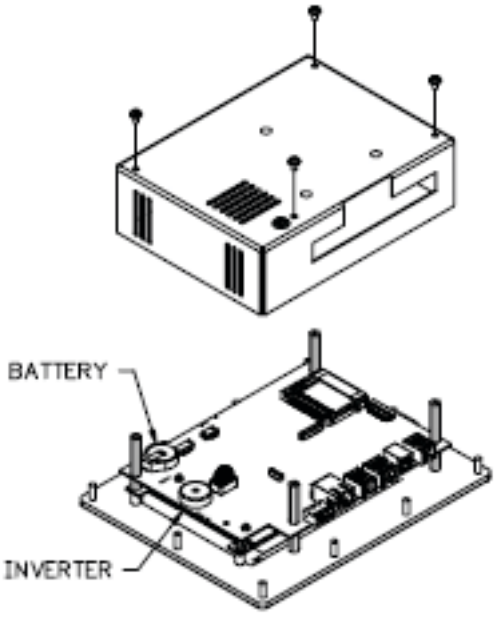
**IMPORTANT:** The circuit board contains static sensitive components. Before handling the operator interface without the rear cover attached, discharge static charges from you body by touching a grounded bare metal object. Ideally, handle the operator interface at a static controlled clean workstation.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



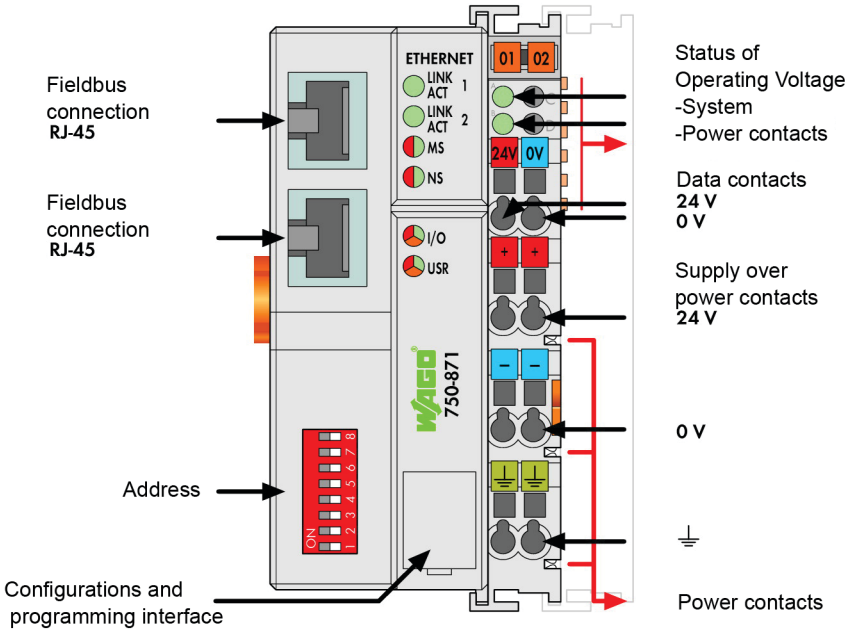
The battery used by the G306A is a lithium type CR2025.

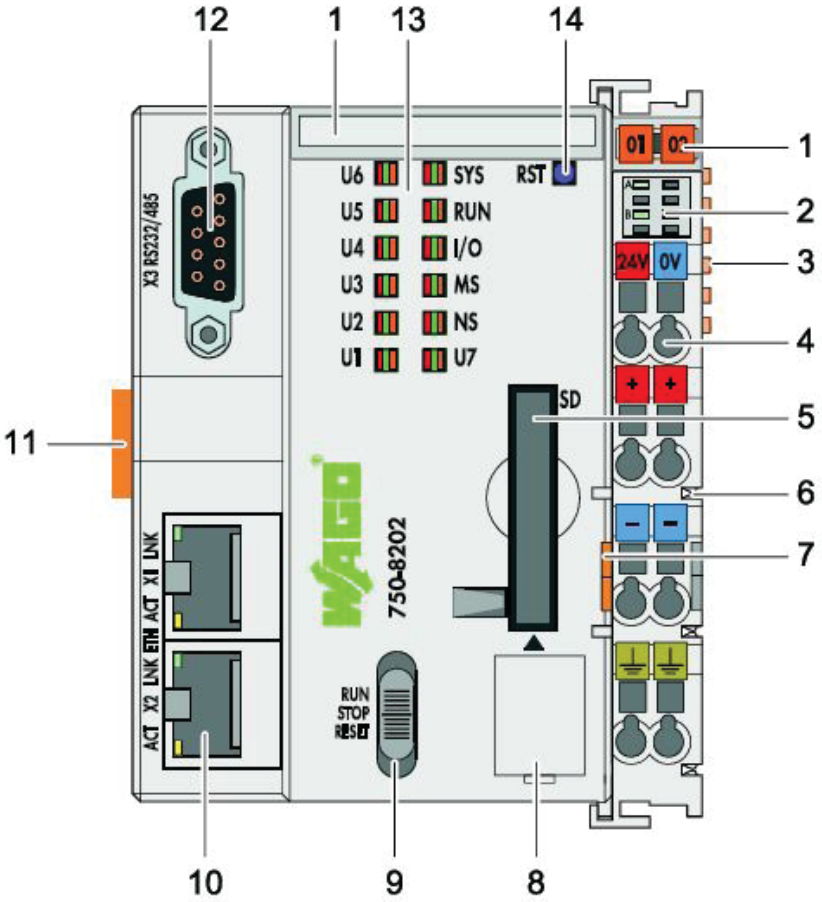
To remove the battery:

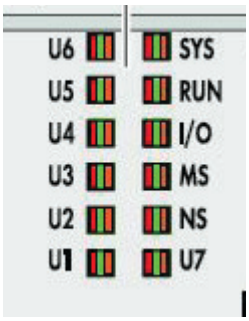
1. **Disconnect power from the unit.**
2. **Disconnect all cables connected to the unit.**
3. **Remove the four screws designated by arrows on the rear of the unit to remove the rear cover of the unit.**
4. **Lift on the top side hinge cover to provide clearance for the connectors on the bottom side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





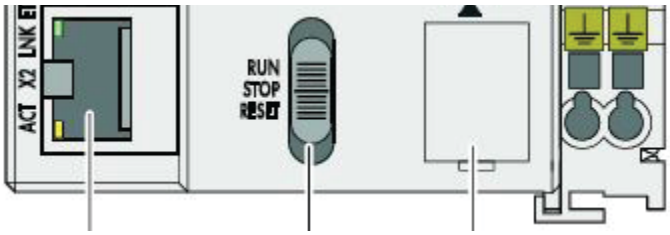

# Controller Connections LEDs

| LED | Description | Normal State | Other States |
|---|---|---|---|
| SYS | Indicates the system status. | GREEN | **OFF** - No data exchange<br>**ORANGE** - Program running but not all I/O configured<br>**RED** - Program not running |
| RUN | Indicates the program status. | GREEN | **OFF** - No data exchange<br>**ORANGE** - Program running but not all I/O configured<br>**RED** - Program not running |
| I/O | The status of the internal bus | GREEN | **OFF** - No data cycle on the internal bus<br>**RED** - During controller startup<br>❒ Wait for internal bus to initialize.<br>❒ Watch for startup signal displayed by LED flashing fast for approximately 1-2 seconds.<br>**RED** - After controller startup - Error, indicated by three consecutive flashing sequences. There is a short pause between each sequential flash.<br>✎ **NOTE:** Fault message list is located in this Troubleshooting section.<br>❒ Evaluate the fault message.<br>❒ See control manufacturer's instruction manual for more detail. |
| MS | Indicates the state of the node (Module State) | GREEN | **RED/GREEN FLASHING** - Self test<br>**RED** - Controller indicates a not remediable error<br>❒ Restart by turning power off and on again.<br>GREEN FLASHING - Controller is not yet configured<br>OFF - No system supply voltage<br>❒ Check the supply voltage (24V and 0V). |
| NS | Indicates the state of the node (Network State) | GREEN | **RED/GREEN FLASHING** - Self test<br>**RED** - Controller indicates a duplicate IP address on the network<br>❒ Use an IP address that is not used on the network.<br>❒ Cycle power to controller.<br>**RED FLASHING** - Network connection time out<br>❒ Restart by turning power off and on again.<br>**GREEN FLASHING** - No connection<br>**OFF** - No system supply voltage<br>❒ Check the supply voltage (24V and 0V). |
| U1-U7 | The status of the program | GREEN | **GREEN** - Program running and all I/O configured<br>**ORANGE** - Program running but not all I/O configured<br>**RED** - Program not running |
| TxD/RxD | Data Exchange over Ethernet | FLASHING GREEN | **OFF** - No data exchange<br>❒ Check cabling. |

# Controller Connections Overview

The operating mode switch is located behind a cover flap.

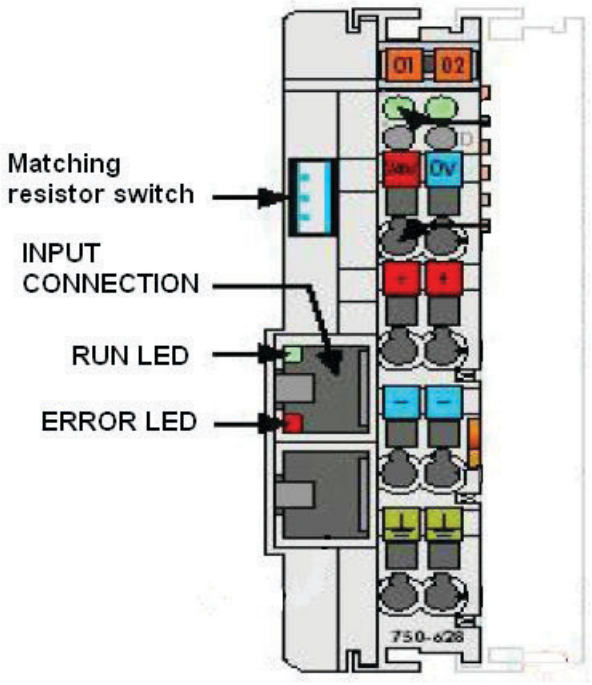
The switch is an external switch.




| 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.<br>• All outputs and flags are reset; variables are set to 0 or false or to an initial value.<br>• Retain variables and flags are not changed.<br>• 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)

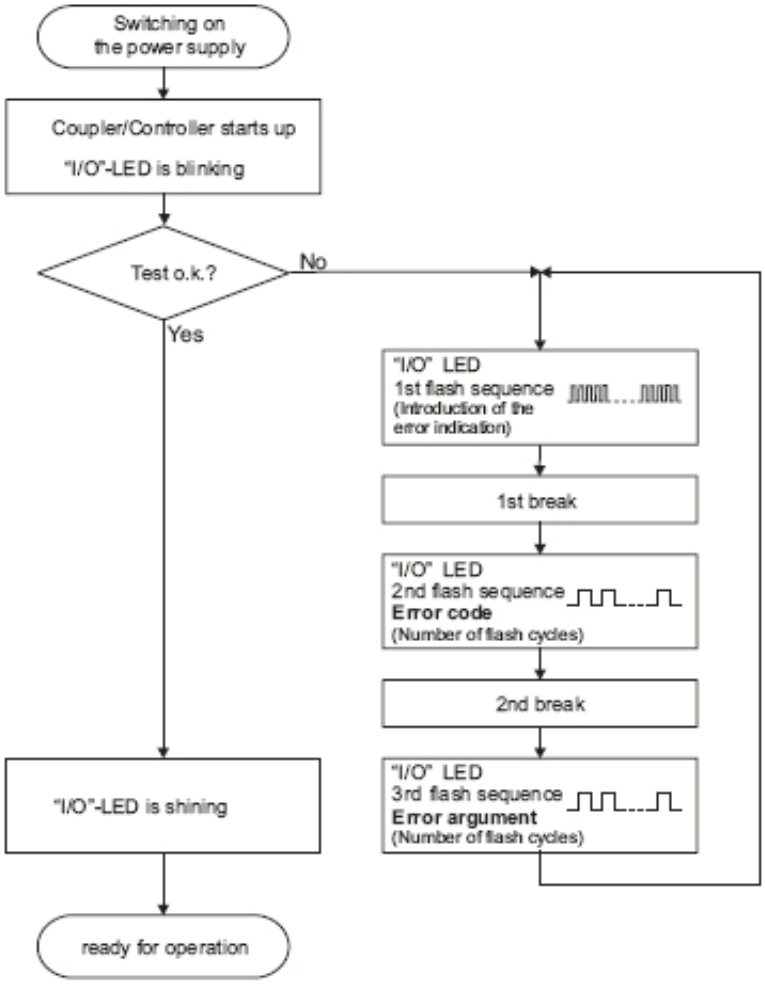
The Bus Extension module is required for output expansion.




The RUN LED must be green.

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

# FLX-128 Plus 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

# FLX-128 Plus Controller Error Codes

## 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.<br>– 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).<br>– 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).<br>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. |
| **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. |

(Continued)

# FLX-128 Plus Controller Error Codes (continued)

## Fault Code 1: "Hardware and configuration fault"

| Fault Argument | Fault Description | Troubleshooting |
|---|---|---|
| **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. |
| **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. |

(Continued)

# FLX-128 Plus Controller Error Codes (continued)

### Fault Code 1: "Hardware and configuration fault"

| Fault Argument | Fault Description | Troubleshooting |
|---|---|---|
| **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. |

### Fault Code 2: "Not used"

| Fault Argument | Fault Description | Troubleshooting |
|---|---|---|
| **--** | Not used. | -- |

(Continued)

# FLX-128 Plus 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.<br>– 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).<br>– 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).<br>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-128 Plus 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.<br>– 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).<br>– 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).<br>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-128 Plus 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. |

### 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. |
| **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 |

(Continued)

# FLX-128 Plus Controller Error Codes (continued)

### Fault Code 9: "Not used"

| Fault Argument | Fault Description | Troubleshooting |
|---|---|---|
| -- | Not used. | -- |

### 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. |
| **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** | TCP/IP initialization error | Check the task configuration concerning the adjusted sampling intervals and watchdog times. |
| **4** | Network configuration error (no IP address) | 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-128 Plus 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 (User Settings) Program Using a CompactFlash Card

The HMI database of the FLX-128 Plus 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.

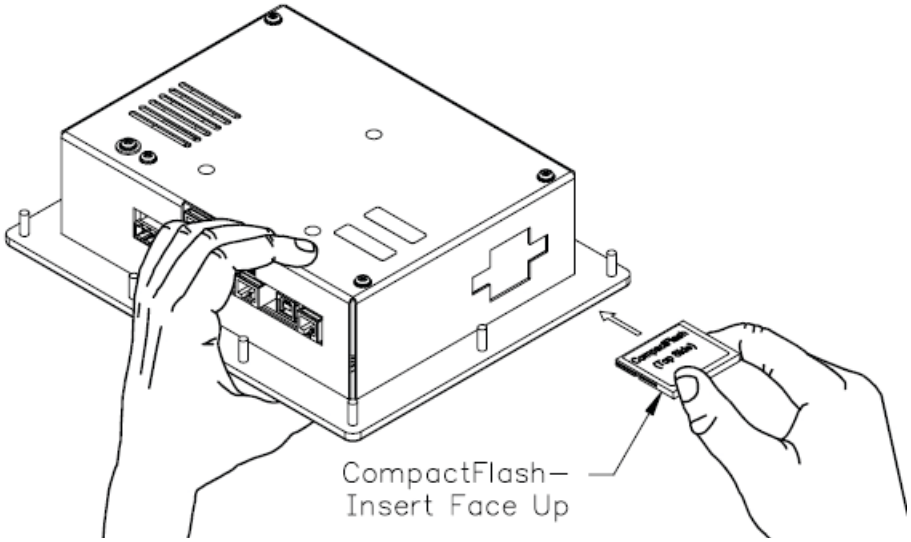
- A Compact Flash card formatted to the FAT16 file system using the Red Lion formatting software avalable at the Red Lion web site.
- CompactFlash reader.

✎ **NOTE:** Conair recommends you save the data to the Compact Flash card twice to make sure that all data is saved. Wait until the screen says "Done" before re-saving.

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 (User Settings) Program Using a CompactFlash Card (continued)

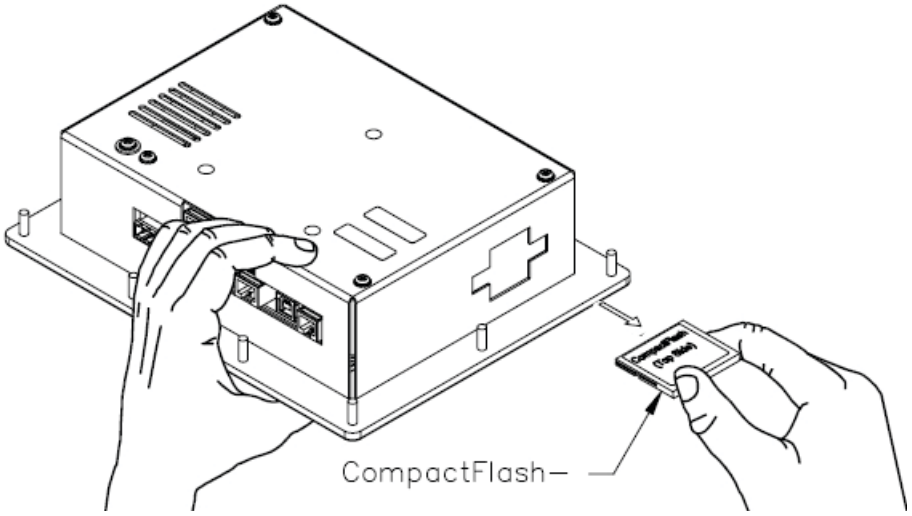



**4** **Turn power on to the operator interface.**

- 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-128 Plus Configuration and Settings Via Compact Flash

These steps allow you to save your FLX-128 Plus 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.
3. Press the Save Data button to backup the FLX names and settings. This replaces any old data and typically takes about 10 seconds.
4. 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.
5. 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 Plus 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.

# 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 |
|---|---|---|
| RPRO Pump 1 | Pump 1 | 10.1.61.156 |
| RPRO Pump 2 | Pump 2 | 10.1.61.157 |
| RPRO Pump 3 | Pump 3 | 10.1.61.158 |
| RPRO Pump 4 | Pump 4 | 10.1.61.159 |
| RPRO Pump 5 | Pump 5 | 10.1.61.160 |
| 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 Op2 161-168 | 10.1.61.221 |
| Combo Box 2 | Loader 73-80/Opt1 137-144 Op2 169-176 | 10.1.61.222 |
| Combo Box 3 | Loader 81-88/Opt1 145-152 Op2 177-184 | 10.1.61.223 |
| Combo Box 4 | Loader 89-96/Opt1 153-160 Op2 185-192 | 10.1.61.224 |
| Combo Box 5 | Loader 97-104/Opt1 193-200 Op2 225-232 | 10.1.61.225 |
| Combo Box 6 | Loader 105-112/Opt1 201-208 Op2 233-240 | 10.1.61.226 |
| Combo Box 7 | Loader 113-120/Opt1 209-216 Op2 241-248 | 10.1.61.227 |
| Combo Box 8 | Loader 121-128/Opt1 217-224 Op2 249-256 | 10.1.61.228 |
| Source Box 1 | Opt1 129-136 Op2 161-168 | 10.1.61.231 |
| Source Box 2 | Opt1 137-144 Op2 169-176 | 10.1.61.232 |
| Source Box 3 | Opt1 145-152 Op2 177-184 | 10.1.61.233 |
| Source Box 4 | Opt1 153-160 Op2 185-192 | 10.1.61.234 |
| Source Box 5 | Opt1 193-200 Op2 225-230 | 10.1.61.235 |
| Source Box 6 | Opt1 201-208 Op2 | 10.1.61.236 |
| Source Box 7 | Opt1 209-216 Op2 | 10.1.61.237 |
| Source Box 8 | Opt1 217-224 Op2 249-256 | 10.1.61.238 |
| RPRO Source 1 | Source 1 | 10.1.61.161 |
| RPRO Source 2 | Source 2 | 10.1.61.162 |
| RPRO Source 3 | Source 3 | 10.1.61.163 |
| RPRO Source 4 | Source 4 | 10.1.61.164 |
| RPRO Source 5 | Source 5 | 10.1.61.165 |

**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.

# Expansion Box IP Addresses (continued)

| Box Type/Number | | IP Address |
|---|---|---|
| RPRO Source 6 | Source 6 | 10.1.61.166 |
| RPRO Source 7 | Source 7 | 10.1.61.167 |
| RPRO Source 8 | Source 8 | 10.1.61.168 |
| RPRO Source 9 | Source 9 | 10.1.61.169 |
| RPRO Source 10 | Source 10 | 10.1.61.170 |
| 16 Loader Box 1 | Loader 65-80 | 10.1.61.241 |
| 16 Loader Box 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 |
| ILP 1 | 1 | 10.1.61.131 |
| ILP 2 | 2 | 10.1.61.132 |
| ILP 3 | 3 | 10.1.61.133 |
| ILP 4 | 4 | 10.1.61.134 |
| ILP 5 | 5 | 10.1.61.135 |
| ILP 6 | 6 | 10.1.61.136 |
| ILP 7 | 7 | 10.1.61.137 |
| ILP 8 | 8 | 10.1.61.138 |
| ILP 9 | 9 | 10.1.61.139 |
| ILP 10 | 10 | 10.1.61.140 |
| ILP 11 | 11 | 10.1.61.141 |
| ILP 12 | 12 | 10.1.61.142 |
| ILP 13 | 13 | 10.1.61.143 |
| ILP 14 | 14 | 10.1.61.144 |
| ILP 15 | 15 | 10.1.61.145 |
| ILP 16 | 16 | 10.1.61.146 |

# FLX-128 Plus Distribution Box IP Layout

| IP address | Loaders | Sources | Pumps | Description | Source/Device Assignments | Responds as IP Numbers |
|---|---|---|---|---|---|---|
| 10.1.61.131 | | | | ILP Box 1 | | 10.1.61.131 |
| 10.1.61.132 | | | | ILP Box 2 | | 10.1.61.132 |
| 10.1.61.133 | | | | ILP Box 3 | | 10.1.61.133 |
| 10.1.61.134 | | | | ILP Box 4 | | 10.1.61.134 |
| 10.1.61.135 | | | | ILP Box 5 | | 10.1.61.135 |
| 10.1.61.136 | | | | ILP Box 6 | | 10.1.61.136 |
| 10.1.61.137 | | | | ILP Box 7 | | 10.1.61.137 |
| 10.1.61.138 | | | | ILP Box 8 | | 10.1.61.138 |
| 10.1.61.139 | | | | ILP Box 9 | | 10.1.61.139 |
| 10.1.61.140 | | | | ILP Box 10 | | 10.1.61.140 |
| 10.1.61.141 | | | | ILP Box 11 | | 10.1.61.141 |
| 10.1.61.142 | | | | ILP Box 12 | | 10.1.61.142 |
| 10.1.61.143 | | | | ILP Box 13 | | 10.1.61.143 |
| 10.1.61.144 | | | | ILP Box 14 | | 10.1.61.144 |
| 10.1.61.145 | | | | ILP Box 15 | | 10.1.61.145 |
| 10.1.61.146 | | | | ILP Box 16 | | 10.1.61.146 |
| 10.1.61.156 | | | 1 | RPRO Pump Box | | 10.1.61.201 |
| 10.1.61.157 | | | 2 | RPRO Pump Box | | 10.1.61.202 |
| 10.1.61.158 | | | 3 | RPRO Pump Box | | 10.1.61.203 |
| 10.1.61.159 | | | 4 | RPRO Pump Box | | 10.1.61.204 |
| 10.1.61.160 | | | 5 | RPRO Pump Box | | 10.1.61.205 |
| 10.1.61.161 | 1 | 1 | | RPRO Source Box | Source Options 1 and 2: L65-L72 | 10.1.61.231 (10.1.61.111) |
| 10.1.61.162 | 2 | 2 | | RPRO Source Box | Source Options 1 and 2: L73-L80 | 10.1.61.232 (10.1.61.112) |
| 10.1.61.163 | 3 | 3 | | RPRO Source Box | Source Options 1 and 2: L81-L88 | 10.1.61.233 (10.1.61.113) |
| 10.1.61.164 | 4 | 4 | | RPRO Source Box | Source Options 1 and 2: L89-L96 | 10.1.61.234 (10.1.61.114) |
| 10.1.61.165 | 5 | 5 | | RPRO Source Box | Source Options 1 and 2: L97-L104 | 10.1.61.235 (10.1.61.115) |
| 10.1.61.166 | 6 | 6 | | RPRO Source Box | Source Options 1 and 2: L105-L112 | 10.1.61.236 (10.1.61.116) |
| 10.1.61.167 | 7 | 7 | | RPRO Source Box | Source Options 1 and 2: L113-L120 | 10.1.61.237 (10.1.61.117) |
| 10.1.61.168 | 8 | 8 | | RPRO Source Box | Source Options 1 and 2: L121-L128 | 10.1.61.238 (10.1.61.118) |
| 10.1.61.206 | | Dev-Opt1 153-160<br>Dev-Opt2 185-192 | 21-24 | 4 pumps/16 sources | 89-96 | 201 and 234 |
| 10.1.61.207 | | Dev-Opt1 193-200<br>Dev-Opt2 225-232 | 25-28 | 4 pumps/16 sources | 97-104 | 202 and 235 |
| 10.1.61.208 | | Dev-Opt1 201-208<br>Dev-Opt2 233-240 | 29-32 | 4 pumps/16 sources | 105-112 | 203 and 236 |
| 10.1.61.209 | | Dev-Opt1 209-216<br>Dev-Opt2 241-248 | 33-36 | 4 pumps/16 sources | 113-120 | 204 and 237 |
| 10.1.61.210 | | Dev-Opt1 217-224<br>Dev-Opt2 249-256 | 37-40 | 4 pumps/16 sources | 121-128 | 205 and 238 |
| 10.1.61.211 | 65-72 | | | 8 loaders | | 211 |
| 10.1.61.212 | 73-80 | | | 8 loaders | | 212 |
| 10.1.61.213 | 81-88 | | | 8 loaders | | 213 |
| 10.1.61.214 | 89-96 | | | 8 loaders | | 214 |
| 10.1.61.215 | 97-104 | | | 8 loaders | | 215 |
| 10.1.61.216 | 105-112 | | | 8 loaders | | 216 |
| 10.1.61.217 | 113-120 | | | 8 loaders | | 217 |
| 10.1.61.218 | 121-128 | | | 8 loaders | | 218 |

(Continued)

# FLX-128 Plus Distribution Box IP Layout
**(continued)**

| IP address | Loaders | Sources | Pumps | Description | Source/Device Assignments | Responds as IP Numbers |
|---|---|---|---|---|---|---|
| 10.1.61.219 | 65-80 | Dev-Opt1 129-136<br>Dev-Opt2 161-168 | | 16 loader/16 sources | 65-72 | 211,212,231 |
| 10.1.61.220 | 81-96 | Dev-Opt1 145-152<br>Dev-Opt2 177-184 | | 16 loader/16 sources | 81-88 | 213,214,233 |
| 10.1.61.221 | 65-72 | Dev-Opt1 129-136<br>Dev-Opt2 161-168 | | 16 loader/32 sources | 65-72 | 211 and 231 |
| 10.1.61.222 | 73-80 | Dev-Opt1 137-144<br>Dev-Opt2 169-176 | | 16 loader/32 sources | 73-80 | 212 and 232 |
| 10.1.61.223 | 81-88 | Dev-Opt1 145-152<br>Dev-Opt2 177-184 | | 16 loader/32 sources | 81-88 | 213 and 233 |
| 10.1.61.224 | 89-96 | Dev-Opt1 153-160<br>Dev-Opt2 185-192 | | 16 loader/32 sources | 89-96 | 214 and 234 |
| 10.1.61.225 | 97-104 | Dev-Opt1 193-200<br>Dev-Opt2 225-232 | | 16 loader/32 sources | 97-104 | 215 and 235 |
| 10.1.61.226 | 105-112 | Dev-Opt1 201-208<br>Dev-Opt2 233-240 | | 16 loader/32 sources | 105-112 | 216 and 236 |
| 10.1.61.227 | 113-120 | Dev-Opt1 209-216<br>Dev-Opt2 241-248 | | 16 loader/32 sources | 113-120 | 217 and 237 |
| 10.1.61.228 | 121-128 | Dev-Opt1 217-224<br>Dev-Opt2 249-256 | | 16 loader/32 sources | 121-128 | 218 and 238 |
| 10.1.61.227 | 97-112 | Dev-Opt1 193-200<br>Dev-Opt2 225-232 | | 16 loader/16 sources | 97-104 | 215,216,235 |
| 10.1.61.228 | 113-128 | Dev-Opt1 209-216<br>Dev-Opt2 241-248 | | 16 loader/16 sources | 113-120 | 217,218,237 |
| 10.1.61.239 | 65-96 | Dev-Opt1 129-160 | | 32 Dev-Opt1 sources | 65-96 | 231,232,233,234 |
| 10.1.61.240 | 97-128 | Dev-Opt1 193-224 | | 32 Dev-Opt1 sources | 97-128 | 235,236,237,238 |
| 10.1.61.241 | 65-80 | | | 16 loaders | | 211 and 212 |
| 10.1.61.242 | 81-96 | | | 16 loaders | | 213 and 214 |
| 10.1.61.243 | 97-112 | | | 16 loaders | | 215 and 216 |
| 10.1.61.244 | 113-128 | | | 16 loaders | | 217 and 218 |
| 10.1.61.245 | 65-80 | Dev-Opt1 129-44<br>Dev-Opt2 161-176 | | 16 loaders/32 sources | 65-80 | 211,212,231,232 |
| 10.1.61.246 | 81-96 | Dev-Opt1 145-160<br>Dev-Opt2 177-192 | | 16 loaders/32 sources | 81-96 | 213,214,233,234 |
| 10.1.61.247 | 97-112 | Dev-Opt1 193-208<br>Dev-Opt2 225-240 | | 16 loaders/32 sources | 97-112 | 215,216,235,236 |
| 10.1.61.248 | 113-128 | Dev-Opt1 209-224<br>Dev-Opt2 241-256 | | 16 loaders/32 sources | 113-128 | 217,218,237,238 |
| 10.1.161.249 | 65-96 | Dev-Opt2 161-192 | | 32 Dev-Opt2 sources | 65-96 | 231,232,233,234 |
| 10.1.161.250 | 97-128 | Dev-Opt2 225-256 | | 32 Dev-Opt2 sources | 97-128 | 235,236,237,238 |
| 10.1.161.251 | | | | Dolphin 1 | | 251 |
| 10.1.161.252 | | | | Dolphin 2 | | 252 |
| 10.1.161.253 | | | | Dolphin 3 | | 253 |
| 10.1.161.254 | | | | Dolphin 4 | | 254 |

**NOTE:** It is not wise to use both combo boxes and source boxes with the same outputs - both box outputs will come on and if the source only box loses communications the FLX-128 Plus will not alarm.

# FLX-128 Plus Ethernet Expansion IP Addressing

| | 4th octet | Dip Switch 1 | Dip Switch 2 | Dip Switch 3 | Dip Switch 4 | Dip Switch 5 | Dip Switch 6 | Dip Switch 7 | Dip Switch 8 | Dip Switch 9 | Dip Switch 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Box 1** | 221 | on | off | on | on | on | off | on | on | off | off |
| **Box 2** | 222 | off | on | on | on | on | off | on | on | off | off |
| **Box 3** | 223 | on | on | on | on | on | off | on | on | off | off |
| **Box 4** | 224 | off | off | off | off | off | on | on | on | off | off |
| **Box 5** | 225 | on | off | off | off | off | on | on | on | off | off |
| **Box 6** | 226 | off | on | off | off | off | on | on | on | off | off |
| **Box 7** | 227 | on | on | off | off | off | on | on | on | off | off |
| **Box 8** | 228 | off | off | on | off | off | on | on | on | off | off |

## 750-457, 750-459 / 753-457, 753-459

# 4-Channel Analog Input Module ±10 V/0-10 V

**Single-ended (S.E.)**

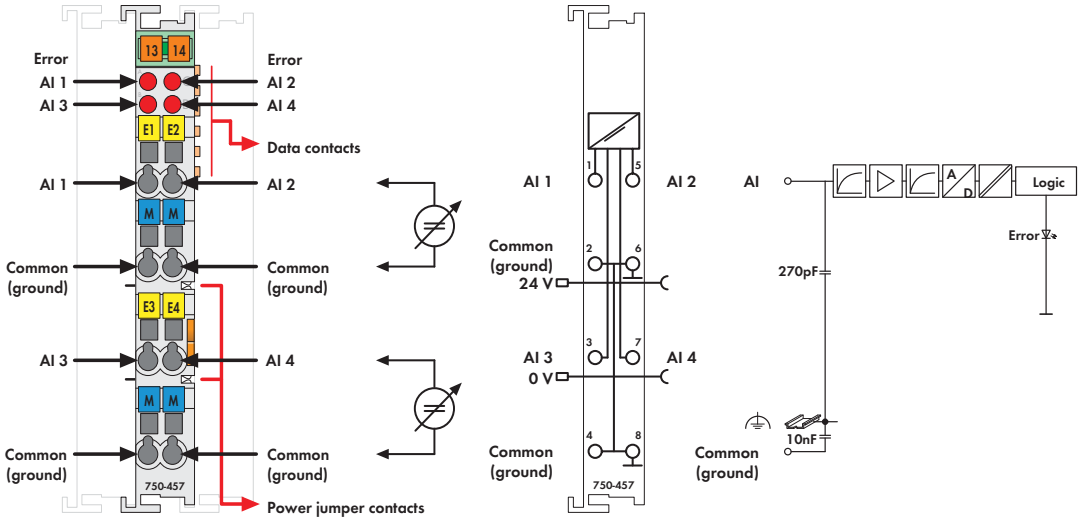



**Fig. 750 Series**
**Delivered without miniature WSB markers**

The analog input module receives signals with the standardized values ±10V and 0-10V.

The input signal is electrically isolated and will be transmitted with a resolution of 12 bits.

The internal system supply is used for the power supply of the module.

The input channels of a module have one common ground potential.

| Description | Item No. | Pack. Unit |
|---|---|---|
| **4AI ±10V DC S.E.** | **750-457** | 1 |
| **4AI 0-10V DC S.E.** | **750-459** | 1 |
| **4AI ±10V DC S.E./T** | **750-457/025-000** | 1 |
| Extended temperature range: -20 °C ... +60 °C | | |
| **4AI ±10V DC S.E. (without connector)** | **753-457** | 1 |
| **4AI 0-10V DC S.E. (without connector)** | **753-459** | 1 |

| Accessories | Item No. | Pack. Unit |
|---|---|---|
| **753 Series Connectors** | **753-110** | 25 |
| **Coding elements** | **753-150** | 100 |
| **Miniature WSB Quick marking system** | | |
| plain | **248-501** | 5 |
| with marking | see Section 11 | |

## Approvals

| | |
|---|---|
| Conformity marking | CE |
| Korea Certification | KC |
| Marine applications (versions upon request) | ABS, BV, DNV, GL, KR, LR, NKK, PRS, RINA |
| cULus UL 508 | |
| cULus ANSI/ISA 12.12.01 | Class I, Div. 2, Grp. ABCD, T4 |
| TÜV 07 ATEX 554086 X | I M2 Ex d I Mb, |
| | II 3 G Ex nA IIC T4 Gc, |
| | II 3 D Ex tc IIIC T135°C Dc |
| Permissible ambient temperature | 0 °C ... +60 °C |
| IECEx TUN 09.0001 X | Ex d I Mb, |
| | Ex nA IIC T4 Gc, |
| | Ex tc IIIC T135°C Dc |
| Permissible ambient temperature | 0 °C ... +60 °C |

## Technical Data

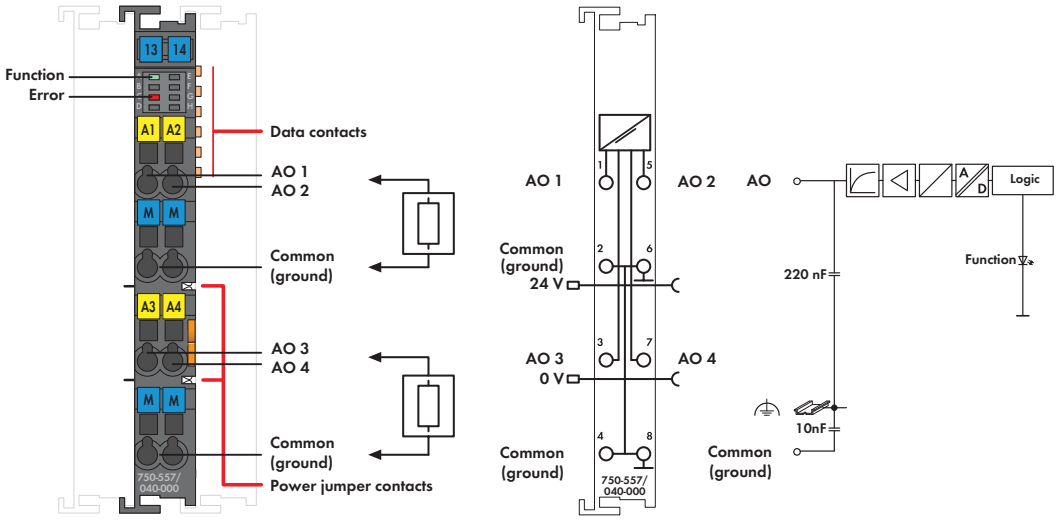
| | |
|---|---|
| Number of inputs | 4 |
| Power supply | via system voltage DC/DC |
| Current consumption (internal) | 65 mA |
| Input voltage (max.) | ± 40V |
| Signal voltage | ± 10 V (750-457 / 753-457) |
| | 0 V ... 10 V (750-459 / 753-459) |
| Input resistance | > 100kΩ |
| Resolution | 12 bits |
| Conversion time (typ.) | 10 ms |
| Measuring error (25 °C) | < ± 0.2 % of the full scale value |
| Temperature coefficient | < ± 0.01 % / K of the full scale value |
| Isolation | 500 V system/supply |
| Bit width | 4 x 16 bits data |
| | 4 x 8 bits control/status (optional) |
| Wire connection | CAGE CLAMP® |
| Cross sections | 0.08 mm² ... 2.5 mm² / AWG 28 ... 14 |
| Strip lengths, 750/753 Series | 8 ... 9 mm / 0.33 in |
| | 9 ... 10 mm / 0.37 in |
| Width | 12 mm |
| Weight | 51 g |
| EMC immunity of interference | acc. to EN 61000-6-2, marine applications |
| EMC emission of interference | acc. to EN 61000-6-4, marine applications |

# WAGO Modules (continued)

## 750-557/040-000, 750-559/040-000

### 4-Channel Analog Output Module ±10 V/0-10 V

**for eXTReme environmental conditions**




This analog output module generates standard ±10 V or 0–10 V signals. The output signal is electrically isolated and transmitted with a resolution of 12 bits.
The internal system supply powers the module.
The output channels of the module have a common ground potential.

**The module is ideally suited for operation in harsh environmental conditions:**
**- strongly extended temperature range**
**- higher dielectric strength and EMC resistance**
**- higher vibration and shock resistance**

| Description | Item No. | Pack. Unit |
|---|---|---|
| **4AO ± 10VDC /XTR** | **750-557/040-000** | 1 |
| **4AO 0-10VDC /XTR** | **750-559/040-000** | 1 |

| Accessories | | Item No. | Pack. Unit |
|---|---|---|---|
| **Miniature WSB Quick marking system** | | | |
|  | plain | **248-501** | 5 |
| | with marking | see Section 11 | |

| Approvals | |
|---|---|
| Conformity marking | CE |
| Korea Certification | |
| Marine applications | GL |
| UL 508 | |
| ANSI/ISA 12.12.01 | Class I, Div. 2, Grp. ABCD, T4 |

| Technical Data | |
|---|---|
| Wire connection | CAGE CLAMP® |
| Cross sections | 0.25 mm² ... 2.5 mm² / AWG 24 ... 14 |
| Strip lengths | 8 ... 9 mm / 0.33 in |
| Dimensions (mm) W x H x L | 12 x 62 x 100 |
| | Height from upper-edge of DIN 35 rail |
| Weight | 53.5 g |
| Operating temperature | -40 °C ... +70 °C |
| Storage temperature | -40 °C ... +85 °C |
| Relative humidity | 95 %, short-term condensation acc. to class 3K7 / IEC EN 60721-3-3 (except wind-driven precipitation, water and ice formation) |
| Operating altitude | without temperature derating: 0 m ... 2000 m; with temperature derating: 2000 m ... 5000 m (0.5 K/100 m); max.: 5000 m |

| Technical Data | |
|---|---|
| No. of outputs | 4 |
| Signal voltage | ±10 V (750-557/040-000) |
| | 0 V ... 10 V (750-559/040-000) |
| Load impedance | > 5 kΩ |
| Resolution | 12 bits |
| Conversion time (typ.) | 10 ms |
| Recovery time (typ.) | 100ms |
| Measuring error (25 °C) | < ± 0.1 % of the full scale value |
| Temperature coefficient | < ± 0.01 % / K of the full scale value |
| Max. current consumption (internal) | 125 mA |
| Voltage via power jumper contacts | 24 V DC |
| under laboratory conditions +15 °C ... +35 °C | 18 V ... 31.2 V (17.4 V ... 31.2 V)[1] |
| for -40 °C ... +55 °C | 18 V ... 28.8 V (17.4 V ... 28.8 V)[1] |
| for +55 °C ... +70 °C | 18 V ... 26.4 V (17.4 V ... 26.4 V)[1] |
| | [1] including residual ripple of 15 % |
| Current via power jumper contacts (max.) | 10 A |
| Isolation (peak value) | 510 VAC or 775 VDC |
| | power supply/DIN rail |
| Rated surge voltage | 1 kV |
| Overvoltage category | III |
| Bit width | 4 x 16 bits data |
| | 4 x 8 bits control/status (optional) |
| Vibration resistance | acc. to IEC 60068-2-6 (acceleration: 5g), EN 60870-2-2, IEC 60721-3-1, -3, EN 61131-2 |
| Shock resistance | acc. to IEC 60068-2-27 |
| EMC immunity of interference | acc. to EN 61000-6-1, -2, EN 61131-2, marine applications, EN 50121-3-2, -4, -5, EN 60255-26, EN 60870-2-1, EN 61850-3, IEC 61000-6-5, IEEE 1613, VDEW: 1994 |
| EMC emission of interference | acc. to EN 61000-6-3, -4, EN 61131-2, EN 60255-26, marine applications, EN 60870-2-1, EN 61850-3, EN 50121-3-2, -4, -5 |