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USER GUIDE
UGC020/1003

Intelligent Loading System

ILS Model - ControlLogix, Panel View Plus

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: UGC020/1003

Serial Number(s):

Model Number(s):

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A Appendix

SECTION

1

Introduction

Purpose of the User Guide

This User Guide describes the installation and operation of the ILS control.

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

How the Guide is Organized

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

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

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

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

❒ An open box marks items in a checklist.

• A circle marks items in a list.

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

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

Your Responsibility as a User

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

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

ATTENTION:
Read this so no one gets hurt

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

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

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

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

⚠ WARNING: Voltage hazard

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

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

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

SECTION
2

Description

What is the Intelligent Loading System?

The Intelligent Loading System (ILS) is a flexible, configurable, loading control system. It is available in three basic architectures: local I/O, remote I/O, and fully distributed. Architectures can be deployed simultaneously.

Local I/O Architecture
In the local I/O architecture, the PLC processor and operator interface, as well as enough I/O to support 32 loaders and 14 pumps, are located in a single enclosure.

Remote I/O Architecture
Up to three additional enclosures can be remotely installed that can each support 16 loaders. Each of these enclosures can be mounted centrally to a group of loaders to minimize wiring runs.

Fully Distributed Architecture
With the fully distributed architecture, the PLC and operator interface are mounted in separate enclosure without local I/O. Instead, remote Allen Bradley MaXum I/O drops are distributed throughout the plant, connecting to the PLC via DeviceNet flat media. Three networks can be installed which allow totally flexible configuration. With these three networks, up to 55 MaXum network drops can be added to each of them. These drops can then be connected using "DIN" type screw-on connectors to any of the following devices:

- Loader
- Pump
- Grinder
- Regrind Loader

Once connected, these devices can be configured on the operator interface, allowing any of the 55 devices to be configured as any of the listed devices.

This control system configuration greatly simplifies installation, reducing labor, and wiring costs and allows system expansion by simply adding more I/O modules.

The system architectures use Allen Bradley ControlLogix PLC for control. An Allen Bradley ten inch PanelView Plus operator interface is connected to the processor via Ethernet communications. One additional operator interface can be remotely mounted, as needed, elsewhere in the plant. Additionally, the operator interfaces can be upgraded from 10 to 15 inches.

Typical Applications

Conveying applications with more than 32 loaders, 32 material sourses regrind evacuation or multiple interfaces.

Specifications

Model	ILS
Performance Characteristics	
Maximum number of standard devices*	245
Controller	Allen Bradley ControLogix
Operator interface inches {mm}	10 {254} Allen Bradley PanelView Plus 15 {381} Allen Bradley PanelView Plus (optional) Up to 4 operator interfaces, simultaneously
Communications	Ethernet, DeviceNet
Output voltage to devices	24 VDC
Input voltage from devices	24 VDC
Dimensions inches {mm}	
Fully distributed base unit (controller and operator interface)	
Height	24 {610}
Width	24 {610}
Depth	10 {254}
Local I/O base unit (controller, I/O, and operator interface)	
Height	42 {1067}
Width	36 {914}
Depth	12 {305}
Remote I/O base unit (I/O)	
Height	30 {762}
Width	24 {610}
Depth	8 {203}
Distributed I/O power supply unit	
Height	20 {508}
Width	20 {508}
Depth	9 {229}
Weight lb {kg}	
Fully distributed base unit (controller and operator interface)	
Installed	50 {22.7}
Shipping	80 {36.3}
Local I/O base unit (controller, I/O, and operator interface)	
Installed	120 {54.4}
Shipping	160 {72.6}
Remote I/O base unit (I/O)	
Installed	75 {34.0}
Shipping	105 {47.6}
Distributed I/O power supply unit	
Installed	30 {13.6}
Shipping	75 {34.0}
Voltages Total amps	
Fully distributed base unit (controller and operator interface)	120 VAC/5 A/60 Hz
Local I/O base unit (controller, I/O, and operator interface)	120 VAC/15 A/60 Hz
Remote I/O base unit (I/O)	120 VAC/15 A/60 Hz
Distributed I/O power supply unit	120 VAC/5 A/60 Hz

NOTE *: A device may be a vacuum receiver, a pump, a grinder, or a regrind vacuum receiver.

SECTION
3

Installation

Unpacking the Boxes

The ILS distributed loading control comes in one or more boxes, depending on the options ordered. The boxes should include:

- ❒ Base unit with touchscreen interface panel;
- ❒ Power supply unit;
- ❒ MaXum I/O modules and bases;
- ❒ DIN blocks and bases;
- ❒ Termination blocks and bases;
- ❒ Kwik-Link flat DeviceNet cable;
- ❒ Cable installation brackets.

Master Control Unit with Touchscreen Interface Panel

Power Supply Unit

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

2 **Remove all packing material, protective paper,** tape and plastic.

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

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

5 **You are now ready to begin installation.** Follow the preparation steps on the next page, paying particular attention to all wiring consideration and recommendations.

Preparing for Installation

You should plan the location of the ILS base unit to ensure easy access and minimal wiring. Remote touchscreen panels can be connected to the control via an ethernet port inside the control enclosure of the primary touchscreen interface.

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

- ❒ **Is central to loaders that the ILS will control.** Keep the ILS base unit as close as possible to the loading stations to minimize the amount of wire needed to connect the vacuum receivers to the control.
- ❒ **Provides adequate clearance for safe operation and** maintenance**.** The base unit should be mounted at a height that allows the operator to easily see and use the touch screen. Maintain at least 3 feet (1 m) clearance in front of the base unit for safe access to the Input/Output enclosure.
- ❒ **Provides a clean, dry, vibration-free environment.** Exposure to wide temperature variations, high ambient temperature, power line fluctuations, caustic fumes or excessive amounts of dust, dirt, vibration, shock and moisture could harm performance and reduce the life of this equipment.
- ❒ **Provides a grounded source of 120 VAC power.** The three-prong power cords supplied with the ILS base unit and power supply requires a grounded 120 VAC outlet rated for at least 15 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 ILS system and your conveying equipment before beginning installation. *See **Wiring Considerations.***
- ❒ **Keep communication wires away from sources of** static electricity. Static electricity can damage the controls. Communication cables should ***not*** be run near the material lines and hoses, which produce large amounts of static electricity when material is conveyed.
- ❒ **Avoid running communication cables across power** feed lines. If you must run the cable across power feed lines, run the cable at right angles (90°) to the lines.
- ❒ **Do not run power cable together with communication cables** inside cable trays. Communication cables include ethernet and DeviceNet communications.

Installing the ILS

Installation consists of:

❒ Installing the Kwik-Link flat DeviceNet cables.
❒ Installing the MaXum bases and termination blocks.
❒ Installing the MaXum I/O units.
❒ Mounting the base unit and power supply.
❒ Installing the loader drop cables.
❒ Wiring the purge and pocket valves included in the system.
❒ Installing the drop cables between the pump MaXums and the pump starters.
❒ Initial setup of the system control.

Wiring Considerations

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

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

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

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

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

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

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

Mounting the Base Unit and Power Supply

The ILS base unit and power supply should be mounted on a wall, or other secure vertical surface, at a height providing easy access and a clear view of the touchscreen panel.

1. **Bolt the base unit and** power supply to the mounting surface. Use the mounting brackets on the base unit enclosures.

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

Installing the Brackets

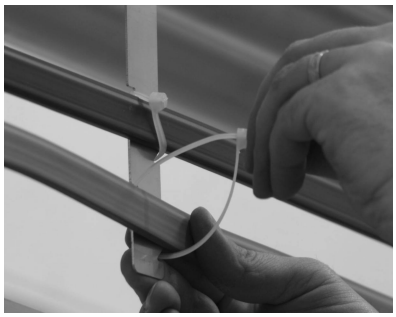
⚠ **WARNING:** Improper installation may result in equipment damage or personal injury.

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

It is important to keep the communication wires away from conveying lines, which can produce large amounts of static electricity.

1 Install the Kwik-Link flat DeviceNet cable brackets provided or prepare your chosen method of cable support.

2 Install the two Kwik-Link flat DeviceNet cables. The gray cable provides communications and inputs; the black cable provides output power. Insure that the cables are installed so that the tabbed edge of the cable may be installed into the MaXum bases and termination blocks correctly.



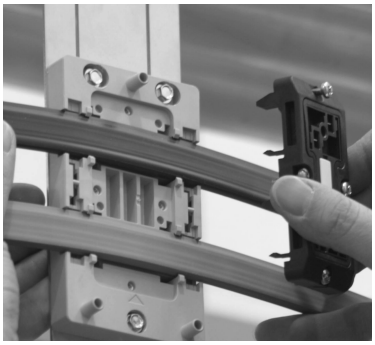
3 Install the MaXum base brackets or prepare your chosen method of MaXum support wherever there is a loader or a pump.

Installing the Bases and Cables

1 **Install the MaXums bases** on the base brackets.

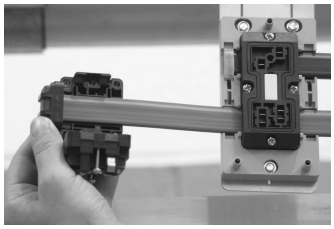
2 **Install the Kwik-Link flat DeviceNet cables** in the MaXum bases. Insure that the cables are properly installed in the bases and the piercing caps are clamped evenly. If the cables are not flat in their slots, the contacts will not pierce the cables correctly. Remove the bases and discard. Install a new base 1/2 inch to 1 inch from the removed base. Refer to Allen Bradley MaXum MaXum I/O Cables Bases Manual (Publication 1792D-5.9) included with the bases for further details.

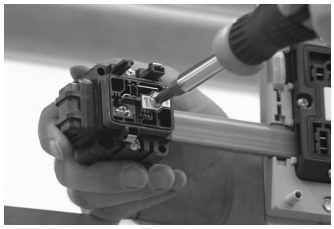
Initially install just two bases, one loader and one pump. The remaining bases can be installed one at a time after the system is powered up.



Installing the Terminal Blocks

1 **Install the termination blocks** on the two ends of the gray cable. Install any link couplers if the system has multiple segments and multiple power supplies.





2 **Install the base unit anywhere along the length of the flat cable** run within 25 feet of the cable. Install the DeviceNet Mini-DIN termination tap on the gray flat cable. Connect the base unit to the DeviceNet cable using the attached Mini-DIN connector.

Attaching Power Supply Units

1 **Install the power supply units along the DeviceNet cable** so that the power from the units will be evenly distributed along the cable. For example if there are ten loaders evenly spaced along a 75 meter cable, the power supply should be placed in the center of the cable with five loaders on one side and five on the other. If nine of the loaders were on one end and the tenth loader on the other end, the power supply should probably be placed somewhere in the middle of the nine loaders on the one end. The desired result will be that half of the current from the power supply will flow one direction down the auxiliary power cable and half of the current will flow in the other direction. If there are questions refer to your Allen-Bradley DeviceNet Cable System Planning and Installation Manual (Cat. No. DN-6.7.2), or contact your Conair Representative. Install the power supply units within 25 feet of the DeviceNet cable.

2 **Install the two power supply taps on the DeviceNet cable.** The two power supply cables from the power supply unit must be placed on the correct flat cable. The cable marked “DeviceNet Power Supply” should be attached to the gray DeviceNet cable and the cable marked “Auxiliary Power” should be attached to the black auxiliary power cable.

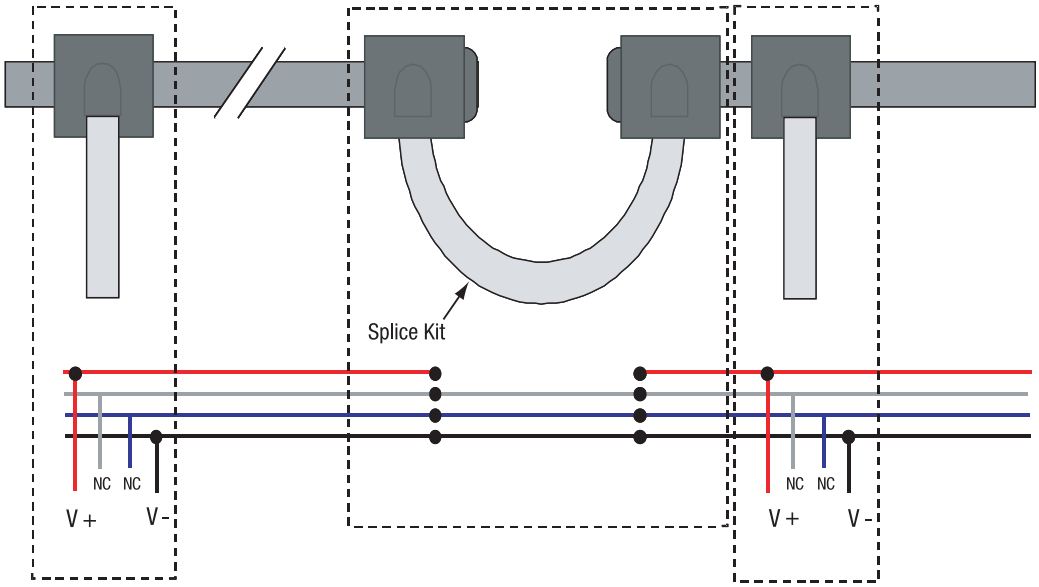
Installing a Splice Kit

You will need to install a splice kit for every 16 loaders or 75 meters of cable installed. You can order a splice kit from the Conair Parts department (800.458.1960, or outside the US 814.437.6861)

1 Install a base on either end of the DeviceNet cable run.
See Section 3, "Installing the Bases and Cables."

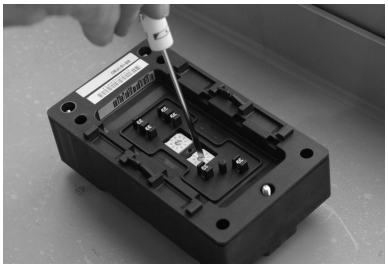
2 Install a splice kit on the bases.

Connecting Multiple Power Supplies with Flat Media

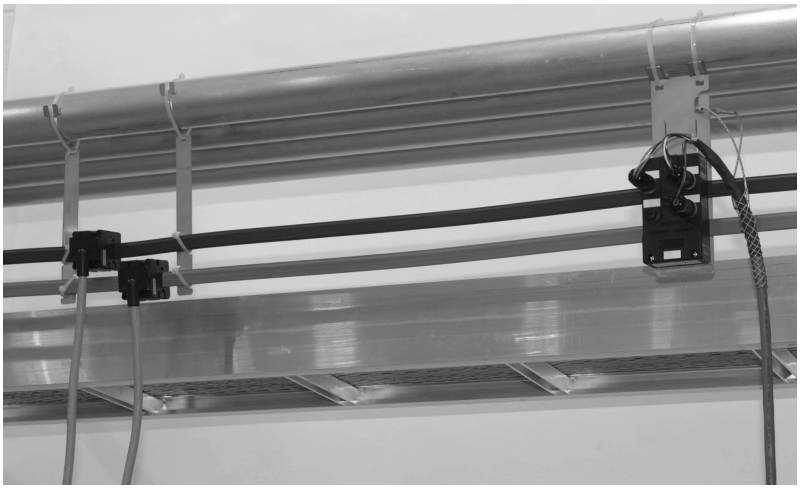


Installing the I/O Units

1 **Install the MaXum I/O units on the bases.** Set the rotary switches on the bottom of the block to the desired node number. MaXum should be set to 1-55. Do not duplicate addresses on the same network. Mark the white tag on the block with the node number for future reference. Please refer to Allen Bradley MaXum MaXum 4 Input/4 Output Module Manual (Publication 1792D-IN012B-EN-P) included with the MaXums for further details.



2 **Install the loader drop cables between the MaXums and the Universal Terminal Boxes (UTB).** The connectors should be installed on the MaXums so that the connector with four wires is installed on the upper left MaXum connectors. Install the connector with three wires on the upper right MaXum connectors. The final loader drop cable connector should be installed on the lower right hand MaXum connector.



Installing the I/O Units (continued)

3 **Install the wiring for any purge and pocket** valves included with the system. The purge/pocket valve should be wired from the junction box on the valve to the nearest Universal Terminal Box (UTB). The wiring should be connected to the UTB using the supplied green Phoenix connector. The pocket valve is given a number based on the loader it is connected to. For example the pocket valve that is connected to loader number 12's UTB will be addressed as material source number 12 in the settings screen.

4 **Install the drop cables from the pump** MaXums to the pump starters. Insure that the input side of the MaXum goes to the input connection on the starter and that the output side of the MaXum goes to the output connection on the starter.

Wiring Pocket Conveying Valves (optional)

The ILS can operate 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. Since the valves are located at the material source instead of the loader, separate wiring connections to the nearest loader universal terminal box (UTB) are required.

NOTE: Purge valves and pocket conveying valves connect to the same outputs on the ILS control. Therefore, pocket conveying valves cannot be used with loaders that are connected to purge valves.

Connecting to Main Power

The ILS base unit and power supply are equipped with a three-prong plugs and power cords.

1 **Plug the power cords into grounded 120 VAC** outlets rated for at least 15 Amp service.

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

WARNING: Electrical shock hazard

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

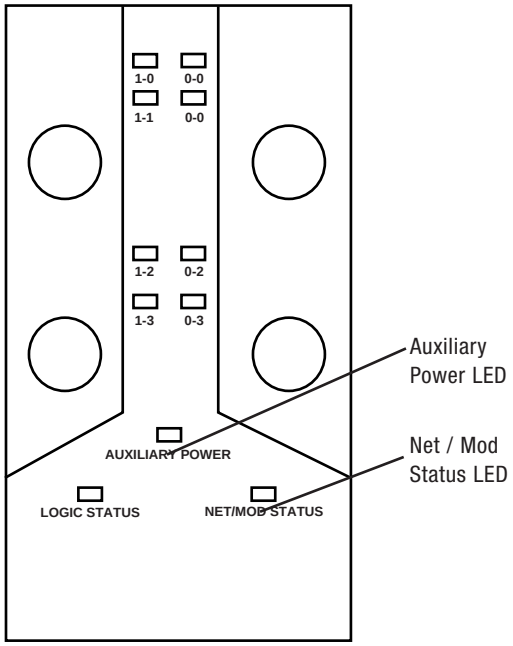
The control must be connected to a grounded power source. A properly sized conductive ground wire must be connected to the chassis ground terminal inside the base unit enclosure.

Starting Up the ILS

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

2 **Turn on the power supply unit and test to make sure** that power is correctly distributed. It is recommended that you remove the MaXum that is located farthest from the power supply and, using a voltmeter, check to insure that both the DeviceNet and Auxiliary power is 24 VDC.

3 **Once the power supply unit is turned on,** check each MaXum to insure that the Auxiliary Power LED is on and glowing green. If not, the MaXum base is not clamped correctly and will need to be removed, discarded, and a new base installed. Install the new base so that the piercing contacts enter the flat cable at a different location than the incorrectly mounted base. In the event that the LEDs fail to illuminate, a known good MaXum should be temporarily fitted to the base to check if the MaXum module may be bad.



(continued)

Starting Up the ILS (continued)

4 Once the first two MaXums display a green Auxiliary Power LED, turn on the power switch on the base unit to start the controller and touchscreen. With the processor in run mode, check all the MaXums for the condition of the Net/Mod Status LED. On all MaXums, the Net/Mod status LED show as blinking red or blinking green. If any block shows a solid red Net/Mod status light, either the address is incorrect on the rotary switches for one or more blocks may be defective. Check all switch positions and correct/replace the block(s) as necessary.

5 When the MaXums show solid green on auxiliary power, and the Net/Mod status LEDs blinking green, the enable the nodes via the operator interface. *See "Installing the I/O Units"* in the Installation section of this manual. When a node is enabled, the blinking red light changes to solid green (this may take a few seconds).

6 Install remaining MaXum base and MaXums. This can be done all at once or one at a time. Enable the blocks as they are installed and check the status LEDs for the correct status.

7 After MaXums are enabled and show a solid green Auxiliary Power LED and a solid green Net/Mod Status light, the system is ready to run.

NOTE: MaXums and bases can be added or removed from the system while the system is powered on.

Remote I/O System Architecture

Installing the I/O Enclosures

1 **Install the DeviceNet Mini-DIN termination tap on the gray flat cable.** (*See Section 3 "Installing the Terminal Blocks"* for detailed information.)

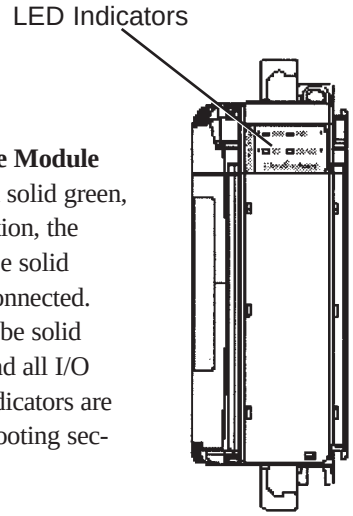
2 **Connect the I/O rack to the DeviceNet cable** using the attached Mini-DIN connector.

Note: The following installation procedures apply to the Proofing Station I/O Enclosure and the 16-Device Enclosure.

Starting Up the I/O Enclosure

1 **Turn on the I/O Enclosure.**

2 **Once the enclosure is turned on, check the Module Status Indicator** (MS). It should be on and solid green, indicating the device is operational. In addition, the Network Status Indicator (NS) should also be solid green, indicating the device is on-line and connected. Finally, the I/O Status Indicator (IO) should be solid green, indicating the device is operational and all I/O modules are in Run Mode. If these three indicators are not solid green, please refer to the troubleshooting section.



Main Enclosure with I/O

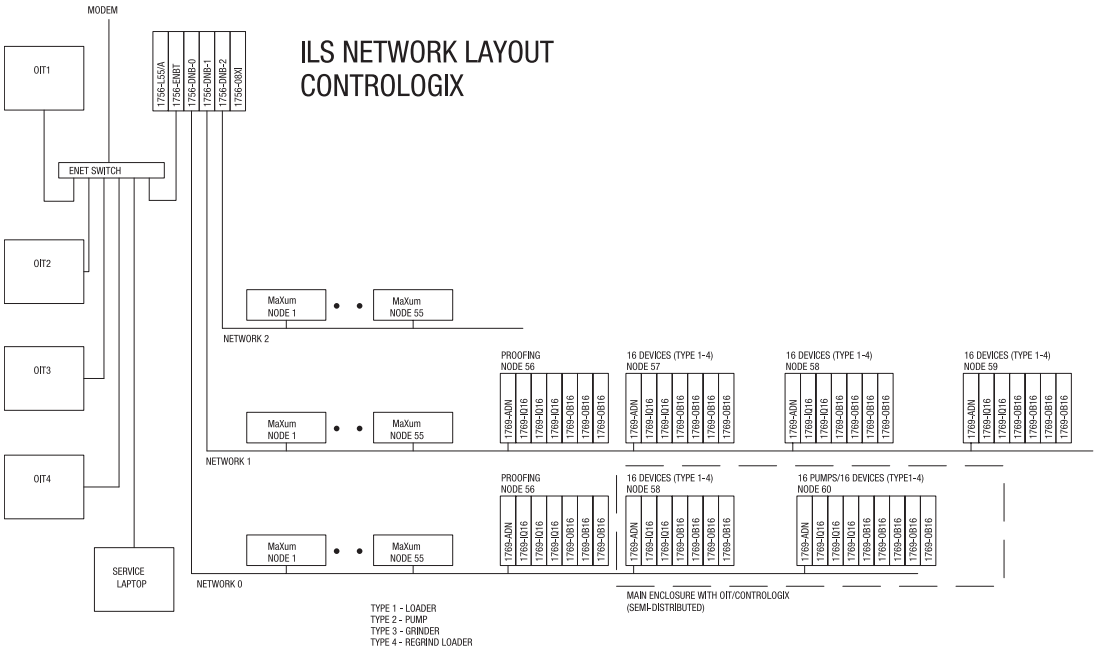
The main enclosure can have optional I/O located inside. One rack will have three input modules and five output modules. The switches for this rack are factory set at 60 and should not be changed. This rack contains I/O to accommodate 16 loaders and 14 pumps. These loaders will be displayed as loaders 1 though 16 on network four. The pumps will be displayed as pumps 33 through 46 on network four.

The second rack will have two input modules and four output modules. The switches for this rack are factory set at 58 and should not be changed. This rack contains I/O to accommodate 16 loaders. These loaders will be displayed as loaders 17 through 32. No additional remote loader racks can be added to this network (4).

Main Enclosure without I/O

The main enclosure may not have an additional I/O located inside. In this instance, up to three external, 16 loader boxes may be added. These boxes are designated as follows:

Node 57 - 16 loaders network 4, loaders 1-16
Node 58 - 16 loaders network 4, loaders 17-32
Node 59 - 16 loaders network 4, loaders 33-48



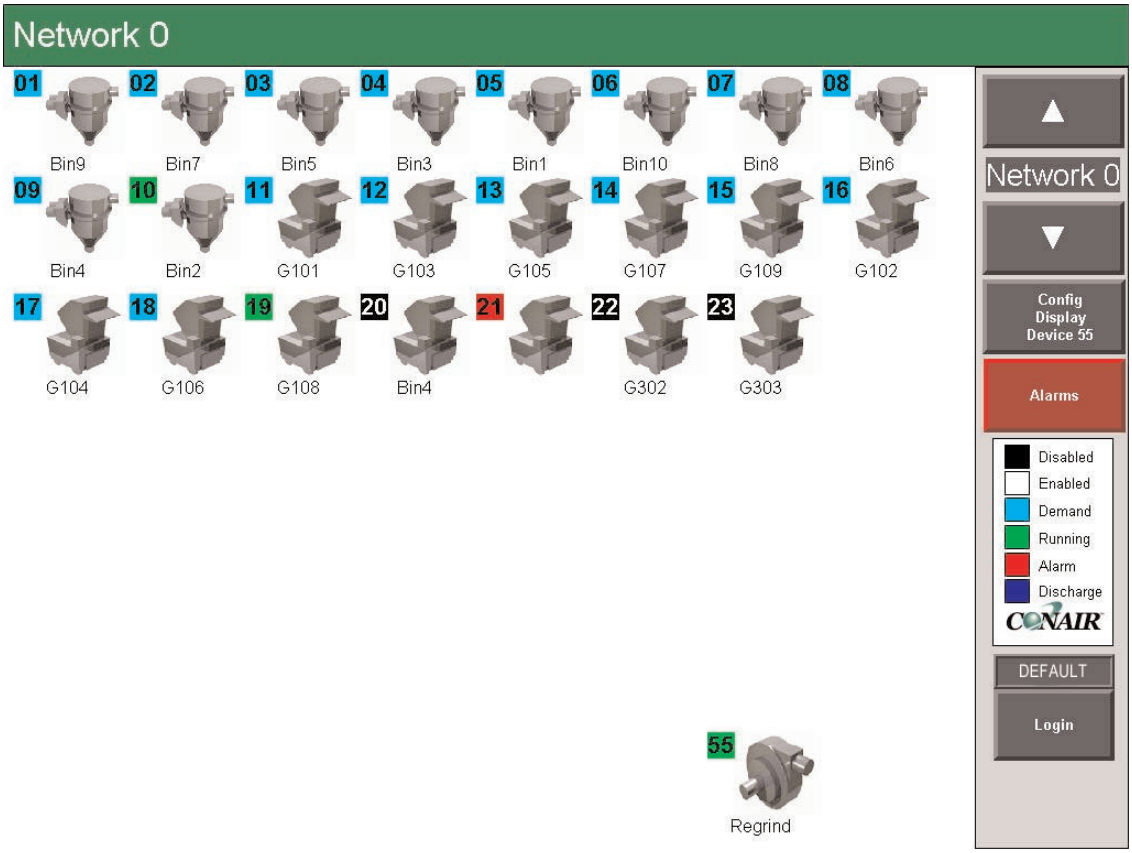
Proofing Station

One proofing station can be added to any network. The switch setting is factory set to 56.

SECTION
4

Operation

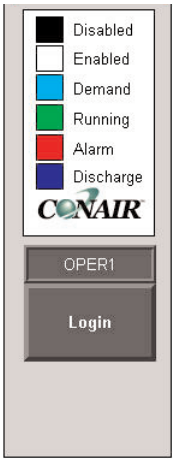
Upon power-up, the PLC and operator interface(s) turn on and Network 0 is displayed initially. At this point, the security level is "Default".



Setting or Changing the Security Level

In order to set or change security level, the user needs to log in by pressing the Login button on the navigation bar. Login status is shown just above the button.

There are three levels of security.



1. The lowest security level is "Default" (Oper) which is the Operator Level. This level of security allows the user to enable or disable devices.

2. The second security level is "Oper1" which is the Supervisory Level. This level of security allows existing devices to be configured (for example: change discharge time on a loader).

3. The highest level of security is "Admin" which is the Administrator Level. This level of security allows devices to be added to each network. In addition, Proofing can only be configured at this level.

The password for each "Oper1" and "Admin" is the same as the user name.

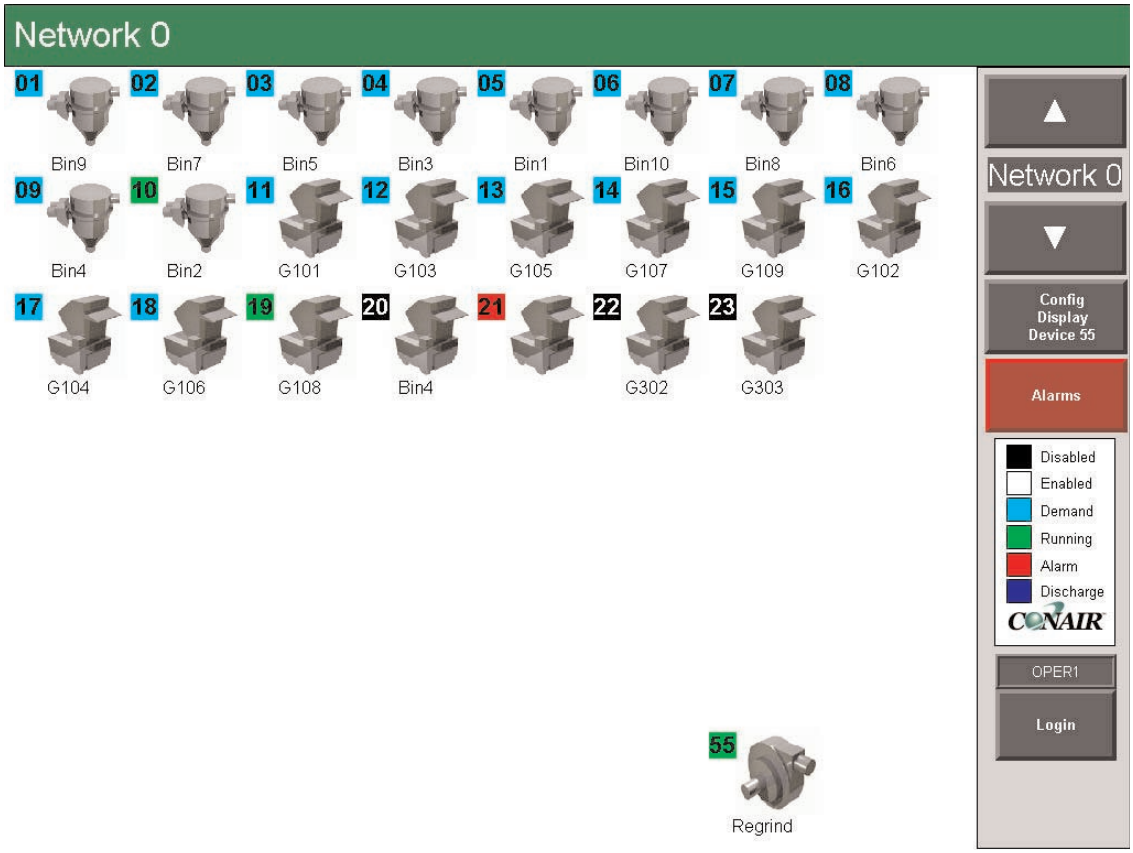
After 5 minutes of non-use, the security level is set back to "Default".

Network Navigation

The ILS supports up to six networks (Network 0 through Network 5). Networks 0, 1, and 2 make up the "Fully Distributed" system, Network 4 is a virtual network that makes up the local I/O. Network 5 is a virtual network on a remote I/O network.

At the "Default" (Oper) and "Oper1" security levels, only configured devices are shown on the network screen. When the user is logged on as "Admin", unconfigured devices are shown as MaXums.

The network on display is shown in the Title bar across the top of the screen. Pressing the Up and Down arrow keys in the Navigation bar allows the user to scroll through the networks.



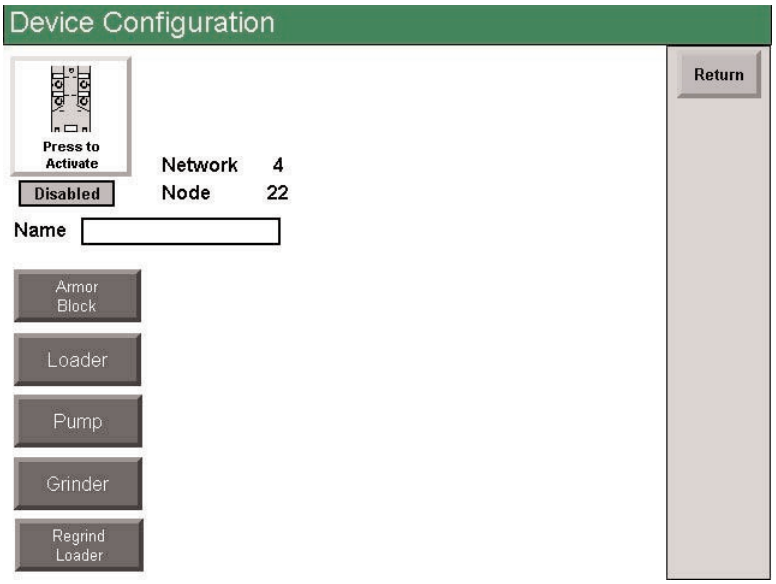
Network Navigation (continued)

The name, type, status, and network node number are shown for each device. The network node number is between 1 and 55 and is shown in the upper left hand corner of each device. The background of this number provides the status. The type of device is shown graphically and the name of the device is shown below the device.

In order to view or configure a device, first select the device by pressing it. In the Navigation bar, the "Display Config Device XX" button is updated so the device number just selected is displayed. Pressing this button navigates to the Configuration screen for that device.

Device Configuration

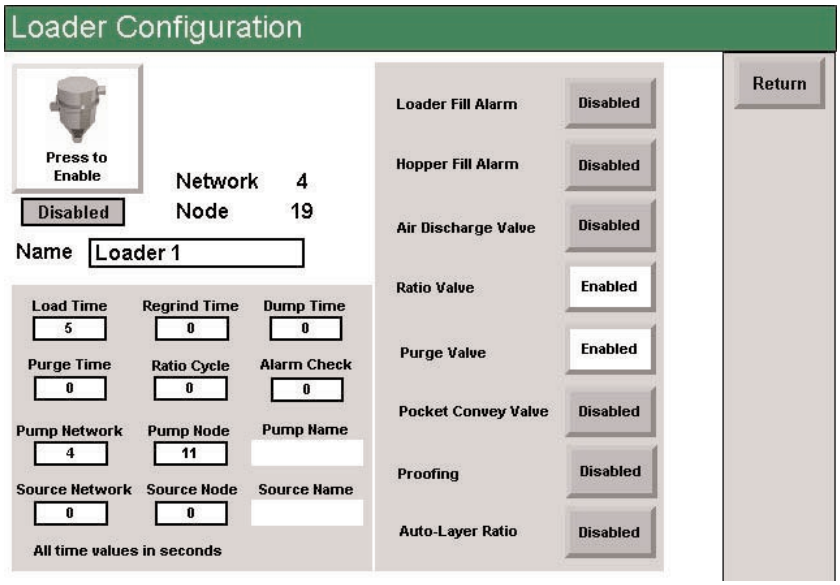
To configure a new device, the user must be logged on as "Admin". Pressing the MaXum icon from the Network screen selects the device. Pressing the Config Display Device button navigates to the following screen.



Pressing the button for the type of device to be added (for example: loader) assigns the device type to the device. To activate the device, press the icon and it will change to "Press to Deactivate". The name of the device can be added at this point by pressing Name Entry and entering in the name. The name field is limited to ten characters. Pressing the Return button navigates to the Network screen.

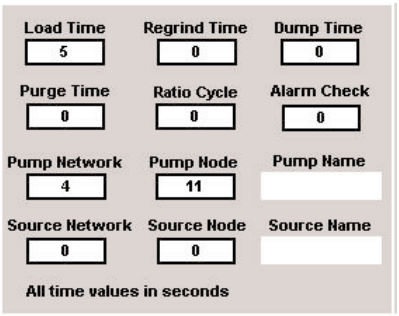
Loader Configuration

To configure or view details of a loader, press the icon for the loader from the Network screen then press the Config Display Device button to navigate to the following screen.

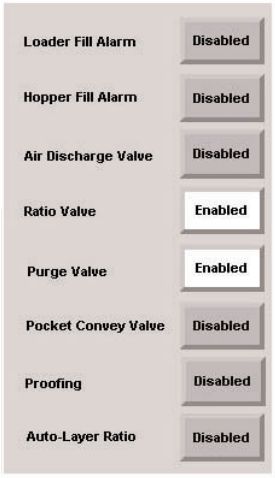


Once on this screen, both the Title bar and the icon indicate that the device being viewed is a loader. The loader's name, network, and node are all displayed. The loader's status is also shown directly below the icon. The loader can be disabled or enabled regardless of security level.

There are two areas on the screen for configuring the loader. The first, larger, area has data entry areas for setting Load Time, Dump Time, etc.



Loader Configuration (continued)



These values can only be changed if the user's security level is "Oper1" or "Admin". Any parameter that has a black line around it (for example: Load Time in this case) can be modified. If the user is logged in as "Default" (Oper) the black line around the parameter disappears. Pressing on the parameter in this case has no effect.

This is also where the loader is assigned to a pump. To accomplish this, enter the network and node where the pump is located prior to enabling the loader or an alarm will be generated. Once the network and node of the pump have been entered, the name of the pump will appear under Pump Name.

The second area allows various options to be enabled or disabled. These options are only visible if the user security level is "Oper1" or "Admin".

The following are descriptions of all of the loader parameters.

- Load Time: The number of seconds (1-300) that the receiver loads material.
- Regrind Time: The number of seconds (1-300) that regrind, or a second material, should be loaded with virgin material when a ratio valve is used. This parameter is only visible if the Ratio Valve option is enabled.
- Dump Time: The number of seconds (1-300) that the receiver will discharge material into a vessel before the next load cycle begins.
- Purge Time: The number of seconds (1-300) that vacuum continues to pull material through the line after a purge or pocket conveying valve closes to the material source. This clears the line of material. This parameter is only visible if either the Purge Valve or Pocket Conveying Valve options are enabled.
- Ratio Cycle: The number of times (1-5) that a ratio valve switches between virgin and regrind material when a ratio valve is used. This parameter is only visible if the Ratio Valve option is enabled.
- Alarm Check: The number of times (1-20) that system will try to load a receiver before sounding an alarm when demand has not been satisfied.
- Pump Network: The communication network (0, 1, 2, or 4) to which the pump is assigned. The pump and loader are allowed to be on separate networks.
- Pump Node: The commutation network drop (1-55) to which the pump is assigned.
- Pump Name: The name of the pump at the Pump Network and Pump Node. This is a read only parameter.
- Source Network: The communication network (0-6) that identifies a material source equipped with a pocket conveying valve. This setting is also used for material line proofing. This parameter is only visible if the Pocket Conveying Valve option is enabled.

Loader Configuration (continued)

- Source Node: The communication network drop (1-55) that identifies a material source equipped with a pocket conveying valve. This setting is also used for material line proofing. This parameter is only visible if the Pocket Conveying Valve option is enabled.
- Source Name: The name of the source at the Source Network and Source Node. This is a read only parameter. This parameter is only visible if the Pocket Conveying Valve option is enabled.

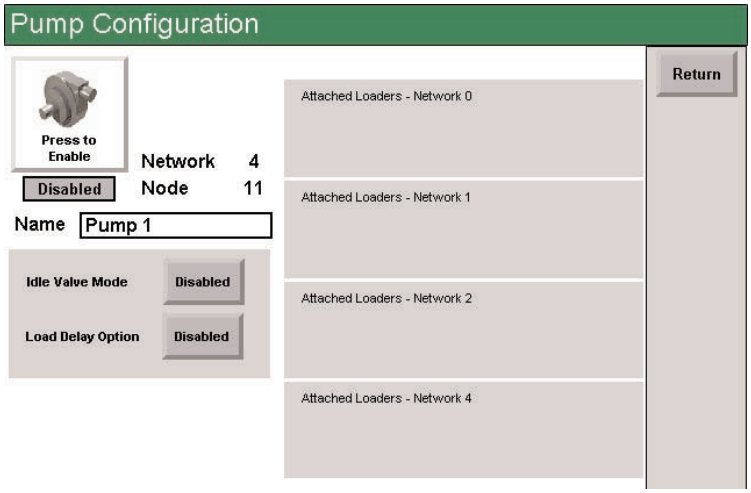
The second, right hand area of the loader screen is where the various loader options are enabled and disabled. This area is only visible if the security level is "Oper1" or "Admin". Enabling some of these options will make some of the data areas on the left hand side visible.

- Loader Fill Alarm: Activates a No Material alarm if the loader does not fill before the load time is reached. This function requires an optional fill sensor in the receiver.
- Hopper Fill Alarm: Activates a No Material alarm if the receive or hopper is not filled by the loader within the number of tries set by the user. This function requires a demand sensor in the vessel.
- Air Discharge Valve: Controls an air activated discharge on the loader. This function requires an optional positive discharge.
- Ratio Valve: Controls loading of more than one material into one vacuum receiver. This function requires an optional ratio valve at the material inlet of the receiver.
- Purge Valve: Purges material from the conveying line at the end of the loading cycle. This function requires an optional purge valve on the material line.
- Pocket Conveying Valve: Releases material from the source into the conveying line. This function requires the installation of a valve at the base of the drying hopper or other vessel.
- Proofing: Indicates that a material line is connected to the correct material source. This function requires material line couplings equipped with electrical plugs.
- Auto-Layer Ratio: Automatically layers virgin and regrind material based on the number of ratio cycles.

NOTE: The total time a loader is under vacuum is:
Regrind Time + Load Time + Purge Time = Total Time

Pump Configuration

To configure or view details of a pump, press the icon for the pump from the Network screen then press the Config Display Device button to navigate to the following screen.



Both the title bar and the icon indicate that the device being viewed is a pump. The pump's name, network, and node are all displayed. The pump's status is shown directly below the icon. The pump can be disabled or enabled regardless of security level.

There are six large gray areas that show all of the loaders on the individual networks that are attached to the pump. When a loader is configured on the loader configuration screen and it is attached to a pump, that loader will be displayed on the pump configuration screen.

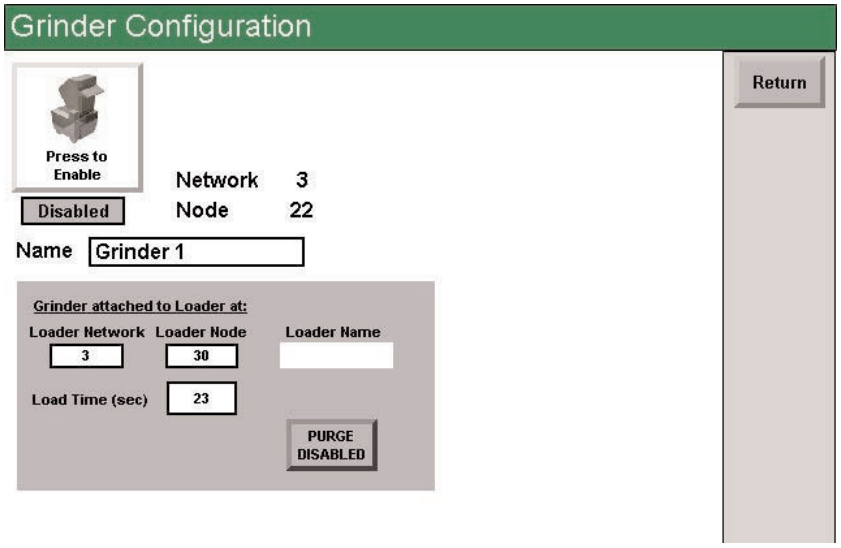
While the pump is running, the active loader is also displayed. The numeric background of the loader is attached and the name of the active loader is displayed below the Pump icon.

The following pump options are also available.

- Idle Valve Mode: Allows the pump to remain running instead of shutting off when all demands have been satisfied. This option prevents excessive pump cycling.
- Load Delay: When enabled, a loader must finish its discharge cycle before the next loader begins its load cycle.

Grinder Configuration

To configure or view details of a grinder, press the icon for the grinder from the Network screen Then press the Config Display Device button to navigate to the following screen.



Both the Title bar and the icon indicate that the device being viewed is a grinder. The grinder's name, network, and node are all displayed. The grinder's status is shown directly below the icon. The grinder can be disabled or enabled regardless of security level.

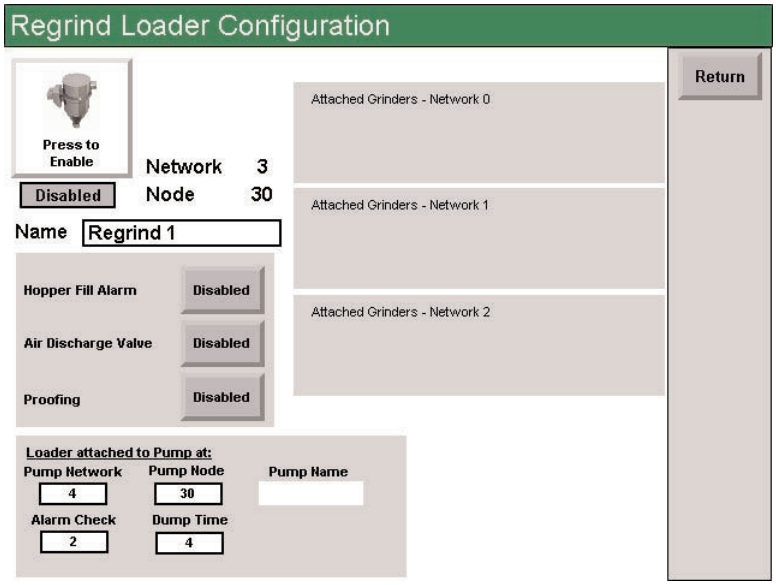
In the gray configuration box, the node and network of the regrind loader that the grinder bin is emptied into are set. Once the network and node are set, the loader's name appears.

The load time for the regrind loader can be set if the user's security level is "Oper1" or "Admin". If the Purge Enabled button is pressed, the purge time may also be set.

NOTE: A grinder is in demand if no input signal exists. Therefore, the system will work with or without sensors in the grinder drawer. For a regrind loader pulling regrind from multiple grinders on a fantail with purge is required, a dual solenoid purge valve is required.

Regrind Loader Configuration

To configure or view details of a regrind loader, press the icon for the regrind loader from the Network screen then press the Config Display Device button to navigate to the following screen.



Both the Title bar and the icon indicate that the device being viewed is a regrind loader. The regrind loader's name, network, and node are all displayed. The status is shown directly below the icon. The regrind loader can be disabled or enabled regardless of security level.

The following options can be set in the configuration box located below regrind loader name.

- Hopper Fill Alarm: Activates a No Material alarm if the receive or hopper is not filled by the loader within the number of tries set by the user. This function requires a demand sensor in the vessel.
- Air Discharge Valve: Controls an air activated discharge on the loader. This function requires an optional positive discharge.
- Proofing: Indicates that a material line is connected to the correct material source. This function requires material line couplings equipped with electrical plugs.

Regrind Loader Configuration (continued)

The gray configuration box at the bottom of the screen allows the user to select which network and node the pump is attached. Once the node and network have been set, the name of the pump appears.

The following parameters can be set.

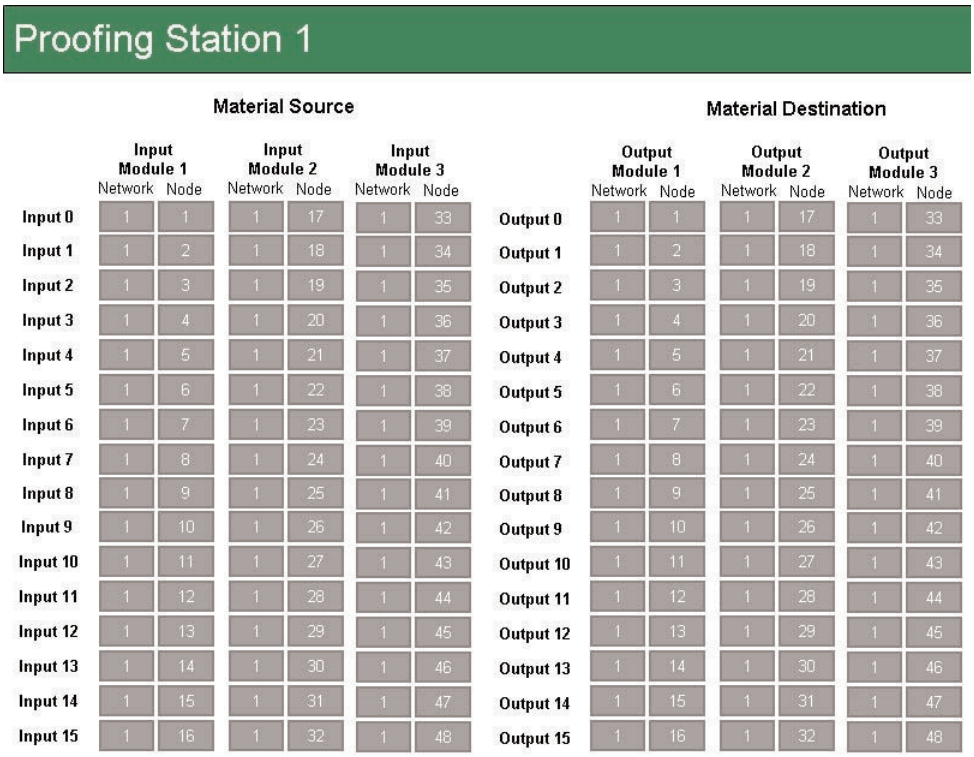
- Alarm Check: The number of times (1-20) that the system will try to load a receiver before sounding an alarm when demand has not been satisfied.
- Dump Time: The number of seconds (1-300) that the receiver will discharge material into a vessel before the next load cycle begins.

The three boxes to the right show which grinders are attached to the regrind loader. When a grinder is configured for attachment to the regrind loader, its number appears on the Regrind Loader screen. When the grinder is active, its numeric background turns green. The name of the active grinder also appears at the top of the screen.

NOTE: A regrind loader will cycle through all grinders attached to the loader before continuing to the next regrind loader.

Proofing Configuration

When the Proofing button is pressed, the following screen appears



There can be a total of three Proofing screens that can have identical setups:

- Networks 0 and 4 share a proofing station,
- Networks 1 and 5 share a proofing station.

A proofing station is fully configurable, accommodating 48 inputs and 48 outputs. For regrind loader/grinder proofing, the regrind loader address is tied to an output; the grinder address is tied to the input. For loader/purge/pocket valves, the address of the purge/pocket valve is tied to an output; the loader address is tied to the input.

When proofing is enabled for a device, the connection is verified by pulsing the output, then checking for the input. Once the connection is verified, the loader will load. If the connection does not exist, a Proofing alarm will be displayed.

SECTION

5

Maintenance

Maintenance Checklist

You should develop a preventive maintenance schedule for all components in the conveying system to ensure optimum operation and performance.

The ILS requires the following maintenance checks:

- **Whenever you change materials**

❒ **Verify the loader settings for pump systems** or loaders effected by the material change. Pay particular attention to load times, dump times, and material source identification if you have pocket conveying valves and material line proofing. *See "Changing Loader Settings"* in the Operation section.

- **Quarterly**

❒ **Check power and cable connections and wires.** Over time, the power and cable connections between the ILS and conveying system components may become loose or wires may become worn. Tighten any loose connections and replace any wire or cable that has become worn or damaged.

- **After loading new software, or as needed**

❒ **Recalibrate the operator interface.** If the operator panel becomes unresponsive to a touch on the screen, you may need to recalibrate the touchscreen. This could happen after reloading or updating the ILS software. *See "Operator Interface Calibration."*

Operator Interface Calibration

If the operator interface becomes unresponsive to a touch on the screen, you may need to recalibrate the touchscreen. In order to calibrate the Operator Interface touchscreen, the security level must be "Admin".

From the Network screen, press the Shutdown button. The system takes several seconds to respond, so there is no need to keep tapping the shutdown button. After approximately ten seconds, the RSViewME Station screen appears. From this screen, press the Terminal Settings button. From the Terminal Settings screen, select Input Devices and press Enter. From the Input Devices screen, select Touchscreen and press Enter. From the Touchscreen screen, select Calibration and press Enter.

Follow the instructions by touching the four corners when prompted. Once complete, touch the screen within 30 seconds. The screen is now calibrated. Press the Close button on the next three screens until the RSViewME Station screen appears. Press Run.

⚠ **CAUTION: Changes to other settings in the PanelView Plus may result in improper operation.**

SECTION
6

Troubleshooting

Before Beginning

Before you begin troubleshooting:

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

A Few Words of Caution

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

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

 **DANGER: Electrical shock hazard**

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

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

The ILS allows operators and maintenance personnel to disable and enable conveying system components. Unexpected energization 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 are clear of the machine, tools have been removed, and any safety guards have been reinstalled.

Operator Interface Alarms

The following is a description of the alarms that can be displayed on the Operator Interface screen. All the alarms are of format {alarm message} on Network X, Node Y, where X designates the network and Y designates the node where the alarm occurred.

Alarm	Description
Device Fault	Indicates the device is active but not on the network.
Overload	Indicates a pump overload.
Material	The number of load cycles exceeds the alarm check value without satisfying the demand.
Fill	The material fails to reach the fill sensor within the cycle time.
Proofing	Indicates that proofing failed for the given device.
Configuration Fault	Indicates that a loader is has been enabled without being assigned to a valid pump.

"The information provided is an excerpt from a user manual and is not meant to replace the complete document. As such, it may not contain all the safety precautions or all of the information necessary to configure your automation system that is available in the complete user manual. Please refer to the full product installation and user documentation paying particular attention to all safety precautions prior to implementation."

Network Errors - Fully-Distributed System or Remote I/O System

DeviceNet Network Errors

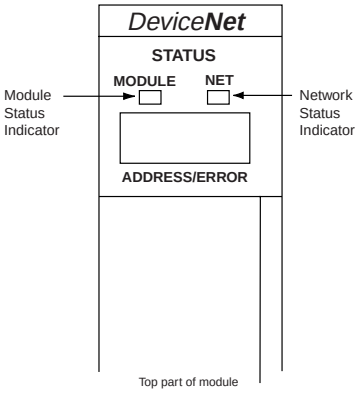
What This Section Contains

This section describes the diagnostics provided by the LED diagnostic indicators on the 1756-DNB module's front panel.

Power-Up Cycle Diagnostics

When you apply chassis power, check the module's alphanumeric indicators to determine if the module is operating. The alphanumeric indicators will display the following:

1. Firmware major revision (01 through 128)
2. Firmware minor revision (01 through 255)
3. Baud rate (125, 250, or 500)
4. MAC ID (00 to 63)



Node Address/Status Indicator

After power up, the 1756-DNB interface module uses the alphanumeric display as a node address/status indicator that displays numeric codes providing diagnostic information about the module. The display flashes at approximately one second intervals. The following table summarizes the meanings of the numeric codes.

Node Address/Status Indicator

Numeric Code	Description	Action
Network Address Displays 0 to 63	Normal operation. The numeric display matches the module's node address on the DeviceNet network.	Do nothing.
70	The module failed the Duplicate Node Address check.	The node address you selected is already in use on that network. Change the module address to another available address.
71	Illegal data in the scan list table (node number alternately flashes).	Reconfigure the scan list table and remove any illegal data.
72	The slave device stopped communicating (node number alternately flashes).	Inspect the field devices and verify connections.
73	The device's identity information does not match electronic key in scan list table entry (node number alternately flashes).	Verify that the correct device is at this node number. Make sure that the device at the flashing node address matches the desired electronic key (vendor, product code, product type).
74	Data overrun on port detected.	Modify your configuration and check for invalid data. Check network communication traffic.
75	No scan list is active in the module.	Enter a scan list.
76	No direct network traffic for module was detected.	None. The module hears other network communication.
77	Data size expected by the device does not match scan list entry (node number alternately flashes).	Reconfigure your module for the correct transmit and receive data sizes.

Node Address/Status Indicator

(continued)

Numeric Code	Description	Action
78	The slave device in scan list table does not exist (node number alternately flashes).	Add the device to the network, or delete the scan list entry for that device.
79	The module has failed to transmit a message.	Make sure that your module is connected to a valid network. Check for disconnected cables.
80	The module is in IDLE mode.	Put the controller in RUN mode. Enable the RUN bit in module command register.
81	The module is in FAULT mode.	Check the Module Command Register for the fault bit set.
82	Error detected in sequence of fragmented I/O messages from the device (node number alternately flashes).	Check the scan list table entry for the slave device to make sure that input and output data lengths are correct. Check the slave device configuration.
83	The slave device is returning error responses when the module attempts to communicate with it (node number alternately flashes).	Check the accuracy of scan list table entry. Check the slave device configuration. The slave device may be in another master's scan list. Reboot the slave device.
84	The module is initializing the DeviceNet network.	None. This code clears itself once the module attempts to initialize all the slave devices on the network.
85	Data size larger than 255 bytes (node number alternately flashes).	Configure the device for a smaller data size.

Node Address/Status Indicator

(continued)

Numeric Code	Description	Action
86	The device is producing zero length data (idle state) while the module is in the Run Mode.	Check the device configuration and the slave node status.
90	The user has disabled communication port.	Check the Module Command Register for a disable bit set.
91	Bus off condition detected on the com port. The module is detecting communication errors.	Check the DeviceNet connections and physical media integrity. Check the system for failed slave devices or other possible sources of network interference.
92	No network power detected on the com port.	Provide network power. Make sure that the module drop cable is providing network power to the module com port.
95	Application FLASH update in progress.	None. Do not disconnect the module while application FLASH is in progress. You will lose any existing data in the module's memory.
97	Module operation halted by user command.	Check the Module Command Register for a halt bit set.

Interpreting the Three LED Status Indicators
The three LED status indicators on the module provide information about the network and its connections. The tables on the following pages outline the indicator condition and the corresponding status, and explain what each condition means.

MOD/NET Status Indicator
This bi-color (Green/Red) LED provides limited device and communication status. The combined Module/Network (or Mod/Net) Status LED indicates whether or not the device has power and is operating properly.

MOD/NET Status Indicator

Condition	Status	Indicates
Off	Not powered/not online.	The device is not online. The device has not completed the Dup_MAC_ID test yet. The device may not be powered.
Green	Device operational.	The device is operating in a normal condition.
Flashing Green(1)	Device in standby (device needs commissioning).	The device needs commissioning due to missing, incomplete, or incorrect configuration. The device may be in the standby state. Refer to the DeviceNet Specification, Volume II, Identity Object.
Flashing Red(1)	Minor fault.	Recoverable fault.
Red	Unrecoverable fault.	The device has an unrecoverable fault and may need to be replaced.
Flashing Red/Green	Device self testing.	The device is in the self test mode. Refer to the DeviceNet Specification, Volume II, Identity Object.

NOTE:(1) The flash rate of the LED is approximately 1 flash per second. The LED should be on for approximately 0.5 seconds and off for approximately 0.5 seconds.

IO Status Indicator

This bi-color (Green/Red) LED indicates the status of the communication link.

IO Status Indicator

Condition	Status	Indicates
Off	Not powered/not online.	The device is not online. The device has not completed the Dup_MAC_ID test yet. The device may not be powered; look at the Module Status LED.
Flashing Green(1)	Online, not connected.	The device is online, but has no connections in the established state. The device has passed the Dup_MAC_ID test, is online, but has no established connections to other nodes. For a Group 2 Only device, it means that this device is not allocated to a master. For a UCMM capable device, it means that the device has no established connections.
Green	Link okay, online, connected.	The device is online and has connections in the established state. For a Group 2 Only device, it means that the device is allocated to a master. For a UCMM capable device, it means that the device has one or more established connections.
Flashing Red(1)	Connection time-out.	One or more I/O connections are in the timed-out state.
Red	Critical link failure.	Failed communication device. The device has detected an error that has rendered it incapable of communicating on the network (Duplicate MAC ID or Bus-off).

NOTE: (1) The flash rate of the LED is approximately 1 flash per second. The LED should be on for approximately 0.5 seconds and off for approximately 0.5 seconds.

OK Status Indicator

This bi-color (Green/Red) LED provides device status in the ControlLogix chassis. It indicates whether the device has power and is operating properly.

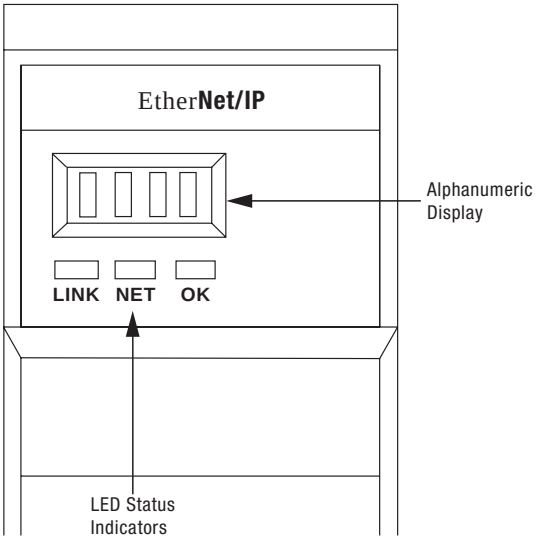
OK Status Indicator

Condition	Status	Indicates
Off	No power.	No power applied to device. Apply chassis power. Verify the module is completely inserted into chassis and backplate.
Green	Device operational.	The device is operating in a normal condition. A controlling device has established connection to the module.
Flashing Green(1)	Device in standby.	The device is operating correctly; however, no controlling device has established connection to the module.
Flashing Red(1)	Minor fault.	Recoverable fault. To recover, reconfigure the device, reset the device, or perform error recovery.
Red	Unrecoverable fault or device self testing.	The device has an unrecoverable fault; repair or replace it; or device is in self test during power up.

NOTE: (1) The flash rate of the LED is approximately 1 flash per second. The LED should be on for approximately 0.5 seconds and off for approximately 0.5 seconds.

EtherNet Network Errors

The front of the 1756-ENBT modules have alphanumeric displays, as well as LED status indicators. When power is applied, the alphanumeric display should cycle through the following states: "TEST - PASS - OK - REV x.x", where "x.x" is the module's firmware revision. The display then alternates between "OK" and the module's default BOOTP address.



Interpreting the Status Indicators

The three bi-color (red/green) LED status indicators provide diagnostic information about the module and its connections to the network. The following tables describe each indicator condition.

Network Status Indicator

The Network (NET) Status LED provides the following information.

State	Status	Description
Off	Not powered No IP address	The module is not powered, or does not have an IP address. • Verify there is chassis power and that the module is completely inserted into the chassis and backplate. • Make sure the module has been configured.
Flashing Green	No connections	The module has obtained an IP address, but has no established connections.
Green	CIP connections	The module has an IP address and at least one established connection.
Flashing Red	Connection timeout	One or more of the connections in which the module is the target has timed out.
Red	Duplicate IP address	The module has detected that its IP address is already in use. Assign a unique IP address to the module.

Link Status Indicator

The Link Status LED provides the following information.

State	Status	Description
Off	No data transmission	Module is not ready to communicate.
Green	Ready	Module is ready to communicate.
Flashing Green	Data transmission in progress	Module is communicating over the network.

OK Status Indicator

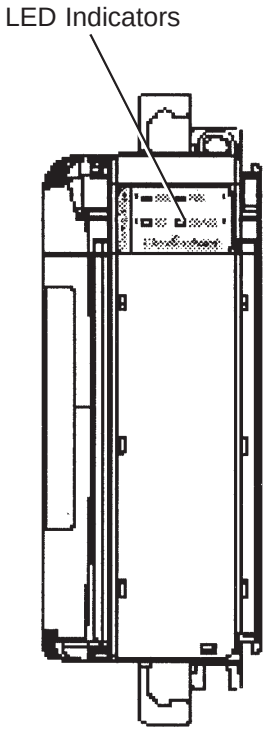
The OK Status LED provides the following module information.

State	Status	Description
Off	No power	Module does not have 24 V DC power. Verify there is chassis power and the module is completely inserted into the chassis and backplate.
Flashing Green	Standby	Module is not configured.
Green	Operational	Module is operating correctly.
Flashing Red	Minor fault	A recoverable fault has been detected. This could be caused by an error in the configuration.
Red	Major fault	An unrecoverable fault has been detected. Recycle power to the module. If this does not clear the fault, replace the module.
Flashing Red and Green	Self test	The module is performing a power-up self-test.

Network Errors - Local or Remote I/O System

Troubleshooting with the Indicators

This section addresses the diagnostic indicators for a local or remote I/O system and their meanings.



Diagnostic Indicators

LED Indication	Meaning
Module Status (MS)	
OFF	No power
Flashing GREEN/OFF	On-line, but configuration missing
Solid GREEN	Device is operational
Flashing RED/OFF	Recoverable fault: • Configuration is incorrect • Duplicate MAC ID (node address) check failed • Node address switch changed • Main program checksum failed • Configured I/O size is too large
Solid RED	Unrecoverable fault: • Terminator/end cap is missing • Connector/cable between modules is missing/not connected • Bad configuration memory • Watchdog tripped
Network Status (NS)	
OFF	No power or no network access
Flashing GREEN/OFF	On-line, but not connected
Solid GREEN	On-line and connected
Flashing RED/OFF	Connection time-out
Solid RED	Critical network failure

(continued)

LED Indication	Meaning
I/O Status (IO)	
OFF	No power or outputs are off
Flashing GREEN/OFF	Idle/program mode - one or more I/O modules in Idle Mode
Solid GREEN	Device operational - all I/O modules in Run Mode
Flashing RED/OFF	Recoverable fault - one or more I/O modules may be in Fault Mode
Solid RED	Unrecoverable fault - one or more I/O modules may be in Fault Mode
Diagnostic Status (DIAG)	
OFF	No power or no diagnostics running
Flashing Amber	Main program detected an error - number of flashes indicates the error
Flashing RED/OFF	Diagnostics found error - number of flashes indicates which test failed: • One flash - RAM test failed • Two flashes - Boot program checksum failed • Three flashes - Main program checksum failed • Four flashes - Configuration checksum failed • Five flashes - Access to program or configuration failed

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.

How to Contact Customer Service

To contact Customer Service personnel, call:

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

Equipment Guarantee

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

Performance Warranty

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

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

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

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

Warranty Limitations

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