

User Guide

Distributed Loader Control

DLC48 Model

Installation

Operation

Maintenance

Troubleshooting



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UGC009/0902

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, serial and software version numbers 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: UGC009/0902
Model number:
Serial number(s):
Software version number(s):

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INTRODUCTION

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no one gets hurt 1-3*






PURPOSE OF THE USER GUIDE

This User Guide describes the Conair DLC48 Distributed Loader Control 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.
-  Numbers within shaded squares 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 shaded circle marks items in a list.

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.

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.

 **ATTENTION:**
READ THIS SO NO
ONE GETS HURT



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 equipment.

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 equipment serial tag and data plate.



WARNING: Electrical shock hazard

This equipment is powered by electrical voltage 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 Input/Output enclosure. Improper grounding can result in 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 troubleshooting or routine maintenance. Only qualified personnel should perform troubleshooting procedures that require access to the electrical enclosure while power is on.

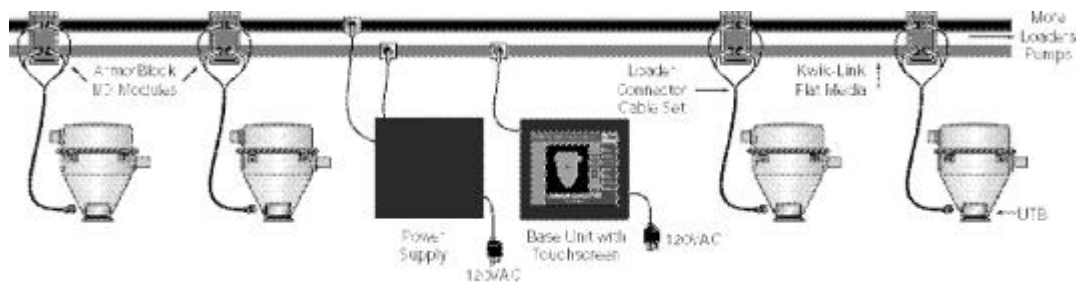
DESCRIPTION

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WHAT IS THE DLC48?

The DLC48 is a flat-media, distributed input/output (I/O) loading control system. It provides I/O electronics near each loader in the system, then connects all the I/O modules with simple flat media cable. The DLC48 main control box contains only the operator interface station plus a control processor and an interface to the I/O network. This control system configuration greatly simplifies installation, reducing labor and wire costs and allows system expansion by simply adding more I/O modules.

The DLC48 is designed to control up to 48 loaders and 8 vacuum pumps with 1 standby pump. In its current configuration it has all the options of the DLC48 except proofing and a remote terminal (both of these options may be added in the future). Both 6" and 10" color touchscreens are available.



The DLC48 system uses Allen Bradley ArmorBlock I/O modules for loaders and pumps. The modules are clamped onto Kwik-Link flat DeviceNet cable. The DeviceNet flat cables (one for solenoid power, one for electronics/communications) are typically run around the plant in one continuous routing.

WHAT IS THE DLC48?

Variations to this standard routing are also possible, as needed. A Power Supply is connected to the DeviceNet cable to provide power for solenoids and communications. There is no traditional cutting, stripping, and terminating wire. The I/O modules simply clamp on the DeviceNet cable. Connections with the I/O modules are then made with “DIN” type screw-on connectors that terminate at the loader with Conair’s unique plug-in UTB connector.

The controller and touchscreen panel automatically turn on when power is applied to the I/O station. After a bootup sequence, the Home Screen displays. From the Home screen you can view the operating status of all vacuum receivers connected to the system.

Color-coded icons indicate receiver status:

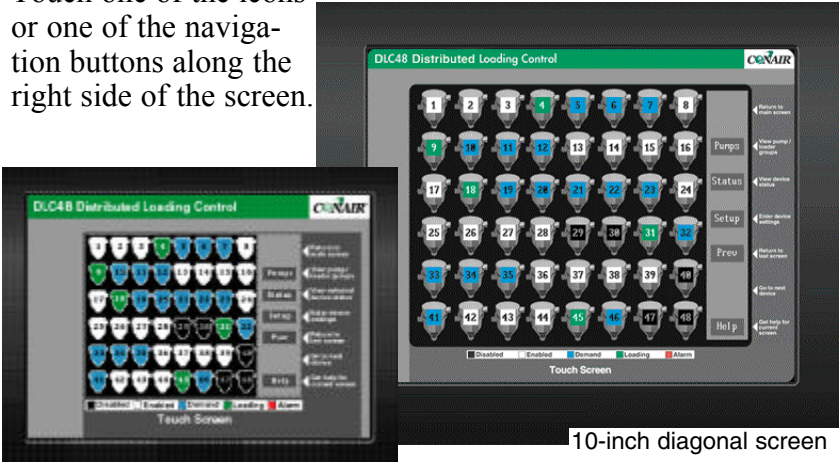
- Disabled = Black
- Demanding material = Blue

The DLC48 Home Screen lets the operator monitor the status of all vacuum receivers at a glance. Color-coded icons indicate the real-time status of each receiver.

Other screens allow you to change system settings or to view pump systems, loader details, alarm histories and help screens that provide instructions pertaining to the specific screen.

- Disabled = Black
- Enabled = White
- Loading = Green
- Demanding material = Blue
- Alarming = Red

Touch one of the icons or one of the navigation buttons along the right side of the screen.



6-inch diagonal screen

10-inch diagonal screen

TYPICAL APPLICATIONS

The DLC48 has been designed for central material conveying applications, including Conair's CDS Central Drying and Distribution System.

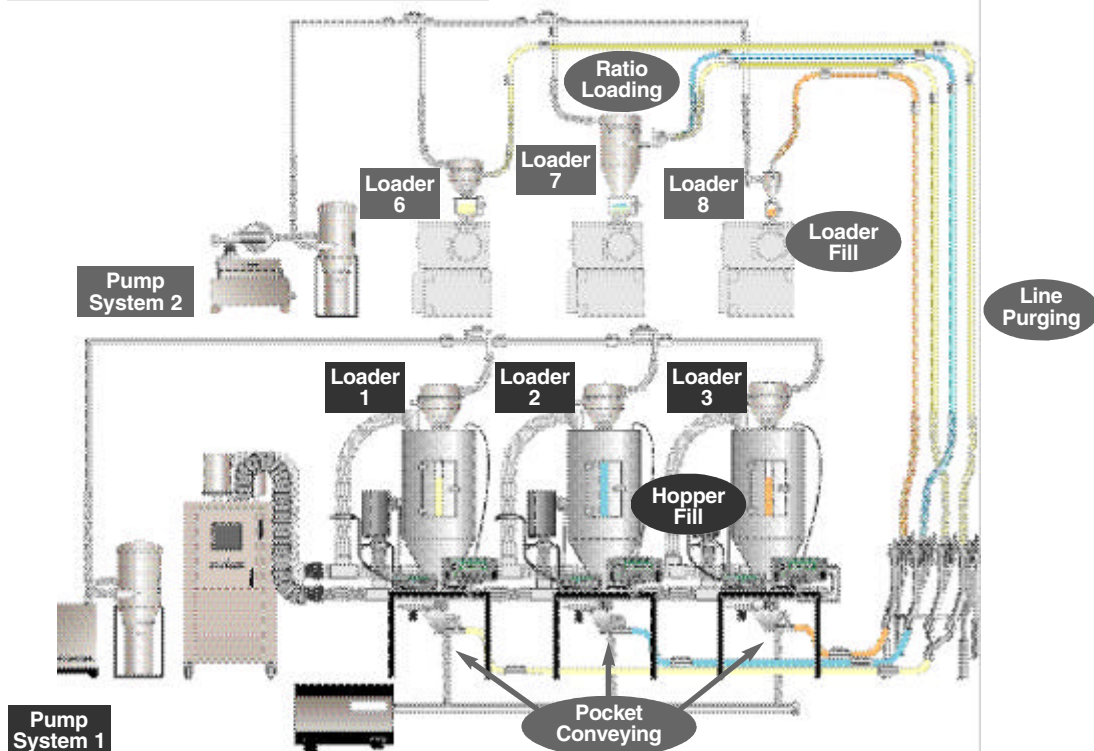
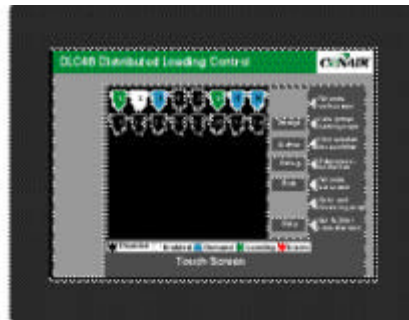
Loader-pump assignments are completely flexible. Individual vacuum receivers can be assigned to any one of the eight loading systems. Each receiver can be configured for:

- Single-material loading.
- Ratio loading, with or without automatic material layering.
- Positive (air-operated) receiver discharge.
- Material line purging.
- Material line proofing.
- Pocket conveying from a drying hopper or other vessel.
- Loader fill alarm to work with an optional fill sensor mounted in the receiver body or direct feed chamber.
- Hopper fill alarm to work with the demand sensor mounted in a drying hopper or other material vessel.

In this example, the DLC48 monitors and controls conveying in a typical CDS application.

Pump System 1 conveys material to the drying hoppers from three different material sources.

Pump System 2 conveys material from the drying hoppers to three processing machines as it is needed.

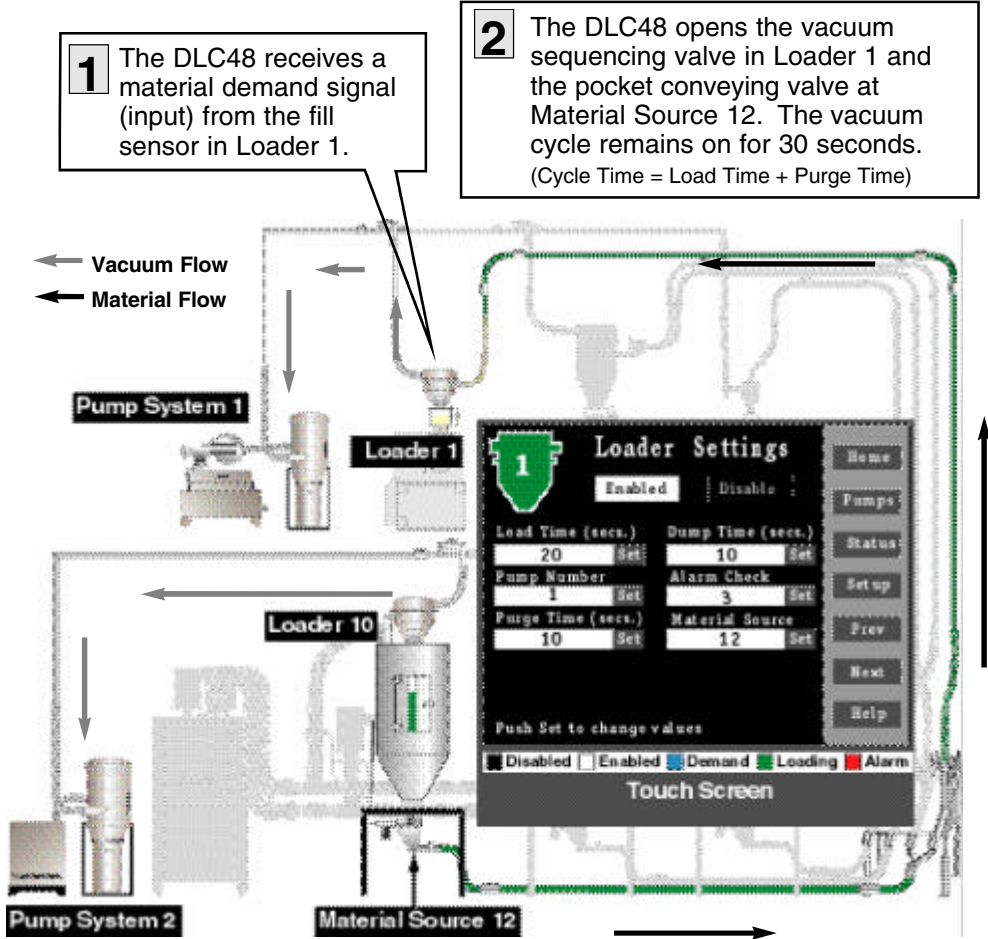


HOW IT WORKS

The DLC48 communicates with each pump, vacuum receiver and material valve wired to ArmorBlock modules. The DLC48 controls conveying operation based on settings the operator enters on a touchscreen panel.

When receivers in a pump system demand material, the DLC48 turns on the vacuum pump and dust collector in the appropriate pump system. It then opens the correct vacuum and material valves to convey material to satisfy the demand.

In the example below, the operator has specified that Loader 1 draw material from Material Source 12, a drying hopper with a pocket conveying valve installed at the hopper discharge.



1 The DLC48 receives a material demand signal (input) from the fill sensor in Loader 1.

2 The DLC48 opens the vacuum sequencing valve in Loader 1 and the pocket conveying valve at Material Source 12. The vacuum cycle remains on for 30 seconds. (Cycle Time = Load Time + Purge Time)

3 The DLC48 closes the pocket conveying valve after 20 seconds, shutting off material flow from the hopper. The vacuum valve at the receiver remains open for 10 seconds (purge time) to continue pulling material from the line into the receiver.

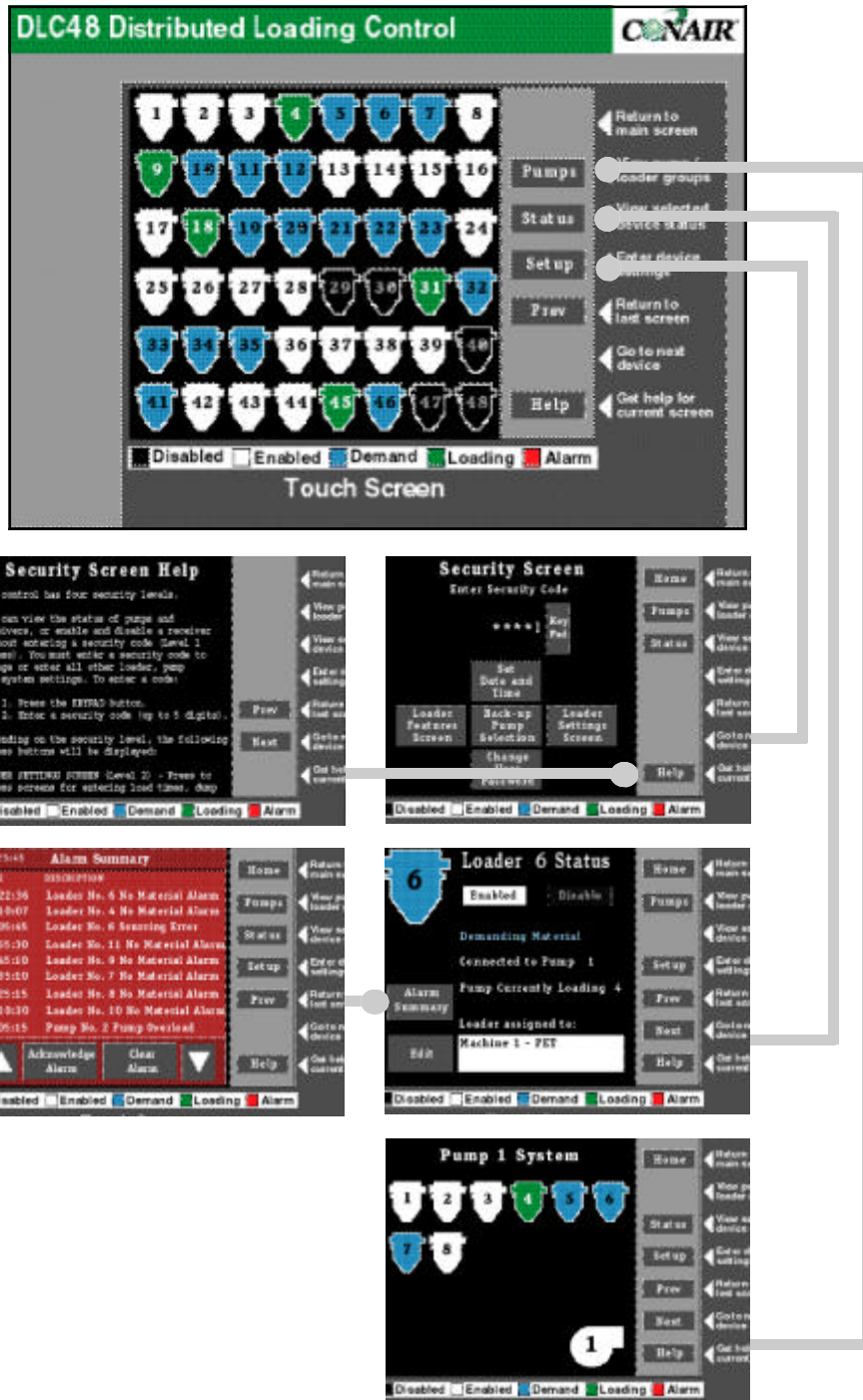
The DLC48 will signal an alarm if:

- Demand for material at Loader 1 is not satisfied within 3 loading cycles (Alarm Check triggers a No Material Alarm).
- Material cannot be pulled from the assigned Material Source 12 (Sourcing Error).

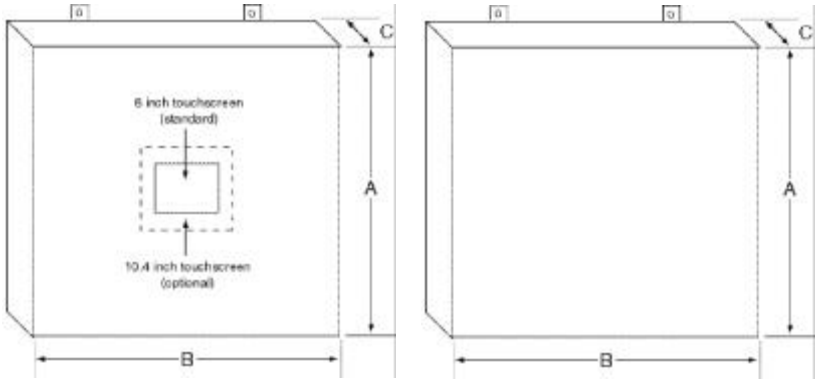
HOW IT WORKS

The DLC48 Home Screen lets the operator monitor the status of all vacuum receivers at a glance. Color-coded icons indicate the real-time status of each receiver.

Other screens allow you to change system settings or to view pump systems, loader details, alarm histories and Help screens that provide instructions pertaining to the specific screen.



SPECIFICATIONS



DLC48 Base Unit
and Touchscreen

Power
Supply
Unit

MODELS	DLC48
Performance characteristics	
Maximum number of vacuum receivers	48
Maximum number of vacuum pumps	8 (plus back-up)
Maximum number of source valves	32
Maximum number of proofing loaders	48
Programmable logic controller	Allen Bradley DLC504
Touchscreen operator interface	CTC/Parker Automation
Communications with master control	DH485
Screen size diagonal inches (mm)	
standard	5.7 {145}
optional	10.4 {264}
User interface method	
standard	resistive touchscreen
optional	keyboard, mouse
Output voltage to receivers/valves	24 VDC
Sensor voltage to receivers	24 VDC
Output voltage to pumps	24 VDC
Dimensions inches (mm)	
Base unit cabinet	
A - Height	20 {508}
B - Width	20 {508}
C - Depth	8.6 {219}
Power supply cabinet	
A - Height	20 {508}
B - Width	20 {508}
C - Depth	8.6 {219}
Weight lb {kg}	
Base unit	
Installed	60 {27.2}
Shipping	75 {34}
Power supply	
Installed	60 {27.2}
Shipping	75 {34}
Voltages Total amps	
115V/1 phase/60Hz (master control)	15
115V/1 phase/60 Hz (remote control)	5

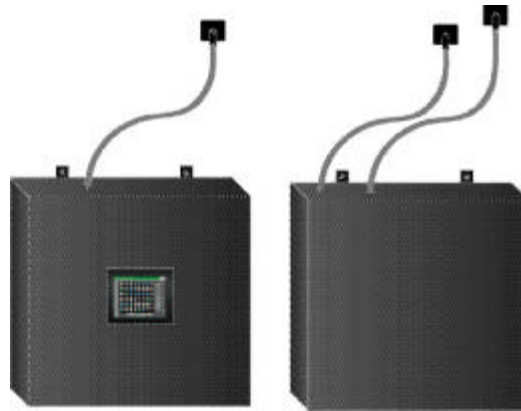
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UNPACKING THE BOXES

The DLC48 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;
- ArmorBlock 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 DLC48 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 DLC48 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 DLC48 will control.**
Keep the DLC48 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. An external keyboard, if used, should be located on a stable horizontal surface within sight of the touchscreen. 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 115 VAC power.** The three-prong power cords supplied with the DLC48 base unit and power supply requires a grounded 115 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 DLC48 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 to the lines.

INSTALLING THE DLC48

Installation consists of:

- Installing the Kwik-Link flat DeviceNet cables.
- Installing the ArmorBlock bases and termination blocks.
- Installing the ArmorBlock 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 ArmorBlocks 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 DLC48 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 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.

The DLC48 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.



MOUNTING THE BASE UNIT AND POWER SUPPLY

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.

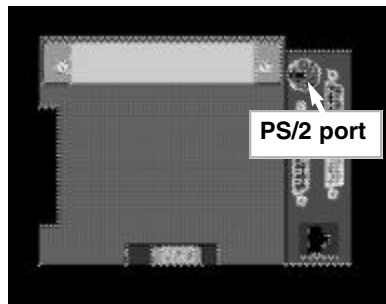
An alphanumeric keypad is built into the 10-inch touchscreen interface. If you have the 6-inch screen size and want to enter additional information about loaders connected to the system, you will need an external keyboard.

A keyboard can be connected to the PS/2 port on the back of the touchscreen interface panel. Use a strain relief, if you run the keyboard cable through a hole in the base unit enclosure.

CONNECTING A KEYBOARD (OPTIONAL)

1 Open the DLC48 base unit enclosure.

2 Plug the keyboard into the available PS/2 port.



INSTALLING THE BRACKETS

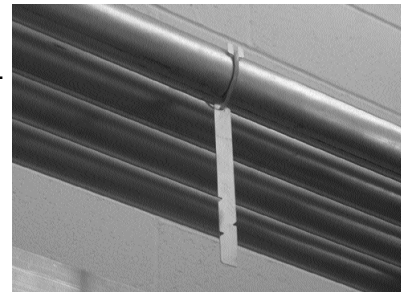


WARNING: Improper installation may result in equipment damage or personal injury.

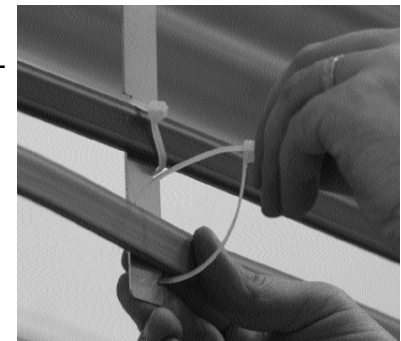
Always refer to the wiring diagrams that came with your controls before making electrical connections. The diagrams show the most accurate electrical component information.

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

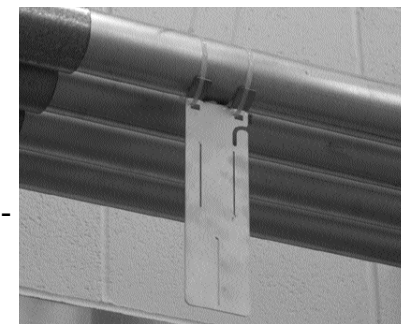
- 1** Install the Kwik-Link flat DeviceNet cable brackets provided or prepare your chosen method of cable support.



- 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 ArmorBlock bases and termination blocks correctly.



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



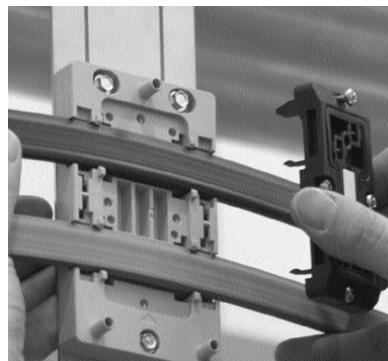
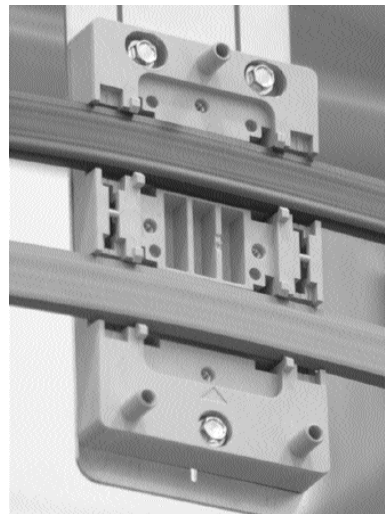
INSTALLING THE BASES AND CABLES

- 1** Install the ArmorBlocks bases on the base brackets.



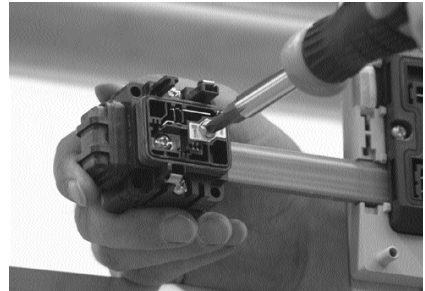
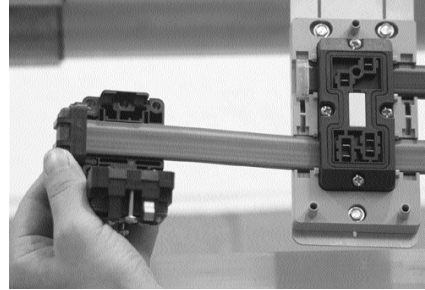
- 2** Install the Kwik-Link flat DeviceNet cables in the ArmorBlock bases. Insure that the cables are properly installed in the bases and the piercing caps are clamped evenly. If the cables are not flat in their slots, the contacts will not pierce the cables correctly. Remove the bases and discard. Install a new base 1/2 inch to 1 inch from the rremoved base. Refer to Allen Bradley ArmorBlock 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.

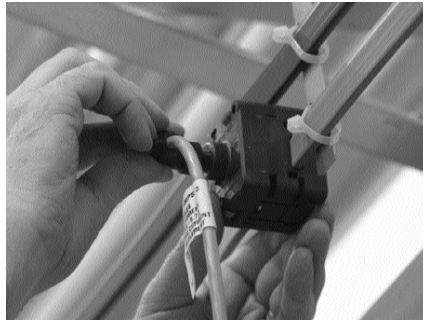


INSTALLING THE TERMINAL BLOCKS

- 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.

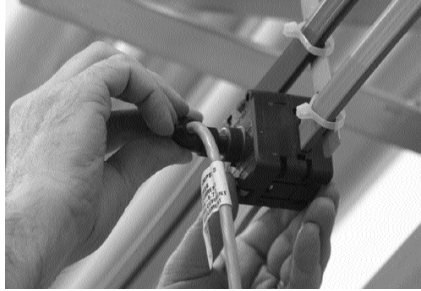


- 2** Install the base unit anywhere along the length of the flat cable run within 25 feet of the cable. Install the DeviceNet Mini-DIN termination tap on the gray flat cable. Connect the base unit to the DeviceNet cable using the attached Mini-DIN connector.

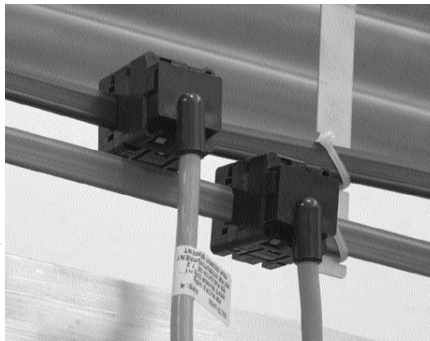


ATTACHING POWER SUPPLY UNITS

- 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. Half of the current from the power supply will flow one direction down the auxiliary power cable and half of the current will flow 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.



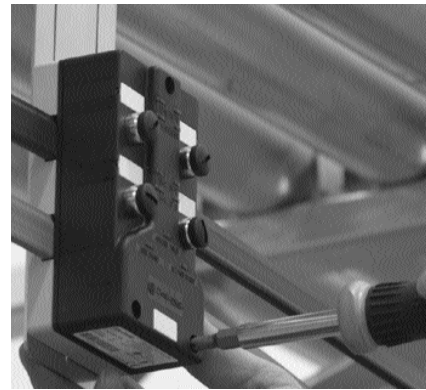
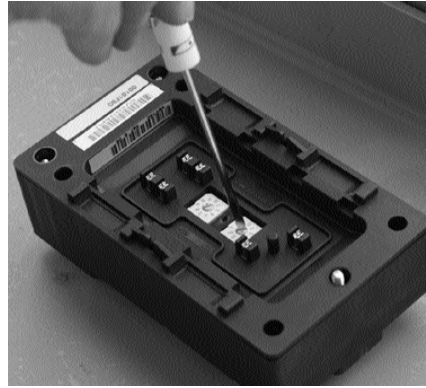
- 2** **Install the two power supply taps on the** DeviceNet cable. The two power supply cables from the power supply unit must be placed on the correct flat cable. The cable marked "DeviceNet Power Supply" should be attached to the gray DeviceNet cable and the cable marked "Auxiliary Power" should be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



INSTALLING THE I/O UNITS

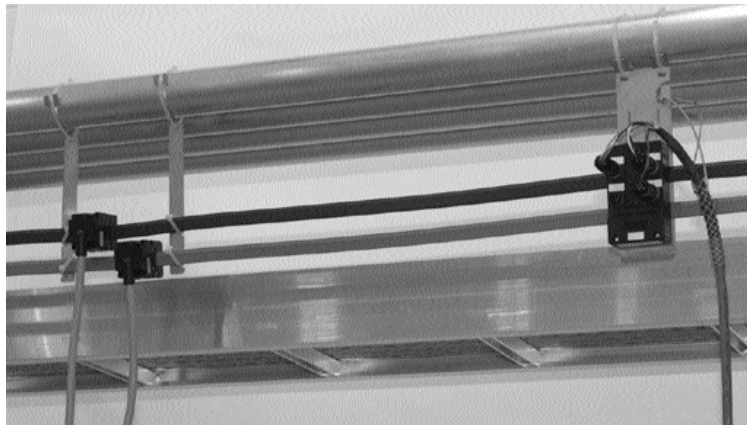
1 Install the ArmorBlock I/O units on the bases.

Set the rotary switches on the bottom of the block to the desired node number. Loaders should be set to node 01 to 48 (loader 1 to 48). Pump I/O blocks should be set to 51 to 58 (pump 1 to 8). The standby pump should be set to node 59. Mark the white tag on the block with the node number for future reference. Please refer to Allen Bradley ArmorBlock MaXum 4 Input/4 Output Module Manual (Publication 1792D-IN012B-EN-P) included with the ArmorBlocks for further details.



2 Install the loader drop cables between the ArmorBlocks and the Universal Terminal Boxes (UTB).

The connectors should be installed on the ArmorBlocks so that the connector with four wires is installed on the upper left ArmorBlock connectors. Install the connector with three wires on the upper right ArmorBlock connectors. The final loader drop cable connector should be installed on the lower right hand ArmorBlock connector.



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 ArmorBlocks to the pump starters. Insure that the input side of the ArmorBlock goes to the input connection on the starter and that the output side of the ArmorBlock goes to the output connection on the starter.



WIRING POCKET CONVEYING VALVES (OPTIONAL)

The DLC48 can operate up to 32 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)DLC48 are required.

NOTE: *Purge valves and pocket conveying valves connect to the same outputs on the DLC48 control. Therefore, pocket conveying valves cannot be used with loaders that are connected to purge valves.*

CONNECTING TO MAIN POWER

The DLC48 base unit and power supply are equipped with a three-prong plugs and power cords.

- 1 Plug the power cords into grounded 115 VAC** outlets rated for at least 15 Amp service.
- 2 Make sure the base unit is grounded.**



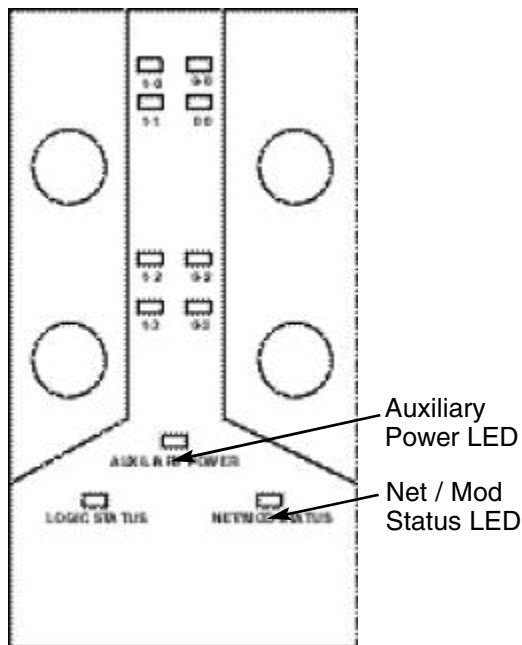
WARNING: Electrical shock hazard

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 DLC48

- 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 ArmorBlock 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 ArmorBlock to insure that the Auxiliary Power LED is on and glowing green. If not, the ArmorBlock 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. It is also possible that the ArmorBlock may be bad. In this case, a known good ArmorBlock should be temporarily fitted to the base to check if the ArmorBlock module may be bad.



STARTING UP THE DLC48

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

- 4** Once the first two ArmorBlocks 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 ArmorBlocks for the condition of the Net/Mod Status LED. For loader 1 (node address 01) and pump 1 (node address 51), the LEDs display as solid green indicating that the loader and pump are enabled (factory default). On all other ArmorBlocks, 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 ArmorBlocks show solid green, blinking red, 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 ArmorBlock base and ArmorBlocks, one at a time. Enable the blocks as they are installed and check the status LEDs for the correct status.
- 7** After ArmorBlocks are enabled and show a solid green Auxiliary Power LED and a solid green Net/Mod Status light, the system is ready to run.

INITIAL SETUP

Before you begin conveying, you must configure and identify the loaders and conveying features you want to use.

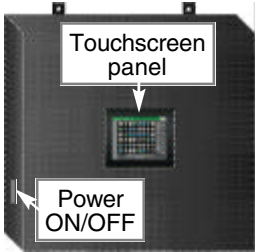
For initial setup you need to:

- Configure each loader in the system.
- Assign loaders to pump systems.
- Add details to further identify each loader.
- Set the date and time that will appear in the alarm history.
- Select or set security levels required by your operation.

To begin Initial Setup:

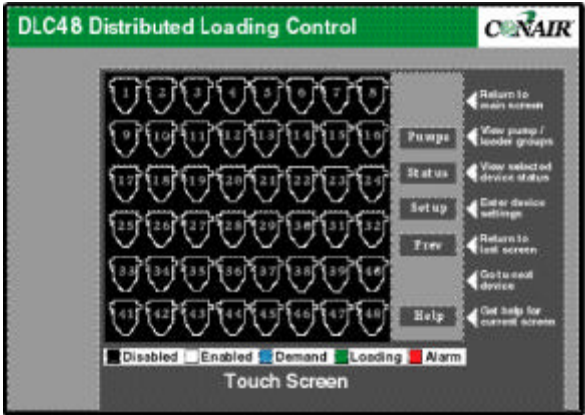
1 Turn on power to the DLC48.

The Power ON/OFF switch is on the side of the base unit.



2 Wait for the control to initialize.

Do not touch the touchscreen panel until the control has completed the bootup and initialization process. This process takes 20 to 30 seconds. When the control has initialized, the Home screen displays the number of available loading positions.



NOTE: All loaders display as disabled (black icons) at initial setup until they are enabled.

TIP: You will need the Level 3 or 4 security code to perform most procedures in the initial setup. If you are not familiar with the DLC48 security levels, please review **SETTING SECURITY LEVELS** in the Installation section before proceeding.

ACTIVATING NODES

Each loader and each pump is considered a node on the DeviceNet system. The system is sent from the factory with one loader node and one pump node active. Before more loaders or pumps can be used, the nodes must be activated via the touchscreen. The loaders must be set at nodes 1 to 48 (loader 1 to 48). The pumps must be set at nodes 51 to 58 (pump 1 to 8).



WARNING:

Turning nodes active or inactive will cause a brief stop (approximately two seconds) to the operation of the loading system. It is recommended that all loaders be disabled and the system stopped when making nodes active or inactive.

- 1 When a node (either a loader or a pump) is added to the loading system, the associated hardware (I/O base and ArmorBlock I/O) must first be mounted on the DeviceNet trunk cables and the rotary switches on the bottom of the ArmorBlock I/O module must be set to the correct node number.**
- 2 Once the hardware is mounted, the Module Status indicating light on the module blinks red or green indicating that the new node is not recognized. Mounting the I/O base and ArmorBlock module may be done while the loading system is running. Once the hardware is in place, stop the loading system and disable all loaders.**
- 3 Go to the settings screen and place the system**
in the highest level of password access (54647). A “rack and slot status” button displays in the lower left corner of the screen. Press this button; the rack and slot status screen displays.
- 4 Press the Nodes button.**
The Nodes screen displays.

ACTIVATING NODES

CONT'D



- 5** To enable a node, press the **INC** or **DEC** button until the correct node number (1 to 48 are loaders, 51 to 58 are pumps) displays on the screen. The **Enable** and **Disable** buttons highlight, showing the current status of the node. Press the **Enable** button to enable the node. After a few seconds the indication on the touchscreen should go from “Disabled” to “Enabled”. Also the Module Status indicating light on the ArmorBlock I/O module should go from blinking red or green to a solid green color. The node is now active and available for use.

*NOTE: Any action taken on this screen requires multiple communication messages on the DeviceNet. This will make the response time seem sluggish compared to the other screens. After pressing the **INC**, **DEC**, **Enable**, or **Disable** buttons, it may take 5 to 10 seconds before a response is seen.*

DISABLING NODES



WARNING:

Prior to disabling a node, remove all wiring from the ArmorBlock I/O to ensure that all inputs are in the off state. If a node is disabled while an input is on, this input will be retained in memory after the node is disabled. This will cause incorrect operation of the loading control. If this situation occur, the node must be reinstalled and enabled. Remove the input wiring and disable the node in the correct sequence.

To disable a node from the Nodes screen. Press the Disable button to disable the node. The indication on the touchscreen changes from Enabled to Disabled. The Module status indicating light on the ArmorBlock I/O module changes from solid green to blinking green or blinking red.





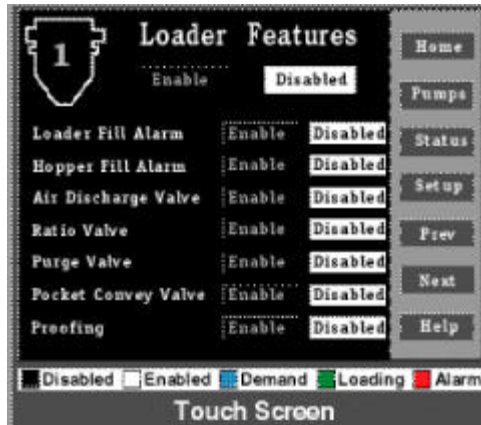
CAUTION: Incorrect configurations cause the DLC48 control to stop.

Before enabling loaders and loading functions, make sure the loader, valve and option have been installed in the system. Each loader and feature must be wired to a correctly installed and enabled ArmorBlock. The DLC will fault and the loading control will stop if the required ArmorBlock has not been installed for the feature you enabled.

CONFIGURING LOADERS

Configure each loading station in the system by enabling vacuum receivers and loading functions on the Loader Features screen.

The loader or feature must be correctly installed and wired before it can be enabled.



LOADER FEATURES:

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

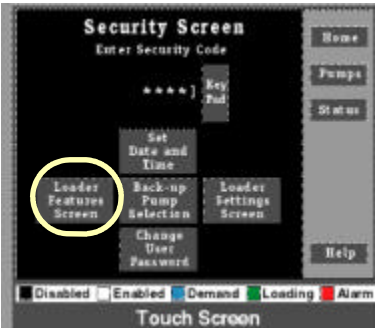
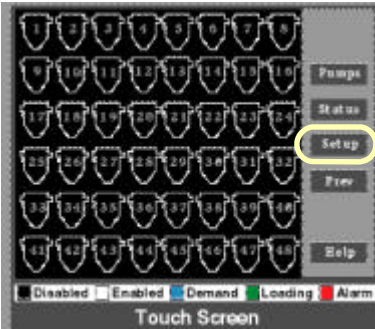
TIP: Touch the Help button on any screen to find instructions and definitions about the functions available on that screen.

CONFIGURING LOADERS

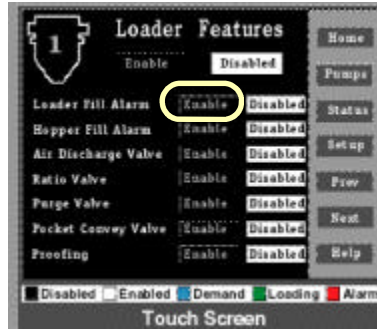
LOADER FEATURES:	
Closed/Open Loop Control	Allows the pump systems to operate either in a closed loop or open loop mode. In a closed loop system, dry air that is pulled from the loaders during a load cycle is routed back into the drying hopper lines. In an open loop system, this air is released into the ambient atmosphere. The system consists of an additional valve that is added at each pump to switch between closed or open loop loading. This function can be selected on a loader by loader basis by using the "Loader Features Scrn II" button located on the security screen. On this screen, closed loop control can be either enabled or disabled for each loader.
* NOTE: You can enable either a purge or a pocket conveying valve, but not both for the same loader.	

To enable conveying features, you must open the Loader Features screen and enter the Level 3 access code to complete this procedure. See [SETTING SECURITY LEVELS](#) in the Installation section.

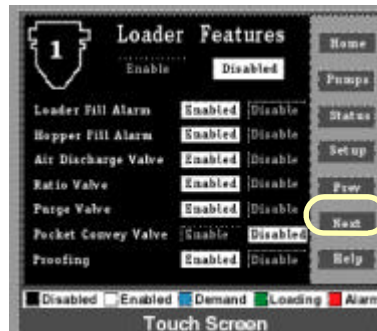
- 1** Press **Setup** button on the Home Screen. The Security Screen displays.
- 2** Enter the **Level 3** access code. Press Key Pad to open the keypad. Enter the numbers for Level 3 access and press Enter. The Security Screen displays four choices.
- 3** Press **Loader Features** Screen button. The Loader Features for Loader 1 displays.



- 4 Press **Enable** for each feature installed on that loading station. You also can enable the loader, but you should leave the loader disabled (off) until you have assigned it to a pump system. The feature is on when Enabled is lit.



- 5 Press **Next** to access features for the next loader in the system.
- 6 Repeat the procedure for each loader.



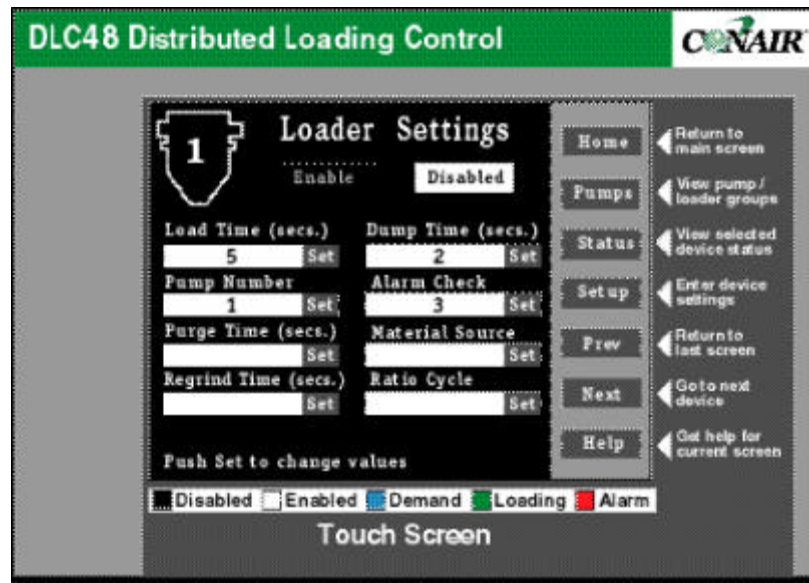
CONFIGURING LOADERS

IMPORTANT: Verify installation of vacuum receivers, valves and options before enabling them in the DLC48.

Loader positions are installed in the DLC48 in banks of 16 — Loaders 1 to 16, 17 to 32 and 33 to 48. This allows easier expansion of the system. But it also means the control may display a Loader Features screen for a loader position where no vacuum receiver exists. (Example: Loader 36 in a 35-loader system.)

ENTERING PUMP AND LOADER SETTINGS

You assign loaders to pump systems, enable loaders, set load times, and enter other loading parameters on the Loader Settings screen.



Below are the loader functions that can appear on the screen.

LOADER SETTINGS:	
Load Time	The number of seconds (1-300) that the receiver loads material.
Dump Time	The number of seconds (1-300) that the receiver will discharge material into a vessel before the next load cycle begins.
Pump Number	Assigns the loader to a pump system (1-8).
Alarm Check	The number of times (0-20) that the DLC48 will try to load a receiver before sounding an alarm when demand has not been satisfied.
Purge Time*	The number of seconds (0-300) 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.
Material Source*	The number (1-32) that identifies a material source equipped with a pocket conveying valve. This setting also is used for material line proofing.
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.
Ratio Cycle*	The number of times (1-3) that a ratio valve switches between virgin and regrind during the load cycle to produce layers of material.

* **NOTE:** These settings will be displayed only if the corresponding feature has been installed and enabled for the specific loader.

NOTE: Loaders may be assigned to any pump in the conveying system. Each pump system can handle up to 24 loaders.

The DLC48 initially assigns loaders sequentially, in groups of six loaders to one pump. (Example: Loaders 1-6 to Pump 1, Loaders 7-12 to Pump 2, etc.)

NOTE: Optimum settings vary according to equipment and application. Refer to the manuals for each component of your conveying system for information about the best settings for your application.

ENTERING PUMP AND LOADER SETTINGS

To get to the Loader Settings screen and enter the settings:

1 Touch “Setup” to open the Security Screen.

2 Enter the Level 3 access code. Touch “Key Pad” to open the keypad. Enter the numbers for Level 3 access and then touch “Enter”.

◆ The Security Screen displays four choices.

3 Touch “Loader Settings Screen.”

◆ The settings screen for Loader 1 is displayed.

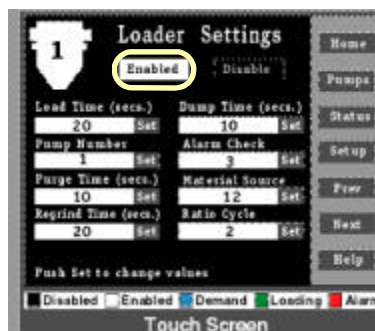
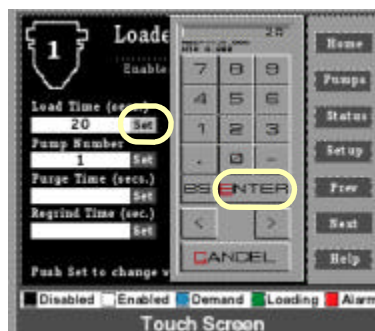
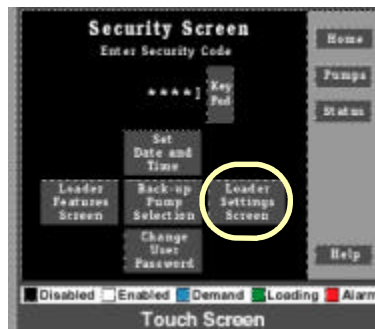
4 Enter the settings.

Touch the “Set” key for each loader function you want to set or change. A keypad opens on the screen. Touch the number keys corresponding to the setting, then touch “Enter” on the keypad.

5 Enable the loader.

Touch “Enable” to make the loader available to vacuum conveying.

6 Repeat the procedure for all loaders. Touch “Next” or “Prev” to scroll to the Loader Settings Screen for each loader.



TIP: The overall vacuum-on time (cycle time) for a loader equals the Load Time unless a purge or pocket conveying valve is used. With purge and pocket conveying options, the cycle time equals Load Time + Purge Time.

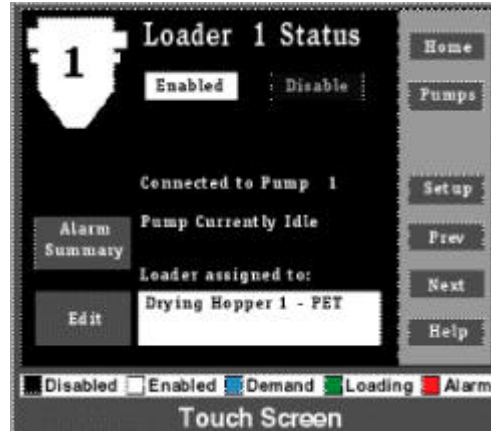
Proceed to [IDENTIFYING LOADERS](#).

IDENTIFYING LOADERS

The DLC48 identifies each loader in the system by a number.

On the Loader Status screen you can add more information to help identify the loader.

You may want to add text that describes the material source, the destination or the materials being loaded.

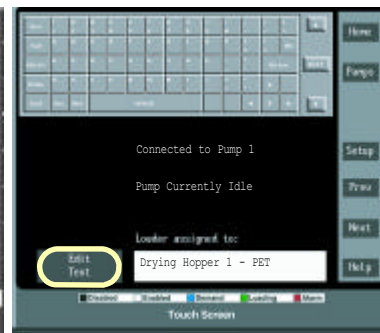


1 Press Status to go to the Loader Status screen. This screen does not require a security code for access.

2 Press Edit, then the white text block. This activates the keyboard. On 6-inch screen models, you must use an external keyboard to enter the text. The 10-inch screen models display an on-screen keyboard.



6-inch touchscreen



10-inch touchscreen

3 Enter the text using the keyboard. Press the Enter button on the keyboard to save the text. If you are using an external keyboard, touch the “Send Text” key on the touchscreen. If you are using the on-screen keyboard, touch “Save Text.”

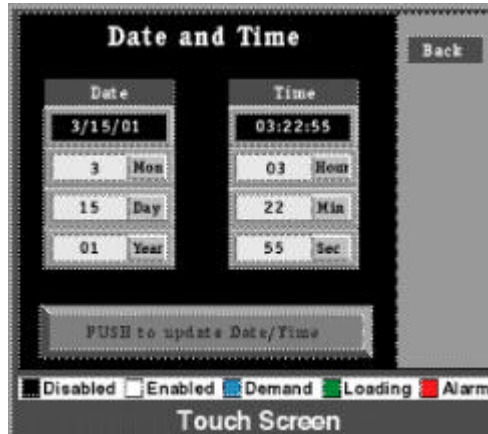
4 Repeat the procedure for each loader. Touch Next to go to the next loader in the system or Prev to go to the previous loader.

TIP: Touch the “Help” key on any screen to find instructions and definitions about the functions available on that screen.

Set the date and time that the control uses to record alarm histories.

The DLC48 automatically updates the time for Daylight Savings Time. To set or change the date and time:

- 1 **Press Setup** from any screen. The Security screen displays.
- 2 **Enter the Level 3** access code. Touch Key Pad to open the keypad. Enter the numbers for Level 3 access and press Enter. The Security screen displays four choices.
- 3 **Press Set Date and Time.** The Date and Time screen displays.
- 4 **Enter the date and the time.** Touch the button next to the field you want to change (Example: “Mon” for Month). On the keypad, touch the numbers corresponding to the date or time, then press Enter to close the keypad. Repeat this process for all fields, then touch PUSH to Update Date/Time to save the changes.
- 5 **Press Back to return to** the Security screen.



SETTING THE DATE AND TIME

IMPORTANT: For changes to take effect, you must enter a setting in every field — even fields that do not require a change — before you touch “PUSH to Update Date/Time.”

Time and Date must be set at the touchscreen interface on the Input/Output enclosure. It cannot be set at a remote touchscreen.

Enter time as 24-hour time in Hours/Minutes/Seconds.
(Example: 14:30:00 for 2:30 PM)

Enter dates as numbers representing Month/Day/Year.

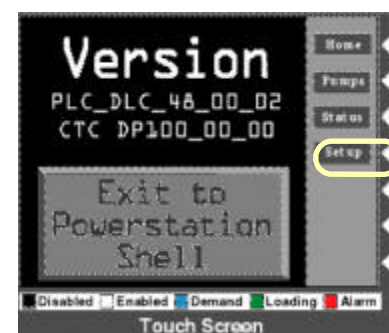
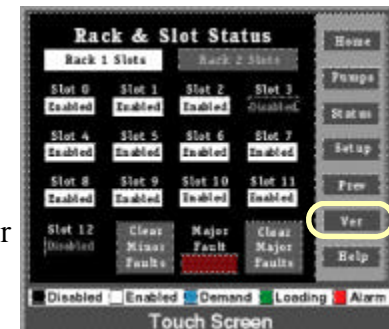
Touch < or > to move the keypad to the left or right of the screen.

RECORDING THE SOFTWARE VERSION

Before starting operation, record the version of the DLC48 software in the front of this manual. The Conair service department will need this information, along with the serial number, to provide help for the specific equipment you installed.

To determine the software version number:

- 1 Press Setup to** display the Security Screen.
- 2 Enter the Level 4** security code. Press Key Pad button to open the keypad. Enter the numbers for Level 4 access and then press Enter. (See [SETTING SECURITY LEVELS](#))
- 3 Press Rack & Slot** Status. This opens the Rack & Slot Status screen.
- 4 Press the Ver** button. This opens the software version screen displaying the version number and access to the powerstation shell.
- 5 Record the software** version number. In this example, the version number is P108_01.
- 6 Press Setup to return** to the Security screen.



The DLC48 provides four levels of security to prevent unauthorized changes to loader or system settings. You should set the most appropriate level for your operating procedures.

SETTING SECURITY LEVELS

TIP: To control access to the DLC48 security level codes, you may want to remove pages 3-27 and 3-28 from this manual and store them in a safe place.

● Level 1 Access

(no security code required)

This is the most restrictive level, allowing no changes to loader or system settings. The operator can view the status of loaders and pump systems, acknowledge an alarm, and disable or enable a loader.



● Level 2 Access

(user-selectable code)

The operator has access to Loader Settings, in addition to Level 1 monitoring screens. The Level 2 operator cannot assign the loader to a pump, but can change load time, dump time, alarm check and settings for optional loader functions. The default code of 0000. See [CHANGING THE LEVEL 2 PASSWORD](#).



● Level 3 Access

(factory-set code 7373)

This is a supervisory level. The Level 3 user can change the Level 2 security code, as well as set system time and date; assign loaders to pumps; assign the backup pump; and configure loader features.



● Level 4 Access

(factory-set code 54647)

This provides factory-level access to all functions and system parameters. Use only when expanding the original system or troubleshooting DLC processor error codes.



IMPORTANT: The security level remains at whatever level was most recently used unless you enter the code for a different security level.

If you have made changes to system settings using a security code for Level 2, 3 or 4, make sure you return to the Security Screen and enter the code for the access level you want to use for operation.

CHANGING THE LEVEL 2 PASSWORD

Security codes for access Levels 3 and 4 are set at the factory and can not be changed.

Users with Level 3 access can set or change the Level 2 security code, which is set by the factory at 0000.

To set or change the Level 2 security code:

- 1 Press Setup** to display the Security screen.
- 2 Enter the Level 3 security code.** Press Key Pad on the Security screen to open the numeric keypad. Touch 7, 3, 7, 3, and press Enter.
- 3 Press Change User Password.** The User Password Entry screen displays.
- 4 Enter a new code.** Press Key Pad button to open the numeric keypad. The new code can be any 1- to 5-digit number between 0 and 64000. Enter the new code on the keypad, and press Enter to save the change and close the keypad.
- 5 Press Prev** to return to the Security screen.
- 6 Set the appropriate security level.** Press Key Pad button to open the keypad. Enter the security code for the access level you want your operators to use.



IMPORTANT: The security level remains at whatever level was most recently used unless you enter the code for a different security level.

If you have made changes to system settings using a security code for Level 2, 3 or 4, make sure you return to the Security Screen and enter the code for the access level you want to use for operation.

You may want to record the new Level 2 security code on the security pages of this manual.

OPERATION

- *DLC48 Control Features*4-2
- *Operating the Conveying System* .4-4
- *Enabling and Disabling Loaders* . .4-5
- *Changing Loader Settings*4-6
- *Entering Loader Settings*4-7
- *Assigning a Backup Pump*4-8

DLC48 CONTROL FEATURES

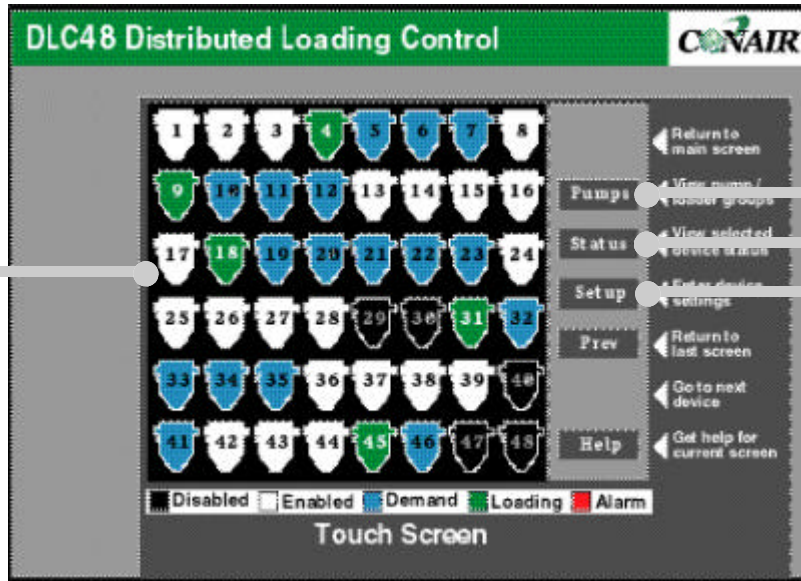
The DLC48 operator interface allows you to view the status of every vacuum receiver in your conveying system at a glance. It also provides touchscreen access to additional screens used to monitor pump groups, enter settings for each loading station, view alarms and change system parameters.

Home Screen

Color-coded loader icons display the status of each vacuum receiver in the system. Colors change as the operating status of the receivers change:

- Black = Loader disabled
- White = Loader enabled
- Blue = Loader demanding material
- Green = Loader loading
- Red = Loader alarm

Touch an icon to view additional details about the status of a specific loader.



Help

Use to view instructions about the specific screen you are currently viewing.



Security Screen

Press Setup to display the security screen. To prevent accidental or unauthorized changes to system settings, security codes are required to access any screen that allow changes to loader settings or system parameters.

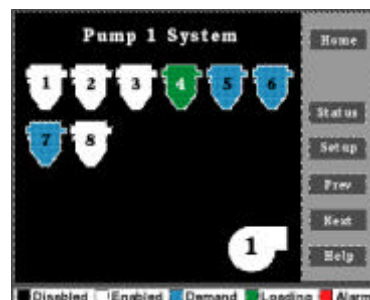
Alarm Summary

Press to acknowledge an alarm or view a summary of alarms.



Loader Status Screens

Press Status or a specific loader icon to view details about a vacuum receiver and the assigned pump. You can enable or disable the loader or view a summary of alarms. Press Next or Prev to scroll through all loaders in the system



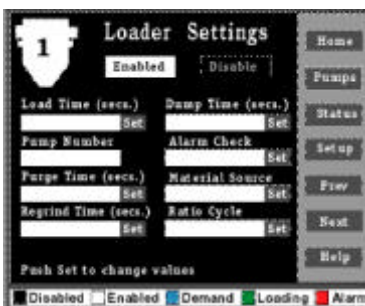
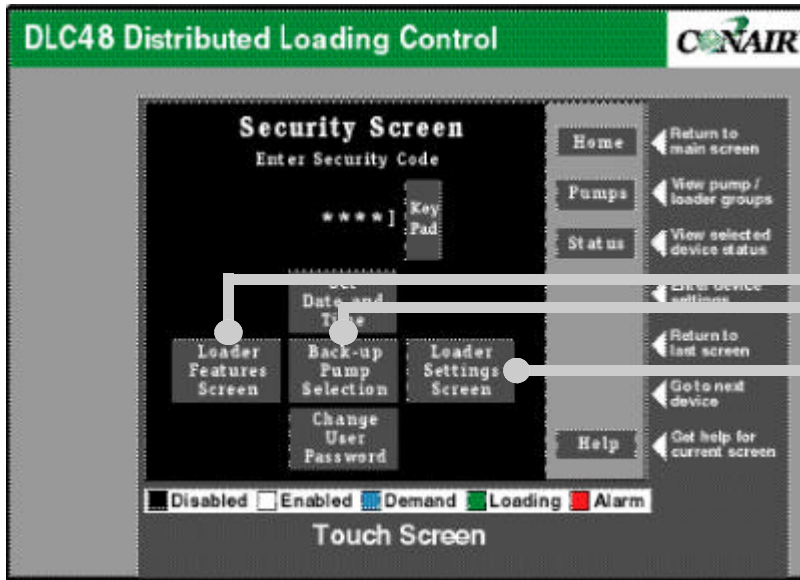
Pump System Screens

Press Pumps to view the status of all vacuum receivers assigned to a specific pump system.

Press Next or Prev to scroll through all pump groups.

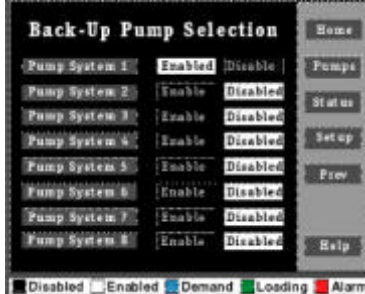
Security codes are required to access any screens that allow changes to loader, pump or conveying system settings. Press Setup on any screen to reach the Security screen, where the security code is entered using the on-screen keypad.

DLC48 CONTROL FEATURES



Loader Settings

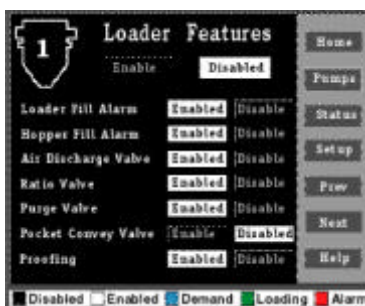
(Requires Level 2 Security Code)
For each loader, enter the load time, discharge time, and the number of times the loader will try to load before activating an alarm. Enter settings for any options, such as ratio or purge valves, that are installed.



Back-Up Pump Selection

(Requires Level 3 Security Code)
Assign a backup pump to any pump system by enabling the pump next to the appropriate system number.

Press Home, Pumps, Status or Setup to view those screens.



Loader Features

(Requires Level 3 Security Code)
You can enable or disable features for each loader.

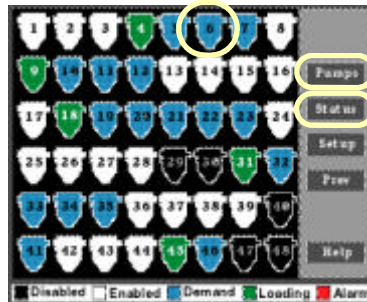
Press Next or Prev to scroll through all loaders.

NOTE: Enabling a feature that is not installed will stop the control.

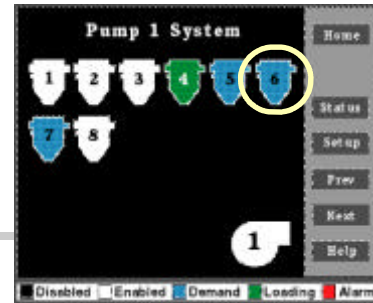
OPERATING THE CONVEYING SYSTEM

Once power is applied to the system, the DLC48 automatically operates vacuum pumps, loaders and material valves according to the conveying functions and loader settings entered during the initial setup.

You can monitor all aspects of the conveying system from the touchscreen panel on the Input/Output enclosure.



The Home Screen displays the status of all loaders.



To view loaders in a specific pump system:

- 1 Press Pumps to view the Pump System screen.**
- 2 Press Next or Prev to view each pump system.**

To view details about a specific loader:

- 1 Press Status or the loader icon to view Loader Status.**
- 2 Press Next or Prev to view each loader.**

To acknowledge an alarm:

- 1 Press the specific loader icon to view Loader Status.**
- 2 Press Silence Alarm to display the Alarm Summary screen.** The cause of the alarm must be fixed before the pump or loading station will resume operation. See the [TROUBLESHOOTING](#) section of this manual.

TIP: Press the Help key on any screen to find instructions and definitions about the functions available on that screen.

ENABLING AND DISABLING LOADERS



WARNING: Develop and follow procedures for safe operation of the system from the central control panel to avoid possible injury or equipment damage.

The DLC48 allows operators and maintenance personnel to disable and enable conveying system components. Unexpected energization of these components could result in equipment damage or injury.

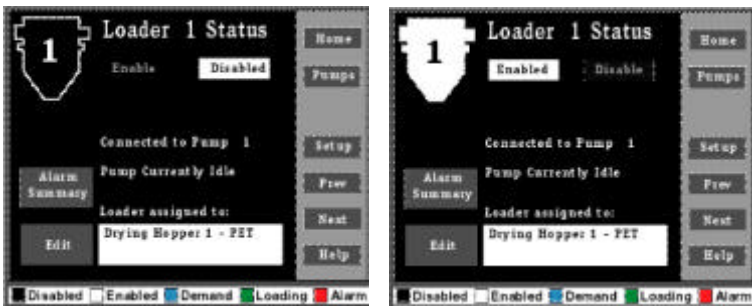
Safe operating procedures should include:

- 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 or enabling pumps, loaders or material valves, make sure that all personnel are clear of the machine, tools have been removed and any safety guards have been reinstalled.

During operation, you may need to disable a loader for maintenance or enable a loader that was taken out of service.

To disable or enable a loader from the Loader Status screen:

- 1** Touch the loader icon or “Status” on any screen. Touch “Prev” or “Next” to view loaders in the system.

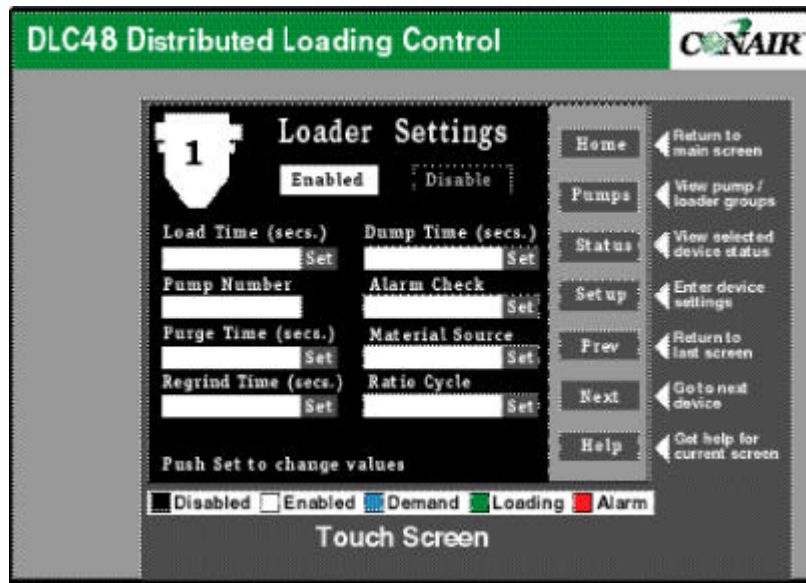


- 2** Press **Disable** to disable the loader or **Press Enable** to enable the loader.

The loader icon changes to black when the loader is disabled. When the loader is enabled, the icon color changes to the color indicating the loader’s operating status.

CHANGING LOADER SETTINGS

You may need to change loader settings whenever you change materials or to obtain the best conveying performance.



You must enter a security code to access the Loader Settings screen and change the following settings.

LOADER SETTINGS:	
Load Time	The number of seconds (1-300) that the receiver loads material.
Dump Time	The number of seconds (1-300) that the receiver will discharge material into a vessel before the next load cycle begins.
Pump Number	Assigns the loader to a pump system (1-8).
Alarm Check	The number of times (0-20) that the DLC48 will try to load a receiver before sounding an alarm when demand has not been satisfied.
Purge Time*	The number of seconds (0-300) 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.
Material Source*	The number (1-32) that identifies a material source equipped with a pocket conveying valve. This setting also is used for material line proofing.
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.
Ratio Cycle*	The number of times (1-3) that a ratio valve switches between virgin and regrind during the load cycle to produce layers of material.
* NOTE: These settings will be displayed only if the corresponding feature has been installed and enabled for the specific loader.	

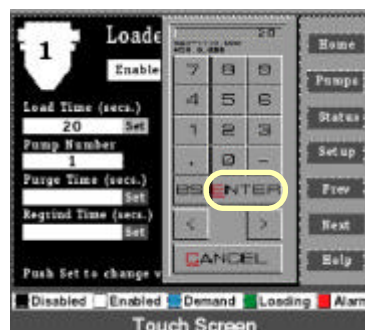
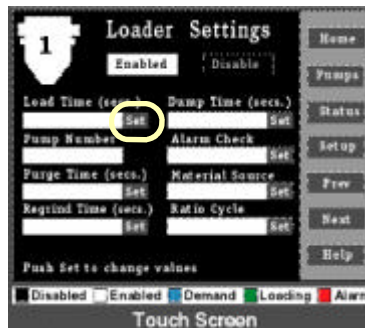
TIP: Press the Help button on any screen to find instructions and definitions about the functions available on that screen.

ENTERING LOADER SETTINGS

NOTE: Optimum settings vary according to application. Refer to the manuals for each component of your conveying system for information about the best settings to use for your application.

To view the Loader Settings screen and enter new settings:

- 1 Press Setup** to go to the Security screen.
- 2 Enter the Level 2** security code. Press Key Pad on the Security screen to open the numeric keypad. Enter the code for Level 2 access and press Enter to save.
- 3 Press Loader Settings** Screen button. The settings screen for Loader 1 displays.
- 4 Press the Set button** next to the setting you want to change. The keypad displays.
- 5 Enter the new setting** on the keypad and press Enter to save.
- 6 Repeat the procedure** for each setting and loader you want to change. Use the Next and Prev buttons to scroll to the Loader Settings screen for other loaders.
- 7 Set the correct security** level for operators. If necessary, return to the Security Screen and enter the password for Level 1 access.

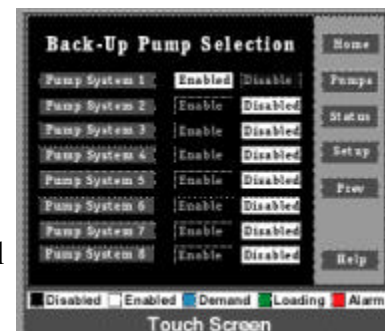


ASSIGNING A BACKUP PUMP

A backup pump can be assigned to replace any of the eight pump systems during operation.

To assign a backup pump:

- 1 Press Setup** to go to the Security Screen.
- 2 Enter the Level 3 security code.** Press the Key Pad button to open the numeric keypad. Enter the code for Level 3 access, then press Enter to save.
- 3 Press Back-up Pump Selection.** The Back-Up Pump Selection screen displays.
- 4 Press Enabled** next to the pump system that will have the backup pump.
- 5 Set the correct security level for operators.** If necessary, press Setup to return to the Security screen. Enter the password for the operator access level (Level 1 or Level 2) that you assigned during initial setup.



MAINTENANCE

- *Maintenance Checklist5-2*
- *Recalibrating the Touchscreen .5-3*

MAINTENANCE CHECKLIST

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

The DLC48 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 DLC48 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 touchscreen. 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 DLC48 software. See [RECALIBRATING A TOUCHSCREEN](#).

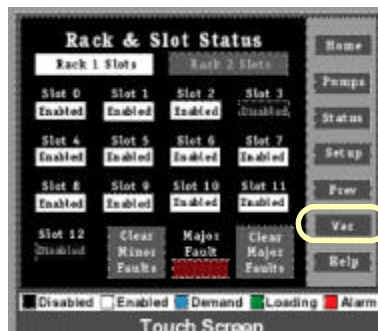
RECALIBRATING THE TOUCHSCREEN

If the operator panel becomes unresponsive to a touch on the screen, you may need to recalibrate the touchscreen. Before beginning, make sure that a standard PS/2 keyboard has been connected to the control. See [CONNECTING A KEYBOARD](#) in the Installation section.

1 Press **Setup** and enter the Level 4 security code. Press Key Pad on the Security screen to open the keypad. Enter the code for Level 4 access and press Enter to save the code.



2 Press the **Rack & Slot Status** button. The Rack and Slot Status screen displays.



3 Press **Ver** to view the version information.

4 Press **Exit** to Powerstation Shell. The DLC48 reboots into the CTC powerstation shell.



5 Press **Settings**, and then **Pwrsta**. This displays the Calibrate Touchscreen screen.

6 Press **Calibrate Touchscreen** and follow the onscreen instructions. Use the keyboard to complete the procedures.

7 Press **Back** after the calibration routine is complete. This returns you to the powerstation shell.

8 Press **Run** and then **Interact**. This restarts the DLC48 program. Wait until the DLC48 finishes initializing before continuing operation.

TROUBLESHOOTING

- *Before Beginning*6-2
- *A Few Words of Caution*6-2
- *Identifying the Cause of a Problem*6-3
- *Clearing Conveying Alarms*6-4
- *Clearing CPU and I/O Alarms* . .6-5
- *Memory Errors*6-6
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- *Network Errors*6-20
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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 DLC48 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 DLC48 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.
-

IDENTIFYING THE CAUSE OF A PROBLEM

The TROUBLESHOOTING section explains how to clear an alarm, and provides diagnostic tables to help determine the cause of the alarm.

Diagnostic tables have been divided into:

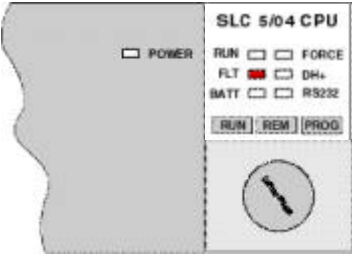
☐ Conveying System Alarms.

These tables focus on the “No Material” and “Pump Overload” alarms that the DLC48 displays on the Alarm Summary screen. The DLC48 continues to control the system, but the alarming loading station do not load until the alarm is acknowledge and the cause of the problem is fixed.



☐ Power and Processor Problems.

These tables focus on power supply, processor or rack problems indicated by LEDs located on the power supply and SLC 5/04 processor module (Slot 0) located inside the base unit. These problems cause the DLC48 control to stop.



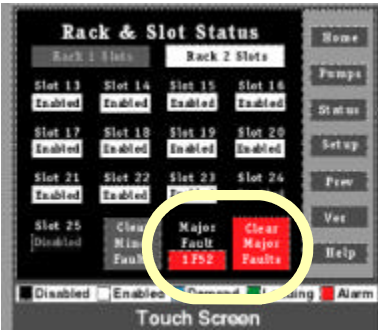
☐ CPU Faults.

These tables focus on Hex error codes that apply to the SLC 5/04 processor module (Slot 0) and are displayed as faults on the Rack & Slot screen. These problems cause the DLC48 control to stop.



☐ Input/Output Errors.

These tables focus on Hex error codes that apply to Input/Output modules (Slots 1-48) and are displayed as faults on the Rack & Slot screen. The first two digits of the code refer to the Slot number that caused the error. If the Slot cannot be determined, the first two digits are 1F. These problems cause the DLC48 control to stop.



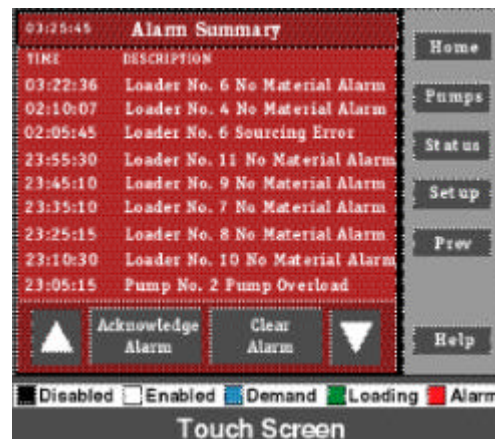
IMPORTANT: Refer to the manuals supplied by the manufacturers of loaders, pumps and material valves in your system for additional diagnostic and repair information.

Contact Conair Service for additional details on the SLC 5/04 processor or Rack & Slot components.

CLEARING CONVEYING ALARMS

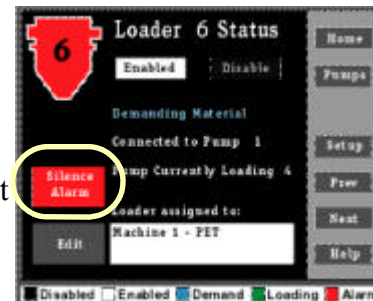
When a conveying problem occurs, the icon for the affected loader or pump flashes red and the control turns on the audible alarm.

The DLC48 reports the time and type of alarm on the Alarm Summary screen. Up to 100 No Material, Pump Overload and Sourcing Error alarms can be stored in the alarm history. To scroll through the history, touch the up or down arrows.

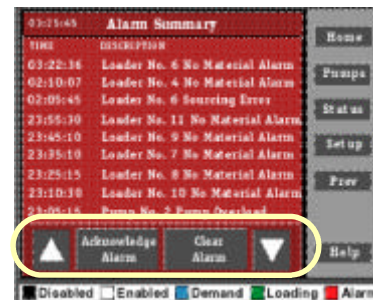


To silence the alarm and fix the problem:

- 1 Press Status or the loader icon.** This displays the Loader Status screen.
- 2 Press Silence Alarm.** When the audible alarm is not active, the control displays the See Alarms button.
- 3 Press See Alarms to view the Alarm Summary.** Note the type and time of the alarm. Use the up and down arrows to scroll through the alarm history and view other alarms that may involve this device.



- 4 To resume operation,** press Acknowledge Alarm and fix the problem. Refer to the diagnostic tables in the Troubleshooting section to determine the cause of the problem. Also refer to the troubleshooting and repair information contained in manuals supplied with the alarming device.

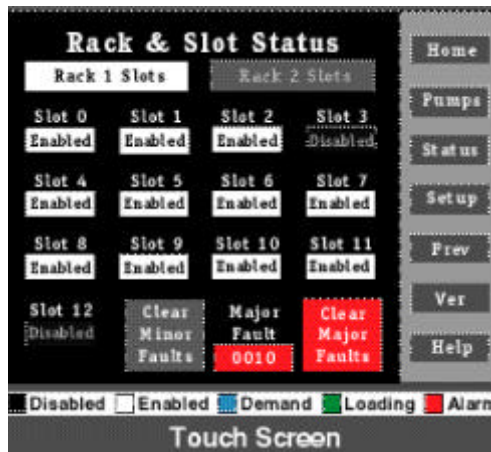


NOTE: To remove all alarms from the Alarm Summary history, press Clear Alarms. Alarms are removed from the alarm history only after the alarm has been acknowledged and the alarm condition is no longer present. The Acknowledge and Clear alarm buttons are displayed only to users with access to Security Levels 2, 3 or 4.

CPU and Input/Output alarms will stop the DLC48 control.

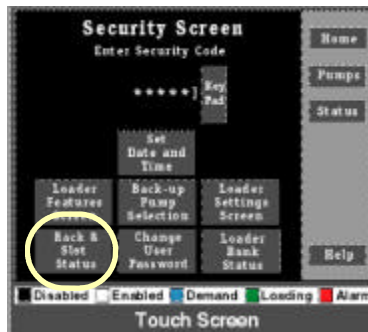
CLEARING CPU AND I/O ALARMS

These alarms may be caused by problems with the power supply, processor, power racks or Input/Output modules. The alarm will be indicated by error codes on the Rack & Slot Status screen or by LEDs on the SLC 5/04 CPU and power supply modules.



To clear and fix a CPU or I/O error:

- 1** Press **Setup** to display the Security screen.
- 2** Enter the **Level 4** security code.
- 3** Press **Rack & Slot** Status to display the Rack & Slot screen.



- 4** Look for the error code under **Major Fault**.

Review screens for both Rack 1 and Rack 2 slots by touching the appropriate keys on the screen. Note the error code. Refer to the error code table below to identify the affected slot, then see the diagnostic tables in this section. The error code is reported in hexadecimal format, with the first two digits identifying a specific I/O module slot. If the digits are 1F, an exact slot cannot be determined.

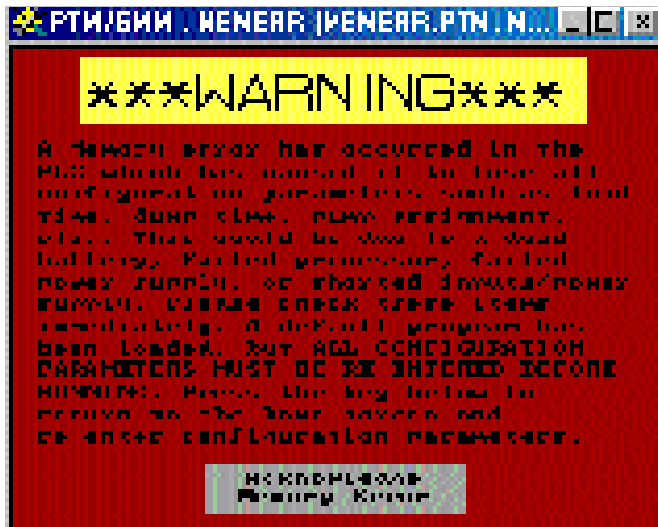
SLOTS AND HEX CODE EQUIVALENTS (xx represents first two digits of the error code)									
Slot	xx	Slot	xx	Slot	xx	Slot	xx	Slot	xx
0	00	7	07	14	0E	21	15	28	1C
1	01	8	08	15	0F	22	16	29	1D
2	02	9	09	16	10	23	17	30	1E
3	03	10	0A	17	11	24	18		
4	04	11	0B	18	12	25	19		
5	05	12	0C	19	13	26	1A		
6	06	13	0D	20	14	27	1B		

- 5** Press **Clear Major Fault** or **Clear Minor Fault** after the fault is corrected.

MEMORY ERRORS

Under certain conditions, such as low backplane power or low battery conditions, the Allen Bradley SLC line of controllers are designed to dump their main memory. This is to prevent the controller from operating with corrupted memory. The logic behind this is that it is better to dump the program and not operate at all then to operate with corrupted memory that may cycle outputs in an erratic and possibly unsafe manner. Although this may protect equipment and personnel, it will leave you with a non-functioning control.

To make the control functional as soon as possible, Conair has added a flash memory module to the control. This module contains the original program as loaded at the factory. When a memory fault occurs, this program is loaded from the flash memory module into the SLC controller's memory. This enables you to get back up and running without requiring Conair service personnel to reload the program. However, the flash memory only loads the factory default configuration. All items that are field tuned such as feature selection, load times, dump times, pump assignments, etc., must be re-entered for all of the loaders. If a memory error does occur, a warning displays:



If this screen displays, a qualified technician should check the loading control system to be certain there are no electrical problems. Press Acknowledge Memory Error to return to the configuration/operation screens. The factory default program has been loaded so all configuration parameters need to be re-entered before the loaders are enabled.

The real time clock in the programmable controller is also stopped if a memory loss occurs. The clock needs to be restarted by entering the correct time and date. See **SETTING DATE AND TIME** in the Installation section for this procedure.

MEMORY ERRORS

It is also possible to store a copy of the program with all parameters (load times, dump times, etc.) on an optional external device to enable recovery from a memory error without reloading all parameters manually. Please contact Conair Service if this option is desired.

CONVEYING SYSTEM ALARMS

The No Material Alarm can be triggered in two ways:

- The Alarm Check signaled an alarm after the operator-set number of consecutive loading attempts failed to satisfy the receiver's demand for material.
- The optional fill sensor in the receiver or hopper was not satisfied after one loading cycle.

Alarm	Possible cause	Solution
No Material alarm	There is no material at the source.	<ul style="list-style-type: none"> <input type="checkbox"/> Verify that there is enough material at the source, including regrind sources if a ratio valve is used. <input type="checkbox"/> Verify that the material line is connected to the correct source of material.
	The loader settings are incorrect.	<p>If the parameters set on the Loader Settings screen are incorrect, material demand may not be satisfied.</p> <ul style="list-style-type: none"> <input type="checkbox"/> Verify that the Load Time, or Load Time plus Purge Time, is sufficient to fill the receiver. Adjust as needed. <input type="checkbox"/> Verify that the Alarm Check allows a sufficient number of loading cycles to fill the receiver. Adjust as needed. <input type="checkbox"/> Verify that the Material Source is correctly identified when using pocket conveying or material proofing. <input type="checkbox"/> Verify that the loader is assigned to the correct pump system.
	There is a leak in the vacuum system.	<p>If there are leaks in the system, the pump cannot pull a good vacuum and the receiver may have no or little material flowing into it. Check the vacuum pump gauge. If the reading is low, check all hoses, gaskets, receiver lids, and valves for signs of damage or wear. Replace as needed.</p>

CONVEYING SYSTEM ALARMS

The No Material Alarm can be triggered in two ways:


- The Alarm Check signaled an alarm after the operator-set number of consecutive loading attempts failed to satisfy the receiver's demand for material.
- The optional fill sensor in the receiver or hopper was not satisfied after one loading cycle.

Alarm	Possible cause	Solution
No Material alarm (continued)	Is the vacuum pump working correctly?	Verify that the vacuum pump is on, connected to the DLC48 and working correctly. Refer to the pump manual.
	The fill/demand sensor or demand switch are not working properly.	<input type="checkbox"/> Verify that sensors and switches are connected correctly at the loader or hopper and at the control. <input type="checkbox"/> Verify that fill and demand sensors are set at the correct height and adjusted properly. Refer to manuals supplied with the fill or demand signaling device.
	Compressed air lines connected incorrectly.	If a compressed air line is not connected to vacuum or material valves, the valves cannot open to allow the pump to draw material into the receiver. Verify that compressed air lines supplying the correct pressure have been connected to the vacuum sequencing valve, ratio valve, pocket conveying or purge valve.
Pump Overload	The vacuum pump overload has tripped.	This alarm will prevent the pump from being energized until the overload is corrected. Refer to the pump manual to correct the problem.

PROCESSOR AND POWER PROBLEMS



WARNING: Electrical shock hazard
 Diagnosing electrical and processor problems require access to the electrical enclosure while power is on. Only qualified electrical technicians, who are trained in how to avoid voltage hazards, should perform troubleshooting procedures that require access to the DLC48 base unit while power is on.


Fault	Possible cause	Solution
	<p>No line power or improper line power voltage selection.</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Verify power line voltage and connections on the power terminals. <input type="checkbox"/> Verify proper 120/240V power supply jumper selection.
<p>Inadequate System Power</p>	<p>Power supply fuse blown.</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Check the incoming power fuse and verify that incoming power connections are correct. Replace fuse. <input type="checkbox"/> If fuse blows again, replace the power supply.
	<p>Power supply overloaded.</p>	<p>This problem can occur intermittently if the power supply is overloaded when output loading and temperature varies.</p> <ul style="list-style-type: none"> <input type="checkbox"/> Disconnect power to the power supply. Remove several output modules from the rack. Wait five minutes. Reapply power. <input type="checkbox"/> If the condition recurs, recalculate the power required by the module configuration and verify proper power supply selection.
	<p>Defective power supply.</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Recheck other probable causes. <input type="checkbox"/> Check power to the rack power supply for possible transient or shorting. <input type="checkbox"/> Replace the power supply.



WARNING: Electrical shock hazard

Diagnosing electrical and processor problems require access to the electrical enclosure while power is on. Only qualified electrical technicians, who are trained in how to avoid voltage hazards, should perform troubleshooting procedures that require access to the DLC48 base unit while power is on.

PROCESSOR AND POWER PROBLEMS

Fault	Possible cause	Solution
	<p>Improper mode selected or user program logic error.</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Verify processor mode. <input type="checkbox"/> Try Run mode entry if control is in program/test mode. <input type="checkbox"/> Check user program logic for suspend instructions if control is in suspend mode.
<p>Processor Not in Run Mode</p>	<p>Line power out of operating range.</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Check for proper 120/240V power supply jumper selection and incoming power connections. <input type="checkbox"/> Check for proper line voltage at the incoming power connections.
	<p>Power supply and/or processor is seated improperly in the rack.</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Disconnect power and remove the power supply and processor from the rack. Check connections. <input type="checkbox"/> Reinstall the power supply and processor, then apply power. <p>IMPORTANT: <i>The processor only operates in Slot 0 of Rack 1.</i></p>
	<p>Defective processor, power supply or rack.</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Try Run mode selections of processor in existing rack. <input type="checkbox"/> Place the processor in a test rack. Apply power, reconfigure and try Run mode selection. If unsuccessful, replace the processor. <input type="checkbox"/> Place the power supply in a test rack. If unsuccessful, replace power supply. If you can enter Run mode, replace the existing rack.

CPU FAULTS



WARNING: Electrical shock hazard
 Diagnosing electrical and processor problems require access to the electrical enclosure while power is on. Only qualified electrical technicians, who are trained in how to avoid voltage hazards, should perform troubleshooting procedures that require access to the DLC48 base unit while power is on.

Error Code	Possible cause	Solution
0001 - NVRAM error	<ul style="list-style-type: none"> ● Noise ● Lightning ● Improper grounding ● No surge suppression on inductive loads ● Poor power source ● Loss of battery or capacitor backup 	The problem is detected during power up. See WIRING CONSIDERATIONS in the Installation section to correct the problem. Reload the program and enter Run mode. You can use the autoload feature with a memory module to reload the program and enter Run mode automatically.
0002 - Unexpected hardware watchdog time-out	<ul style="list-style-type: none"> ● Noise ● Lightning ● Improper grounding ● No surge suppression on inductive loads ● Poor power source 	The problem is detected during power up. See WIRING CONSIDERATIONS in the Installation section to correct the problem. Reload the program and enter Run mode. You can use the autoload feature with a memory module to reload the program and enter Run mode automatically.
0003 - Memory module memory error	<p>Memory in the memory module is corrupted.</p>	Reprogram the memory module. If the error persists, replace the memory module.
0004 - Memory error occurred during the Run mode	<ul style="list-style-type: none"> ● Noise ● Lightning ● Improper grounding ● No surge suppression on inductive loads ● Poor power source 	The problem is detected during power up. See WIRING CONSIDERATIONS in the Installation section to correct the problem. Reload the program and enter Run mode. You can use the autoload feature with a memory module to reload the program and enter Run mode automatically.

**WARNING: Electrical shock hazard**

Diagnosing electrical and processor problems require access to the electrical enclosure while power is on. Only qualified electrical technicians, who are trained in how to avoid voltage hazards, should perform troubleshooting procedures that require access to the DLC48 base unit while power is on.

CPU FAULTS

Alarm	Possible cause	Solution
0010 - Processor does not meet required revision level	The program was developed for a processor with a revision level different than the revision of the installed processor.	The problem is detected as the DLC tries to enter Run mode. Contact Conair service.
0011 - Executable program file #2 is absent	Incompatible or corrupt program is present.	The problem is detected as the DLC tries to enter Run mode. Reload the program or reprogram with RS Logix 500 software.
0012 - The ladder program has a memory error	<ul style="list-style-type: none">● Noise● Lightning● Improper grounding● No surge suppression on inductive loads● Poor power source	The problem is detected as the DLC tries to enter Run mode. See WIRING CONSIDERATIONS in the Installation section to correct the problem. Reload the program and enter Run mode. You can use the auto-load feature with a memory module to reload the program and enter Run mode automatically.
0013 - Internal file error 0014 - Configuration file error	Both of these faults may be caused by: <ul style="list-style-type: none">● Noise● Lightning● Improper grounding● No surge suppression on inductive loads● Poor power source	The problem is detected as the DLC tries to enter Run mode. See WIRING CONSIDERATIONS in the Installation section to correct the problem. Reload the program and enter Run mode. You can use the auto-load feature with a memory module to reload the program and enter Run mode automatically.

CPU FAULTS



WARNING: Electrical shock hazard

Diagnosing electrical and processor problems require access to the electrical enclosure while power is on. Only qualified electrical technicians, who are trained in how to avoid voltage hazards, should perform troubleshooting procedures that require access to the DLC48 base unit while power is on.

Error Code	Possible cause	Solution
0020 - A minor error bit is set at the end of the scan.	<ul style="list-style-type: none">● A math or FRD instruction overflow has occurred.● Sequencer or shift register instruction error was detected.● A major error was detected while executing a user fault routine.● M0-M1 file addresses were referenced in the user program for a disabled slot.	<p>The problem is detected during the software run time. Correct the programming problem, reload the program and enter the Run mode.</p>
0021 - A remote power failure of an expansion I/O rack has occurred.	<p>Power was removed, or power dipped below specifications, for an expansion rack.</p>	<p>Reapply power to the expansion rack.</p> <p><i>NOTE: Voltage or current that is over specifications in any of the power supplies also can produce any of the I/O error codes listed on the following pages. The over-voltage or over-current condition also will be indicated by the power supply LED being off.</i></p>

**WARNING: Electrical shock hazard**

Diagnosing electrical and processor problems require access to the electrical enclosure while power is on. Only qualified electrical technicians, who are trained in how to avoid voltage hazards, should perform troubleshooting procedures that require access to the DLC48 base unit while power is on.

I/O ERRORS

NOTE: The “xx” in the following codes represent the I/O slot number. If the first two digits of the code are 1F, the exact slot cannot be determined.

Error Code	Possible cause	Solution
xx50 - A rack data error is detected.	<ul style="list-style-type: none">● Noise● Lightning● Improper grounding● No surge suppression on inductive loads● Poor power source	See WIRING CONSIDERATIONS in the Installation section to correct the problem. Clear the fault on the Rack & Slot screen and re-enter Run mode.
xx51 - A “stuck” runtime error is detected on an I/O module.	If this is a discrete I/O module, this is a noise problem. If this is a specialty I/O module, refer to the appropriate user manual for the probable cause.	Cycle power to the system. If this does not correct the problem, replace the module.
xx52 - A required I/O module has been detected as missing.	An I/O module that was configured and enabled for a particular slot is missing or has been removed.	Disable the slot and insert the required module.
xx53 - The DLC detected an I/O module in a slot that the user program defines as unused.	<ul style="list-style-type: none">● The I/O module has reset itself.● The I/O slot is not configured for a module that is present.	If you suspect the module has reset itself, clear the major fault and run. Otherwise: <ul style="list-style-type: none"><input type="checkbox"/> Disable the slot, remove the module, clear the fault, and run.<input type="checkbox"/> Modify the I/O configuration to include the module, then reload the program and run.

I/O ERRORS



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NOTE: The “xx” in the following codes represent the I/O slot number. If the first two digits of the code are 1F, the exact slot cannot be determined.

Error Code	Possible cause	Solution
xx54 - A module required by the user program is detected as the wrong type.	The I/O module in the specific slot is different than the type configured by the user for that slot.	<input type="checkbox"/> Replace the module with the correct module, clear the fault, and run. <input type="checkbox"/> Change the I/O configuration for the slot, reload the program, and run.
xx55 - The DLC detected the wrong I/O count for a discrete I/O module or the wrong driver for a specialty I/O module.	<ul style="list-style-type: none"> ● If this is a discrete I/O module, the I/O count is different than what was selected in the I/O configuration. ● If this is a specialty I/O module, the card driver is incorrect. 	<input type="checkbox"/> Discrete I/O module: Replace it with a module having the I/O count selected in the I/O configuration. Clear the fault, then run. <input type="checkbox"/> Specialty I/O module: Refer to the user manual for that module.
xx56 - The rack configuration is incorrect.	The rack configuration specified by the user does not match the hardware.	Check the I/O modules in the rack against the enabled and disabled slots in the Rack & Slot screen. Correct the rack configuration, reload the program and run.
xx57 - A specialty I/O module has not responded to the Lock Shared Memory command.	The specialty I/O module is not responding to the processor within the required time limit.	Cycle rack power. If this does not correct the problem, refer to the user manual for the specialty I/O module. You may have to replace the module.

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I/O ERRORS

NOTE: The “xx” in the following codes represent the I/O slot number. If the first two digits of the code are 1F, the exact slot cannot be determined.

Error Code	Possible cause	Solution
xx58 - A specialty I/O module generated a generic fault.	The card fault bit is set (1) in the module’s status byte.	Cycle power to the rack. If this does not correct the problem, refer to the user manual for the specialty I/O module. you may have to replace the module.
xx59 - A specialty I/O module has not signaled completion of a command within the time limit.	The specialty I/O module complete a command from the processor within the time allowed.	Refer to the user manual for the specialty I/O module. You may have to replace the module.
xx5A - Hardware interrupt problem.	<ul style="list-style-type: none">● If this is a discrete I/O module, this is a noise problem● If this is a specialty I/O module, refer to the user manual for the module.	<ul style="list-style-type: none"><input type="checkbox"/> Discrete I/O module: Cycle rack power. Check for a noise problem and be sure proper grounding practices are used.<input type="checkbox"/> Specialty I/O module: You may have to replace the module. Refer to the user manual for this module.
xx5E - Processor I/O driver error	The processor I/O driver software is corrupt.	Reload the program.
xx60 through xx6F	Identifies an I/O module specific recoverable error.	Refer to the user manual for the specialty I/O module.
xx70 through xx7F	Identifies an I/O module specific recoverable error.	Refer to the user manual for the specialty I/O module.
xx90 - Interrupt problem on a disabled slot	A specialty I/O module requested service while a slot was disabled.	Refer to the specialty I/O module user manual. You may have to replace the module.

I/O ERRORS



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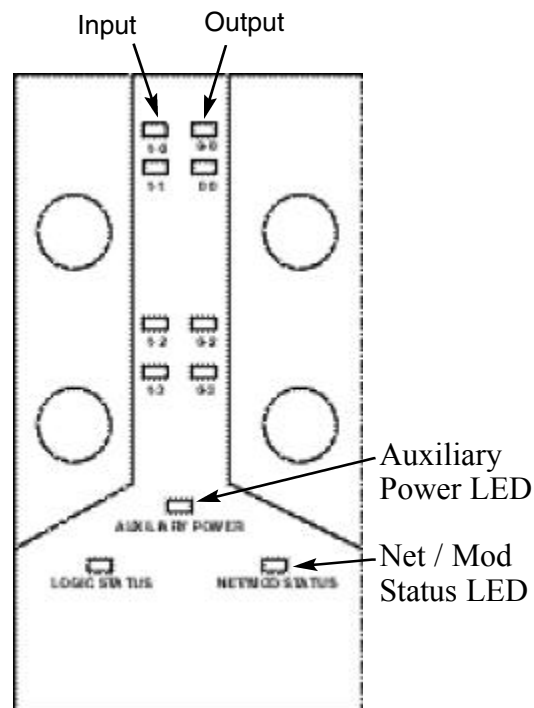
NOTE: The “xx” in the following codes represent the I/O slot number. If the first two digits of the code are 1F, the exact slot cannot be determined.

Error Code	Possible cause	Solution
xx91 - A disabled slot has faulted.	A specialty I/O module in a disabled slot has faulted.	Cycle rack power. If this does not correct the problem, refer to the user manual for the specialty I/O module. You may have to replace the module.
xx92 - Invalid or non-existent module interrupt subroutine (ISR) file.	The I/O configuration and ISR file information for the specialty I/O module is incorrect.	Refer to the user manual for the specialty I/O module for the correct ISR file information. Correct the I/O configuration/ISR file information, reload the program and run.
xx93 - Unsupported I/O module specific major error.	The processor does not recognize the error code from a specialty I/O module.	Refer to the user manual for the specialty I/O module.
xx94 - The DLC detected that a module was inserted under power in the run or test mode.	<ul style="list-style-type: none">● The module was inserted in the rack under power.● The module has reset itself.	Modules should never be inserted in a rack under power. If this occurs and the module is not damaged: <ul style="list-style-type: none"><input type="checkbox"/> Remove the module, clear the fault, and run.<input type="checkbox"/> Add the module to the I/O configuration, reference the module in the user program where required, reload the program, and run.

If one or more loaders fail to operate, start troubleshooting at the loader and work your way backward to the controls until the problem is found.

LOADER(S) FAIL TO OPERATE

The first place to check is at the ArmorBlock itself. Are the Auxiliary Power and Net/Mod Status lights solid green? Check to see if the orange LED's that display the input and output states are turning on at the correct times. If so, the problem is probably a mechanical or electrical problem at the loader itself.



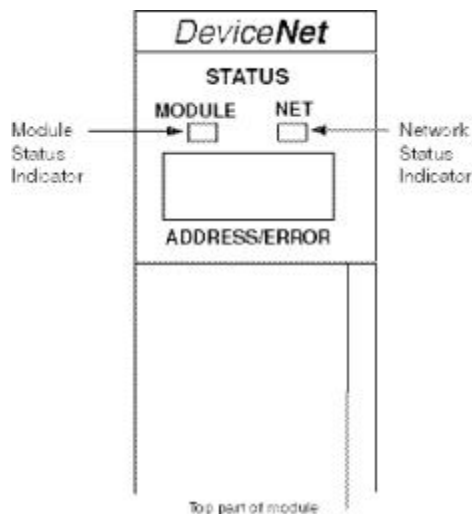
If the orange LED's are not coming on, check back at the operator interface to be sure the loader is configured and enabled correctly. If so, check the DeviceNet scanner card located inside the base unit to see if any error codes are displayed (see chart following for explanations of error codes).

NETWORK ERRORS

The ArmorBlock Interface Module is supplied with two LED diagnostic indicators and a numeric address/error display. This section identifies the the information and messages supplied by the LEDs and display.

Module Status Indicator

The bi-color (green/red) module indicator confirms that power is presently at the module and if the module is functioning correctly.



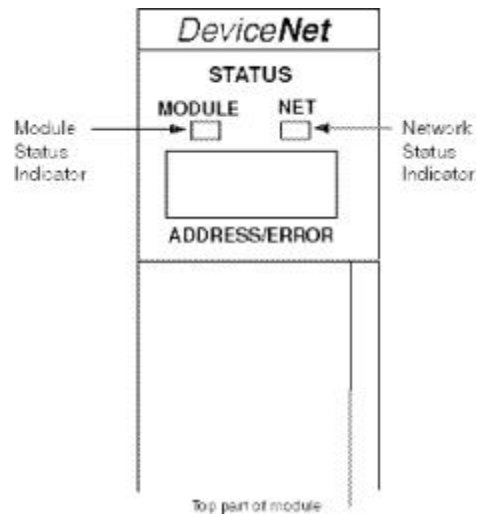
LED Status	Possible cause	Solution
Off	No power at the module.	Check the power connections and apply power to the module.
Green	The module is operating properly.	No action required.
Flashing green	The module is not configured.	Configure the module.
Flashing red	The module is not configured correctly.	Correctly reconfigure the module.
Red	The module has an unrecoverable fault.	Replace the module.

NOTE: Information for this Network Errors section was derived from the Troubleshooting chapter in Allen Bradley publication # 1747-6.5.5 - August 2000.

Network Status Indicator

The bi-color (green/red) network indicator supplies troubleshooting information about the DeviceNet channel communication link.

NETWORK ERRORS



LED Status	Cause/Indication	Solution
Off	The device has no power or the channel is disabled for communication due to bus off condition, loss of network power, or has been intentionally disabled.	Power up the module, provide network power to the channel, and insure the channel is enabled in both the module configuration table and the module command word.
Green	Indicates normal operation. All slave devices in the scan list table are communicating normally with the module.	No action required.
Flashing green	The two-digit numeric display for the channel indicates an error code that provides more information about the condition of the channel. The channel is enabled but no communication is occurring.	Configure the scan list table for the channel to add devices.

NETWORK ERRORS

Network Status Indicator (Continued)

LED Status	Cause/Indication	Solution
Flashing red	The two-digit numeric display for the channel indicates an error code that provides more information about the condition of the channel. At least one of the slave devices in the module's scan list table has failed to communicate with the module.	Examine the failed device(s) and the scan list table for accuracy.
Red	The communication channel has failed. The two-digit numeric display for the channel displays an error code that provides more information about the condition of the channel. The module may be defective.	Reset the module. If failures continue, replace the module.

Numeric Display Code Summary

The ArmorBlock Interface Module uses numeric codes to display diagnostic information. The display flashes at one second intervals.

The following table summarizes the meanings of the numeric codes.

Numeric code	Description	Solution
0 - 63	Normal operation. The numeric display indicates the interface's node address on the DeviceNet network.	None.

Numeric code	Description	Solution
70	Module failed “Duplicate Node Address” check.	Change the module channel address to another available address. The node address selected is already in use on that channel.
71	Illegal data in scan list table (node number alternately flashes).	Reconfigure the scan list table and remove any illegal data.
72	Slave device stopped communicating (node number alternately flashes).	Inspect the field devices and verify connections.
73	Device key parameters do not match scan list table entry (node number alternately flashes).	Enter a matching scan list device ID. Make sure that the device at the flashing node address matches the desired key parameters (vendor, product code, product type).
74	Data overrun on port detected.	Modify your configuration and check for invalid data.
75	No scan list is active in the module.	Enter a scan list.
76	No direct network traffic for module detected.	None. The module hears other network communication.
77	Data size returned does not match scan lists entry (node number alternately flashes).	Reconfigure your module and change the addressing.
78	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.

NETWORK ERRORS

Numeric Display Code Summary (Continued)

Numeric code	Description	Solution
79	Module has failed to transmit a message.	Make sure that your module is connected to a valid network. Check for disconnected cables. Verify baud rate.
80	Module is in IDLE mode.	None.
81	Module is in FAULT mode.	None.
82	Error detected in sequence of fragmented I/O messages from device (node number alternately flashes).	Check scan list table entry for slave device to make sure that input and output data lengths are correct. Check slave device configuration.
83	Slave device is returning error responses when module attempts to communicate with it (node number alternately flashes).	Check accuracy of scan list table entry. Check slave device configuration.
84	Module is initializing the DeviceNet channel.	None. This code clears itself once module attempts to initialize all slave devices on the channel.
85	Run time data size returned from slave device is not the size expected.	Check slave device installation and configuration.
86	Device is producing idle state data while the scanner is in Run Mode.	Check device configuration/slave node status.

Numeric code	Description	Solution
87	Available for allocation. Scanner has not yet been detected by allocated master, or slave mode is enabled but scanner is not allocated to a master.	Monitor scanner to determine if error code clears when master detects scanner. If error remains, check scanner slave mode configuration.
88	This is not an error. At power-up and reset, the module displays all 14 segments of the node address and status display LEDs.	None.
89	Auto Device Replacement (ADR) error. Slave device responded with an error to the initialization data sent to it by the scanner; or the configuration table in the scanner's flash memory is not valid for a slave node.	Try the ADR download again. If it still fails, try clearing the ADR flash by downloading an empty ADR configuration to the scanner and then try the ADR configuration again.
90	User has disabled communication port	Reconfigure your module. Check the disable bit in the Module Command Register.
91	Bus-off condition detected on comm. port. Module is detecting communication errors.	Check DeviceNet connections and physical media integrity. Check system for failed slave devices or other possible sources of network interference.
92	No network power detected on comm. port.	Provide network power. Make sure that module drop cable is providing network power to module comm port.

NETWORK ERRORS

Numeric Display Code Summary (Continued)

Numeric code	Description	Solution
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 halted by user command.	None.
98	Unrecoverable firmware failure.	Service or replace your module.
99	Unrecoverable hardware failure.	Service or replace your module.
E9	Non-volatile configuration corrupt	Cycle power to module. Download configuration to module.

ARMORBLOCK ERRORS

For detailed information on errors encountered with the ArmorBlocks, refer the the Troubleshooting section of the Alan Bradley ArmorBlock User's Manual supplied with the units.

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.

WE'RE HERE TO HELP

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.

HOW TO CONTACT CUSTOMER SERVICE

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.

BEFORE YOU CALL ...

Additional manuals and prints for your Conair equipment may be ordered through the Customer Service or Parts Departments for a nominal fee.

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.