Pro-Meter S-Series
Two-Component PCI Controller
with Integrated Temperature Conditioning

Product Manual 1095978A
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NORDSON CORPORATION • AMHERST, OHIO • USA

Contact Us

Nordson Corporation welcomes requests for information, comments, and inquiries about its products.

General information about Nordson can be found on the Internet using the following address:

www.nordson.com

Address all correspondence to:

Nordson Corporation
100 Nordson Drive
Amherst, OH 44001
Attn: Customer Service
Mail Station 81

Notice

Trademarks

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Safety

Read and follow these safety instructions. Task- and equipment-specific warnings, cautions, and instructions are included in equipment documentation where appropriate.

Make sure all equipment documentation, including these instructions, is accessible to persons operating or servicing equipment.

Qualified Personnel

Equipment owners are responsible for making sure that Nordson equipment is installed, operated, and serviced by qualified personnel. Qualified personnel are those employees or contractors who are trained to safely perform their assigned tasks. They are familiar with all relevant safety rules and regulations and are physically capable of performing their assigned tasks.

Intended Use

Use of Nordson equipment in ways other than those described in the documentation supplied with the equipment may result in injury to persons or damage to property.

Some examples of unintended use of equipment include

- using incompatible materials
- making unauthorized modifications
- removing or bypassing safety guards or interlocks
- using incompatible or damaged parts
- using unapproved auxiliary equipment
- operating equipment in excess of maximum ratings

Regulations and Approvals

Make sure all equipment is rated and approved for the environment in which it is used. Any approvals obtained for Nordson equipment will be voided if instructions for installation, operation, and service are not followed.

Personal Safety

To prevent injury follow these instructions.

- Do not operate or service equipment unless you are qualified.
- Do not operate equipment unless safety guards, doors, or covers are intact and automatic interlocks are operating properly. Do not bypass or disarm any safety devices.
- Keep clear of moving equipment. Before adjusting or servicing moving equipment, shut off the power supply and wait until the equipment comes to a complete stop. Lock out power and secure the equipment to prevent unexpected movement.
- Relieve (bleed off) hydraulic and pneumatic pressure before adjusting or servicing pressurized systems or components. Disconnect, lock out, and tag switches before servicing electrical equipment.
- While operating manual spray guns, make sure you are grounded. Wear electrically conductive gloves or a grounding strap connected to the gun handle or other true earth ground. Do not wear or carry metallic objects such as jewelry or tools.
- If you receive even a slight electrical shock, shut down all electrical or electrostatic equipment immediately. Do not restart the equipment until the problem has been identified and corrected.
- Obtain and read Material Safety Data Sheets (MSDS) for all materials used. Follow the manufacturer's instructions for safe handling and use of materials, and use recommended personal protection devices.
- Make sure the spray area is adequately ventilated.
- To prevent injury, be aware of less-obvious dangers in the workplace that often cannot be completely eliminated, such as hot surfaces, sharp edges, energized electrical circuits, and moving parts that cannot be enclosed or otherwise guarded for practical reasons.

High-Pressure Fluids

High-pressure fluids, unless they are safely contained, are extremely hazardous. Always relieve fluid pressure before adjusting or servicing high pressure equipment. A jet of high-pressure fluid can cut like a knife and cause serious bodily injury, amputation, or death. Fluids penetrating the skin can also cause toxic poisoning.

If you suffer a fluid injection injury, seek medical care immediately. If possible, provide a copy of the MSDS for the injected fluid to the health care provider. The National Spray Equipment Manufacturers Association has created a wallet card that you should carry when you are operating high-pressure spray equipment. These cards are supplied with your equipment. The following is the text of this card:

WARNING: Any injury caused by high pressure liquid can be serious. If you are injured or even suspect an injury:

- Go to an emergency room immediately.
- Tell the doctor that you suspect an injection injury.
- Show him this card
- Tell him what kind of material you were spraying

MEDICAL ALERT—WOUNDS:
NOTE TO PHYSICIAN

Injection in the skin is a serious traumatic injury. It is important to treat the injury surgically as soon as possible. Do not delay treatment to research toxicity. Toxicity is a concern with some exotic coatings injected directly into the bloodstream.

Consultation with a plastic surgeon or a reconstructive hand surgeon may be advisable.

The seriousness of the wound depends on where the injury is on the body, whether the substance hit something on its way in and deflected causing more damage, and many other variables including skin microflora residing in the paint or gun which are blasted into the wound. If the injected paint contains acrylic latex and titanium dioxide that damage the tissue's resistance to infection, bacterial growth will flourish. The treatment that doctors recommend for an injection injury to the hand includes immediate decompression of the closed vascular compartments of the hand to release the underlying tissue distended by the injected paint, judicious wound debridement, and immediate antibiotic treatment.

Fire Safety

To avoid a fire or explosion, follow these instructions.

- Ground all conductive equipment. Use only grounded air and fluid hoses. Check equipment and workpiece grounding devices regularly. Resistance to ground must not exceed one megohm.
- Shut down all equipment immediately if you notice static sparking or arcing. Do not restart the equipment until the cause has been identified and corrected.
- Do not smoke, weld, grind, or use open flames where flammable materials are being used or stored.
- Do not heat materials to temperatures above those recommended by the manufacturer. Make sure heat monitoring and limiting devices are working properly.
- Provide adequate ventilation to prevent dangerous concentrations of volatile particles or vapors. Refer to local codes or your material MSDS for guidance.
- Do not disconnect live electrical circuits when working with flammable materials. Shut off power at a disconnect switch first to prevent sparking.
- Know where emergency stop buttons, shutoff valves, and fire extinguishers are located. If a fire starts in a spray booth, immediately shut off the spray system and exhaust fans.
- Shut off electrostatic power and ground the charging system before adjusting, cleaning, or repairing electrostatic equipment.
- Clean, maintain, test, and repair equipment according to the instructions in your equipment documentation.
- Use only replacement parts that are designed for use with original equipment. Contact your Nordson representative for parts information and advice.

Halogenated Hydrocarbon Solvent Hazards

Do not use halogenated hydrocarbon solvents in a pressurized system that contains aluminum components. Under pressure, these solvents can react with aluminum and explode, causing injury, death, or property damage. Halogenated hydrocarbon solvents contain one or more of the following elements:

Element	Symbol	Prefix
Fluorine	F	“Fluoro-“
Chlorine	Cl	“Chloro-“
Bromine	Br	“Bromo-“
Iodine	I	“Iodo-“

Check your material MSDS or contact your material supplier for more information. If you must use halogenated hydrocarbon solvents, contact your Nordson representative for information about compatible Nordson components.

Action in the Event of a Malfunction

If a system or any equipment in a system malfunctions, shut off the system immediately and perform the following steps:

- Disconnect and lock out system electrical power. Close hydraulic and pneumatic shutoff valves and relieve pressures.
- Identify the reason for the malfunction and correct it before restarting the system.
- If necessary, contact your Nordson service technician for assistance.

Disposal

Dispose of equipment and materials used in operation and servicing according to local codes.

Description

See Figure 1. The Pro-Meter S-Series PCI controller uses signals from a robot or cell controller to control the material dispensing rate. A constant bead size can be maintained by adjusting the material dispensing rate for changes in robot speed.

The PCI controller also

- displays recovery procedures if faults are detected.
- communicates faults to the robot controller.
- stores SPC and fault data.
- heats, cools, and circulates conditioned water through the material supply system to maintain constant material temperature

Specifications

Input Power: TYP 500 V, 3 Ø, , 60 Hz, 10 A

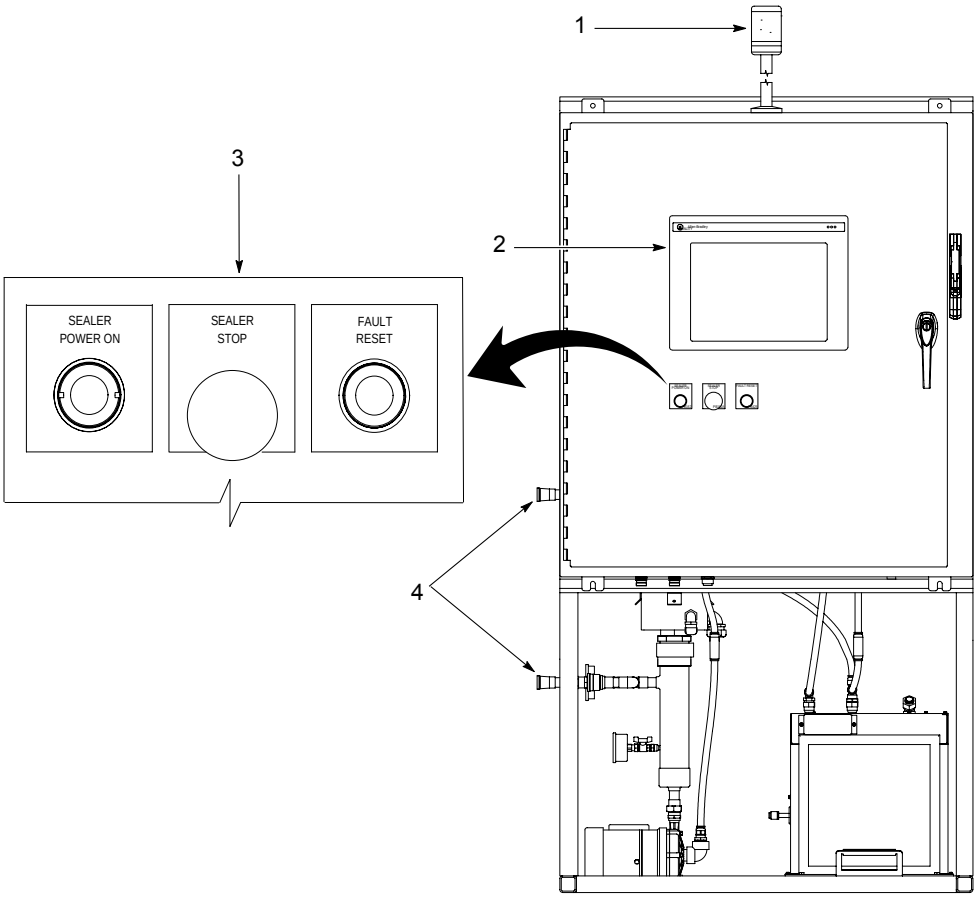


Figure 1 Typical PCI Pro-Meter S-Series Controller

Item	Description
1	Alarm Tower-Alerts the operator that a fault condition exists within the system.
2	Touch Screen-Operator interface for the system. Refer to the *Operator Interface* section for more data.
3	Operator Controls: SEALER POWER ON-Enables main power to the controller SEALER STOP-Disables power to the controller FAULT RESET-Resets fault conditions including the servo drive; Note: Some faults are self-resetting.
4	Hose connections for conditioning water-1/2-in. JIC fittings

Theory of Operation

The robot or cell controller sends a 0 to 10 volt DC analog signal that is proportional to the speed of the robot. The voltage can be a 12-bit word in DeviceNet I/O systems, or a single-ended voltage in discrete I/O systems. The voltage controls the speed of the servomotor. The servomotor controls the material flow rate to ensure that a uniform material bead is applied to a part during the dispense process.

Material dispense rates can be changed by using the Bead Size feature. The Bead Size feature controls the percentage of the robot analog signal to the servomotor. It also eliminates the need to change the robot program due to changes in the material dispense rates. Increasing the bead size value increases the material dispense rate. Decreasing the bead size value decreases the material dispense rate.

NOTE:
A different bead size can be entered for each Part ID. A Global bead size can be entered if the bead size applies to all Part IDs.

Alarms

The PCI controller alerts the operator when a fault occurs by lighting the alarm tower. The status screen will also flash the graphic of the faulted system component, allowing the user to quickly access help information for the fault by simply touching the flashing icon. The fault help screen provides a description of the fault, the corrective action needed, and how to contact Nordson Corporation for assistance. A fault log screen displays a list of the most recent faults.

Temperature Conditioning

The temperature conditioning system in the PCI controller maintains temperature based on feedback from an RTD in the material stream, typically in a coaxial material hose.

Temperature is maintained by heating or chilling the water that is circulated throughout the system through coaxial material supply hoses, insulated jackets with tracer tubing, and the CP Gun water manifold.

Temperature setpoint and out-of-range limit are user adjustable. If the process temperature goes outside of this limit, a fault is posted, along with on-screen help information for use in troubleshooting.

The heating element features an over-temperature thermostat that will disable power to the heater if the temperature of the water exceeds a factory-set limit.

Water Requirements for Temperature Conditioning

The temperature conditioning section is constructed of the following materials. Always refer to this list if different water, corrosion inhibitors or biocides other than those listed in the following sections are used.

Black Iron Pipe	Stainless Steel	Nylon
Brass	PVC Plastic	Copper
Buna Rubber	Aluminum	Polyurethane
Steel	Viton	PTFE

Water Types

Refer to Table 1. To minimize the introduction of contaminants that may degrade system components, review these guidelines before selecting the type of water to use.

NOTE:
Water types are listed in order of preference.

Corrosion Levels

To maintain proper performance, minimum levels of corrosion to aluminum and copper must be maintained. To maintain safe operation keep the corrosion levels of

- aluminum at or below 3 mil/year (0.003 in./yr).
- copper at or below 1 mil/year (0.001 in./yr).

When adding water to the system, corrosion inhibitor must be added. CorrShield MD405 corrosion inhibitor is shipped with temperature–conditioned systems. This is a Molybdate–based corrosion inhibitor that contains an Azole additive to protect copper and is used in the concentration of 1.5 ounces per gallon of water to maintain a concentration of 250-350 ppm.

Ford Tox number for CorrShield MD 405: 149163

GM FID number for CorrShield MD 405: 225484

Refer to the *Parts* section to order CorrShield MD 405.

Biocide Water Treatment

Do not use the following Biocides:

- oxidizers, such as chlorine, bromine, hydrogen peroxide, iodine, ozone, etc.
- cationic, or positively charged biocides.

Biocides for use with CorrShield MD405 are BetzDearborn Spectrus NX114. The recommended concentration of Spectrus NX114 is 150-PPM which is 0.017 oz./gal (0.5 ml/gal).

Ford Tox Number for Spectrus NX114: 148270

Table 1 Water Types

Water	Description
1. Distilled	No minerals and chemicals Lacks the nutrients necessary to support biological growth and the minerals that wear away at system components Neutral nature reduces interaction with additives used to protect the system **NOTE** Distilled water is the best choice for use in the temperature conditioning section.
2. Well	Contains an abundance of minerals that can support plant and animal life Contains minerals like calcium and iron that are abrasive; accelerates wear and tear on components **NOTE** If well water is the only option available, it must be softened to reduce the mineral content.
3. City	Contains chlorine that can degrade all metals including stainless steel Hard on most non-metals Usually contains an abundance of minerals that are capable of supporting plant and animal life; accelerates wear on components
4. Weld (Tower)	Often heavily treated both for bacterial suppression and to make it more compatible with the welding and cooling tower processes Treatment process usually involves some aggressive chemicals that can degrade metals, plastics and other materials Usually contains an abundance of metals and other contaminants picked up from the welding and cooling tower processes that can interfere with the components of the temperature control system
5. DI	**CAUTION** Do not use DI water in this system. DI water draws free electrons from metal to normalize ion levels. This process causes degradation of metals.

Installation

WARNING

Allow only qualified personnel to perform the following tasks. Follow the safety instructions in this document and all other related documentation.

The robot controller contains electrical potentials that can be fatal. Disconnect and lock out electrical power before making connections.

Read and understand this entire section along with the *Operation* section before performing installation procedures. Contact a Nordson representative regarding these procedures if necessary.

Unpack the PCI Controller

1. Unpack the PCI controller and inspect it for dents, scratches, corrosion, or other physical damage. If there is any visible damage, call a local Nordson Corporation representative immediately.
2. Install the controller as close to the robot controller as possible.

Guidelines

Review the following guidelines:

Hard-wire the controller to a dedicated power supply to provide safe operation and reduce interference from electrical noise.

Install all electrical connections to local code.

Install a locking disconnect switch or breaker in the service line ahead of any electrical equipment.

Electrical, fluid, and air connections are dependent upon application requirements. Use the System Layout and Interconnect drawings provided with the system documentation for all connections.

Make sure that there is enough slack in all hose and cable routings to allow for proper system operation.

Follow the DeviceNet specifications regarding cable type and lengths, and terminations when installing network components.

Schematics and Wiring Diagrams

See the system documentation for the schematics and wiring diagrams that are specific to your system.

Controller	Schematic
1094371 Controller, PCI, Pro-Meter S2K, Dual-Drive	1094372

Configure the Robot Controller

Use the following information to configure the flow rate analog signal from the robot or cell controller.

Flow Rate Analog Setup: Speed Proportional

NOTE:
The analog signal is typically referred to as *tool speed*.

See Figure 2. Configure the robot controller to vary the analog signal from 0 to 10 Vdc over the full range of robot speed.

1. Determine the highest and lowest robot speeds to be used in production.
2. Configure the robot controller to output an analog #1 signal of +10 Vdc when the robot is moving at, or slightly above maximum speed.
3. Configure the robot controller to output the analog #1 signal of 0 Vdc when the robot is stationary.

NOTE:
Figure 2 represents an example of the approximate relationship between robot speed and analog #1 voltage as a guide for the operator. A robot speed of 80% corresponds to 8 Vdc. A robot speed of 40% corresponds to 4 Vdc.

Flow Rate Analog Setup: Fixed or Point-to-Point

If the path to be programmed does not have complex motion, sharp corners, or variations in speed, select a fixed value for the analog signal to simplify robot programming.

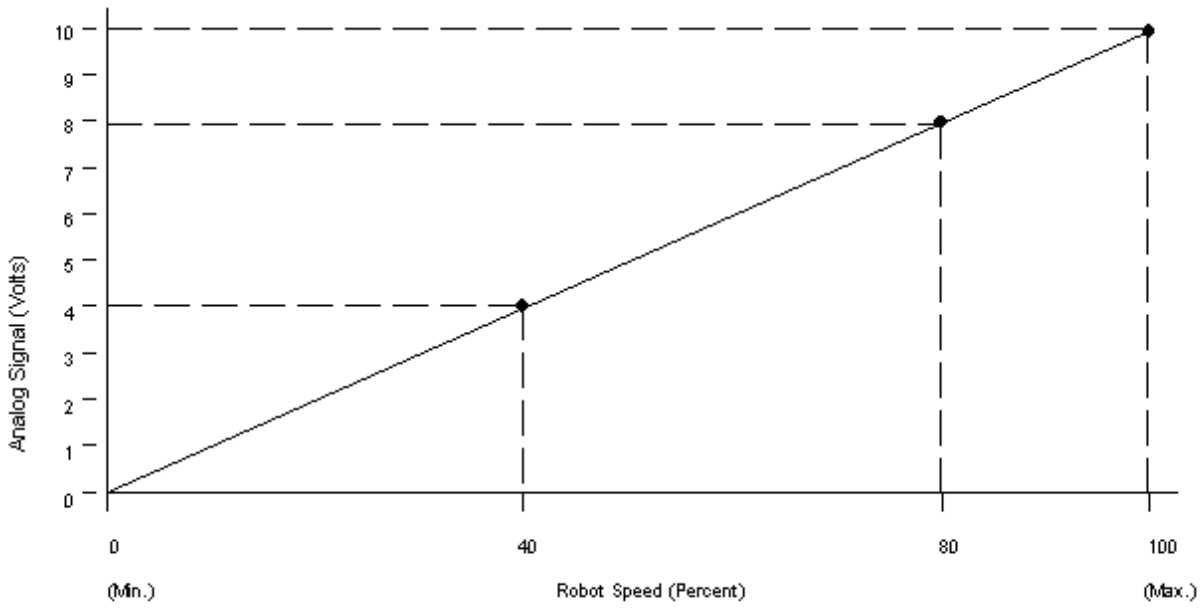


Figure 2 Relationship Between Analog Signal and Robot Speed

Configure the Robot Communication

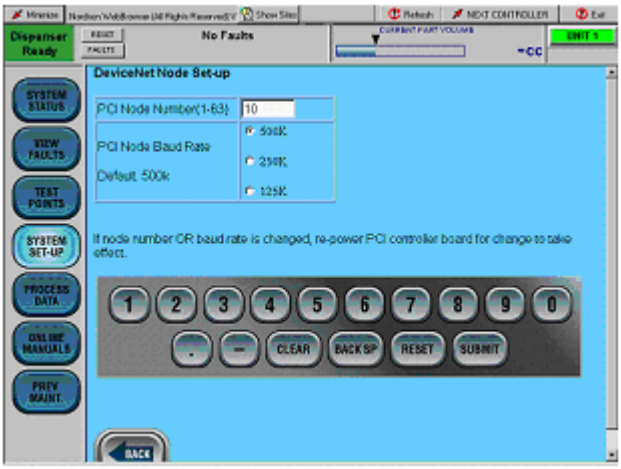
The following paragraphs provide procedures for configuring the robot communication.

DeviceNet Configuration

NOTE:

- If changes are made to the node number or baud rate, cycle the power to the controller board for the changes to take effect.
- Set the address and baud rate of both units for a PCI dual-controller.
- The PCI controller produces and consumes 8-bytes of data. Refer to the EDS file for the controller and the I/O bitmap for this system or contact the Nordson Automotive Engineering group for details.
- The PCI controller should typically be the last device started when the network is powered-up.

1. Touch **SYSTEM SETUP**.
2. Touch the Nordson oval to access the hidden service menu.
3. Enter password 1111 in the password field.
4. Touch **DEVICENET NODE**. The DeviceNet Node Set-up screen appears.
5. Use the keypad to enter the DeviceNet node address and baud rate. Make sure to set the address and baud rate for both units of a dual controller.
6. Touch **SUBMIT** to save the changes.
7. Cycle power to the controller for the changes to take effect.



DeviceNet Node Set-up Screen

Set I/O Sequencing

Refer to Table 3 and see Figure 3 for a description of the required signal sequence.

Table 3 Sealer Signal Sequence

Sequence	Description
1	Robot checks for Dispenser Ready input.
2	Robot raises Robot In Process output.
3	Robot raises desired Part ID output bits for part to be dispensed.
4	Robot pulses Style Strobe output >100 mS; meter starts pre-pressurizing motion.
5	Robot waits for Meter Pre-pressurized input.
6	Part ID bits can drop at this time.
7	Robot sends analog flow voltage and raises Gun On output for each bead as required to apply desired volume.
8	At end of part, robot raises Dispense Complete output.
9	Within 200 mS after the Dispense Complete output, robot checks for presence of Volume OK input to verify part volume was within the acceptable limits.
10	Robot drops Dispense Complete output.
11	Robot drops Robot In Process output.

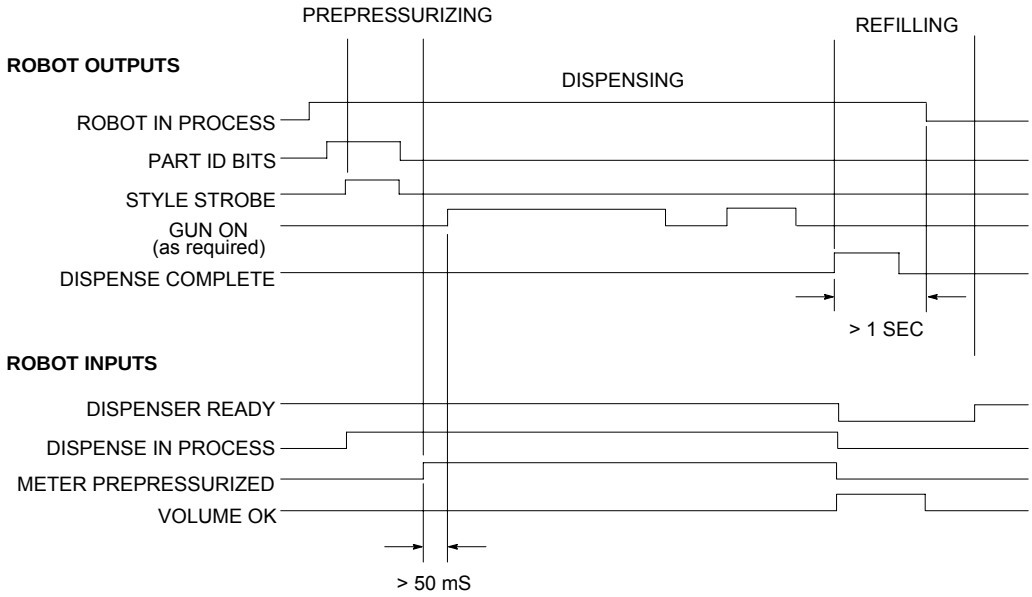


Figure 3 Signal Sequence

I/O Signal Descriptions

Refer to the following tables for the IO signal descriptions.

Input Signals

Signal	Description
Part ID bits 1-8	These 8 bits define the Part Style to be dispensed. Up to 256 individual parts can be defined in terms of bead size, target volume setpoint, and prepressure setpoint. These bits must be HIGH at the rise of the Part Strobe input in order to be recognized. If none of the bits are HIGH at the rise of the strobe input, part ID ZERO is used. The bits can be dropped any time after the strobe is raised without affecting the active value of the part cycle.
Robot In Process	This input is Dispense Enable signal. When it is LOW, the dispense controller ignores all other inputs, resulting in no dispensing. If this input is dropped during the dispensing cycle, the part will be aborted. Any volume that has been dispensed is cleared from the volume total and faults regarding volume target error will not be posted. The meter refills when this signal is dropped to abort a part.
Part Strobe	This input must pulse at least 50 mS in duration. The robot holds this input HIGH until it receives the Dispense In Process signal from the PCI controller at which time the Part Strobe is dropped. The rise of this input causes the meter to pressurize in preparation for the dispense cycle.
Gun On	When this input is HIGH, the outlet valve opens and the meter moves forward to dispense material at a rate determined by the analog voltage from the robot and the selected bead size.
Dispense Complete	This input is a pulse at least 50 mS in duration that must be sent after the last GUN ON input for the part cycle is dropped. It calculates the volume total and compares it against the target volume setpoint. This input also refills the meter if it is set to Refill After Every Part. If the meter is set to Refill After Setpoint Is Reached, this input causes the part's volume to be added to a running total, and will not cause a refill until the total has exceeded the value entered for Refill Setpoint.
Fault Reset	The rising edge of this pulse input resets any faults that are not Self-Clearing.
Remote Start	This input should be a pulse of at least 500 mS in duration. It causes the material supply pump to pressurize and energizes the contactor of the temperature control system. This prepares the system production without having an operator at the controller.
Purge	This input causes the meter to be purged at a rate set in the Service Menu screen named Meter Setup. The meter purges when this input is held HIGH, or until the Extend Prox switch is reached. The meter refills when this input is dropped.

Output Signals

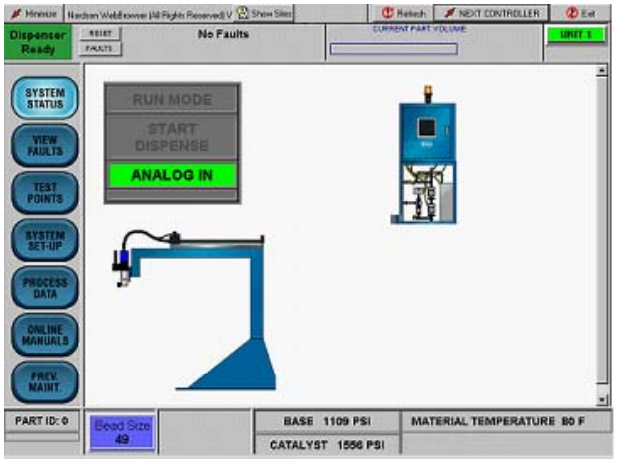
Signal	Description
Dispenser Ready	This output indicates that the PCI controller is ready to dispense and that no faults are present that will affect the performance of the system. Individual faults that are set to Major can cause this output to be held LOW. Program the robot to check for this output to be HIGH before attempting to run a part cycle.
Dispense In Process	This output goes HIGH when the controller receives a Part Strobe input and is an indication that the controller is in the process of totalizing volume. It is typically used as a confirmation signal to the robot to indicate that the program may continue.
Auto Mode	This output is HIGH until the operator places the controller in the Manual mode. The robot can use this output as a confirmation that dispensing can be performed. When the controller is in the Manual mode, Dispenser Ready is forced to LOW.
Meter Prepressurized	This output goes HIGH when the servomotor moves far enough forward to pressurize the meter to the value programmed in Service Menu on the Prepressure Setpoints screen. This pressure setpoint can be set to different values for each Part ID and is helpful in assuring that the start of the material bead is correct. Program the robot to wait for this output to go HIGH before the first Gun On input is raised.
Volume OK	This output is raised at the end of a part cycle if the volume dispensed is within the MAJOR HIGH/LOW percentages of the Target Volume set on the Meter Faults menu. Use this output to determine if a part is acceptable for processing or if it should be rejected.
Major Fault	This output is raised when a fault defined as a major fault has been detected. Major faults will cause Dispenser Ready to be forced LOW.
Minor Fault	This output is raised when a fault defined as a minor fault has been detected. Minor faults do not affect the Dispenser Ready output.
Remote Start In Progress	This output goes HIGH when the controller receives a Remote Start input pulse. The output remains HIGH until all the conditions are met to restore Dispenser Ready such as the pump stand pressurized and the temperature zones within their defined setpoint limits.

Load Material into the System

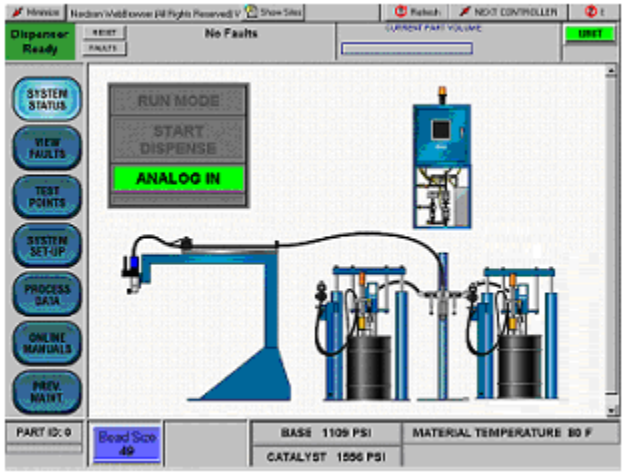
Enable the Pump Stand

The pump stand must be enabled before the PCI controller can operate it. Perform the following to enable the pump stand:

1. Touch **SYSTEM SETUP**.
2. Touch the Nordson oval to access the hidden service menu.
3. Enter password 1111 in the password field.
4. Touch **FAULT SETUP.**
5. Set the **PUMP STAND** option to **ENABLED**. Touch **SUBMIT** to save changes. The pump stand appears on the Main Status screen.



Pumps Disabled Screen

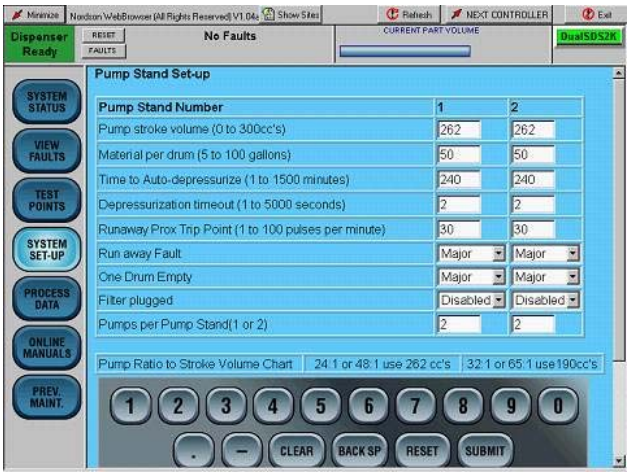


Pumps Enabled Screen

6. Touch **PUMP STAND** to configure the pump faults and the timeout values for automatic depressurization. This feature allows the system to automatically depressurize at a preset time after the last dispense cycle.

NOTE:

Pump Stand Number 1 is the Base material pump. **Pump Stand Number 2** is the catalyst Material pump.

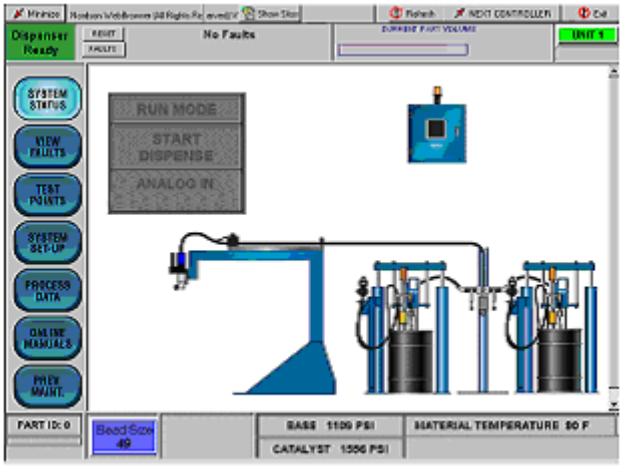


Pump Stand Setup Screen

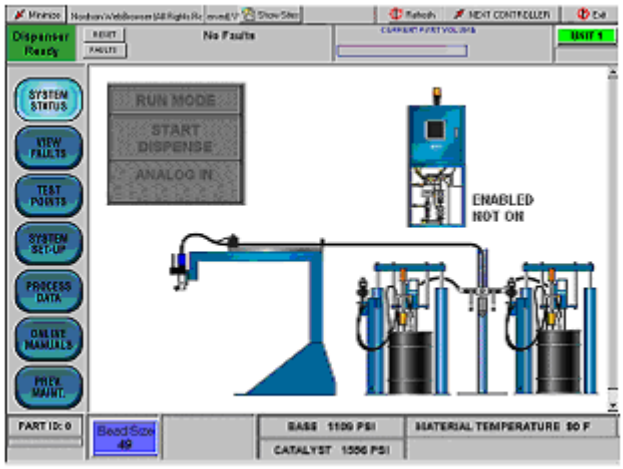
Enable Temperature Control

The temperature control must be enabled before the PCI controller can operate it. Perform the following to enable the temperature control:

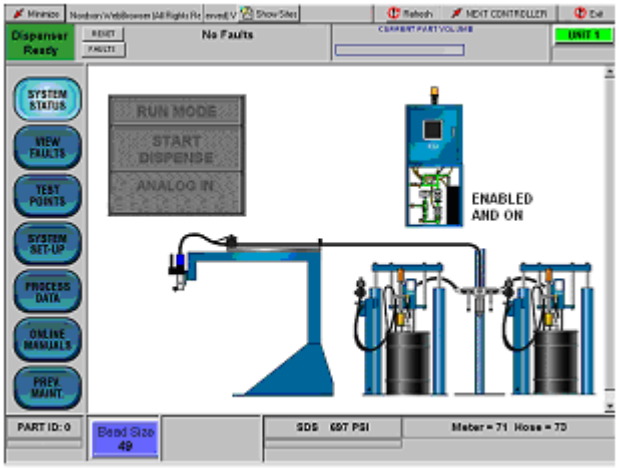
1. Touch **SYSTEM SETUP**.
2. Touch the Nordson oval to access the hidden service menu.
3. Enter password 1111 in the password field.
4. Touch **FAULT SETUP.**
5. Set the **TEMPERATURE** option to **ENABLED**. Touch **SUBMIT** to save the changes.



Temperature Control Disabled Screen



Temperature Control Enabled But Not On Screen



Temperature Control Enabled And On Screen

Temperature Conditioning Unit Setup

CAUTION

Do not use DI water in this system. To prevent damage to the system, refer to the Water Treatment section for information on the types of water to use.

CorrShield MD405 corrosion inhibitor must be added to the water to minimize corrosion of system components.

Perform the following to setup the the temperature conditioning unit (TCU).

1. See Figure 4. Open the cover (1) on the water reservoir (2).
2. Mix 1.5 oz of Corrshield MD405 with a gallon of water. Pour this mixture into the reservoir (2).
3. Install the cover (1) onto the reservoir (2).
4. Turn on the power to the PCI controller to boot up the system.
5. Press the SEALER POWER ON switch located on the PCI controller cabinet door to apply auxiliary power to the system.
6. From the main screen, touch either the TCU icon or **SYSTEM SET-UP**.
7. Touch **TEMPERATURE STATUS**.
8. Touch **TEMP COND ON** to start the TCU and the water circulation loop.

NOTE:

The automated system can also start the TCU by pulsing the REMOTE START input.

9. Check the water pressure gauge (3) to ensure that the operating pressure is between 24-30 psi (1.6-2 bar). If the pressure is below 20 psi or above 30 psi, perform the *Purge Trapped Air in the TCU Water Circuit* procedure.
10. The TCU is ready for use.

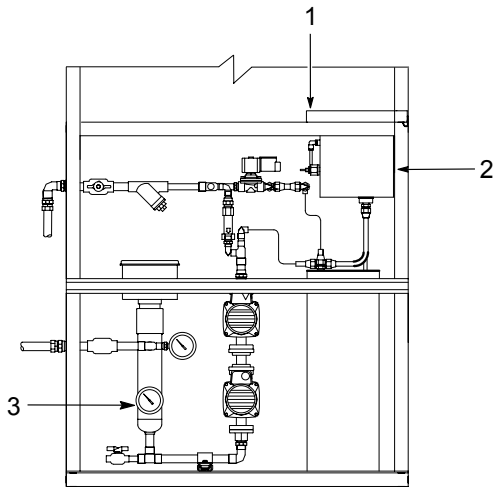
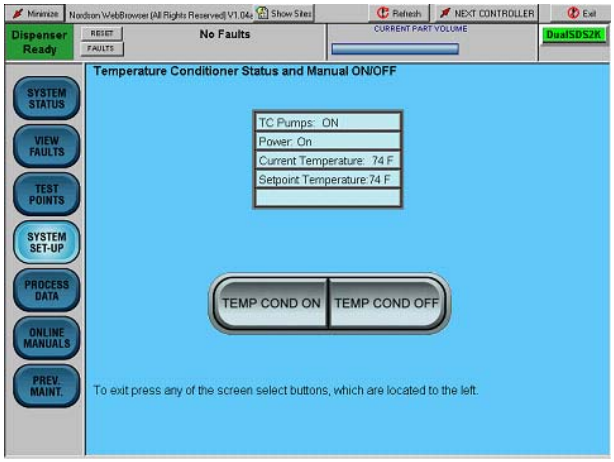


Figure 4 Filling the TCU Reservoir



Temperature Condition Status Screen

Purge Trapped Air in the TCU Water Circuit

1. Touch **TEMP COND OFF** to stop the TCU.
2. See Figure 5. Close the From Process return line valve (2).
3. Open the reservoir cover (4).
4. Disconnect the hose (3) and insert it into the reservoir (4).
5. From the **SYSTEM SETUP** screen, touch **TEMPERATURE SETPOINT**
6. Enter a setpoint that is less than the current temperature to force the system to open the cooling solenoid valve. Touch **SUBMIT** to save the changes.
7. Touch **TEMP COND ON** to start the TCU. When a steady stream of water starts to flow from the hose, touch **TEMP COND OFF** to stop the TCU.

   NOTE:
   If an airlock exists in the TCU pumps, it may be necessary to toggle between **TEMP COND ON** and **TEMP COND OFF** several times to purge air from the system and obtain a steady stream of water.

   If the pressure is above the normal range, check the water circuit for pinched lines or a closed valve.
8. Connect the hose (3). Open the From Process valve (2).
9. Touch **TEMP COND ON** to start the TCU and the water circulation loop.
10. Access the **TEMPERATURE SETPOINTS** screen and adjust the temperature setpoint to the desired value.

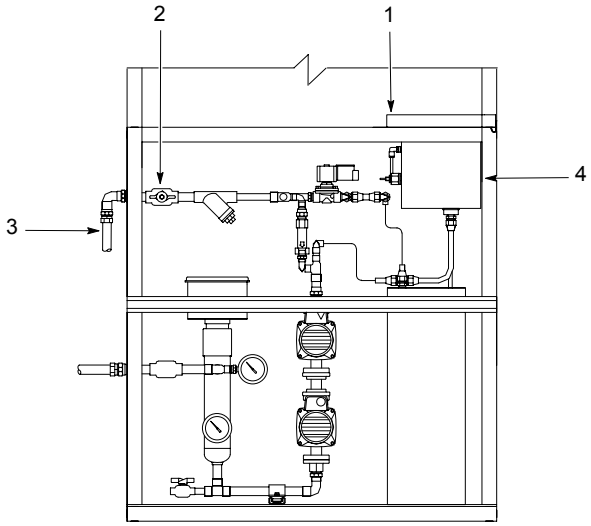
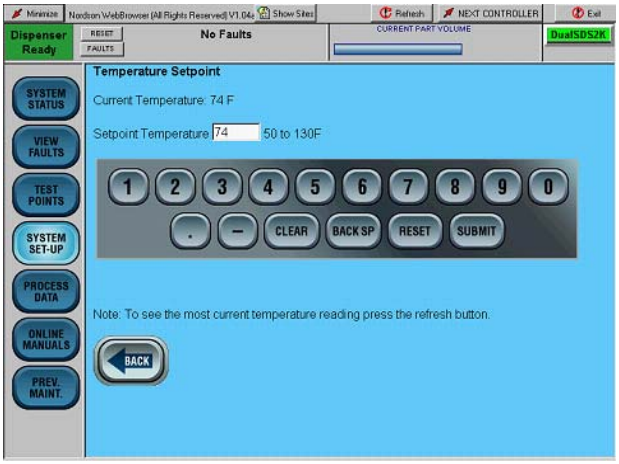


Figure 5 Purging Trapped Air From the TCU Water Circuit



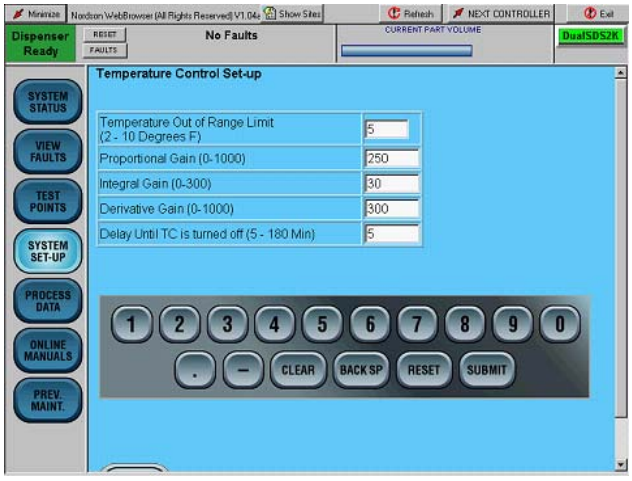
Temperature Setpoint Screen

Temperature Control Setup

Use the Temperature Control Setup screen to adjust the temperature control loop gains and out of range limits for each control zone. A delay parameter can be set to turn off the temperature control after the pump stand depressurizes. To prevent material curing, this feature automatically stops the system from heating the hose and the meter.

Perform the following:

1. From the **FAULT SETUP** screen, touch **TEMPERATURE**. The **Temperature Control Setup** Screen appears.
2. Adjust the desired parameters using the keypad. Touch **SUBMIT** to save the changes.



Temperature Control Setup Screen

Fill the Material Circuit

WARNING

Make sure that that all material hose connections are tight before pressurizing the system.

1. Load a material drum into the bulk unloader(s).

NOTE:

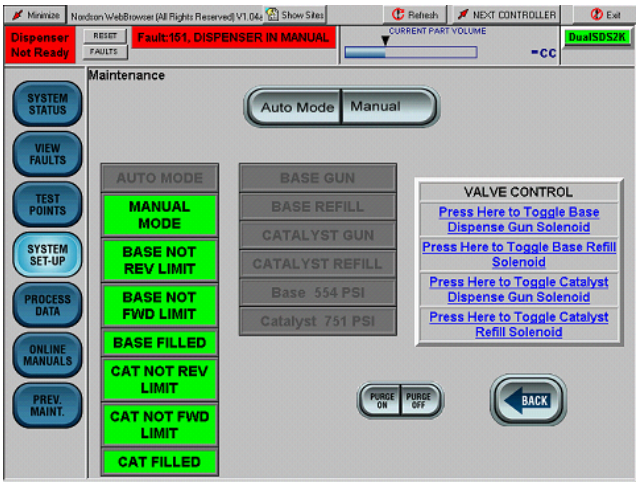
- Operation of this system only requires enough material pressure to move the piston back during meter refilling.
- Use low air motor pressure to avoid rapid stroking as air is bled through the system.

2. If installed, remove the mixer tube from the two-component dispense gun to avoid risk of material flowing backward through the gun.
3. Pressurize the pump stand by touching either the changeover stand icon between the two unloaders or **SYSTEM SETUP**.
4. Touch **PUMP STAND** to access the pump control screen. Touch **PRESSURIZE**.
5. Touch **SYSTEM SETUP**.
6. Touch the Nordson oval to access the hidden service menu. Enter password 1111 in the password field.
7. Touch **SERVO 2K MAINTENANCE**. The **Servo 2K Maintenance** screen appears.
8. Touch **MANUAL** to enable control of the dispense system from this screen.
9. Place a container below the dispense gun to catch material.
10. Touch the links in the **VALVE CONTROL** box to open the base dispense gun and base refill solenoid valves.

NOTE:
In the next step, close the base solenoid refill valve first to prevent trapping pressure in the meter.

11. When a steady stream of material starts to flow from the dispense gun, touch the links to close the valves.
12. Repeat steps 3 through 11 for the catalyst side of the system.

NOTE:
The valves close when **Auto Mode** is touched to prevent the risk of dispensing off-ratio material.



Servo 2K Maintenance Screen

Setup Parameters

NOTE:

Most of the critical setup parameters in this section are configured prior to shipment. The information on enabling/disabling pump and temperature control is provided only for reference and should not be needed during a typical installation.

Servo 2K Meter Setup

Perform the following to setup the Servo 2K Meter

1. Touch **SYSTEM SETUP**.
2. Touch the Nordson oval to access the hidden service menu.
3. Enter password 1111 in the password field.
4. Touch **SERVO 2K SETUP**.

Refill After Every Part/Set-point is reached

This option extends the life of the meter seals by using more piston stroke instead of refilling the meter after every low-volume part cycle. It is used along with the Base Refill Setpoint and Catalyst Refill Setpoint parameters.

NOTE:

Carefully select and enter values to avoid the risk of not having enough material left in the meter to complete the next part cycle.

High Pressure Limit

If the meters exceed the pressure value set in this field, they stop and major fault appears on the screen. The servo drives provide overpressure protection by using current limiting.

Purge Speed

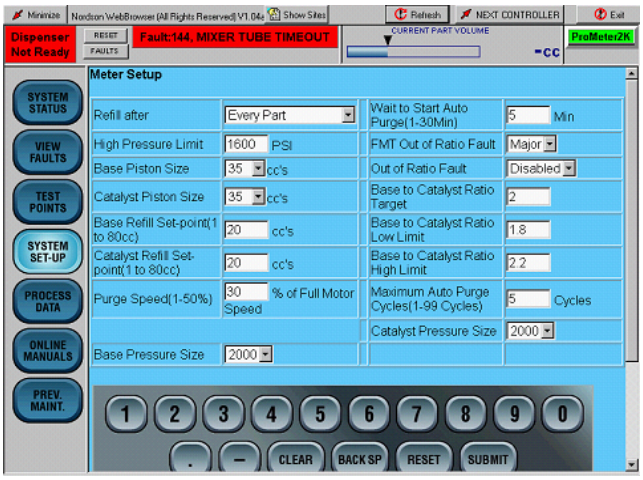
This value is a percentage of maximum motor speed. It sets the speed of the servo motors when the Purge input is raised or by touching **PURGE ON** on the **Maintenance** screen.

Base Piston Size/Catalyst Piston Size

This field is set during installation. It must match the meters in use to avoid errors in ratio and volume reporting.

Base Pressure Size/Catalyst Pressure Size

Use this field to set the range of the pressure transducer input. Make sure that it matches the transducers in use.



Servo 2K Fault Setup Screen

Wait to Start Auto Purge

If the time set in this field expires after a material dispense cycle, the PCI controller executes an automatic purge to prevent material from curing in the mixer tube.

NOTE:

The controller must be in **AUTO MODE** and the **OVER PURGE BUCKET** input must be High for the controller to execute an automatic purge.

Take into account the material characteristics relative to open time and the application temperature when selecting a value.

FMT Out of Ratio Fault

Use this field to enable/disable faults from the optional Ferro-Magnetic Tagging system.

Out Of Ratio Fault

When enabled, this major fault appears on the screen if the ratio of dispensed base volume to dispensed catalyst volume is outside the range set by the following three parameters.

Base to Catalyst Ratio Target

This field sets the ratio of material dispensed by controlling the analog voltages that control the speed of the two servo drives.

NOTE:

When the target value is changed, cycle power to the controller board for the change to take effect.

Base to Catalyst Ratio Low Limit/High Limit

These two fields set the range of the acceptable ratio.

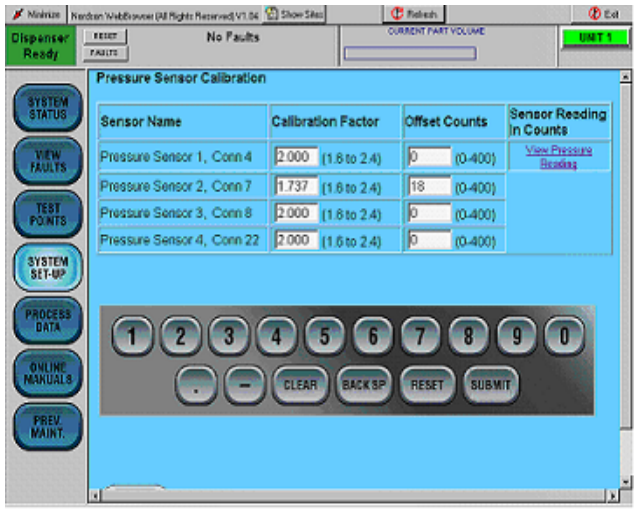
Maximum Auto Purge Cycles

This value sets the limit on how many consecutive automatic purges cycles are performed before purging completely stops. This prevents excessive waste of material in the event of extended downtime of the automation system.

Pressure Sensor Calibration Option

To ensure accurate pressure data, use the following screens to enter the calibration factor and offset for the pressure sensors.

1. Touch **SYSTEM SETUP**.
2. Touch the Nordson logo to access the hidden service menu.
3. Enter 1111 in the password field.
4. Touch **Pressure Sensor Setup**. The **Pressure Sensor Calibration** screen appears.



Pressure Sensor Calibration Screen

Calibration Factor

NOTE:

The calibration factor value provided by the sensor manufacturer is expressed in millivolts-per-volt.

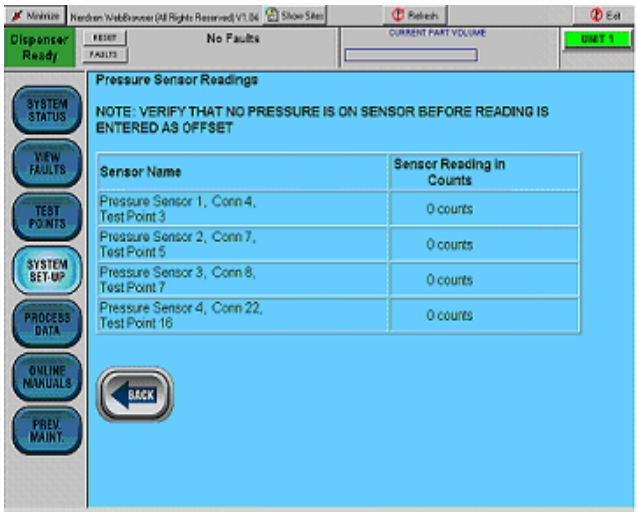
1. Enter the sensor Calibration Factor from the sensor manufacturer datasheet into the applicable Calibration Factor field.
2. Touch **SUBMIT** to save changes.

Sensor Offset

NOTE:

To ensure an accurate offset reading, remove all pressure from the sensor and make sure that it is at a stable operating temperature.

1. Touch **View Pressure Readings** on the **Pressure Sensor Calibration** screen. The **Pressure Sensor Readings** screen appears.
2. Note the value in the applicable **Sensor Reading in Counts** field. Touch **BACK** to return to the **Pressure Calibration** screen.
3. Enter the count value in the **Offset Counts** field.
4. Touch **SUBMIT** to save changes.

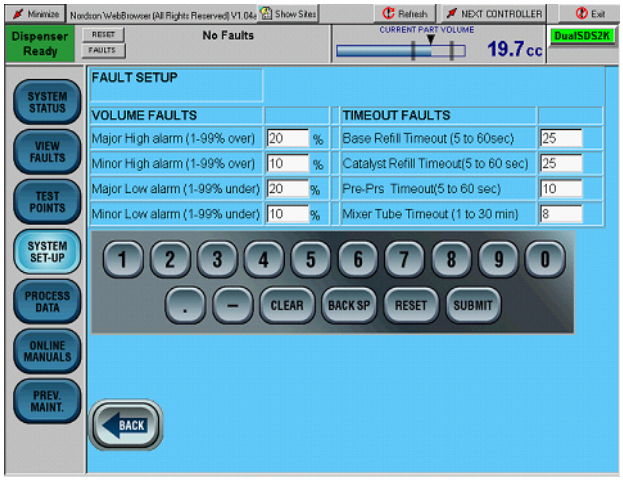


Pressure Sensor Offset Readings Screen

Servo 2K Fault Setup

Perform the following to setup the Servo 2K faults.

1. Touch **SYSTEM SETUP**.
2. Touch the Nordson oval to access the hidden service menu.
3. Enter password 1111 in the password field.
4. Touch **FAULT SETUP**. The Meter Fault Setup screen appears.
5. Enter the desired fault values. Refer to the following paragraphs for a description of each fault field if necessary.



Meter Fault Setup Screen

Major High/Low Alarm Volume Faults

When the percent of Target Volume goes above or below the value entered, a Major fault appears on the screen and inhibit the Sealer Ready or Volume OK outputs.

Minor High/Low Alarm Volume Faults

When the percent of Target Volume goes above or below the value entered, a Minor fault appears on the screen and will not inhibit the Sealer Ready or Volume OK outputs.

Base/Catalyst Refill Timeout

Each timeout value is the allowable time duration for refilling the Servo 2K meter before a Major fault appears on the screen.

This fault is self-resetting. The fault remains and the refill valve stays open until the piston reaches the refill proximity switch. When the piston reaches the proximity switch, the valve closes and the fault automatically clears.

NOTE:
These values may need to be increased when high viscosity materials are used.

Pre-Pressure Timeout

This timer starts when the RUN MODE signal is received and the Servo 2K ball screws start moving forward to pressurize each meter. A Major fault appears on the screen if the pressure value of each meter does not meet its prepressure setpoint for the current Part ID within this time.

Mixer Tube Timeout

This value sets the amount of time allowed between dispense cycles before a fault is posted indicating that the material in the mixer tube is beginning to cure.

Prepressure Setpoints

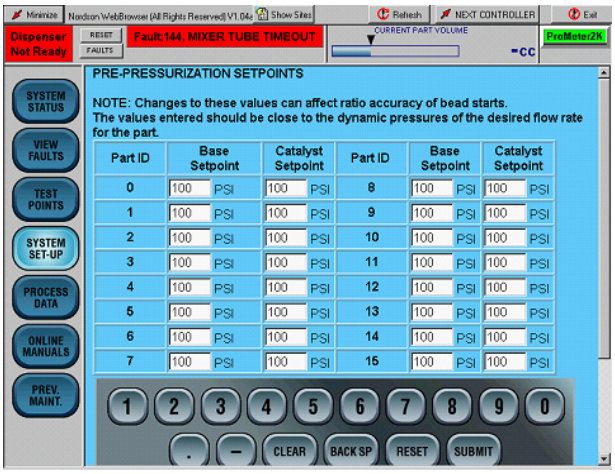
Perform the following to optimize the start of the dispensed bead.

1. Touch **SYSTEM SETUP**.
2. Touch the Nordson oval to access the hidden service menu.
3. Enter password 1111 in the password field.
4. Touch **Prepressure Setpoints**.
   The **PRE-PRESSURIZATION SETPOINTS** screen appears.

The prepressure value should be close to the dynamic value seen during dispensing of the specific part ID.

When the RUN MODE input is received, the ball screws begin to move forward until the prepressure value entered for the current Part ID is reached. At this point, the ball screw stops and the Meter Prepressurized signal is sent to the robot, indicating that dispensing can begin.

NOTE:
Choosing the wrong values may cause the base-to-catalyst material ratio to be incorrect at the start of the dispense path.

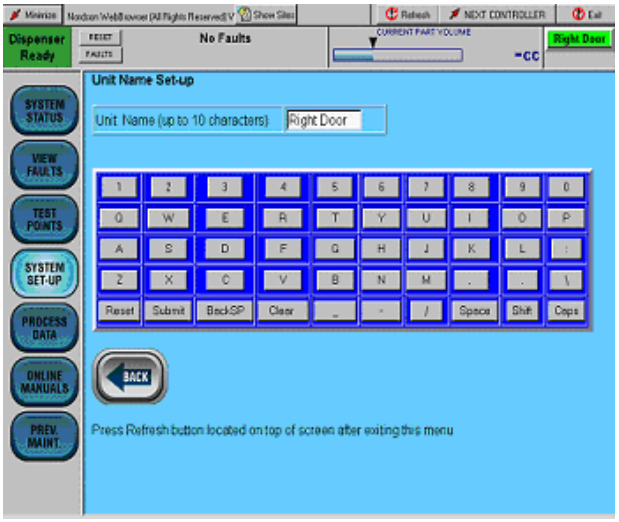


Pre-Pressurization Setpoints Screen

Unit Name

For installations that have multiple dispense controllers, it is helpful to assign a descriptive name to the controller screens.

1. Touch **SYSTEM SETUP**.
2. Touch the Nordson logo to access the hidden service menu.
3. Enter 1111 in the password field.
4. Touch **UNIT NAME**. The **Unit Name Set-up** screen appears.
5. Touch the text field to place the cursor inside it. Touch **CLEAR** to erase the current text. Use the onscreen keyboard to enter up to 10 characters.
6. Touch **SUBMIT** to save changes. When the screen is refreshed the new name appears in the top right corner of all screens.

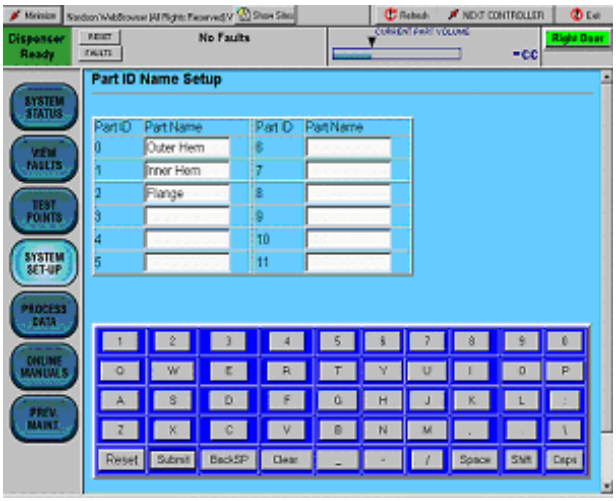


Unit Name Set-up Screen

Part ID Names

In applications that use more than one part style, it is helpful to assign a Part ID name to each part style. Perform the following procedure to assign a Part ID name to a specific part style.

1. Touch **SYSTEM SETUP**.
2. Touch the Nordson logo to access the hidden service menu.
3. Enter 1111 in the password field.
4. Touch **Part ID Name**. The **Part ID Name Set-up** screen appears.
5. Touch the desired text field in the **Part Name** column to place the cursor inside of it. Touch **CLEAR** to erase the current text. Use the onscreen keyboard to enter up to 10 characters.
6. Touch **SUBMIT** to save changes. The Part ID name that is currently active appears in the lower left-hand corner of the **STATUS** screen.



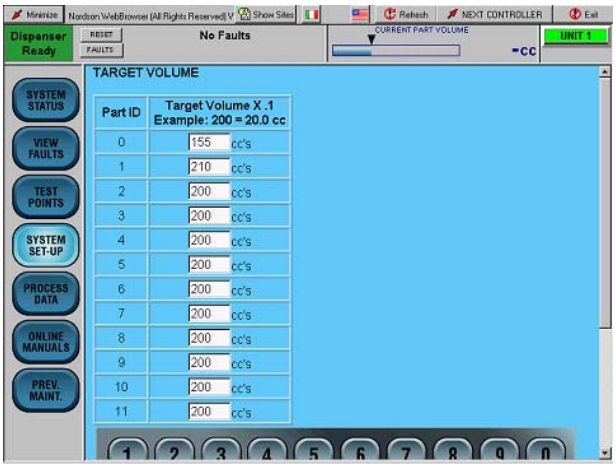
Part ID Name Setup

Target Volume Setpoints/Alarms

For each part ID, a target volume value must be entered equal to the desired volume of the part.

Enter target volumes as integer values; no decimal point. For example, to enter a target volume of 31.5 CC, enter 315 and touch **SUBMIT** to save the changes.

Alarm values should also be entered that define the acceptable percentage above and below the target before a fault is posted. Both these menus are accessed via the hidden service menu.



Target Volume Screen

Operator Interface and Screens

See Figure 6. Touch the screen to select one of seven main menus (1):

SYSTEM STATUS	PROCESS DATA
VIEW FAULTS	ONLINE MANUAL
TEST POINTS	PREV. MAINT.
SYSTEM SET-UP	(Preventive Maintenance)

Refer to Table 4 for a description of the operator interface functions.

SYSTEM STATUS

The **SYSTEM STATUS** screen (8) is the default screen that appears at power up.

This screen shows the layout of major system components including material supply pumps, the dispense meter, and the controller. Each component image flashes red when a fault condition occurs involving that component. When an image is flashing, touching the image or **VIEW FAULTS** takes the user to the **VIEW FAULTS** screen where detailed information on the fault and recovery instructions appears.

The status screen also features indicators for the status of digital inputs (12) and process information (9).

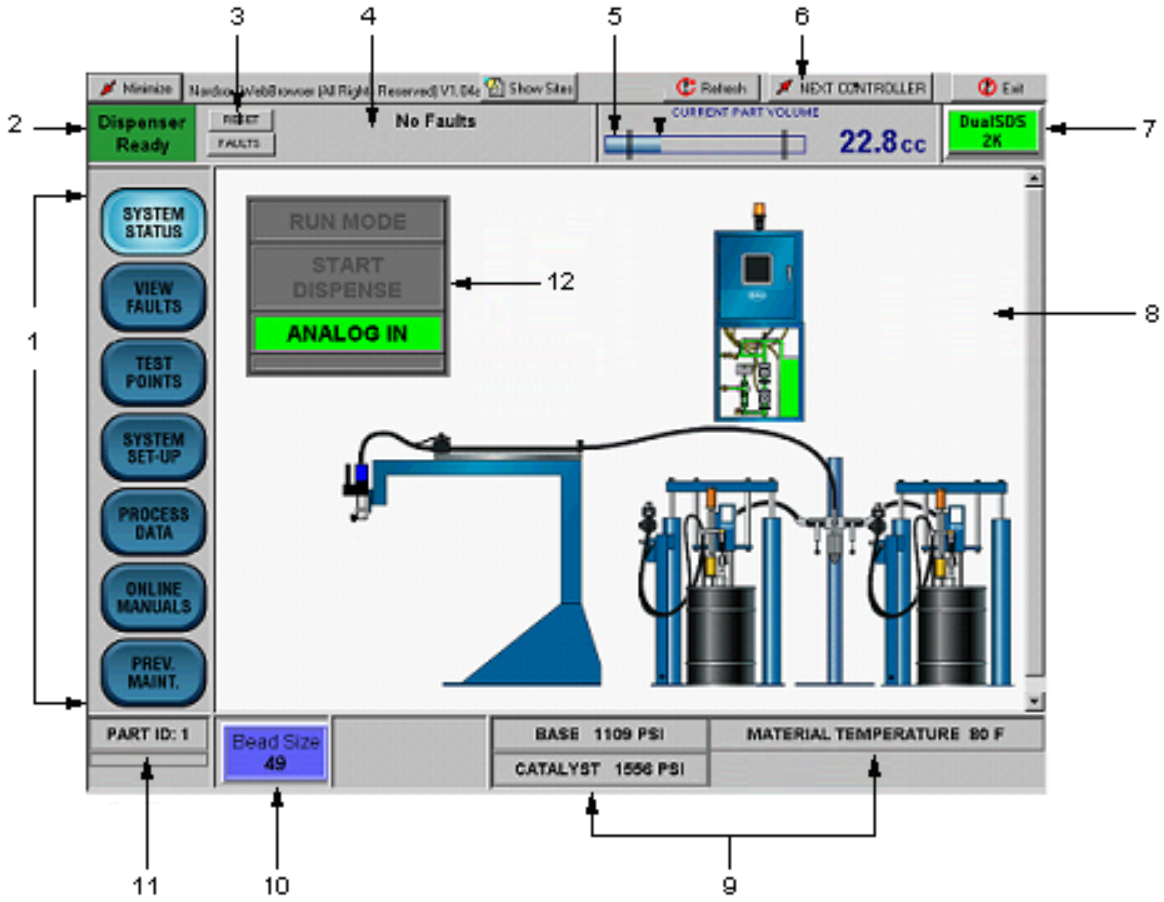


Figure 6 Status Screen

Table 4 Operator Interface Functions

Item	Description	Function
1	**MENU BUTTONS**	Access to various screens and setup menus.
2	**DISPENSER STATUS**	Green when ready, red if not ready.
3	**FAULT RESET BUTTON**	Resets current faults.
4	**FAULT INDICATOR FIELD**	Displays latest fault message.
5	**CURRENT PART VOLUME**	Displays progress of the part cycle; displays last part volume and alarm limit bars.
6	**NEXT CONTROLLER**	Touch to toggle between the Servo 2K and Pro-Meter Series-S systems.
7	**UNIT NAME**	User-defined label; indicates the current operator interface that is displayed on the screen. The label can be up to 10 characters.
8	**SYSTEM STATUS**	Appears as the default screen; displays a graphic representation of active components. Touching icons allows access to component operation screens.
9	**PROCESS INFORMATION**	Displays current pressure and temperature information.
10	**BEAD SIZE**	The bead size value is a percentage of robot analog signal sent to servo drives. Bead size is an arbitrary number between 1 and 99. Touch the icon to access the adjustment menu.
11	**PART I.D.**	Displays the active user-defined part I.D.
12	**ROBOT I/O STATUS**	Displays the state of the primary robot dispense signals.

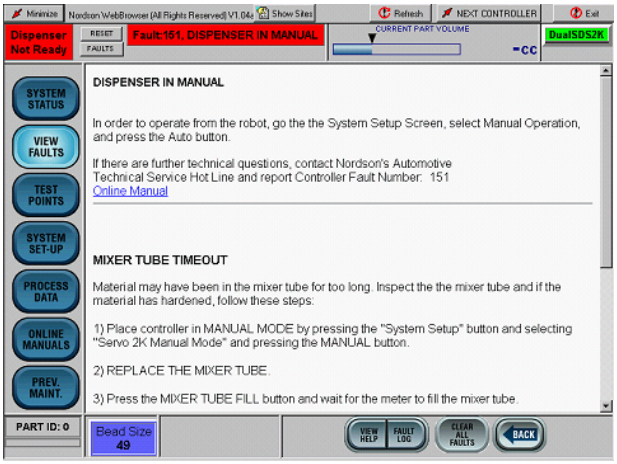
VIEW FAULTS

The **VIEW FAULTS** screen displays the description of the current fault(s) and the corrective action required.

Touch **VIEW HELP/FAULT LOG** to toggle between the fault log and help screens.

Touch **FAULT LOG** to view the history of faults by time and date. The recent fault appears at the top of the screen..

Touch **RESET FAULTS** at the top of screen or **CLEAR ALL FAULTS** at the bottom of the screen to clear the current faults. Note that this only applies to non-self-clearing faults.



View Faults Screen

Fault Log Screen

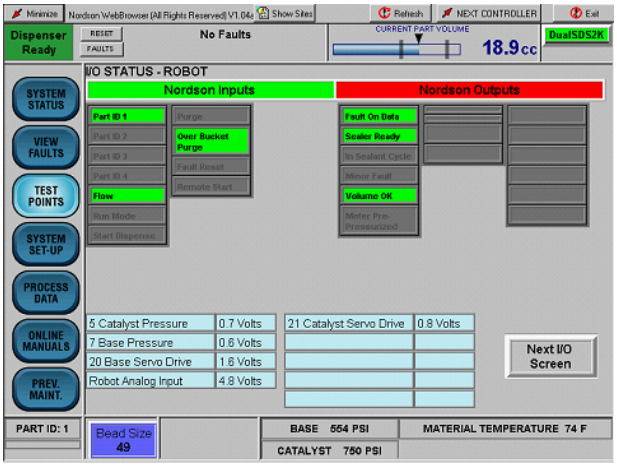
TEST POINTS

These screens are used to verify the state of IO signals to/from the robot and peripheral devices such as the pump stand and temperature controller.

NOTE:

The refresh rate of the browser can affect the ability of the indicators to light in response to fast-acting signals.

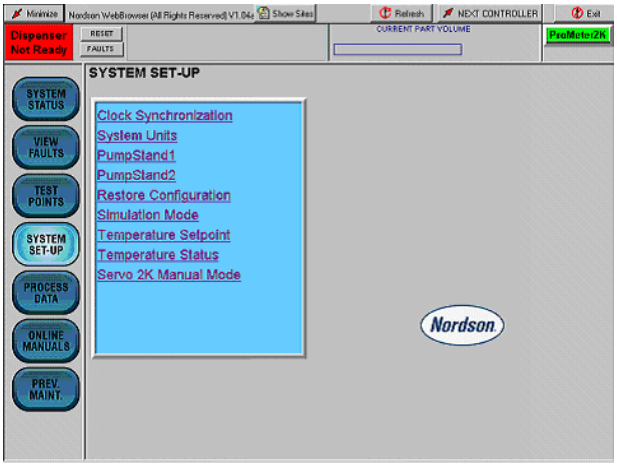
Touch **NEXT I/O SCREEN** to toggle through the available IO screens.



Test Points Screen

SYSTEM SET-UP

Use the **SYSTEM SET-UP** screen to configure the system parameters and to access control screens for pumps and temperature controller. The following paragraphs provide a description of each link.

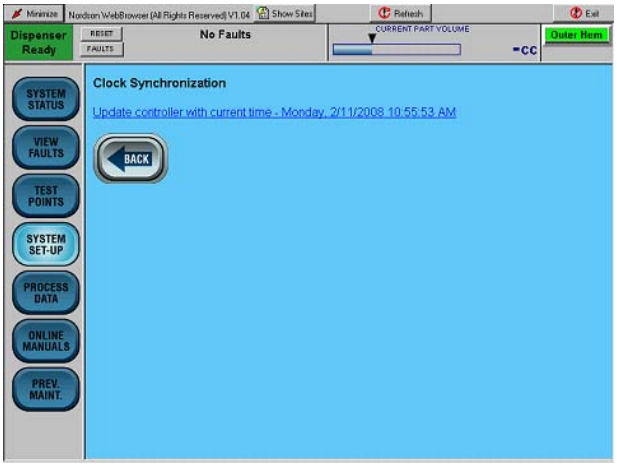


System Setup Screen

Clock

The time and date used in the Process Data screen, and in the stored SPC and fault logs is based on a clock that runs on the PCI controller board. To synchronize the on-board clock with the time set in the PC, touch **Update controller with current time**.

NOTE:
Changes to the PC clock should be done during system installation and whenever there is a discrepancy between the current time and the time displayed on the Process Data screen.

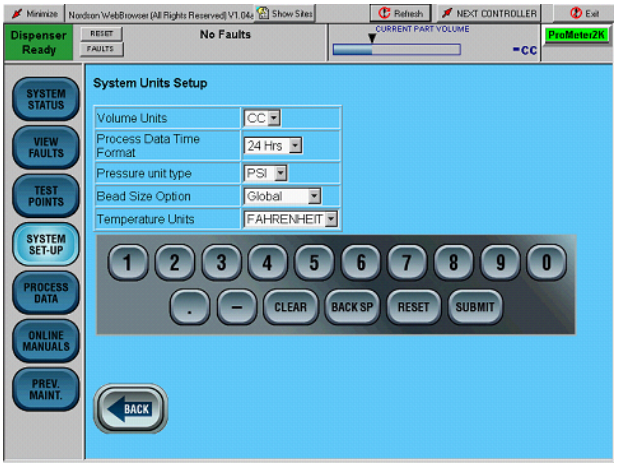


Clock Synchronization Screen

System

Touch the applicable field to select

- **Volume Units** (Metric or US)
- **Process Data Time** Format (24 Hrs or 12 Hrs)
- **Pressure unit type** (Metric or US)
- **Bead Size Option** (Global or Part ID)
- **Temperature Units** (Metric or US)



System Units Screen

Pump Stand Control

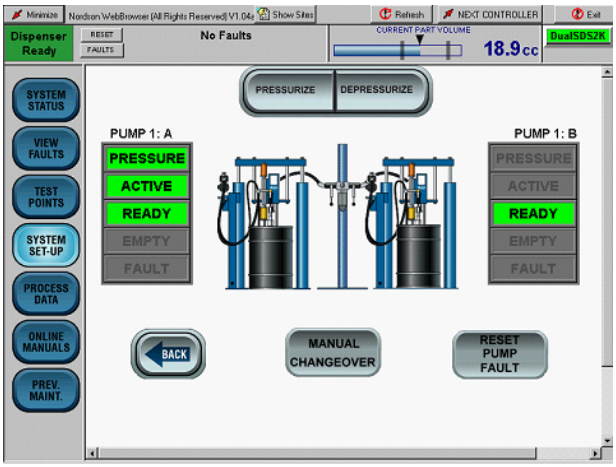
Touch **Pump Stand** on the System Setup menu or touch the crossover valve stand between the pump icons of the System Status screen to open the **Pump Stand Control** screen.

Touch **PRESSURIZE** to pressurize the pump stand.

Touch **DEPRESSURIZE** to depressurize the pump stand.

NOTE:

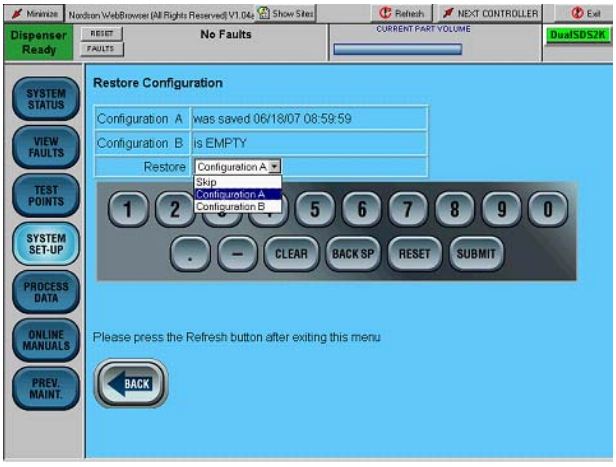
The length of time that the depressurization valve remains open is user-adjustable through the hidden service menu. The length of time required to depressurize the system can vary depending on material viscosity and system volume.



Pump Stand Control Screen

Restore Configuration

Use the dropdown list box to select and reload either of the two previously stored configurations from the battery-backed RAM. When adjusting dispense settings, this feature is useful for returning to a known set of good parameters.



Restore Configuration Screen

Simulation Mode

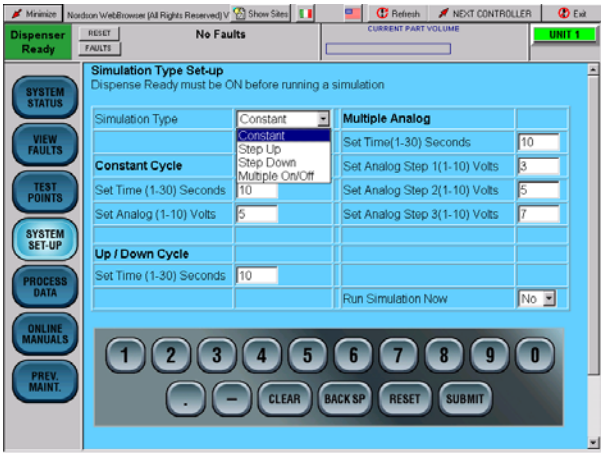
The **Simulation Mode** screen can be used to dispense part cycles without the use of the robot. The dispensed parts are logged on the **Process Data** screen.

There is a 15-second delay after touching **SUBMIT** on the keyboard before the dispense cycle starts. This delay allows the operator time to access the dispense gun and hold cups beneath it to obtain material for ratio testing.

When **SUBMIT** is touched, the meters pressurize to the values entered in the Pre-Pressure Setup menu for the current Part ID. After the 15-second delay, the system will dispense for the amount of time entered in the **Set Time** field, and at a rate set in the **Set Analog** field.

CAUTION

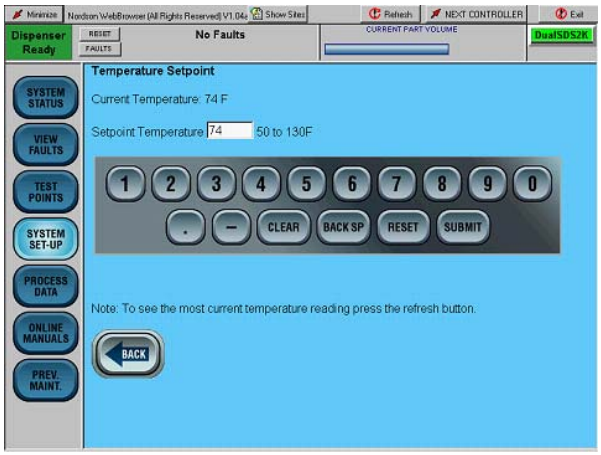
The 2K system uses this menu to control dispense parameters for automatic purges, the **Mixer Tube Fill**, and the **Ratio Check** located on the **Manual Operations** screen. Be aware that changing the values for time and analog will also affect these processes.



Simulation Mode Screen

Temperature Setpoint

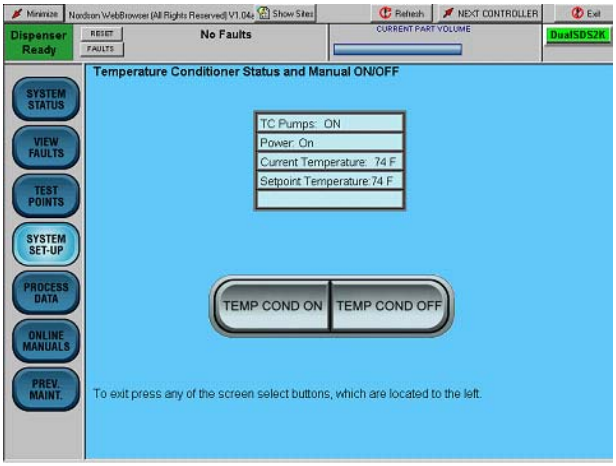
Touch **Temperature Setpoint** to view and adjust material temperature.



Temperature Setpoint Screen

Temperature Status

Touch **Temperature Status** to view the status of the temperature controls. Use this screen to start and stop the temperature conditioning system.



Temperature Status Screen

Servo 2K Manual Operation

Use this screen to manually operate the dispense meters. The system must be in the **MANUAL** mode to use this screen.

Use **Mixer Tube Fill** when a new mixer tube is installed and will dispense material using the time and analog voltage values entered in the **SIMULATION MODE** menu. Set these values to ensure that the entire mixer tube is filled. When **Mixer Tube Fill** is touched, a fault message appears in the fault window at the top of the screen informing the operator that the tube fill is in process. Wait until this message clears before returning to **AUTO MODE**.

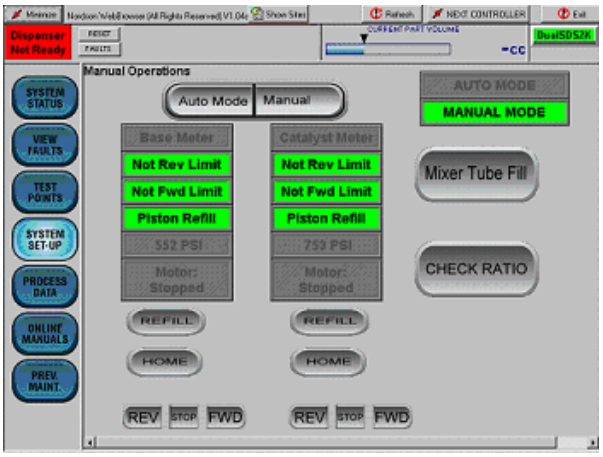
CHECK RATIO is identical to **Mixer Tube Fill** but has an additional 15-second time delay before material dispense begins. This gives the operator time to place measuring cups below the dispense gun and obtain material for use in ratio verifications.

Use **REFILL** and **HOME** to perform manual refill or homing for each meter. If necessary both meters will refill automatically when returning to the **AUTO MODE**.

BOB: Should I add the following blurbs?

If desired, touch **FWD** or **REV** to jog the motor at 5 percent speed.

NOTE:
The dispense gun will open whenever **FWD** is touched to avoid over pressurizing the system.



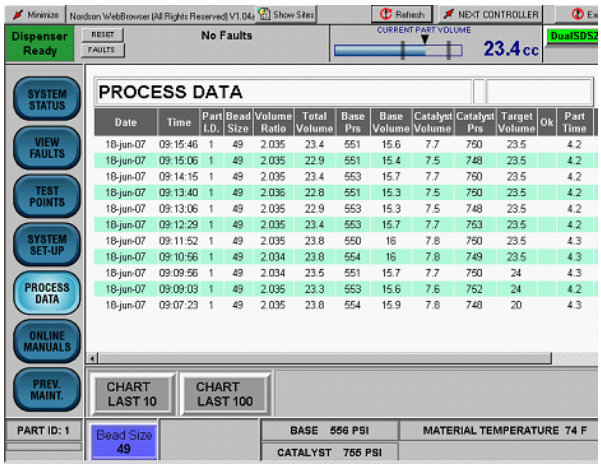
Manual Operation Screen

FMT Setup

FMT Setup is only on systems that use Ferro-Magnetic Tagging (FMT). It is used to minimize the browser window and access the FMT Datalogger screen. Refer to the FMT vendor manual for information on using the FMT Datalogger.

PROCESS DATA

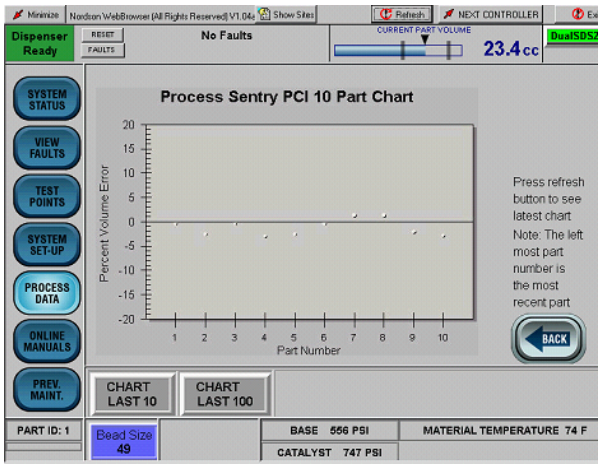
Touch **PROCESS DATA** to view production data. This list shows the last 11 part cycles in first-in and first-out order.



Process Data Screen

PROCESS DATA Part Charts

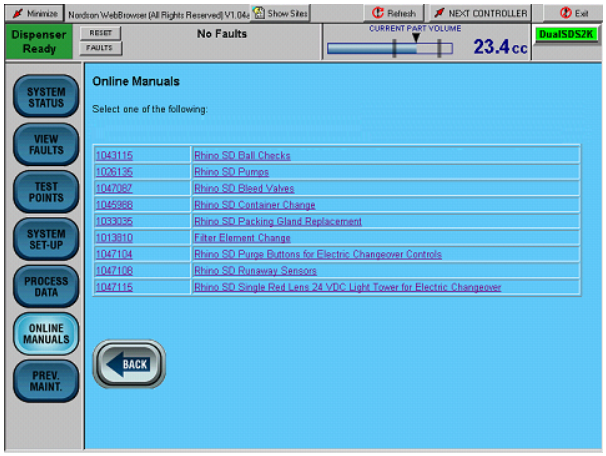
Touch **CHART LAST 10** to view the last 10 parts. Touch **CHART LAST 100** to view the last 100 parts.



Process Data Screen

ONLINE MANUALS

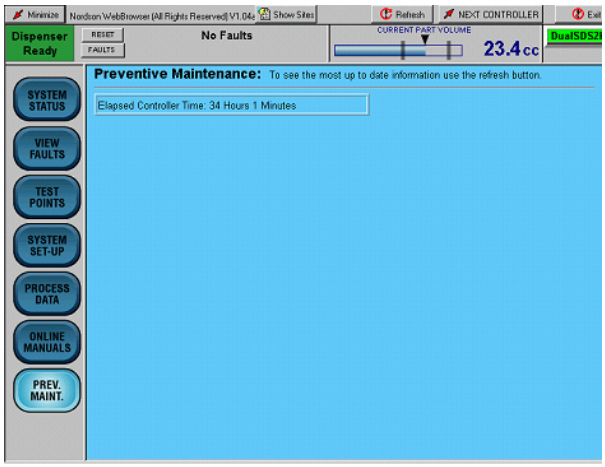
Touch **ONLINE MANUALS** for links to documentation for major system components.



Online Manuals Screen

PREV. MAINT.

Touch **PREV. MAINT.** to view preventive maintenance data.



Preventive Maintenance Screen

Operation

WARNING

- Allow only qualified personnel to perform the following tasks. Follow the safety instructions in this document and all other related documentation.
- Read and understand this section before operating the PCI controller. The procedures in this section assume that the PCI controller was configured by a Nordson Corporation representative.

NOTE:

- Before operating the controller, make sure that each robot is taught the proper tool path. Refer to the robot controller manual for procedures.
- When entering data, touching the field next to the corresponding parameter positions the cursor inside of the field.

Some parameters require the use of the screen keyboard to enter data.

When entering data, touch:

- **CLEAR** to delete the current value in a field.
- **BACK SP** to backspace.
- **RESET** to restore a value.
- **SUBMIT** to save changes.

Startup

NOTE:
Operating procedures may vary due to specific application requirements. Refer to the System Parameter Sheet shipped with the system for specific operating settings.

1. Turn on power to the controller. After the system finishes the boot-up process, press the POWER ON button.
2. Place a waste container under the dispense gun.
3. Install a new mixer tube on the dispense gun.
4. Pressurize the pump stands and start the temperature controller. Note: this can be done manually or by the robot/cell automation by pulsing the Remote Start input.
5. Fill the mixer tube:
   a. Touch **System Setup**.
   b. Touch **Servo 2K Manual Mode**.
   c. Touch **MANUAL** to place the controller in the manual mode.
   d. Touch **Mixer Tube Fill**.
   e. When the Mixer Tube Fill In Process message clears from the message box at the top of screen, touch **AUTO** to return the controller to the automatic mode.
6. Check the bead size for the part being run. Refer to the *Bead Size Adjustment* procedure if necessary to adjust the bead size.
7. Touch **PROCESS DATA** to monitor material dispensing characteristics.
8. Position the part and begin dispensing from the robot controller.

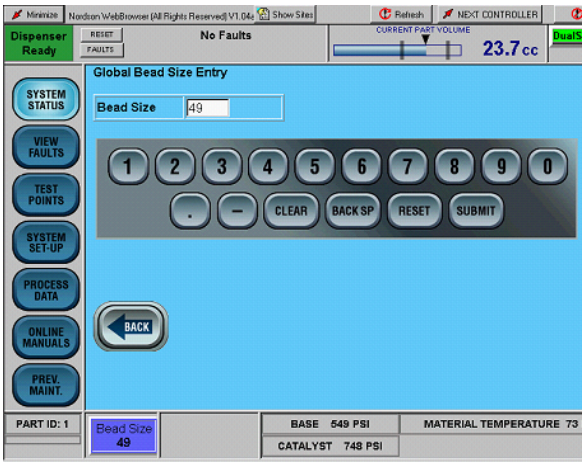
Bead Size Adjustment

Bead size is an arbitrary number between 1 and 99. Bead sizes can be either by Part ID or Global.

A Part ID bead size value applies to one part. Up to 256 Part ID bead sizes can be entered.

A Global bead size value applies to all Part IDs. If the Global bead size value changes, the bead size for all Part IDs change to that value.

1. Touch **BEAD SIZE** to access the bead size screens.
2. Touch the applicable link on the **Bead Size Menu** to access the **Bead Size Setup** screen and change the bead sizes.



Global Bead Size Adjustment Screen.

Fault Messages

If a fault is detected during operation, the alarm tower red light turns on and the type of fault is indicated on the operator interface.

Images on the **SYSTEM STATUS** screen flash red when a fault condition occurs within that component. Touch the flashing image or **VIEW FAULTS** to access the **VIEW FAULTS** screen. A description of the current fault appears along with the corrective action.

NOTE:
Some faults are self-resetting. The fault condition must be corrected before the fault will automatically clear. Pressing the fault reset button does not reset self-resetting faults.

Saving System Parameters

Once all of the parameters are set to optimize the system, store them as a configuration file. The configuration file can be saved to a

- battery-backed memory on the controller board.
- hard drive of the operator interface panel, floppy disk, or USB memory device for storage in a secure place.

It is important to save the configuration file to the hard drive of the operator interface panel for easy access.

This ensures that if the controller board or operator interface panel is replaced, the configuration data can be easily replaced.

NOTE:
Always resave the configuration file whenever changes are made to dispense parameters.

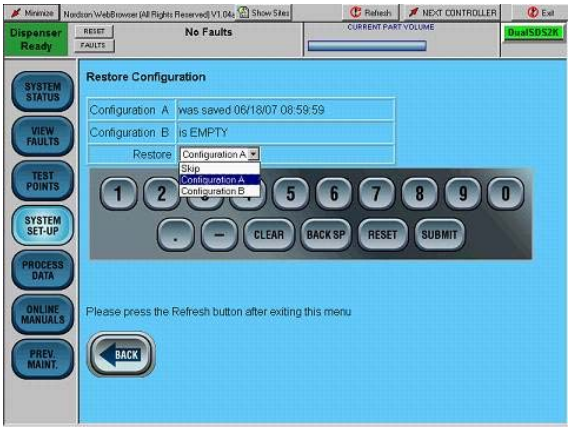
Saving Configuration Settings to a Battery-Backed Memory

1. From the **SYSTEM SETUP** screen, touch **Save Controller Configuration**. The **Save Configuration** screen appears.
2. Select the desired file from the dropdown box and touch **SUBMIT**.
3. Touch **Refresh** at the top of the screen to update the screens with the loaded information.

Save Configuration Screen

Restoring Configuration Settings from Battery-Backed Memory

1. From the **SYSTEM SETUP** screen, touch **Restore Configuration**. The **Restore Configuration** screen appears.
2. Select the desired file from the drop-down box and touch **SUBMIT**.
3. Touch **Refresh** at the top of the screen to update the screens with the loaded information.



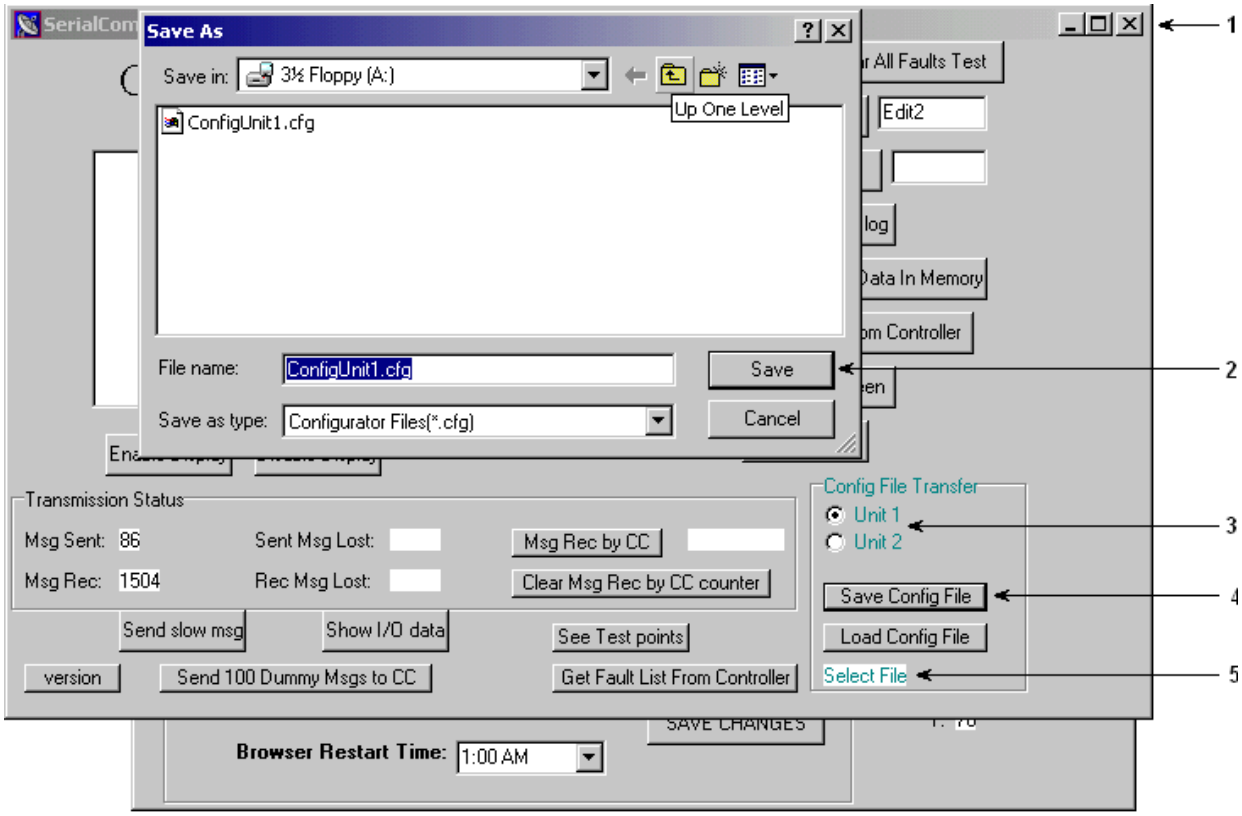
Restore Configuration Screen

Saving Configurations to a Disk

Saving a configuration file to the hard drive, floppy disk, or USB device requires accessing the SerialCom program that operates behind the browser screen.

NOTE:
Use a USB-style keyboard to avoid the need to restart the operator interface panel.

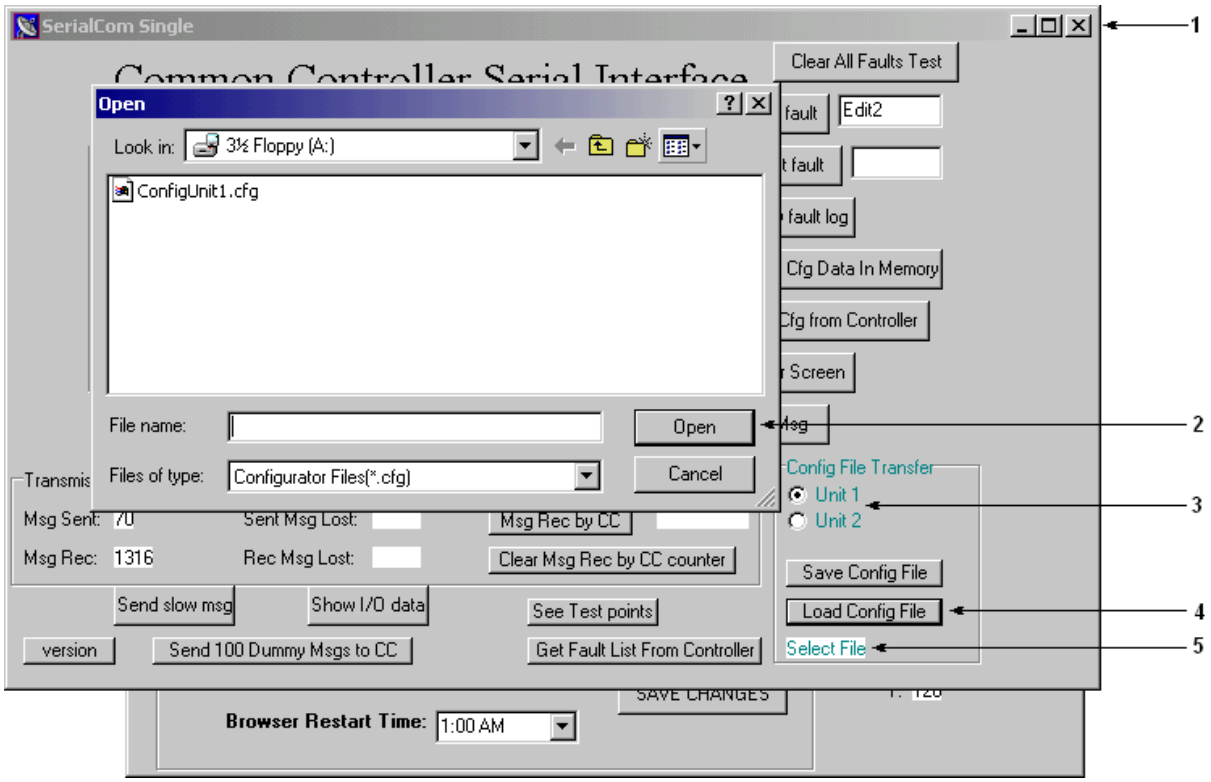
1. Connect a keyboard to the Operator Interface Panel to enter a file name and save data.
2. Touch **Minimize** on the **SYSTEM STATUS** screen to minimize the browser screen.
3. Maximize the **SerialCom** window (1).
4. Touch either Unit 1 or Unit 2 in the **Config File Transfer** field (3) to select data from the applicable dispenser.
5. Touch **Save Config File** (4). Select the desired destination for the file.
6. Using the keyboard, enter the name of the file to save in the filename field. Touch **Save** (2).
7. When **OK-File Saved** appears in the file transfer field (5), minimize the **SerialCom** window.
8. Touch **Maximize** on the **System Status** screen to maximize the browser screen.



Saving Configurations to a Disk

Loading Configurations from a Disk

1. Touch **Minimize** on the **System Status** screen to minimize the browser screen.
2. Maximize the **SerialCom** window (1).
3. Touch either Unit 1 or Unit 2 in the **Config File Transfer** field (3) to select data from the applicable dispenser.
4. Touch **Load Config File** (4). Select the desired file to load.
5. Touch **Open** (2).
6. When **File Transfer Complete** appears in the file transfer field (5), minimize the **SerialCom** window.
7. Touch **Maximize** on the **System Status** screen to maximize the browser screen.
8. Touch **Refresh** at the top of the status screen to update the screens with the loaded information.



Loading Configurations from a Disk

Statistical Process Control Data and Fault Logs

The statistical process control (SPC) data that appears on the Process Data screen is stored on the hard drive of the controller PC. Stored values include

- Date and Time
- Part ID
- Bead Size Setting
- Material Temperature
- Volume Dispensed
- Ratio of Base Volume to Catalyst Volume
- Gun on Time

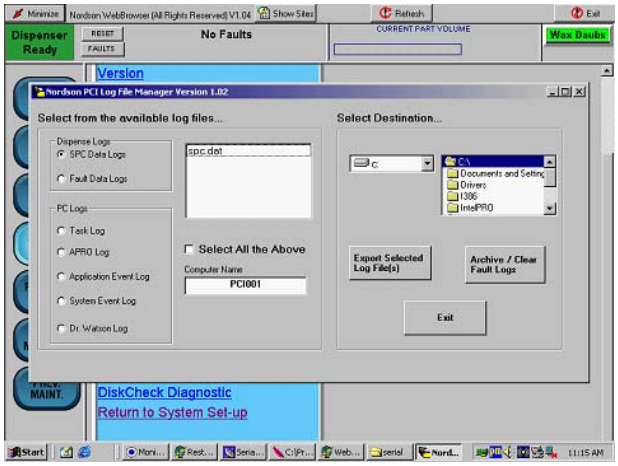
SPC File Format

Column	Description
1	Date
2	Time
3	Part ID
4	Bead Size Setting
5	Target Volume
6	Actual Volume
7	Temperature (x 10)
8	Catalyst Avg Pressure
9	Fault Code 1
10	System Status Code
11	Fault Code 2
12	Not Used
13	Volume Ratio
14	Base Avg Pressure
15	Base Volume (x 10)
16	Catalyst Volume (x 10)
17	Not Used
18	Dispense Time
19	Not Used

Access SPC Data and Fault Logs using Log File Manager Utility

The PCI controller saves part and fault data in comma-delimited format for importing into a spreadsheet. Use the following procedure to export the log files onto a USB memory device:

1. Insert a USB memory stick into the port on side of the cabinet.
2. In the hidden service menu, select **Log File Manager**.
3. Select **Run this program from current location** option. Click **OK**.
4. Click on the **Yes** button.
5. Select the desired file to be exported by touching the file name in the list box.
6. Select the destination drive and folder, then touch **Export Selected Log Files**.



Accessing the SPC Data Screen

Decoding Statistical Process Control Data Files

In addition to valuable process data regarding part values such as time, volume, bead size, and pressure, the controller collects Error Codes and System Status Codes that can be helpful in pinpointing problems.

Follow these steps to decode an SPC Error Code value:

1. Open the SPC.dat file using a text editor or spreadsheet program.
2. Subtract the largest number from the code column that yields a remainder greater than or equal to zero. This is the value of the first decoded error code.
3. If the remainder is greater than zero, subtract the largest number from the code column that yields a remainder greater than or equal to zero. This value is the second decoded error code.
4. Continue subtracting the largest possible value until a remainder of zero is obtained.

EXAMPLE: An SPC error code of 1060 is listed. The largest code that can be subtracted is 1024. The remainder is 36. The largest code that can be subtracted from the remainder is 32. Subtracting 32 from 36 yields 4. The largest code that can be subtracted from 4 is 4. The remainder is 0 and decoding is complete. The following errors were detected:

1024	Servo drive fault or over travel fault
32	Nozzle clog or down stream blockage
4	Meter over pressure

SPC Error Codes

Code	Description
1	High dispensed volume
2	Low dispensed volume
4	Not Used
8	Low material supply pressure
16	Meter not filled
32	Nozzle clog or down stream blockage (Pro-Flo Specific)
64	Gun cable failure (Pro-Flo Specific)
128	Flowmeter failure (Pro-Flo Specific)
256	Nozzle pressure transducer failure (Pro-Flo Specific)
512	Flowmeter cable failure (Pro-Flo Specific)
1024	Servo drive fault or over travel fault
2048	DeviceNet from robot failure
4096	Robot signals out of sequence
8192	Gun or controller failure
16384	Auxiliary device failure either temperature conditioning unit or pumps
32768	Low average nozzle pressure or minimum setpoint error

SPC System Status Codes

Code	Description
1	In Back-up (Pro-Flo Specific)
2	Deferred Back-up (Pro-Flo Specific)
4	Material Calibration has been run (Pro-Flo Specific)
8	New pressure transducer offsets have been measured (Pro-Flo Specific)
16	"a" or "n" value has been changed through the keypad (Pro-Flo Specific)
32	The "a" value changed due to a purge (Pro-Flo Specific)
64	Not used
128	New configuration file or defaults have been loaded
256	SPC data has been downloaded
512	Dispenser Ready went from low to high prior to dispense cycle
1024	Dispenser Ready was low but robot attempted to run a part
2048	Not used
4096	Not used
8192	Not used
16384	Not used
32768	Part cycle ran in Simulation Mode

Shutdown

Use the following shutdown procedure to remove power from the PCI Controller:

1. De pressurize the material supply unloaders(s).
2. Touch **Minimize** (1) at the top of a screen display.
3. Touch **start** (2) on the Windows task bar to access the **Start Menu**.
4. Touch **Shut Down** (3) on the **Start Menu**.
5. Make sure that **Shut Down** is displayed in the **Shut Down Windows** field. Touch **OK** (4).
6. Turn off the controller.

Shutdown Screens

Repair

Repairs consist of replacing the operator interface panel and the PCAs.

WARNING

- Allow only qualified personnel to perform the following tasks. Follow the safety instructions in this document and all other related documentation.
- Disconnect equipment from line voltage. Failure to observe this warning may result in personal injury, death, or equipment damage.

Operator Interface Panel

Perform following procedure to replace the operator interface.

NOTE:

Do not apply sealing compounds to the operator interface. The operator interface has a sealing gasket that forms a compression-type seal.

1. Turn off and lock out external electrical power to the controller.
2. See Figure 7. Open the enclosure door (1).
3. Disconnect the AC (4) and Serial (5) cables from the operator interface (2).

   Make note of the Com port when disconnecting the serial cable. The cable must be connected to the same Com port on the new operator interface.
4. Remove the mounting clips (3) securing the operator interface to the enclosure door. Remove the operator interface from the enclosure door.
5. Make sure that the sealing gasket on the operator interface is properly positioned.
6. Install the new operator interface (2) into the enclosure door (1).
7. Install the mounting clips (3). Using the torque sequence shown in Figure 5, tighten the mounting clips to 10 in.-lb (1.1 N·m). To prevent flexing the touch screen, do not overtighten the clips.
8. Connect the AC cable (4) to the operator interface. Connect the Serial (5) cable to the operator interface. Make sure that it is connected to the same Com port that it was removed from on the old operator interface.
9. Close the enclosure door (1).

Typical PCA Replacement

WARNING

This unit contains electrostatic sensitive devices (ESD). Always wear a grounding wrist strap to prevent damage to ESD parts.

1. Turn off and lock out external electrical power to the controller.
2. Open the enclosure door (1).
3. Disconnect the electrical connectors from the PCA (6).
4. Remove the mounting screws from the PCA.
5. Install the new PCA. Do not over tighten the screws.
6. Connect the electrical connectors to the PCA.
7. Close the enclosure door.

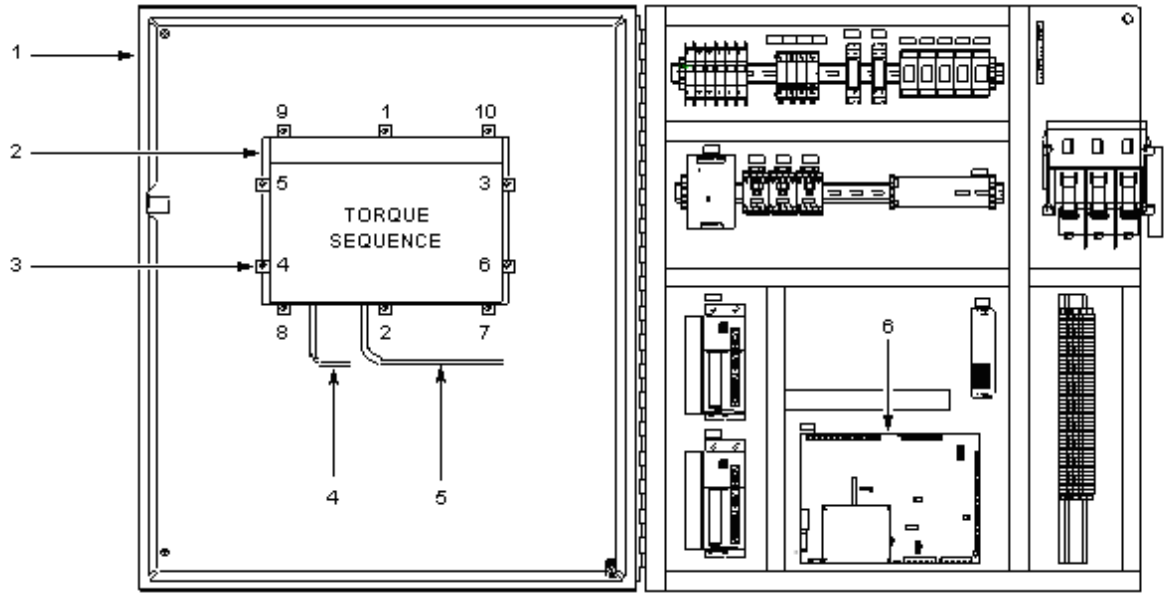


Figure 7 PCI Repairs

Parts

See Figure 8 and the following parts lists. To order parts, call the Nordson Customer Service Center or your local Nordson representative.

Item	Part	Description	Qty
1	1040541	Touch screen assembly	1
2	1062216	Servo Drive, Ultra, 2kW	2
3	1088117	PCA, PCI Gen 2 enhanced board	1
4	1083896	Power supply, 110/220 Vac, 55 w	1
5	1040549	I/O board, embedded 10 in/10 out, discrete	1
6	1040513	Relay, solid state	2

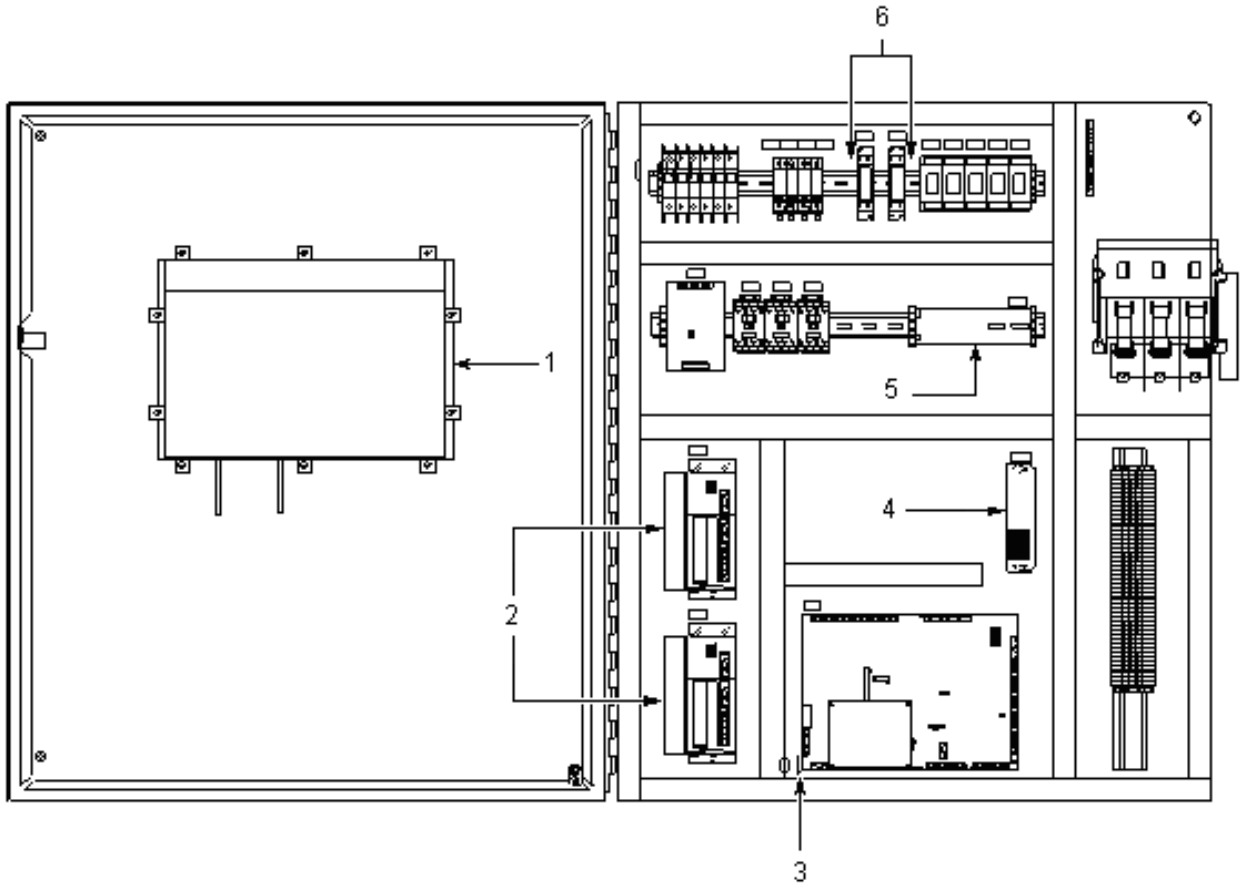


Figure 8 Controller Parts