# **SDS Single-PCI Controller**

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Nordson

NORDSON CORPORATION • AMHERST, OHIO • USA

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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—AIRLESS SPRAY 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	<u>Symbol</u>	<u>Prefix</u>
Fluorine	F	"Fluoro-"
Chlorine	CI	"Chloro-"
Bromine	Br	"Bromo-"
lodine	I	"lodo-"

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.

# Disposal

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

# Description

The SDS Single-PCI controller uses signals from the robot controller and other sensors to control the gun dispensing rate. A constant bead size is maintained by adjusting the dispensing rate for changes in robot speed.

The PCI controller also

- displays recovery procedures if operation faults are generated by the controller or gun.
- communicates faults to the robot controller.

The PCI controller has a software program configured by Nordson Corporation for your application.

See Figure 1 and refer to Table 1 for a description of the major components.

# Theory of Operation

The robot controller sends a 0 to 10 volt DC analog signal that is proportional to the speed of the robot. This voltage can be a 12–bit word in the case of DeviceNet I/O systems, or a single-ended voltage in a discrete I/O system. This voltage controls the speed of the servomotor, which in turn controls the material flow rate, allowing the dispensed bead to remain constant through corners.

A bead size adjustment is provided to allow global increase or decrease of the amount of the robot analog signal sent to the servomotor, giving the operator the ability to increase or decrease the amount of material dispensed without the need to change the robot program.

If the air swirl option is used, a second analog signal from the robot passes through the controller to a proportioning air regulator. The proportioning air regulator controls the amount of swirl air flowing to the nozzle

#### Alarms

The PCI controller alerts the operator when a fault occurs by lighting the alarm tower. The fault screen on the operator interface provides a description of the fault, the appropriate corrective action to take, and how to contact Nordson Corporation for assistance. A fault log screen displays a list of faults.



Figure 1 Typical SDS PCI Controller

ltem	m 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 <i>Operator Interface</i> section for more information.					
3	Operator Controls:					
	POWER ON—Main power pilot light.					
SERVO DRIVE RESET—Resets the 2K Servo Drive after a fault occurs.						
START—Enable power to the controller.						
STOP—Disable power to the controller.						
	AC GROUND FAULT—Ground status lights.					
Electrical Cables—for connecting the controller to the gun, robot controller, and optional equipment.						

Table 1 Major Component
-------------------------

# Installation



- 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.
- Unpack the PCI controller and inspect it for dents, scratches, corrosion, or other physical damage. If there is any visible damage, call your 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.

# Configure the Robot Controller

Use the following data to configure the robot controller analog signals.

### Analog #1

See Figure 2. Configure your robot controller to vary the analog #1 (or tool speed) 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.
- 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 presents 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.

## Analog #2

If the air swirl option is used, a second analog signal from the robot passes through the controller to a proportioning air regulator. The proportioning air regulator controls the amount of swirl air flowing to the nozzle.



Figure 2 Relationship between Analog Signal #1 and Robot Speed

# Set Timing Sequences

There are two signal sequence configurations; RS4 and Non-RS4. Review the applicable paragraph for the desired signal sequence.

### **RS4 Signal Sequence**

Refer to Table 2 and see Figure 3 for a description of an RS4 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. Pulse must be at least 100mS long.			
5	Robot waits for Meter Prepressurized input.			
6	Part ID bits are dropped at this time.			
7	Robot sends analog flow voltage and raises Dispense On output as required to apply desired material bead.			
8	At end of part, robot pulses Dispense Complete output. Pulse must be at least 100 mS long.			
9	Robot drops Robot In Process output.			
10	Robot checks for presence of Volume OK input to verify part volume was within the acceptable limits.			

Table 2 RS4 Signal Sequence



Figure 3 RS4 Signal Timing Chart

### Non-RS4 Signal Sequence

Refer to Table 3 and see Figure 4 for a description of a Non-RS4 signal sequence.

Table 3 Non-RS4 Signal Sequence			
Sequence	Description		
1	Robot checks for Dispenser Ready input.		
2	Robot raises desired Part ID output bits for part to be dispensed.		
3	Robot raises Style Strobe output.		
4	Robot waits for Meter Prepressurized input.		
5	Part ID bits can dropped at this time.		
6	Robot sends analog flow voltage and raises Dispense On output as required to apply desired material bead.		
7	At end of part, robot drops Style Strobe output.		
8	Robot checks for presence of Volume OK input to verify part volume was within the acceptable limits.		



#### Figure 4 Non-RS4 Signal Timing Chart

# **Prepressure Setpoints**

To optimize the start of the dispensed bead, the Prepressure Setpoint parameter is entered in the Setup menu. This menu is hidden in the Service Menu to limit access.

The value entered for prepressure should be close to the dynamic value seen during dispensing of the part.

When the style strobe is received, the ball screw will begin moving forward until the prepressure value entered for the current Part ID is reached. At this point, the ball screws will stop and the Meter Prepressurized signal is sent to the robot, indicating that dispensing can begin.

# **Operator Interface** and Screens

This section describes the SDS screens.

#### SDS Screens

See Screen 1.

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

See Screen 1.

The **SYSTEM STATUS** menu is the default screen. It monitors material dispensing characteristics during production.

Touch a system component to view the

- system illustration which flashes when a fault condition occurs. To view the fault, touch the flashing part or touch the **VIEW FAULTS** button.
- status of STYLE STROBE, GUN ON, ANALOG IN, and DISPENSE COMPLETE signals.



Screen 1 SDS Operator Interface

Table 4	Operator	Interface	Functions
---------	----------	-----------	-----------

Item	Description	Function				
1	Menu Buttons	Set and view parameters of the application.				
2	Dispenser field	Indicates the status of the dispenser: Ready or Not Ready.				
3	Fault Indicator field	Displays fault messages.				
4	CURRENT PART VOLUME	Visually indicates the percent of the job which is completed and the actual dispensed volume at the end of the part cycle.				
5	Label	User-defined label; indicates the current operator interface that is displayed on the screen. The user-defined label can be up to 10 charaters.				
6	SYSTEM STATUS	Appears as the default screen; displays the system configuration.				
7	PRESSURE	Indicates system operating pressures.				
8	BEAD SIZE	Displays bead size. Bead size is an arbitrary number between 1 and 99. Touch <b>BEAD SIZE</b> to increase or decrease bead size.				
9	PART I.D.	Displays the current part I.D.				
10	I/O Indicators	Displays robot signals—RS4 I/O configuration shown. DISPENSE COMPLETE does not appear on Non-RS4 I/O configuration.				

### **VIEW FAULTS**

See Screen 2.

The **VIEW FAULTS** menu displays the description a fault and the corrective action.

**NOTE:** Touch any of the bold or underlined text to proceed directly to the correction.

Touch **VIEW FAULTS>VIEW HELP** to view the corrective action for a fault.



Screen 2 View Faults

#### See Screen 3.

Touch **VIEW FAULTS**>**FAULT LOG** to view the name of the fault and that date and time that the fault occurred.

Touch **VIEW FAULTS**>**CLEAR ALL FAULTS** to clear the fault.

💉 Minimize	Nordson WebB	rowser (All Rights Reserved) V1.04	👫 Show Sites	🕐 Refresh		🗶 Exit
Dispens	er Ready	No Faults			53.6cc	SDS-90 UNIT 2
	Fault	Log				
SYSTEM	Fault	Name		Time and date stamp		
STATUS	(151)MAJ	OR:DISPENSER IN MANUAL		17:42:03, Tue, 04-05-05		
	(151)MAJ	OR:DISPENSER IN MANUAL		16:05:33, Tue, 04-05-05		
VIEW	To heat	iou this near dischie brouse		vaga. Fax Internat Explayer u	ooro ooloot "Evonuui	
FAULIS	page". V	/hich is located under the "Te	mporary Internet files	" section of the "Internet opt	ion" screen. To see	the most
	up to dat	e fault information use the ref	resh button .			
POINTS						
		ACK				
EVETEM		AGN				
SET-UP						
PROCES	s					
DATA						
ONLINE						
MANUAL	2					
PREV. MAINT.						
PART ID:	0 Beac	I Size			R	
I		9		HELP LOG FAULT	S BACK	

Screen 3 Fault Log

### **TEST POINTS**

See Screen 4.

These menus are used to verify that the robot signals are being sent and received by the PCI controller.

Touch either **DeviceNet I/O** or **Physical I/O** to toggle between the screens



	🖌 Minimize	Nordson WebBrowser (All Righ	ts Reserved) V1.04 🤇	🕌 Show Sites	C F	efresh		🕐 Exit
	Dispens	er Ready	No Faults		CURRI		53.6cc	SDS-90 UNIT 2
		VO STATUS - DE	VICE NET					
	SYSTEM	No	Nordson Inputs		Nordson Outputs			
	STATUS	Part I.D.	Robot In Proc		Dispense Re	ady Auto Mode	Meter	
	VIEW	Style Strobe			Disp In Proc	Brum Emp	ty Pressuri	zed quest
	TEST POINTS	Disp Complete           Fault Reset           Remote Start			Major Fault Minor Fault Rem St in Pre	De-Pressu	rized	
een	SYSTEM SET-UP	Purge				_		
	PROCESS						Ph	iysical I/O
	DATA	7 Upstream Press	ure 0.0 Volts	; .				
		10 Temperature	0.0 Volts	;				
	MANUAL	5 SDS Pressure	1.5 Volts	; .				
		9 Robot Analog Inp	ut 4.0 Volts	;				
	PREV. MAINT.							
	PART ID:	Bead Size		SDS	1516 PSI			
		49						





#### SYSTEM SET-UP

#### See Screen 5.

Use the **SYSTEM SET-UP** screen to configure the system parameters. The following paragraphs provide a description of each system parameter.



Screen 5 SYSTEM SET-UP

#### Clock

See Screen 6.

Although the time and date are set during initial setup, you may change the parameters manually or automatically.

To update the time and date automatically, touch **Update** controller with current time.

To update the time and date manually, touch **Set Clock options**. The **Clock Set-up** screen appears. Touch the screen keyboard to set the parameters.

🔰 Minimize 🛛 Nord	lson Webl	Browser (All Rights	s Reserved) V1.04	Show Sites		C Refresh				🕐 Exit		
Dispenser R	leady		No Faults			CURRENT PAR		53.6	cc	<mark>SDS-90</mark> JNIT 2		
SYSTEM STATUS VIEW FAULTS TEST POINTS SYSTEM SET-UP PROCESS DATA	Cloc Upda Set C	k Set-up Op ate controller Clock options	btions with current tim	ne - Tuesda	<u>y, 4/5/200</u>	<u>5 5:50:10 F</u>	<u>PM</u>					
ONLINE	ſ	📕 Minimize 👔	Nordson WebBrowse	: (All Bights Bese	arved) V1 04	Show Sites		C Rei	fresh			🗶 Exit
PREV.	Dispenser Ready No Faults Current Volume							оме 53	3.6 cc	<b>SDS-90</b> UNIT 2		
		SYSTEM STATUS VIEW FAULTS TEST POINTS	Clock Set Date: 4/5/ Time: 5:5: Format 1: Clock spe	- <b>up</b> 2005 2:58 PM 2 Hour Form ed: No Cha	nat 💌 ange 💌 Ri	ın clock fas	ster or sl	ower Sec	c/Month:	0	F	×
		SYSTEM SET-UP		2	3	4	5	6	7	8	9	0
		PROCESS		W	E	R	Т	Y	U	1	0	Р
		DATA		S	D	F	G	Н	J	К	L	
		ONLINE		X	C		В	N	м			
		PREV. MAINT.	Press refr	submit esh button t	o re-load c	Clear lefault time	and dat			Space	Shift	Caps

Screen 6 Clock

#### System

See Screen 7.

Touch the keyboard to select Metric or English system units; clock format; type of pressure unit; bead size global or by Part ID.



Screen 7 System

#### Pump Stand 1

See Screen 8.

Touch either **Pump Stand 1** to view the status of the pump stand.

Touch Pressurize Pump Stand to pressurize the pump stand.

Touch **Depressurize Pump Stand** to depressurize the pump stand.



Screen 8 Pump Stand 1

#### **Restore Configuration**

#### See Screen 9.

Use the drop-down menu to select a previously stored configuration.

🔰 Minimize	Nordson WebB	rowser (All Rights	Reserved) V1.04	🚷 Show Sites		C Refresh			😮 Exit
Dispense	er Ready		No Faults			CURRENT PART V		5 <b>3.6</b> cc	SDS-90 Unit 2
SYSTEM	Resto	ore Configu	ration						
STATUS	Confi	guration A	is EMPTY						
VIEW	Confi	guration B	is EMPTY						
		Restore	Skip						
TEST POINTS		1)2	Configuration Configuration	B 5	6	7	8	9	
SYSTEM SET-UP				CLEAR	BACK SP	RESET	SUBM		
PROCESS									
ONLINE	Pleas	e press the F	Refresh butto	on after exitir	ng this meni	L			
PREV. MAINT.		BACK							

Screen 9 Restore Configuration

#### Simulation Mode

See Screen 10.

The **Simulation Mode** screen is 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.

🔰 Minimize	Nordson WebB	rowser (All Rights Reserved) V1	.04 🔛 Show	) Sites		C Refresh		Q	🕽 Exit
Dispens	er Ready	No Fau	lts			CURRENT PART VOLUME	<b>53.6</b> o	C UNI	<mark>5-90</mark> T 2
SYSTEM	<b>Simul</b> Dispe	<b>ation Type Set-up</b> nse Ready must be O	N before r	unning a	sim	ulation			<b>^</b>
	Simu	ation Type	Constant	<b>•</b>	M	lultiple Analog			
VIEW			Constant Step Up		s	et Time(1-30) Seconds	;	10	
	Cons	tant Cycle	Step Dov Multiple (	vn Dn/Off	S	et Analog Step 1(1-10)	Volts	3	
POINTS	Set T	ime (1-30) Seconds	5		S	et Analog Step 2(1-10)	Volts	5	
	Set A	nalog (1-10) Volts	5		S	et Analog Step 3(1-10)	Volts	7	
SYSTEM SET-UP		Down Cycle							
PROCESS	Set T	ime (1-30) Seconds	10						
DATA	フ 📃				R	un Simulation Now		Yes 💌	
ONLINE									
MANUAL		1 2 3		5			9		
PREV.					-				
MAINT.	<b>/</b>	( ) ( ) ( CLEAR ) BACK SP ( RESET ) SUBMIT							
									-

#### Screen 10 Simulation Mode

#### SDS Manual Mode

See Screen 11.

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

Touch **PURGE ON.** The meter starts to dispense until **PURGE OFF** is touched or the meter dispenses the entire volume of the meter.

Touch either **REFILL** or **AUTO MODE** to refill the meter.



Screen 11 SDS Manual Mode

# PROCESS DATA

See Screen 12.

Touch **PROCESS DATA** to view production data.



Screen 12 PROCESS DATA (Typical)

### **PROCESS DATA Part Charts**

See Screen 13.

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



Screen 13 PROCESS DATA Part Chart (Typical)

### **ONLINE MANUALS**

See Screen 14.

Touch **ONLINE MANUALS** for links to documentation. Touch either a part number or a manual title to access documentation that is applicable to the dispensing system.

🔰 Minimize 🛛 Nor	rdson WebBrowser (All Rights	Reserved) V1.04 🕍 Sh	ow Sites	C Refresh		😮 Exit
Dispenser I	Ready	No Faults			53.6cc	SDS-90 Unit 2
SYSTEM STATUS	OnLine Manuals Select one of the follo	wing:				
VIEW	1009912	SDS Meter				
FAULTS	1026135	Rhino SD Pumps				
	1045988	Rhino SD Container	<u>r Change</u>			
POINTS	1043115	Rhino SD Ball Chec	: <u>ks</u>			
	1047087	Rhino SD Bleed Va	lves			
COVOTEM.	1033035	Rhino SD Packing (	Gland Replacement			
STSTEM SET-UP	1047104	Rhino SD Purge Bu	ttons for Electric Cl	hangeover		
	1047108	Rhino SD Runaway	<u>Sensors</u>			
PROCESS	334458	Rhino SD Single Re	ed Lens Light Tower			
DATA						
ONLINE						
PREV. MAINT.	BACK					
PART ID: 0	Bead Size			EW FAULT LOG FAULT		

Screen 14 ONLINE MANUALS (Typical).

### PREV. MAINT.

See Screen 15.

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

🔰 Minimize 🛛 N	ordson WebB	rowser (All Rights Reserved) V1.04	🕍 Show Sites		C Refresh			🗶 Exit
Dispenser	Ready	No Faults			CURRENT PART VO	циме <b>37</b>	7.5cc	SDS
Dispenser SYSTEM STATUS VIEW FAULTS TEST POINTS SYSTEM SET-UP PROCESS DATA	Ready Prev Elapse	entive Maintenance	Consection	nost up to da	ate information us	ase the refre	7.5 cc	
ONLINE MANUALS PREV. MAINT.								

Screen 15 PREV. MAINT.

#### **BEAD SIZE**

See Screen 16. Touch **BEAD SIZE** to access the bead size screens. 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.

Touch the applicable link on the **Bead Size Menu** to access the **Bead Size Setup** screen and change the bead sizes.

💉 Minimize 🛛 Nord:	son WebBrowser (All Ri	ights Reserved) V1.04	😤 Show Site	s	C	🕇 Refresh				🕐 Exit			
Dispenser R	eady	No Faults			CU	RRENT PA		53.6	Bcc	SDS-90 Unit 2	1		
SYSTEM STATUS	Bead Size: Part Name:	<u>49</u>	Part ID:	0									
VIEW FAULTS	Bead Size Part ID 0 To 63 Part ID 64 To 1 Part ID 128 To	Change Me 3 127 191	nu										
POINTS	Part ID 192 To	255				_			-				
SYSTEM SET-UP	Minimize Nord	son WebBrowser (All F eady	ights Reserved No F	1V1.04 🏠 aults	] Show Si	tes	CL	Refresh		53.6	с <mark>–</mark>	COS-90 UNIT 2	
PROCESS	SYSTEM	Bead Size L	.ist					_				<u> </u>	
ONLINE MANUALS	VIEW	Part Part ID Name	Bead Size	í	Part ID I	Part Name	Bead Size		Part P ID Na	art Bead			
PREV. MAINT	FAULTS	3	49	CHG	1		49 49	CHG	5	49	CHG		
PART ID: 0	TEST POINTS	6	49	CHG	7		49	CHG	8	49	CHG		
	SYSTEM SET-UP	9 12	49	CHG	10		49 49	CHG	11	49	CHG		
	PROCESS	15	49	CHG	16		49	CHG	17	49	CHG		
	DATA	Minimize Nord	49 Ison WebBrows	er (All Right:	s Reserve	d) V1.04	49 🖓 Show Si	tes	20	Refresh	СПО		🕐 Exit
	ONLINE	Dispenser R	eady		No	Faults			CUF			53.6cc	<b>SDS-90</b> UNIT 2
	PREV.	OVOTEM	Bead Si	ize Set	up								<b>^</b>
		STATUS	Part ID	1	Vame	Be	ead Size	Part I	D	Name	Be	ad Size	
	PARTID: 0	VIEW FAULTS	0				49 49	6			2	19 19	
	, ,	TEST	2				49	8			2	19	
		POINTS	3 4				49 49	9 10			4	19 19	
		SYSTEM SET-UP	5			4	49	11			4	19	
		PROCESS											
		ONLINE	1	2		3)	4	5	6	7	8	9	
		PREV. MAINT.		(	.)(	Ξ	CLEAN	BA	CK SP	RESET	SUBM		
		PART ID: 0	Bead Siz	ze			SI	DS 1552	PSI				

Screen 16 BEAD SIZE.

# Operation



- 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.

See Screen 17. 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.

💉 Minimize	Nordson WebBrowser	(All Rights Reserved) V	1.04 🕍 Show Sites	5	😷 Refresh		🖉 Exit
Dispens	er Ready	No Fai	llts			5 <b>3.6</b> cc	SDS-90 Unit 2
SYSTEM	Bead Siz	e Setup					^
STATUS	Part ID	Name	Bead Size	Part ID	Name	Bead Size	
VIEW	0		49	6		49	
FAULTS			49	7		49	
TEST	2		49	8		49	
POINTS	3		49	9		49	
	4		49	10		49	
SYSTEM SET-UP	5		49	11		49	
PROCESS DATA ONLINE MANUAL PREV. MAINT.		23	4 CLEAR	5 6 BACK SP	78 RESET	9 ( SUBMIT	
PART ID: 0	Bead Size		SDS	6 1552 PSI			

Screen 17 Screen Keyboard (Typical)

# Startup

Startup procedures are provided in the following steps.

#### NOTE

Operating procedures may vary due specific application requirements. Refer to your System Parameter Sheet for specific operating settings.

See Screen 18.

- 1. Turn on power to the controller (2). After the system finishes the boot-up process, press the POWER ON button.
- 2. Place a waste container under the dispense gun (4).
- 3. Verify that the bulk unloader (3) is on and that the supply pressure is within the normal operating range.
- 4. Install a nozzle on the dispense gun (4).
- 5. To purge the nozzle, use the robot command to raise the Purge input or perform the following procedure:
  - a. Touch **System Setup** (5), to access the **SDS Manual Mode** screen (12).
  - b. From the SDS Manual Mode screen (12), touch Manual (7).
  - c. Touch **PURGE ON** (9).

#### NOTE

The meter performs the purge function until it is either empty or **PURGE OFF** (8) is touched.

- 6. Perform one of the following to refill the meter:
  - Drop the robot Purge input.
  - Touch REFILL (10).
  - Touch **Auto Mode** (11) to put the system back into AUTO.
- Check the bead size for the part being run. Touch BEAD SIZE (13) to access the Bead Size Menu and make adjustments if necessary.
- 8. Touch **PROCESS DATA** (14) to monitor material dispensing characteristics.
- 9. Position the part and begin dispensing from the robot controller.

#### NOTE

During dispensing, the robot signal indicators illuminate when signals are received from the robot controller. During normal operation, these lights flash on and off in specific sequence.

## Fault Messages

See Screen 18. If a fault is detected during operation, the alarm tower (1) red light turns on and the type of fault is indicated on the operator interface.

- 1. Touch **VIEW FAULTS** (6). A description of the fault appears along with the corrective action.
- 2. Touch any of the bold or underlined text to proceed directly to the correction.





#### Screen 18 Typical Startup

# Statistical Process Control Data

The statistical process control (SPC) data that appears on the Process Data screen is stored on the hard drive of the controller PC. Typical data that appears are:

- Date and Time
- Part ID
- Bead Size Setting
- Volume Setpoint
- Actual Volume
- Material Temperature

### Accessing SPC Data

The PCI controller saves the data in comma-delimited format for importing into a spreadsheet. Use the following procedure to access the SPC data.

#### NOTE

Only personnel with Administrator Level access to the PCI controller can perform this procedure.

1. Using Windows Explorer access the following folder:

c:\Nordson\Serial

The spc data for unit 1 is stored as

spc.dat

the data for unit 2 is stored as

spc2.dat

2. If desired, export these files by copying them onto a USB memory device.

#### **SPC Error and System Status Codes**

Refer to Tables 5 and 6.

The PCI controller collects the following SPC Error Codes and SPC System Status Codes.

Table 5 SPC Error Code
------------------------

Code Description			
1	High dispensed volume		
2	Low dispensed volume		
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		

#### Table 6 SPC System Status Codes

Code Description		
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	
32768	Part cycle ran in Simulation Mode	

# Shutdown

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

- 1. See Figure 5. Touch **Minimize** (1) at the top of a screen display.
- 2. Touch start (2) on the Windows task bar to access the Start Menu.
- 3. Touch Shut Down (3) on the Start Menu.
- 4. Make sure that **Shut Down** is displayed in the **Shut Down Windows** field. Touch **OK** (4).
- 5. Turn the controller off and relieve all pressures.





# Troubleshooting

This section contains troubleshooting procedures. These procedures cover only the most common problems that you may encounter. If you cannot solve the problem with the information given here, contact your local Nordson representative for help.



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

Problem	Possible Cause	Corrective Action
1. Meter does not dispense	Major fault	Access the VIEW FAULTS screen to determine cause of fault condition.
	Controller in Manual Mode	Set PCI controller to the AUTO mode.
	No air to meter solenoids	Check supply air to the gun and refill meter solenoids. Make sure that the regulator is set to at least 70 psi.
	Robot signals not in proper sequence	See the IO timing charts (Figures 3 and 4) for proper robot IO sequence.
Problem	Possible Cause	Corrective Action
2. Meter does not refill	Low unloader pressure	Check the air pressure to the bulk unloaders. Make sure that there is enough air pressure to refill the meter cylinders.
	No air to meter solenoids	Check supply air to the gun and refill meter solenoids. Make sure that the regulator is set to at least 70 psi.
	Clogged refill valve(s)	Remove the refill valve and either clean or replace the refill valve cartridge.
	Refill proximity switch not within limits.	Make sure that the gap between the refill proximity switch and the piston target disk does not exceed 0.030 in. and that the alignment is correct. Adjust the proximity switch if necessary.
Problem	Possible Cause	Corrective Action
3. Bead deposition "wiggles"	Nozzle too high above work piece	Lower the nozzle. Refer to the robot controller manual.
	Material speed through nozzle too low	Increase the bead size. Refer to <i>Startup</i> in the <i>Operation</i> section.
	Nozzle not large enough	Install a larger nozzle. Contact your Nordson Corporation representative for part numbers.
4. Unexpected bead-size change	Nozzle partially blocked	Remove nozzle; clean or replace.
	Material exceeded shelf life	Use fresh material.

# **Cable Continuity**

Cables should be checked periodically and replaced when worn or frayed. If a system malfunctions, make sure that the cable connections are tight.

#### ! CAUTION !

Disconnect power before removing cables and testing them.

Check the cables for continuity with an ohmmeter. See the cable wiring diagrams included with your system documentation.

# Repair

Repair consists of replacing the operator interface panel and the PCAs.



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

- 1. Turn off and lock out external electrical power to the controller.
- 2. See Figure 6. Open the enclosure door (1).
- 3. Disconnect the AC (4) and Serial (5) cables from the operator interface (3).
- 4. Remove the mounting clips (2) securing the operator interface (3) to the enclosure door (1). Remove the operator interface from the enclosure door (1).

#### NOTE

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

- 5. Make sure that the sealing gasket on the operator interface (3) is properly positioned.
- 6. Install the new operator interface (3) into the enclosure door (1).
- Install the mounting clips (2). Using the torque sequence shown in Figure 6, tighten the mounting clips to 10 in.-lb (1.1 N•m).
- 8. Connect the AC (4) and Serial (5) cables to the operator interface (3).
- 9. Close the enclosure door (1).

# Typical PCA Replacement

The Netburner PCA is used as an example in the following procedure.



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

- 1. Turn off and lock out external electrical power to the controller.
- 2. See Figure 6. Open the enclosure door (1).
- 3. Disconnect the electrical connectors (8) from the PCA (6).
- 4. Remove the screws (7) from the PCA (6).
- 5. Install the new PCA (6) using the screws (7). Do not over tighten the screws.
- 6. Connect the electrical connectors (8).
- 7. Close the enclosure door (1).



Figure 6 Typical Repairs

### Restoring PCI Controller Programs

WARNING

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

Use this procedure to restore the PCI controller programs and configuration.

- 1. See Figure 7. Open the enclosure door (1).
- 2. Connect a mouse and USB-type keyboard to the VersaView PC (2).

#### NOTE

If a standard PS-2 style keyboard is used, the VersaView PC will have to be rebooted to recognize the keyboard.

- 3. Reboot the VersaView PC (2) if necessary.
- 4. Close all running programs.
- 5. Log out as the PCI user and log in as the Administrator. Enter the password. The default password is Nordson.
- 6. Using Windows Explorer, access the *C:\PCI Install\Release\Loader* folder.



Figure 7 Accessing the Operator Interface

- 7. See Screen 19. Double-click on the *PCI Loader.exe* file to run the PCI Program Loader utility (1).
- 8. Check the **Serial Port Number** field (3) and make sure that the program is configured to load the software onto the correct board.

If COM 1 appears in the **Serial Port Number** field, the software will be loaded onto the board connected to COM port 1. To change the serial port, click on **Select Serial Port** (7) and set the port to COM 2.

- 9. Cycle power to the PCI controller circuit boards. Refer to the PCI controller schematic for details.
- When power is restored to the board, the message in the PCI Controller State field (2) changes from Not Ready to Controller Ready.

#### NOTE

Make sure that the correct *s19* file is loaded onto the correct board.

- 11. Click on **Open File** (9) and select the desired *s19* file. Click on **Update PCI** (8).
- 12. The time and file loading progress appears in the Elapsed Time (4) and the File Progress (5) fields.
- 13. When the process is done, click on **EXIT** (6) to exit Windows Explorer.
- 14. Disconnect the keyboard and mouse from the VersaView PC (2).
- 15. See Figure 7. Close the enclosure door and cycle power to the PCI controller.



Screen 19 PCI Program Loader Screen

### Saving and Loading PCI Controller Configurations



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

#### NOTE

Loading a configuration file from a floppy disk does not require a keyboard. Proceed to the *Loading Configurations* procedure.

- 1. See Figure 7. Open the enclosure door (1).
- Connect a USB-type keyboard to the VersaView PC to enter a file name and save configuration data onto a floppy disk or the hard drive.

#### NOTE

If a standard PS-2 style keyboard is used, the VersaView PC will have to be rebooted to recognize the keyboard.

#### **Saving Configurations**

- 1. See Screen 1. Touch **Minimize** on the **System Status** screen to minimize the browser screen.
- 2. Maximize the SerialCom window (1).
- See Screen 20. Touch either Unit 1 or Unit 2 in the Config File Transfer field (3) to save data from the applicable controller board.
- 4. Touch **Save Config File** (4). Using the keyboard, enter the name of the file to save in the file-name field. Touch **Save** (2).
- 5. When **OK-File Saved** appears in the field (5), minimize the **SerialCom** window (1).
- 6. See Screen 1. Touch **Maximize** on the **System Status** screen to maximize the browser screen.
- 7. See Figure 7. Close the enclosure door (1).

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Transmission Status			Config File Transfer
Msg Sent 796	Sent Msg Lost:	Msg Rec by CC	C Unit 1
Msg Rec: 3438	Rec Msg Lost:	Clear Msg Rec by CC counter	Save Config File
Send sk	ow msg Show 1/0 d	ta See Test points	Load Config File
version 9	end 100 Dummy Msgs to CC	Get Fault List From Controller	<u>ا</u>

#### Screen 20 Saving Configurations

### Loading Configurations

- 1. See Screen 1. Touch **Minimize** on the **System Status** screen to minimize the browser screen.
- 2. Maximize the **SerialCom** window (1).
- See Screen 21. Touch either Unit 1 or Unit 2 in the Config File Transfer field (3) to load data to the applicable controller board.
- 4. Touch Load Config File (4).

- 5. Select the desired file to load and touch **Open**.
- Wait for the PCI controller to update. When Transfer Complete appears in the field (5), minimize the SerialCom window (1).
- 7. See Screen 1. Touch **Maximize** on the **System Status** screen to maximize the browser screen.
- 8. See Figure 7. Close the enclosure door (1).



Screen 21 Loading Configurations

# **Parts**

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



Figure 8 SDS Single-PCI Controllers

PCI Controller			1058595	1059146
Item	Part	Description	SDS/1-Gun/0-Temp	SDS 40/0-Temp
1	1040541	Touch screen assembly	1	1
2	1060059	PCA, PCI controller, servo mod	1	1
3	1040544	Netburner PCA	1	1
4	320255	Hybrid, UCS-ON-1, Open PCB	1	0

# Accessories and Kits

These accessories may be purchased separately.

Part	Description	
281132	Valve, proportional assembly	

# Cables

Use this list to order replacement cables of the correct type and length.

Part	Description	
1058761	Cable, 24 pin, 70 ft	

# **Specifications**

Input Power: TYP 480 V, 3  $\varnothing,$  , 60 Hz, 25 A Interface Voltage; 24 Vdc

# Schematics and Wiring Diagrams

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

Controller	Schematic
1058595 SDS/1-Gun/0-Temperature	1058596
1059146 SDS 40/0-Temperature	1059147

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