iTrax® PRx II Module

Customer Product Manual
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– English –
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For parts and technical support, call the Industrial Coating Solutions Customer Support Center at (800) 433-9319 or contact your local Nordson representative.

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http://www.nordson.com.

http://www.nordson.com/en/global-directory

Change Record

Revision	Date	Change
01	2/14	Initial Release
02	3/15	Added Firmware Updates section. Additional changes on page 16, Figure 3.
03	3/18	Updated Figure 4 and tables on pages 27 and 35.
04	9/18	Update pressure transducer part number from 1079965 to 1602880.
05	11/19	Added optional PCA part number (1605550).
06	11/21	Updated system wiring diagram.
07	07/22	Updated approval information.
08	01/25	Updated Manufacturer Address

Safety

Introduction

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 Safety Data Sheets (SDS) 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 SDS 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 them this card
- Tell them 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 SDS 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 SDS 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 Nordson PRx II module provides the following monitoring and control capabilities:

- electronically controls base pressure when used with the iTRAX Pressure Controller, part 1604921 (also compatible with controller part 1602371)
- monitors coating material temperature when used with optional pressure/temperature sensor, part 1602880
- monitors chuck spin speed, chuck bearing speed, or belt speed
- sends the can spin speed setpoint to the customer's control system when used with an optional Anybus module

In addition, the PRx II module can also provide Extended Can-In-Pocket (ECIP) monitoring functions, which include:

- vacuum detect
- gun mount position
- can-in-pocket (CIP) detect
- speed monitor signal (chuck spin speed, chuck bearing speed, or belt speed)

The ECIP function monitors these signals and sends an alarm if any one of them fails. The signals are true/false and do not provide actual vacuum or position readings. The module also includes a run/stop signal to prevent false warnings and alarms from being generated.

The iTRAX Operator Interface (OI) provides the configuration and monitoring interface for the PRx II module. The OI consists of OPC Server and OPC Local Client software, plus a USB-to-CAN adapter, USB cable, and CAN termination resistor.

PRx II Module
Weight: 0.801 kg
(1.77 lbs)

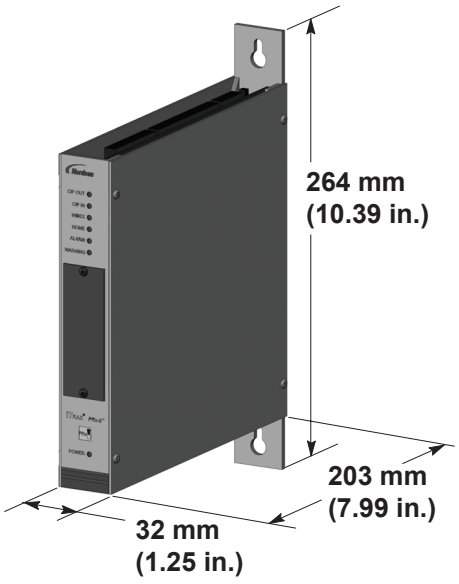


Figure 1 PRX II Module

The Nordson OPC Server and Client run on an IBM-compatible personal or industrial computer with the Windows XP or Windows 2000 operating system. The OPC Client provides a graphical user interface for setting up and monitoring system parameters. It is referred to as the Operator Interface (iTRAX OI). Communication between the OI and the iTRAX modules is through a proprietary CAN (Controller Area Network) using the USB-to-CAN network adapter.

Up to 63 iTRAX modules can be connected to a single CAN (excluding the PC, which is the 64th node). These modules may be a mix of spray monitors, spray controllers, and PRx II modules depending on the application. Because screen refresh times can become noticeably longer with greater numbers of spray monitors, it is recommended that no more than 35 spray monitors be connected to the network. This limitation does not apply to spray controllers or PRx II modules (if not used for pressure control).

NOTE: For systems with more than 63 modules, a CAN-to-CAN gateway is recommended to expand the CAN node capability. Contact your Nordson Container representative for more information.

Once a PRx II module is configured, it remains fully functional even if the computer running the OPC Server and OPC Local Client is shut down.

This manual provides installation, configuration, and parts information for the PRx II module. See the online Help system in the iTRAX Operator Interface for system configuration, setup, and operation.

PRx II Features

Pressure Controller

For the PRx II module to operate as a dual-loop base-pressure control system, an electronic pressure controller and iTRAX Spray Monitor must be installed for each spray gun. These devices communicate to control base pressure in the spray gun.

Operation:

1. The base pressure setpoint value is assigned by the operator and sent from the iTRAX OI to the PRx II module. The PRx II module communicates this setpoint value to the electronic pressure controller.
2. The spray monitor reads the actual base pressure at the spray gun and sends it to the iTRAX OI and PRx II module over the CAN.
3. The iTRAX OI displays the actual pressure in the spray gun. The PRx II module also reads the actual base pressure from the SM module over the CAN.
4. The PRx II module compares the actual base pressure to the setpoint and sends commands to the iTRAX pressure controller over an RS-485 link to adjust the pressure as needed.
5. The pressure controller adjusts the output pressure to produce the desired base pressure at the spray gun. The pressure controller’s internal control loop has a 25 msec update time. The PRx II module serves as a supervisory controller with an eight-second update time. This process is continuous.

Pressured Controller Specifications

Maximum inlet pressure	207 bar (3000 psi)
Maximum outlet pressure	62 bar (900 psi)
Operating temperature	-54−74 °C (-65−165 °F)
Inlet/Outlet ports	3/8-in. NPT
Outlet gauge ports	1/4-in. NPT

See document number 1604922 for more details about the iTRAX electronic pressure controller.

Temperature Monitoring

To use the temperature monitoring feature, the standard spray gun pressure transducer must be replaced by a pressure transducer sensor that contains a resistance temperature detector (RTD). The RTD uses a 4−20 mA signal to monitor temperature ranges of 0−100 °C (32−212 °F).

This feature does not adjust the fluid temperature, it only monitors it through the iTRAX OI. The OI allows the operator to set high and low temperature alarm and warning values and alerts the operator if they are exceeded.

The pressure transducer with RTD is sold separately. See the *Parts* section for more information.

Speed Monitoring

NOTE: There are three speed-monitoring options available. Discuss these options with your Nordson representative to determine which is best for your application. Each option requires specific spray machine options.

Speed monitoring monitors and displays the can spin speed through the iTRAX OI. The operator, using the OI, can set high and low speed alarm and warning limits to alert the operator if they are exceeded.

a. Can chuck spin speed monitoring

- A proximity sensor senses targets on the chuck when it enters the spray pocket. A trigger signal is also required to validate the speed signals being detected (since the proximity switch senses targets in a dynamic environment). An index and home sensor are also required to correlate the speed of each chuck and transfer the data to the correct field in the *Speed Detail Screen*.

b. Chuck bearing speed monitoring

- A proximity switch senses targets on the chuck at a location where the drive belt is disengaged from the chuck. As the chuck speed slows, the module looks for an acceptable speed for a properly working chuck bearing. This option is used when the primary concern is the condition of the bearings. A trigger, index, and home signal are required for this feature.

c. Belt speed monitoring

- A proximity sensor must be installed to sense the RPM (0−3000 RPM) of one of the belt pulleys. The targets on the belt pulley are detected by the proximity sensor to compute the RPM. This feature continuously monitors the pulley speed provided the Run/Stop signal is in run.

Extended Can-in-Pocket

The ECIP feature is used with the following optional, customer-supplied components:

- CIP sensor in the spray pocket
- Vacuum detect sensor
- Belt spin detect sensor
- Gun mount position switch

The PRx II module combines the signals from the above sensors and sends a single CIP signal to the iTRAX Spray Monitor. If one of the sensor signals is not correct, the spray monitor will not receive the CIP signal and will generate a CIP fault. The iTRAX system identifies the sensor causing the CIP fault. This feature can only be used if a CIP sensor is located in the spray pocket.

Anybus® Option Features

NOTE: Nordson offers three options for a fieldbus network: Profibus, Ethernet I/P, and DeviceNet.

By installing an Anybus-S Profibus, Ethernet/IP, or DeviceNet interface module on the PRx II module, the PRx II module can communicate the following information to external controllers:

- Spin Belt Speed Setpoint
- Monitored Speed Value
- Temperature at gun
- General status
- Warnings
- Alarms
- Current One Button Recipe Number (user assigned)

Starting with Version 4.2 of the iTRAX OI, the software allows the user to set a spin speed setpoint. The setpoint, along with the actual speed, is then sent via the Anybus module and fieldbus network to a customer-supplied host PLC/Controller for spin speed control.

See *Parts* for the AnyBus-S module part numbers and ordering information and the *Anybus Option Installation* on page 13 for installation and configuration information.

PRx II Module Requirements

NOTE: For compliance with the European Union Electromagnetic Compatibility Directive, see *EMC Directive Compliance*.

The following customer-supplied hardware is required to install the PRx II module and options:

- Power Supply: 24 Vdc, 0.7 A required per PRx II module/pressure controller combination (the PRx II module alone is 0.35 A max)
- CAN Cable: Belden 9841 or equivalent. The PRx II module is guaranteed to communicate properly only if the total CAN length is ≤ 75m (246 ft).
- Enclosure: IP54 or better metal enclosure
- Cables, as required, for index and timer output, CIP sensors, timer input, spray output, and warning/alarm outputs
- Pressure controller cable (if used): Belden 3084A or equivalent
- 8-mm air tubing for pressure controller air input
- Filtered, compressed air at 5.5 bar (80 psi) minimum for air servos inside the pressure controller

See *Parts* for part numbers and ordering information for optional equipment.

EMC Directive Compliance

For compliance to the European Union Electromagnetic Compatibility Directive (EMC Directive):

1. Mount the PRx II module in an IP54 or better metal enclosure.
2. Use a CE-labeled 24 Vdc power supply.
3. For general safety fuse L1 and L2 of power supply.
4. All customer-supplied cables must be shielded and terminated.

Installation

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

Installation includes mounting, configuring, and wiring the PRx II module and optional equipment. PRx II module configuration is done through the iTRAX Operator Interface.

NOTE: For compliance with the European Union Electromagnetic Compatibility Directive, see *EMC Directive Compliance*.

Conditions of Warranty

The iTRAX PRx II module must be installed and wired per the specifications provided herein. Other than technical support provided under warranty for defective equipment, Nordson will not provide complimentary post-sale technical support if the installation does not comply with the requirements stated in this manual and local electrical codes.

Furthermore, if post-sale technical services are performed and the installation is found to be non-complaint with these requirements, then the customer will be invoiced and be responsible for payment of the charges associated with the service.

Anybus® Option Installation

Install the Anybus module on the PRx II module before installing the PRx II module in an enclosure.

Install the Anybus-S Module

Follow this procedure to install the AnyBus-S module on the PRx II board. See Figure 2.

1. Remove the four screws (2) and cover (1) from the PRx II module.
2. Remove the three screws (5) from the stand-offs (6) on the PRx II board (3).
3. Insert the connector on the AnyBus module (4) into the J4 header (7) on the PRx II board.
4. Secure the AnyBus module to the stand-offs with the three screws removed in step 2.
5. Find the SW4 DIP switch (8) on the PRx II board and set switch SW4−4 to the closed position.
6. Reassemble the module.

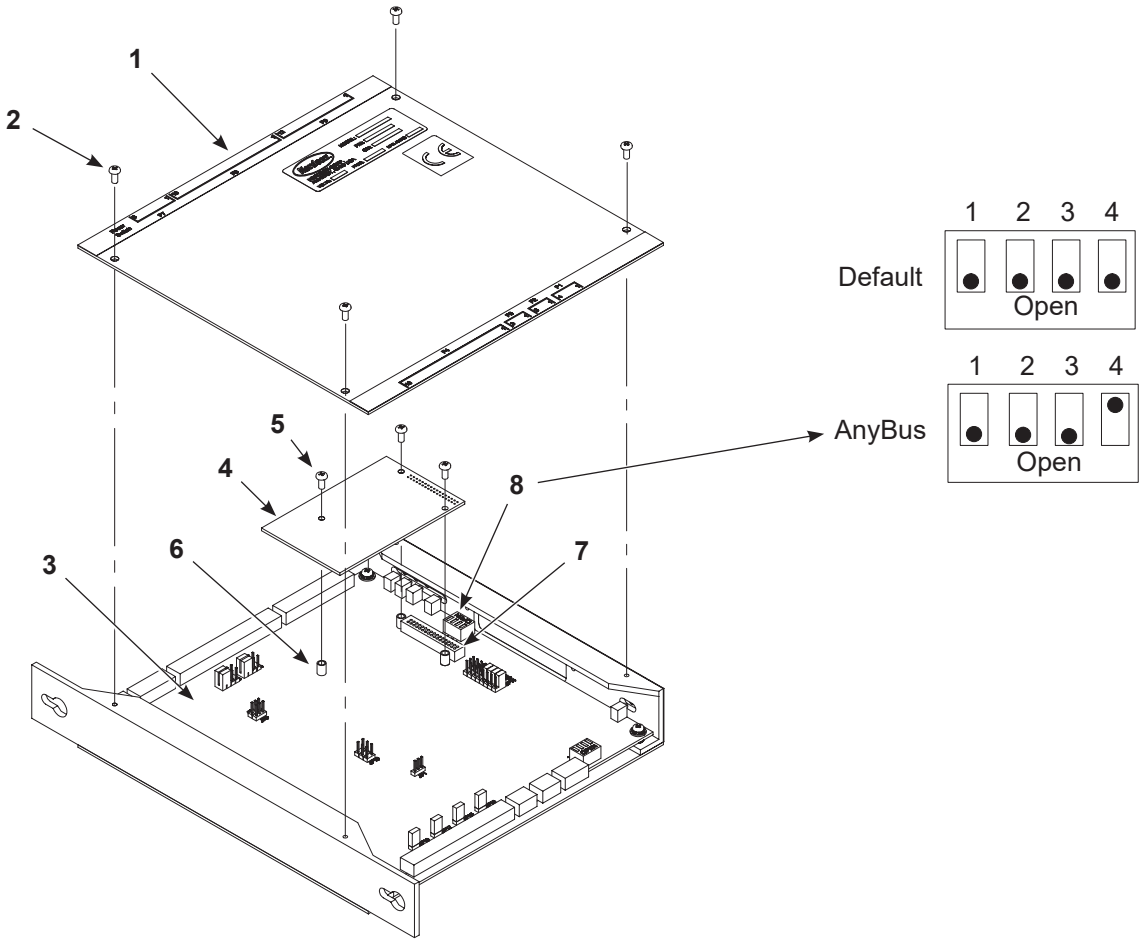


Figure 2 Anybus Module Installation and Jumper Setting

1. Cover
2. Cover screws (4)
3. PRx II board
4. AnyBus board
5. Stand off screws (3)
6. Stand offs
7. Header J4
8. SW4

Configure the Anybus-S Profibus-DP

The PRx II module is compatible with the Anybus-S Profibus-DP slave interface module available from Nordson (see the Parts section) for field installation.

NOTE: The iTRAX OPC Server and Local Client CD includes the required support files for the Anybus option in a folder titled PRx II_Support.

1. Load the file HMS_1003.GSD into the Profibus-DP master so it will recognize the Anybus module.
2. Determine and set the network address of the Anybus module.

The PRx II module software pre-configures the installed Anybus module I/O space for 13 two-byte words of inputs. Table 1 lists the definition of each input word. There are no output words.

3. For the Profibus master, download and create an I/O configuration table using a Profibus system configuration/development tool such as Step 7 from Siemens or SyCon® System Configurator from Hilscher GmbH.
4. Configure the master so that 13 two-byte input words are mapped to the master input image table.

Configure the Anybus-S Ethernet/IP

The PRx II module is compatible with the Anybus-S Ethernet/IP slave interface module available from Nordson (see the Parts section) and is field-installed.

NOTE: The iTRAX OPC Server and Local Client CD includes the required support files for the Anybus option in a folder titled PRx II_Support.

1. Load file 73−9599−EDS_ABS_EIP_V_1_9.EDS into the Ethernet/IP master/scanner so that it will recognize the Anybus module.
2. Determine and set the IP address of the Anybus module. It is recommended to set all the DIP switches on the Anybus card to OFF, and to set the IP address of the module using the Anybus IPConfig software tool, which is included on the iTRAX CD in a folder titled PRx II_Support. The CD also includes an excellent configuration procedure titled EthernetIP_Adapter_RSLogic_2.02.pdf.
3. Set the four-byte IP address to match the network address (first three bytes) of the Ethernet network to which the Anybus module is connected and then have a unique sub-net address (the least significant byte).

The PRx II module pre-configures the installed Anybus module I/O space for 13 two-byte words. Table 1 lists the definition of each input word. There are no output words.

4. Configure the Ethernet/IP master/scanner to create a matching I/O configuration table. This may be done using one of several Ethernet/IP system configuration/development tools such as the Rockwell Automation RSLogixM 5000 or SyCon® System Configurator from Hilscher GmbH. Configure the master/scanner so that 13 two-byte input words are mapped to the input image table.

Configure the Anybus-S DeviceNet

The PRx II module is compatible with the Anybus-S DeviceNet slave interface module. This module is available from Nordson (see Parts section) and is field installed into the iTRAX PRx II module.

NOTE: The iTRAX OPC Server and Local Client CD includes the required support files for the Anybus option. The files are contained in a folder titled PRx_Support. The same and additional support files can be downloaded from www.anybus.com.

1. Assign and set a unique MAC address for the Anybus-S module using the DIP switches provided on the module.

The PRx II module software preconfigures the installed Anybus-S module's I/O space for 13 two-byte words of inputs. Table 1 lists the definition of each input word. There are no output words.

2. Create and save an I/O configuration table for the DeviceNet master (i.e. DeviceNet Scanner). This may be done using one of several Rockwell-Allen Bradley configuration/development tools such as Control Logix 5000M or RSNetWorxM for DeviceNet. Configure the DeviceNet Scanner so that 26 bytes (13 two-byte words) are mapped to the input image table.
3. Load the correct *.EDS file into the DeviceNet scanner (master) so that it will recognize the Anybus slave (i.e. DeviceNet Adapter) module. Files can be downloaded from www.anybus.com. The following list describes when to use which EDS file.

- EDS_ABS_DEV_V_2_3.eds − use with Anybus-S having version 2.x firmware (see label on module) when not using the Quick Connect feature.
- EDS_ABS_DEV_2_2.eds − use with Anybus-S having version 2.x firmware when using the Quick Connect feature.
- EDS_ABS_DEV_V_1_35.eds − use with Anybus-S having version 1.x firmware.

Table 1 Input Words to Master

Word No.	Definition
1	Spin Speed Setpoint (RPM)
2	Actual Spin Speed (RPM)
3	Future Use
4	Actual Temperature (°F)
5	Future Use
6	Future Use
7	Future Use
8	General Status
9	Warnings
10	Alarms
11	One-Button Recipe Number
12	Reserved
13	Watchdog counter to PLC (increments every second)

PRx II Module Installation

Configuration

CAUTION: Electrostatic sensitive device: To avoid damaging the circuit board, wear an ESD wriststrap and use proper grounding techniques.

1. See Figure 3. Using a screwdriver, remove the access plate on the front of the PRx II module.
2. Use a small screwdriver to set the CAN address for the module.

- If using the optional pressure controller, the PRx II module address must match the address of the corresponding spray monitor
- If the optional pressure controller is not used, any unique address from 1−63 may be used

NOTE: The spray monitor address can be verified with the spray monitor configuration window on the iTRAX operator interface.

3. **Last Module in the iTRAX CAN Only**: The last module on the CAN must be terminated. If the module is a PRx II module, close switch SW3 position 1 to terminate the network (see Figure 3). This switch is accessible from the bottom of the PRx II module.
4. Replace the access plate on the front of the PRx II module.
5. Repeat this procedure for all additional PRx II modules in the system.

NOTE: If necessary, remove the PRx II module cover as shown in Figure 2 to set jumpers on the PRx II board for other options.

Mounting

NOTE: For compliance with the European Union Electromagnetic Compatibility Directive, see the EMC Directive Compliance on page 11.

Use the two #10 screws to mount the PRx II module in the controller cabinet.

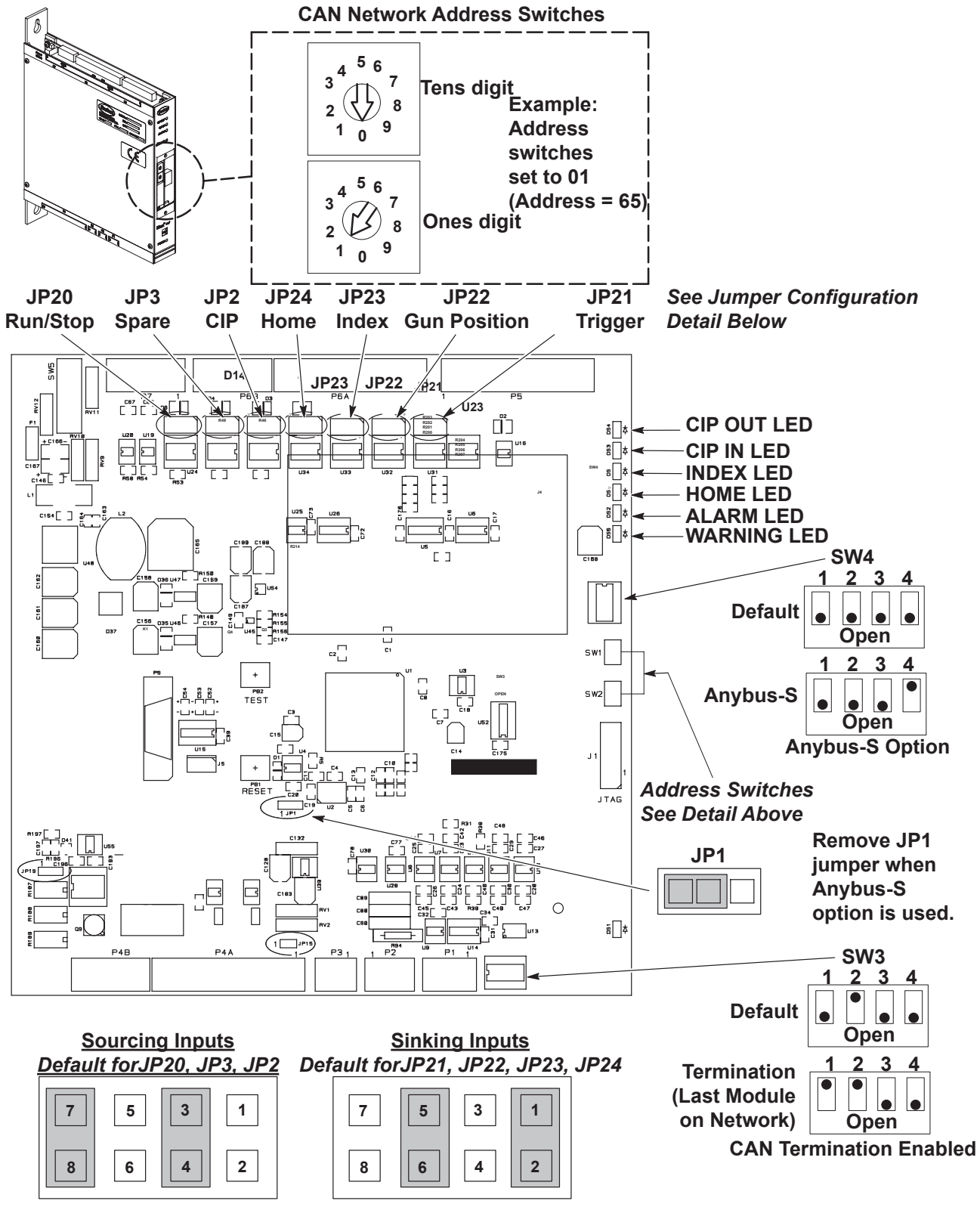


Figure 3 PRx II Circuit Board Switches and Jumper Settings

System Wiring

NOTE: See **Conditions of Warranty** on page 12 for important information. For compliance with the European Union Electromagnetic Compatibility Directive, see *EMC Directive Compliance* on page 11.

See Figure 4 for the wiring diagram.

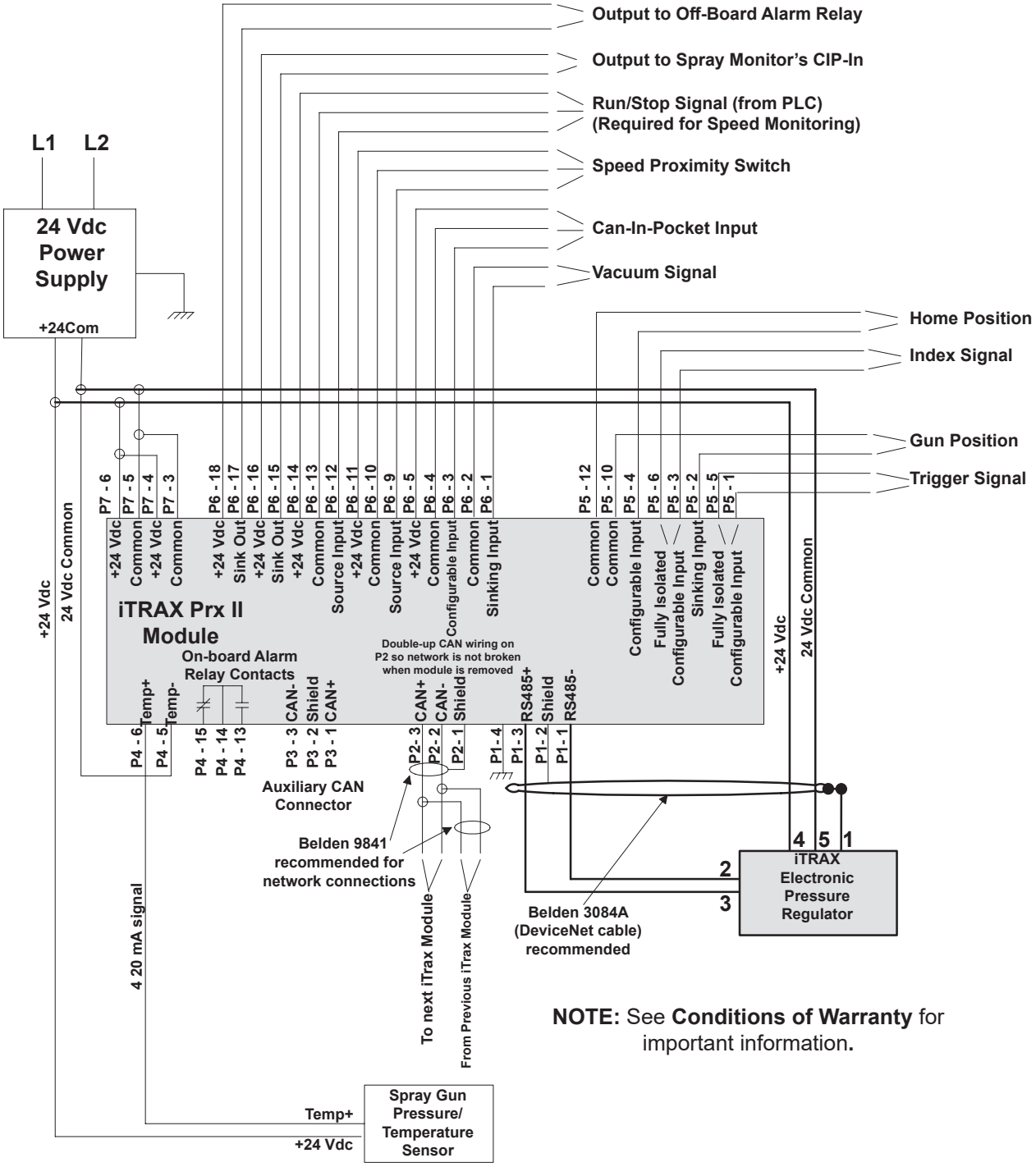
Table 2 PRx II Module Pinouts

Function	Pin Number	Signal Designation	Signal Specification
Electronic Pressure serial communication	P1−1	RS-485 (−)	RS-485 Specification
	P1−2	Shield	RS-485 Specification
	P1−3	RS-485 (+)	RS-485 Specification
	P1−4	Chassis Ground	RS-485 Specification
iTRAX CAN (recommended)	P2−1	CAN Buss Shield	CAN 2.0 Specification
	P2−2	CAN Buss B (−) White	CAN 2.0 Specification
	P2−3	CAN Buss A (+) Blue	CAN 2.0 Specification
iTRAX CAN (optional use)	P3−1	CAN Buss A (+) Blue	CAN 2.0 Specification
	P3−2	CAN Buss Shield	CAN 2.0 Specification
	P3−3	CAN Buss B (−) White	CAN 2.0 Specification
Temperature Monitor Signal	P4−5	Temp (−)	24 Vdc Common
	P4−6	Temp (+)	4−20 mA analog
Alarm Output Contacts (see note A)	P4−13	Normally Open	Dry Contacts
	P4−14	Common	Dry Contacts
	P4−15	Normally Closed	Dry Contacts
Trigger Signal (see note A)	P5−1	Configurable Input Signal	Compatible with SC module Trigger Output (10 mA load)
	P5−5		
Gun Position	P5−2	Configurable Input Signal	10 mA maximum load
	P5−10	Trigger Signal A Reference	24 Vdc Common
Index Signal (see note A)	P5−3	Configurable Input Signal	10 mA maximum load
	P5−6		
Home Signal (see note A)	P5−4	Configurable Input Signal	10 mA maximum load
	P5−12	Signal Reference	24 Vdc Common
Vacuum Signal	P6−1	Sinking Input Signal	from NPN Output or N.O. contact (10 mA load)
	P6−2	Vacuum Signal Reference	24 Vdc Common to Sinking
Can-in-Pocket (CIP) Signal	P6−3	CIP Signal Input	Jumper (JP2) configure to Sinking or Sourcing (See Figure 4)
	P6−4	CIP Signal Reference	24 Vdc Common
	P6−5	CIP Signal Power Source	+24 Vdc @ 20 mA

Function	Pin Number	Signal Designation	Signal Specification
Speed Signal (*see note A*)	P6−9	Sourced Input Signal	from PNP Proximity Switch
	P6−10	Speed Signal Reference	24 Vdc Common
	P6−11	Speed Signal Power Source	+24 Vdc @ 20 mA
Run/Stop Signal from PLC (*see note A and B*)	P6−12	Sourced Input Signal	Requires PNP signal or dry contact across P6−12 and P6−14
	P6−13	Signal Reference	24 Vdc Common
	P6−14	Signal Power Source	+24 Vdc @ 10 mA
Can-in-Pocket (CIP) Output	P6−15	Sinking Output	Compatible with SM CIP Input
	P6−16	CIP Output Power Source	+24 Vdc @ 10 mA
Alarm Output	P6−17	Sinking Output	for external 24 Vdc Alarm Relay
	P6−18	Alarm Output Power Source	+24 Vdc @ 25 mA
Power Connections (*see note A for P7−3, −4, −5, and −6*)	P7−1	24 Vdc Common	
	P7−2	+24 Vdc Switched Output	+24 Vdc for external devices (if used)
	P7−3	24 Vdc Common Input	24 Vdc Common for PRx I/O
	P7−4	+24 Vdc Power Input	+24 Vdc for PRx I/O @ 150 mA (max)
	P7−5	24 Vdc Common Input	
	P7−6	+24 Vdc Power Input	+24 Vdc @ 200 mA (max)

Note A: Wiring requirement for spin speed.

Note B: The Run/Stop signal is provided by the customer's spray machine control system. The signal must be asserted when the spray machine is automatically spraying. The Run/Stop signal may be logically tied to the can-feed control or to the spinner speed control system. The Run/Stop signal serves to validate the time during which monitoring speed is active (and to differentiate from times when the spray machine is shut-off). The iTRAX system also prevents new recipes from being loaded when the Run/Stop signal is in the Run state).



NOTE: See **Conditions of Warranty** for important information.

Figure 4 PRx II System Wiring

Speed Sensors and Targets for Spin Speed

CAUTION: All equipment should be turned off before installing proximity sensors and targets.

One PRx II module, one speed proximity sensor, and two targets (on spinner/chuck) are required for monitoring speed at a single spray pocket. Two targets, machined onto or mounted to the chuck spinners, should be located 180° apart. The best practice would be to use two targets; however, the iTRAX system can be configured for up to four targets. An index and home sensor are required for the starwheel so that the captured speed readings can be properly displayed on the iTRAX Speed Detail Screen. Consult your Nordson container representative to determine the equipment needed for your application.

The speed proximity sensor should be mounted to detect targets on the chuck spinners at a location where the can is spinning at the desired speed for spraying.

Ferrous steel targets are recommended. Aluminum targets require the proximity sensor's sensing range to be derated, which results in compromised performance.

The home proximity sensor should be mounted to detect a single target on the starwheel. The home sensor must detect the home target while the starwheel is stopped at the home position.

The home position is defined by the user and can be assigned as any position on the starwheel. Once the home position is determined, other positions must follow consecutively in a clockwise direction.

Requirements for Spin Speed

- The proximity sensors must have an operating frequency of 2 kHz minimum and sourcing output (PNP) capable of operating at 24 Vdc.
- The mechanical mounting of the proximity sensor may be radial or axial depending on the application.
- For reliable RPM sensing, the target exposure time to the proximity sensor must be at least 1 msec when the chuck spinner is rotating at a speed of 3000 RPM.
- Each chuck spinner needs to be assigned a number, starting with one.
- An index signal must be generated by the spray machine to the PRx II module.
- It is recommended that the system be configured to monitor a pulley that is driven by the belt to allow the detection of a broken belt or a failed spin motor.

Operation

iTRAX system operation is automatic once the PRx II modules are configured to the desired level of process monitoring through the Operator Interface. The OI displays system operation, provides warnings and alarms, and allows the operator to record responses to warnings and alarms.

If the computer is off, the PRx II module remains fully operational and continues to control pressure (if used) and monitor process parameters.

Power Switch

The PRx II module has a power switch on the top rear of the unit. This switch is turned on by default and should be left on. Use this switch to turn off power before disconnecting any of the wire terminal plugs.

WARNING: Turn off external power to the power supply before disconnecting power wires from any terminal plug. Failure to do so could result in an electrical shock.

LED Indicators

The PRx II module has seven LEDs on the front panel:

LED	Color	Function
CIP OUT	Green	Can-in-pocket output signal. Signal is green when all selected can-in-pocket requirements are met. (can-in-pocket sensor, vacuum sensor, belt speed signal, gun in position proximity switch)
CIP IN	Green	Can-in-pocket sensor signal is being received. **NOTE:** Can-in-pocket is an optional function that is set up through the OI. Contact your Nordson representative for more information.
INDEX	Yellow	The Index input is being used for diagnostics.
HOME	Yellow	The Index input is being used for diagnostics.
ALARM	Red	Alarm condition exists. See the iTRAX OI online help system for troubleshooting procedures.
WARNING	Yellow	Warning condition exists. See the iTRAX OI online help system for troubleshooting procedures.
POWER	Green	Power to PRx II module is on. LED will flash when Anybus option is activated.

Spin Speed

The PRx II module uses a number of targets and sensors to transfer data to the iTRAX system OI. The Speed Detail screen (see Figure 5) displays a table where each numbered chuck spinner is listed along with the last recorded reading of its spin speed.

The chuck spinner numbers are assigned by the user in the section *Configuring iTRAX for Indexing Chuck Spinners* on page 25.

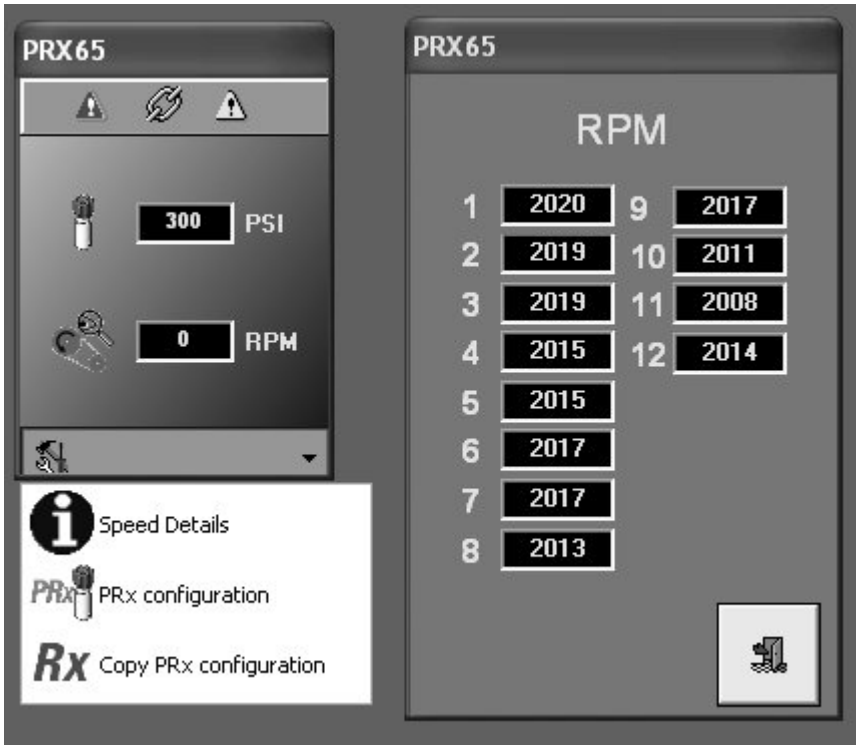


Figure 5 Speed Detail Screen

Configuring for Indexing Chuck Spinners

NOTE: The numbering and settings in the following figures may not be the same as in the user's application.

See Figure 6.

1. Verify that the starwheel is in the home position. The home sensor should be aligned with the home target.
2. Assign each of the chuck spinners a number beginning with one and number consecutively in a clockwise direction. Although chuck number one may be located anywhere on the starwheel, it is recommended to label the chuck located at the spray pocket with the speed sensor as *Chuck Number 1*.
3. See Figure 7. Through the iTRAX OI, go to the PRx II configuration *Service Screen* to customize the settings for *Chuck−Home Offset*.
4. Verify that the number of chuck spinners is correct.
5. In the *Chuck−Home Offset* box, enter the assigned number of the chuck spinner that is located at the Gun 1 spray position. If the above recommendation is followed, this is set to *1*.

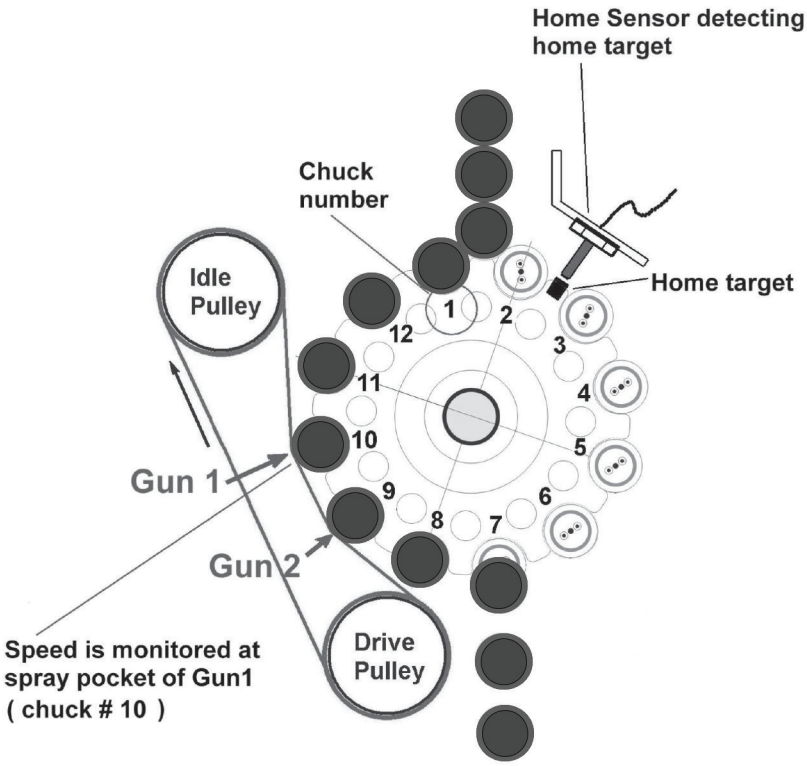


Figure 6 Starwheel in Home Position (with chuck number 10 in speed-monitor position)

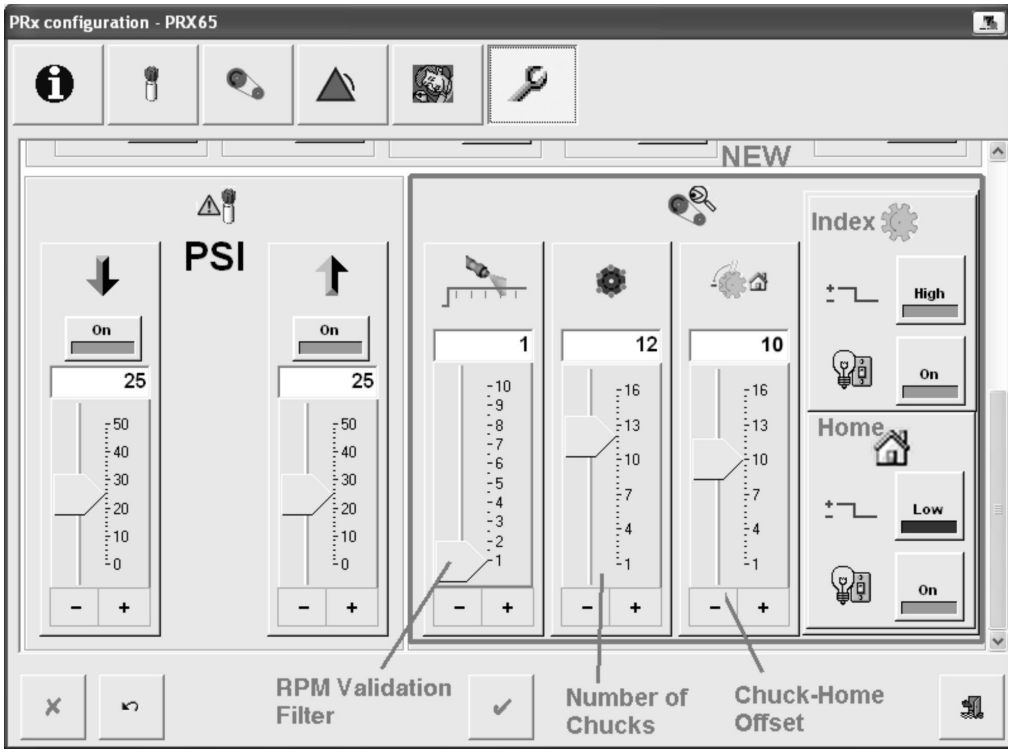


Figure 7 PRx II Configuration Service Screen (for the case in Figure 6)

Configuring Spin Speed for PRx II Alarms

To be sure that the alarms correspond with the correct readings at a chuck spinner, the *RPM Validation Filter* (shown in Figure 7) allows the PRx II module to differentiate between readings that are taken before the chuck spinner has had enough time to reach the desired spin speed. The *RPM Validation Filter* defines which RPM measurement is the first to be accepted and applied to the alarm criteria during the spray duration. The *RPM Validation Filter* number and all the readings following that number for the duration of the spray cycle are applied against the alarm criteria.

The readings displayed through the *Speed Detail* screen are also affected by the setting for the *RPM Validation Filter*.

Figure 8 shows the speed-related events of a typical cycle using the *RPM Validation Filter*. In this example, the desired speed is 2000 RPM, with speed readings happening every 15 msec where the third reading is chosen as the first acceptable reading.

To find the correct *RPM Validation Filter* number for your application, begin at the number one and monitor readings as the spray equipment is in operation. Adjust the number as needed. The time that it takes for a first reading and the time between the readings can vary depending on where the targets are located when entering the spray pocket and the speed of the chuck spinners.

If no RPM measurement is made or accepted during a spray cycle, the iTRAX system will generate a speed alarm with a fault value of 1. In this case, either the RPM Validation Filter is set too high (speed cannot be measured) or repair of the spray equipment is required.

NOTE: The user must decide whether the speed performance is acceptable to the spray process. The iTRAX Spin Speed feature is a speed monitoring system—not a speed control system. Process parameters such as spray delay, duration, can RPM, or line speed may need to be changed to produce an acceptable spray operation on the coated product.

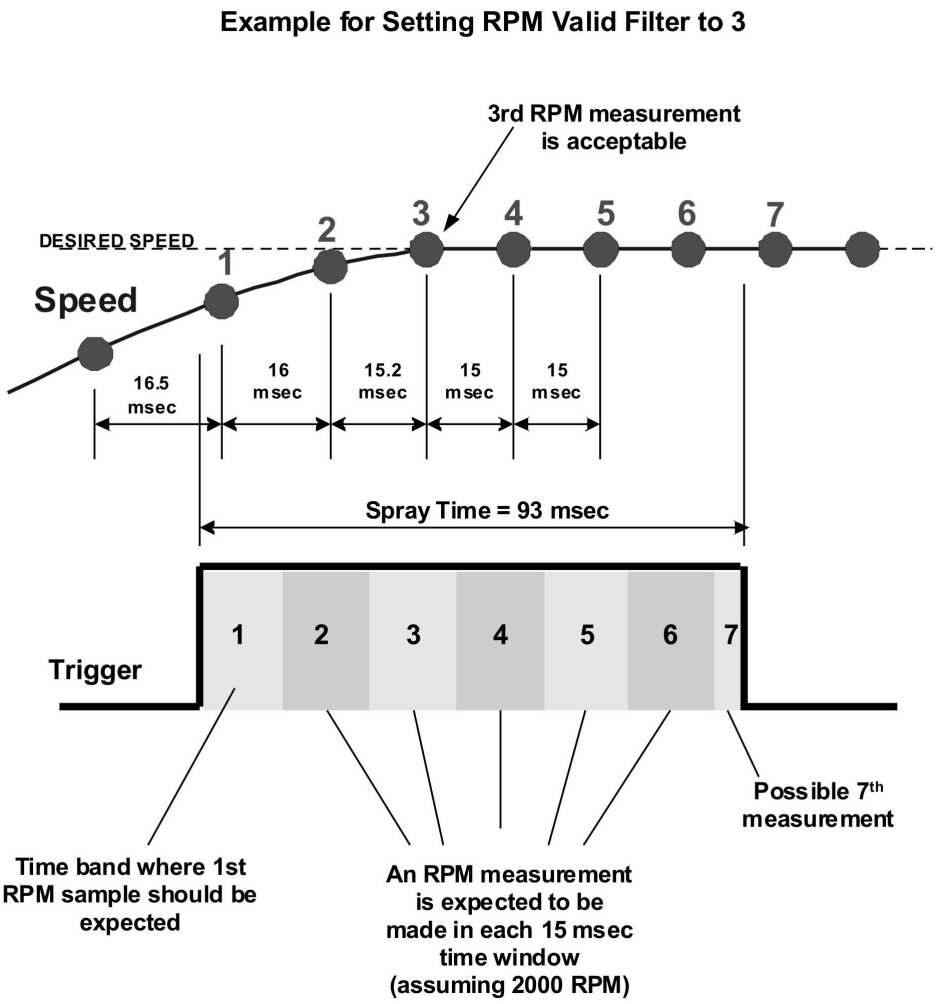


Figure 8 Related Speed Events for Spray Time with the RPM Validation Filter

Sources of RPM Error

The optimal number of targets for detecting spin speed is two. Changing the number of targets affects the accuracy range. Table 3 shows the range needed to keep the accuracy to ±1 RPM as the number of targets change.

NOTE: Having only one target may introduce mechanical balancing or vibration issues.

Table 3 Prx II Module Pinouts

Number of Targets	Range (RPM)
1	500 - 3800
2	250 - 2800
3	200 - 2400
4	150 - 1900

Firmware Updates

NOTE: When installing a new CANproUSB, refer to iTrax Software Installation Manual 1606827.

Version Compatibility

NOTE: All new PRx and PRx II modules are shipped from Nordson with firmware version 1.95 and 2.20 respectively as the default to maximize compatibility with iTrax software versions.

Module	Firmware Version	Part Number	iTrax Version 5.4 and Earlier	iTrax Version 5.6 and later	Notes
PRxII Module	2.28 and later	1107573	NO	YES	A
PRxII Module	2.20	1107573	YES	YES	A
PRx Module	1.98	1077980	NO	YES	A
PRx Module	1.95 or Earlier	11077980	YES	YES	A

NOTE: A. The firmware update for the PRx Module is located on the USB flash drive for the iTrax Version 5.6 software. Existing installed modules and newly purchased modules can be updated via the iTrax touch screen PC. Please follow the directions in Reprogramming the iTrax PRx Modules section.

Electronic Regulator Compatibility

NOTE: All new PRx and PRx II modules are shipped from Nordson with firmware version 1.95 and 2.20 respectively as the default to maximize compatibility with iTrax software versions.

Module	Firmware Version	Module Part Number	Electronic Regulator		Notes
			Part Number 1077141 or 1602371	Part number 1604921	
PRxII Module	2.28 and later	1107573	YES	YES	A
PRxII Module	2.20	1107573	YES	NO	A
PRx Module	1.98	1077980	YES	YES	A
PRx Module	1.95 or Earlier	11077980	YES	NO	A

NOTE: A. When replacing the existing regulator with a 1604921 regulator, iTrax 5.6.0 must be installed on the PC. Only the latest PRx and PRx II module firmware supports the 1604921 regulator.

Copying the Flash Drive Files

NOTE: Before installing iTrax firmware and software, copy the programs from the blue flash drive onto the computer. The flash drive contains all of the software needed to operate the iTrax system and modules.

1. Create a folder in the C:\ Drive of the iTrax PC.
2. See Figure 9. Name the folder *iTrax Blue Flash Drive*.

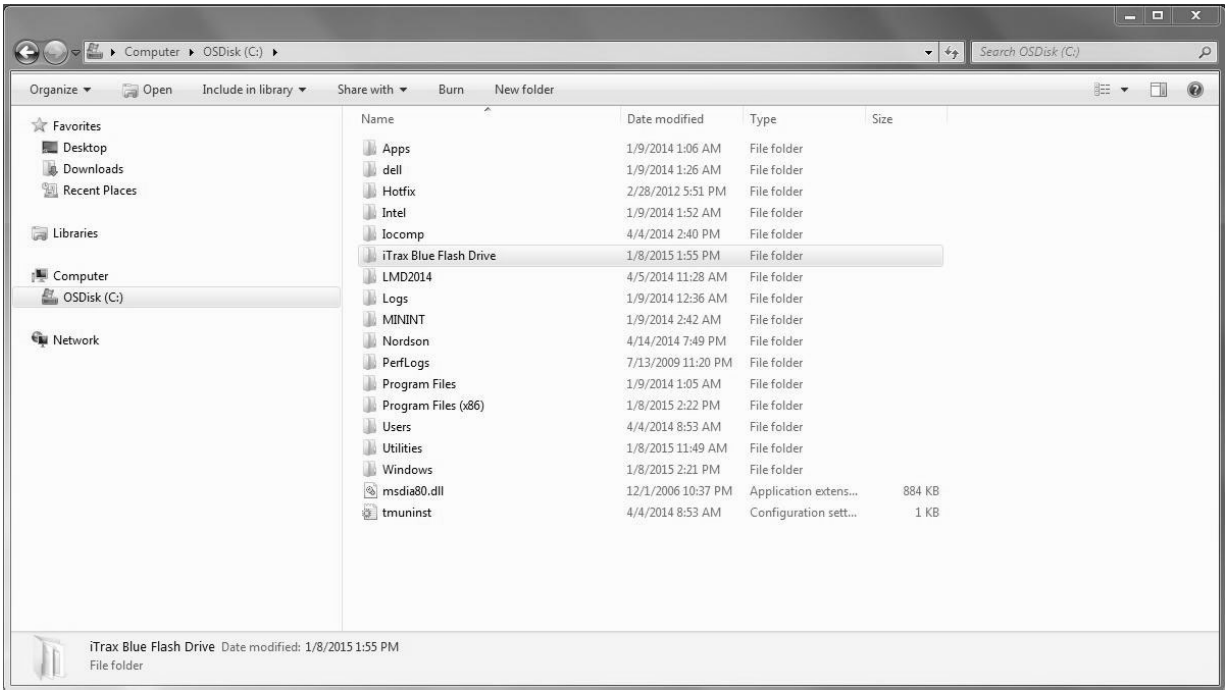


Figure 9 Creating the iTrax Blue Flash Drive Folder

3. Plug in the flash drive in the USB drive and open the file.
4. Copy all files from the flash drive folder to the iTrax Blue Flash Drive folder.
5. See Figure 10. Verify that the contents of the newly created folder match those from the flash drive.

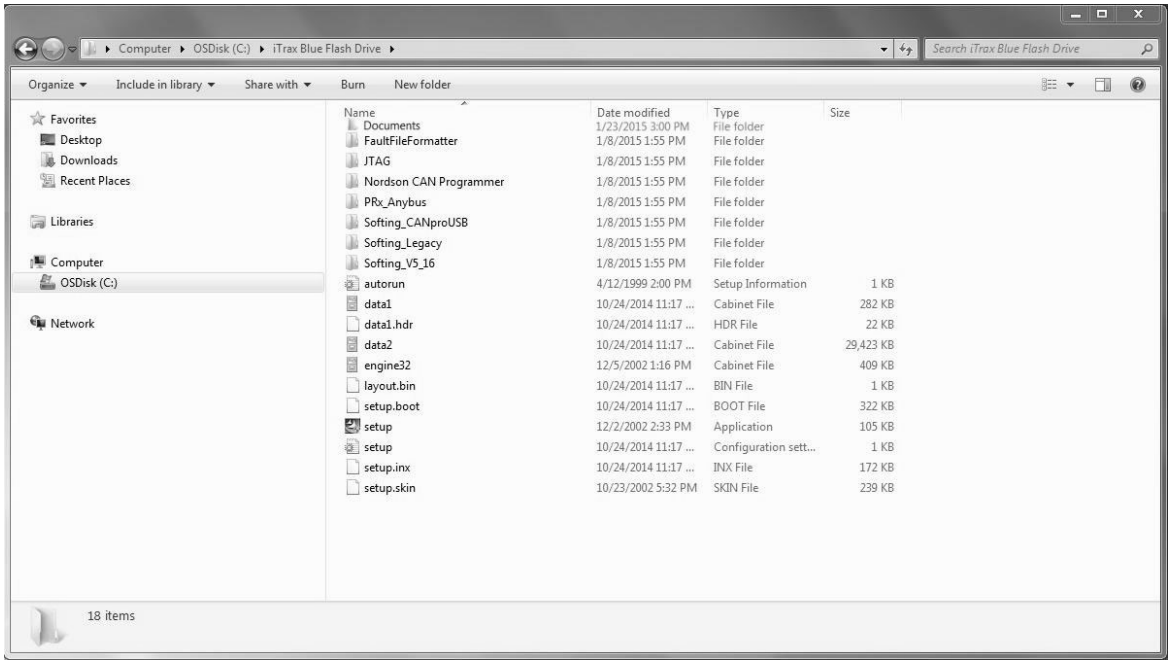


Figure 10 Contents of Blue Flash Drive

Reprogramming the iTrax PRx Modules

Before performing procedure:

- Verify that the *Nordson CAN Programmer* application is loaded on the iTrax PC.
- Plan for a halt in production. The iTrax modules cannot be reprogrammed while they are running in production. Reprogramming iTrax modules should take no more than a few minutes.

Shutting Down the iTrax Software and Server Applications

1. 1.Before starting the *CAN Programmer*, first close the *CanWorks iTrax Operator Interface*.

NOTE: The *CanWorks iTrax Operator Interface* may take several seconds to close.

2. Once the operator interface is closed, close the CanWorks OPC Server.
3. See Figure 11. Verify that there are no active iTrax application icons on the taskbar.
4. See Figure 12. The *Nordson CAN Programmer* icon should appear on the desktop.

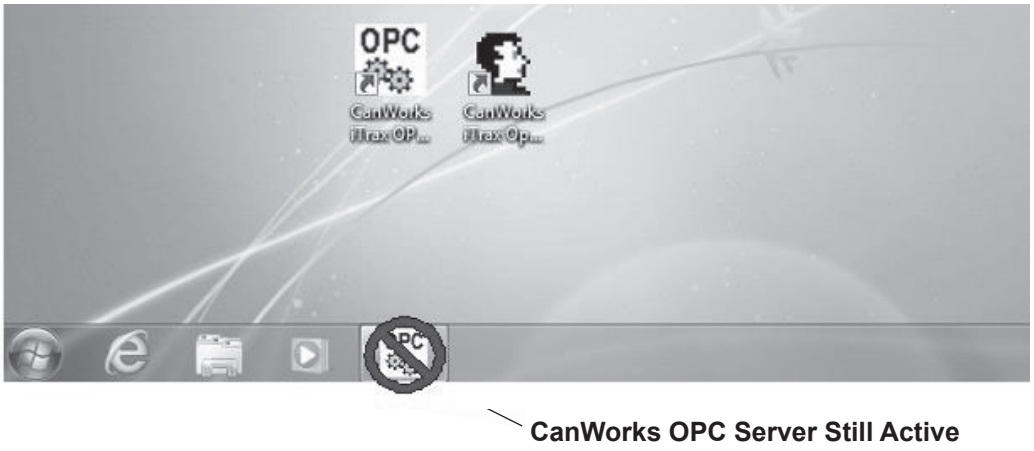


Figure 11 CanWorks OPC Server Showing Active on Taskbar

Figure 12 Nordson CAN Programmer Icon

Programming the Module

Before programming, the user must know whether the module to be programmed is a PRx or a PRx II to ensure the correct software is being used with the correct module.

In the module address listing (7), the PRx software shows as 1.00−1.99, while PRx II shows as 2.00 or greater. However, if modules have not been previously programmed, both the PRx and PRx II software listings show as

0.00 and do not help in showing whether the module is a PRx or a PRx II.

See Figure 13.

1. If the iTrax modules are OFF, power the modules ON. If the iTrax modules are ON, cycle the power OFF and back ON.
2. Select the *Nordson CAN Programmer* on the iTrax PC Desktop to open the *CAN Programmer* main screen.
3. See Figure 13. Select PRx-II Module from the list box (6). Once selected, the module address listing (7) will show selections for the PRx II.

NOTE: PRx II software displays as *Sfw*, Version 2.00 or greater (4). Modules without previously installed software will show as *Sfw*, Version 0.00.

4. Navigate to *C:\JTAG\PRx* (2) folder.
5. Select the S-record file *PRx0228.S* (1) and the file name appears in the location field (3).
6. Select the *All at once* (*broadcast*) button (5) to allow all programs selected to update simultaneously.
7. Select the modules to be updated in the module address listing (7).

NOTE: If selecting all modules, use the *All* button (9) to quickly select all the listings.

8. Select the *Prog* button (8) at the bottom of the screen. Reprogramming the module should take about 1 minute. A progress bar will display indicating progress.
9. After programming is complete, select *OK* and exit the programmer.
10. Cycle 24 Vdc power to all of the iTrax Modules . Cycling ensures that all iTrax modules are rebooted and running the new code.
11. Restart the *iTrax Operator Interface* and the *iTrax OPC Server* application on the PC.
12. The information function on the iTrax operator interface can be used to verify that the reprogrammed PRx II module is configured correctly.

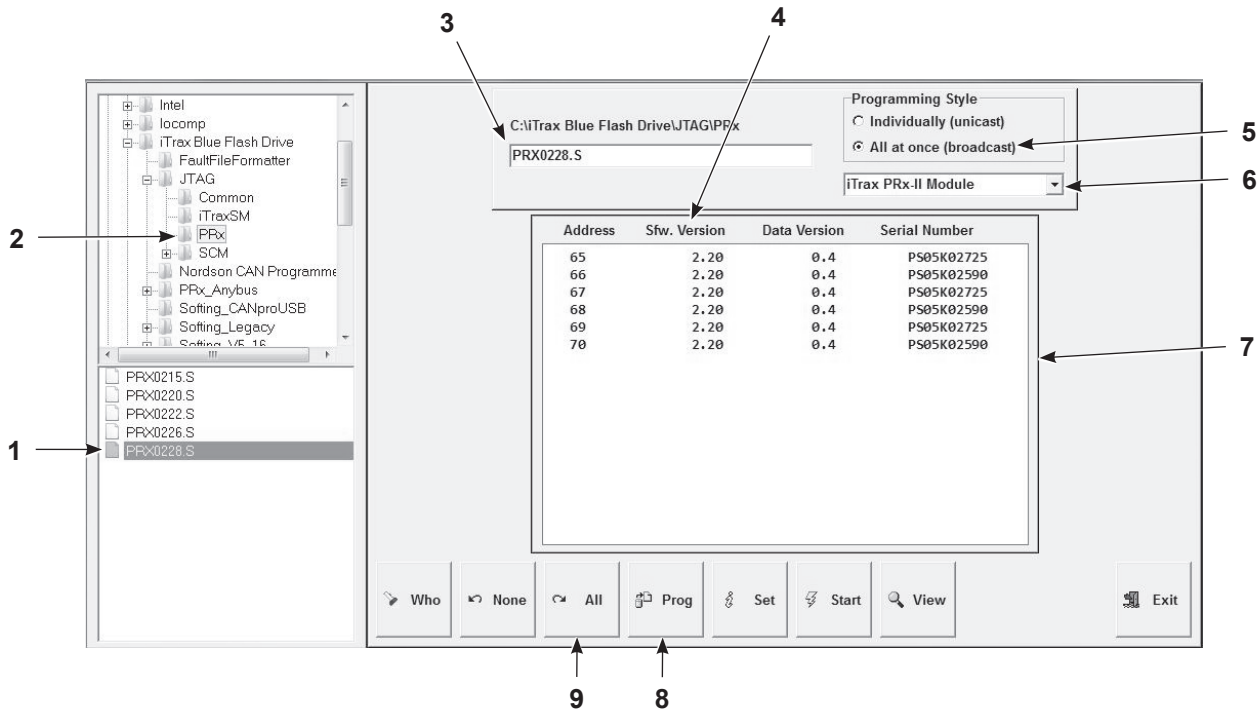


Figure 13 CAN Programmer Main Screen

1. PRx0228.S file
2. PRx folder
3. PRx0228.S location field
4. Software version
5. All at once option
6. Module listing
7. Module address listing
8. Program button
9. Select all button

Parts

To order parts, call the Nordson Finishing Customer Support Center at (800) 433-9319 or contact your local Nordson representative.

Using the Illustrated Parts List

Numbers in the Item column correspond to numbers that identify parts in illustrations following each parts list. The code NS (not shown) indicates that a listed part is not illustrated. A dash (—) is used when the part number applies to all parts in the illustration.

The number in the Part column is the Nordson Corporation part number. A series of dashes in this column (- - - - - -) means the part cannot be ordered separately.

The Description column gives the part name, as well as its dimensions and other characteristics when appropriate. Indentions show the relationships between assemblies, subassemblies, and parts.

- If you order the assembly, items 1 and 2 will be included.
- If you order item 1, item 2 will be included.
- If you order item 2, you will receive item 2 only.

The number in the Quantity column is the quantity required per unit, assembly, or subassembly. The code AR (As Required) is used if the part number is a bulk item ordered in quantities or if the quantity per assembly depends on the product version or model.

Letters in the Note column refer to notes at the end of each parts list. Notes contain important information about usage and ordering. Special attention should be given to notes.

Item	Part	Description	Quantity	Note
—	0000000	Assembly	1	
1	000000	• Subassembly	2	A
2	000000	• • Part	1	

PRx II Module Parts

Part	Description	Quantity	Note
1107573	CONTROL, module, iTRAX PRx II	1	C
1602475	CABLE ASSEMBLY, pressure regulator, 3 m	1	H
1077062	CONNECTOR, cordset	1	F
1602880	PRESSURE TRANSDUCER, 160, RTD, W/INTNL AMPL, 0−1000	1	D
1080102	MODULE, gateway CAN-to-CAN network	1	A, D
1084971	KIT, card,interface, Profibus	1	D, G
1084972	KIT, card, interface, Ethernet/IP	1	D, G
1600544	KIT, card, interface, DeviceNet	1	D, G
1604921	PRESSURE CONTROLLER ASSY, iTRAX	1	C
1078125	KIT, clamp plate assembly, mounting bracket, hardware	1	
1080570	FILTER, regulator, gauge, assembly	1	
900619	TUBING, polyurethane, 8 mm OD, blue	AR	B
1065268	MODULE, Spray Monitor, iTRAX	1	C
1612377	CONTROLLER, Spray Controller, iTRAX	—	D
1092056	SENSOR, proximity, M8, sensor range, 2 mm	1	E
1098326	SENSOR, proximity, M12, sensor range, 4 mm	1	E
1092055	CABLE, three−pin picofast, 6 M, 24 AWG, female	1	E
1605550	PCA, PRx II power distribution board	1	I

NOTE: A. For networks running more than 63 nodes, a CAN-to-CAN gateway is recommended to expand the CAN network node capacity. Contact your Nordson Container representative for more information.

B. Order in increments of one foot.

C. Required for pressure control.

D. Optional part available through Nordson.

E. Required for speed monitor feature. Contact Nordson representative.

F. For pressure controller.

G. For PRx II module.

H. Includes cable and connector.

I. Ordered separately.

AR: As Required

EU DECLARATION of CONFORMITY

This Declaration is issued under the sole responsibility of the manufacture.

Product: iTrax Spray Control, iTrax PRx and NC1 control units for Container Product Line.

Models: iTrax Series modules and NC-1 module.

Description:
iTrax Spray Control – used as a timer / driver module for Container Applicators
iTrax PRx – electrically control pressure, monitors coating material temperature, monitors speed
NC-1 – used as a driver module for Container Applicators
These three units all have the same hardware but different software.

Applicable Directives:
2014/35/EU (Low Voltage Directive)
2014/30/EU (Electromagnetic Compatibility Directive)

Standards Used for Compliance:

EN60204 (2018)	EN55011 (2010)
ANSI/ISO 12100 (2010)	EN6100-6-2 (2005)

Principles:
This product has been designed and manufactured to the directive and standards / norms described above.

DNV – ISO9001 Certified

Date: 13Jan2025

Jeremy Krone
Supervisor Product Development Engineering
Industrial Coating Systems
Amherst, Ohio, USA

Nordson Authorized Representative in the EU
Person authorized to compile the relevant technical documentation.
Contact: Operations Manager
Industrial Coating Systems
Nordson Deutschland GmbH
Heinrich-Hertz-StraBe 42-44
D-40699 Erkrath

UK DECLARATION of CONFORMITY

This Declaration is issued under the sole responsibility of the manufacture.

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Models: iTrax Series modules and NC-1 module.

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These three units all have the same hardware but different software.

Applicable UK Regulations:
Electrical Equipment (Safety) Regulations 2016.
Electromagnetic Compatibility Regulation 2016

Standards Used for Compliance:

EN60204 (2018)	EN55011 (2010)
ANSI/ISO 12100 (2010)	EN6100-6-2 (2005)

Principles:
This product has been designed and manufactured to the directive and standards described above.

DNV – ISO9001 Certified

Date: 13Jan2025

Jeremy Krone
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