iTrax® Spray Controller

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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Change Record

Revision	Date	Change
A04	4/10	Updated Fig. 2 jumper settings and signal specification for Gun (MEG) P201 (page 9)
05	3/15	Added Firmware Update section
06	8/15	Updated parts section
07	2/17	Modified time and driver printed circuit assemblies
08	2/18	Updated driver board
09	8/18	Updated parts section
10	7/22	Updated approval information.
10_update	02/23	Correct pin label from J103-11 to J101-11 in Figure 7.
11	08/23	Updating amp specification on J200-1.
12	01/25	Updating 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 iTrax® spray controller provides timing control and spray gun drive functions for one Nordson spray gun and one CleanSpray® spray gun as part of a complete spray control and monitoring system.

This manual covers spray controller installation, configuration, and parts. Refer to the online *Help* system in the iTrax operator interface software for system configuration, setup, and operation.

The spray controller is shipped with 2 #10 mounting screws, a spare 4-amp fuse, and 1 ribbon cable to connect a second spray controller if required.

Weight: 1.352 kg (2.98 lb)

264 mm
(10.39 in.)

44 mm
(1.73 in.)

200 mm
(7.87 in.)
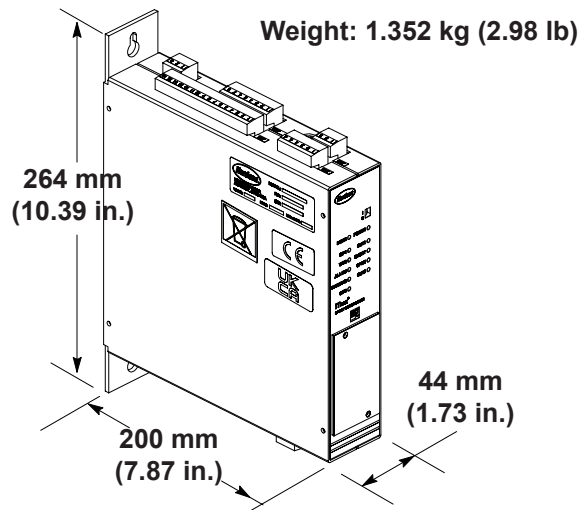
Figure 1   iTrax Spray Controller

iTrax Systems

The Nordson iTrax control system is a configurable spray control and monitoring system using a combination of modules that communicate over a CAN network (Controller Area Network) to an OPC server running on a Windows® computer.

To date, the iTrax modules are:

- **Spray controller modules** − one controller for each lacquer spray gun and CleanSpray gun combination.

- **Spray monitor modules** − one monitor for each lacquer spray gun.

- **PRx modules** − one module for each spray machine or spray gun.

iTrax Systems (contd)

The spray controller, spray monitors and PRx modules are connected to a single CAN network.

The iTrax operator interface (OI) is provided as a local OPC client or, as an option, a remote OPC client. Each module has an independent embedded processor, so once they are set up on the CAN network, they do not require the Windows computer to function.

The CAN network is an industrial standard differential serial bus designed to be robust in electromagnetically noisy environments.

The iTrax system uses a Nordson proprietary data protocol, so only Nordson modules can be on the network.

External data exchange is provided from the OPC server. OPC is an industrial standard that specifies the communication of real-time plant data between control devices and computers from different manufacturers. The Nordson iTrax OPC server is OPC DA 2.0 compliant.

iTrax Software Package

The iTrax software package is required for setup and contains the OPC server, and OPC local client applications.

The OPC server collects data from the modules on the CAN network once a second and organizes it per module inputs and outputs. This "raw" data can be viewed within the server application.

The OPC local client (the iTrax OI) is included on the same CD with the OPC server. It runs on the same computer as the OPC server. The optional OPC remote client (remote iTrax OI) is a remote window into the system. It provides operators or managers the ability to run or monitor the iTrax system from remote computers on a factory-installed Ethernet network. The system can also have the following options:

- Local or remote OPC data logging software package
- Pressure regulators, proximity switches, and other sensors for optional system control and monitoring
- CAN-to-CAN gateways, for very long networks requiring electrical isolation or systems with a large number of modules

Optional OPC Remote Client

The optional OPC remote client application allows the iTrax system OI to be viewed and operated on additional computers on a specific Ethernet network. Talk to a Nordson representative about adding this option.

Spray Controller Requirements

NOTE: For compliance with the European Union Electromagnetic Compatibility Directive, refer to *EMC Directive Requirements*.

The following customer-supplied hardware is required to install the spray controllers:

- **Power Supply:** 24 Vdc, 4-amp required per spray controller
  - 2.5 A required if only triggering on the main spray gun channel or the CleanSpray channel.
  - 4.0 A required if triggering on both the main spray gun channel and the CleanSpray channel at the same time.
- **Network Cable:** RS-485 (Belden 9841 or equivalent)

  NOTE: Total CAN network cable cannot exceed 75 m.

- **Enclosure:** IP54 or better metal enclosure
- **Cable:** as required, for index and timer output and can-in-pocket sensors, timer input, spray output, and warning/alarm outputs

EMC Directive Compliance

See Figure 8 for electrical requirements.

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

1. Mount the spray controller in an IP54 or better metal enclosure.
2. Use CE-labeled power supply (SOLA SDN 10-24-100P or equivalent).
3. For general safety, fuse L1 and L2.
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. All installations must conform to national and local codes.

Installation of the iTrax spray controller consists of configuration, mounting, and electrical connections. Spray controller configuration and calibration is done through the iTrax operator interface.

NOTE: For compliance with the European Union Electromagnetic Compatibility Directive, refer to EMC Directive Requirements on page 7.

Conditions of Warranty

The iTrax spray controller must be installed and wired according to 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-compliant with these requirements, then the customer will be invoiced and will be responsible for payment of the charges associated with the service.

Spray Controller Configuration

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

1. Using a screw driver, remove the access plate on the front of the spray controller.

2. See Figure 2. Set Jumper JP6 as a Master or Remote unit.

   Master: The spray control module that has the spray machine interface wired directly to it (Can-in-Pocket, Index, Inhibit and Run/Stop signals).

   Remote: The spray control module that has the Can-in-Pocket, Index, Inhibit and Run/Stop signals received from a *Master* unit. The ribbon cable eliminates the redundant wiring of shared signals between two or more spray control modules.

   NOTE: The default setting for the spray controller is Remote.

3. Refer to Table 1 and see Figure 2. Use the three address switches to set the spray controller to a unique number between 101 and 163.

   NOTE: If also using spray monitors, it is recommended to set the spray controller address switch to 100 + the spray monitor address switch number.

4. Replace the access plate on the front of the spray controller.

5. Repeat this procedure for all additional spray controllers in the system.

JP6 Front View

3 2 1

Master Jumper Setting

3 2 1

Remote Jumper Setting (default)

SW1 — S T U R V Q W P O X — **100 Position**

SW2 — S T U R V Q W P O X — **10 Position**

SW3 — S T U R V Q W P O X — **01 Position**

TIMER BOARD

Driver PC Board Assembly

Timer PC Board Assembly

JP3 Dry Clean Spray

3 2 1

JP3 Factory Setting Wet Clean Spray

3 2 1

POT 2

POT 3

SW2

JP3

PB1

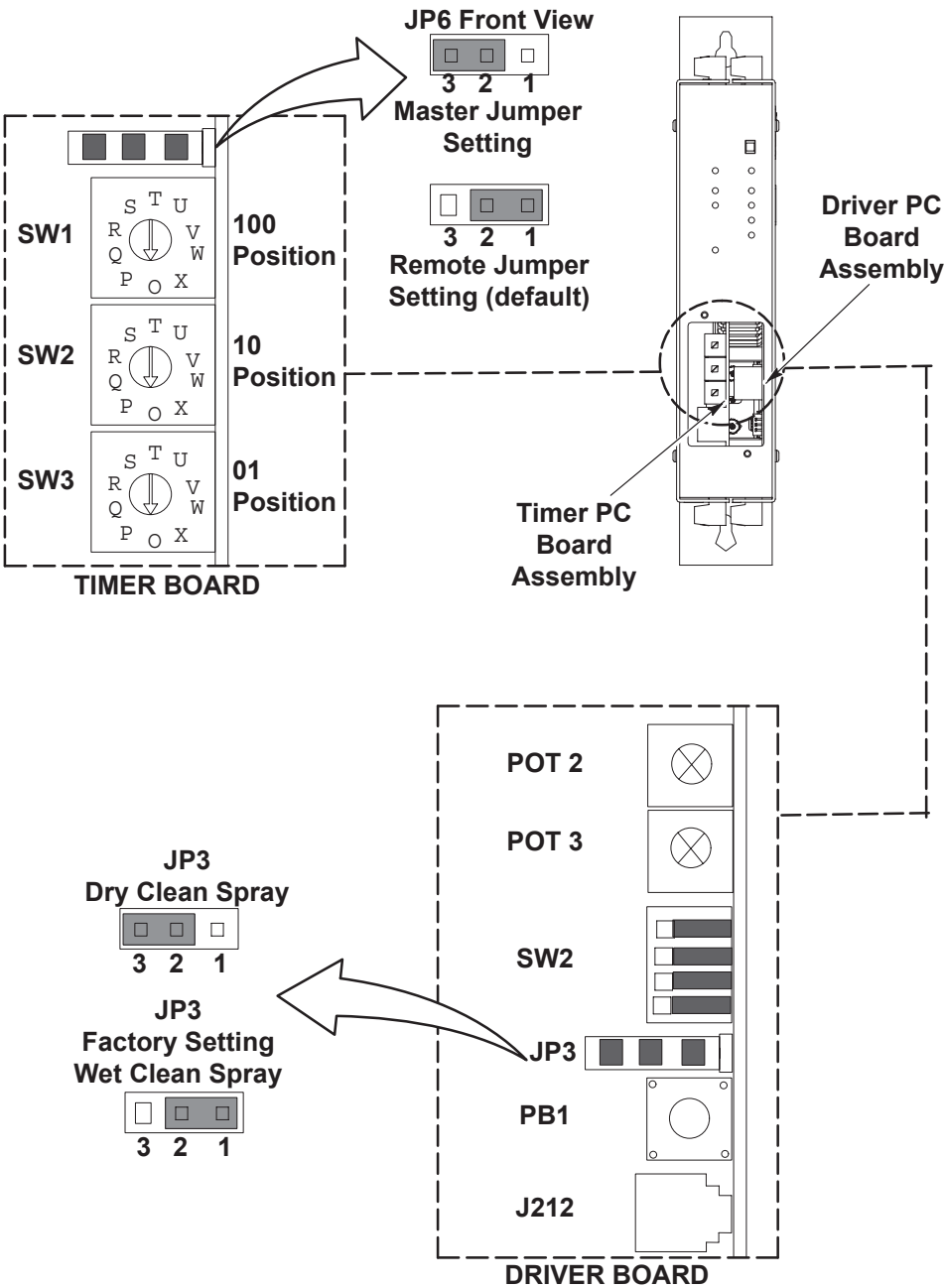**J212**

DRIVER BOARD

Figure 2 Spray Controller Configuration

Spray Machines with Two Spray Guns

See Figure 3.

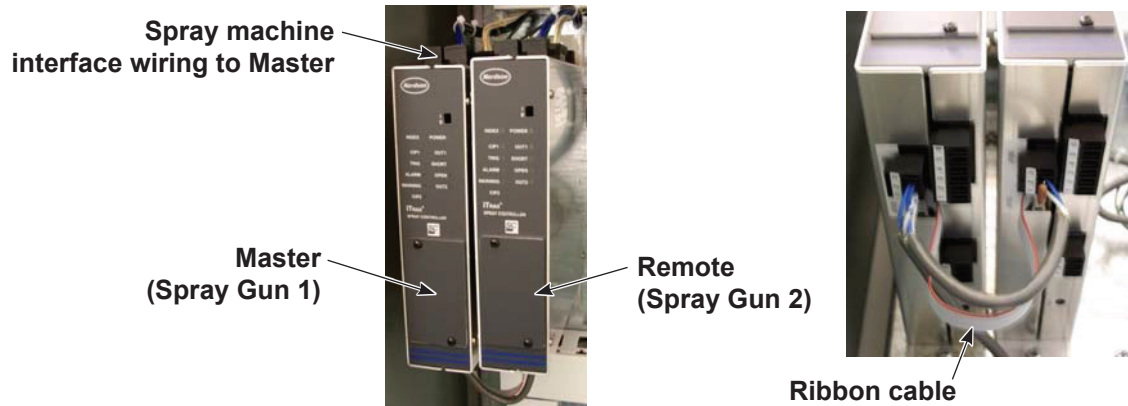Connect the *Master* and *Remote* units using the supplied ribbon cable.

Figure 3   Connecting *Master* and *Remote* Units

Table 1   iTrax Spray Controller Circuit Board Switch and Jumper Settings

Setting	Function/Procedure
Module Power Switch	Removes power to the spray controller and sensors. The default position is up (ON). Set switch to down (OFF) position before working on interface wiring or sensors. ⚠ **CAUTION:** When using a Master with a Remote, both units must be powered from the same power supply. Power must be removed at the same time. Do not use separate switches; instead turn off the single power supply.
Network Address Switches (SW1, SW2, SW3)	Each spray controller must have a unique address. Rotate switch SW1 to set the 100s, SW2 to set the 10s, and switch SW3 (LSB) to set the 1s. For example, for address 102, set SW1 to 1, SW2 to 0, and SW3 to 2.
Watchdog Override Jumper (JP1)	⚠ **CAUTION:** Do not change the default setting of JP1 at pins 1 and 2. JP1 is for software development purposes only.
Can-In-Pocket 1 Jumpers (JP2)	Set the jumpers on JP2 for either sink or source, depending on the Can-In-Pocket 1 sensor type. The default setting is source with jumpers on pins 3 & 4 and 7 & 8. To switch to sink, move the jumper pairs to 1 & 2 and 5 & 6. See Figure 6.
Can-In-Pocket 2 Jumpers (JP3 of Timer Board)	Set the jumpers on JP3 for either sink or source, depending on the Can-In-Pocket 2 sensor type. For most applications, Can-in-Pocket 2 is not required. The default setting is source with jumpers on pins 3 & 4 and 7 & 8. To switch to sink, move the jumper pairs to 1 & 2 and 5 & 6.
Index Jumper (JP4)	Set the jumpers on JP4 for either sink or source, depending on the index sensor type. The default setting is source with jumpers on pins 3 & 4 and 7 &8. To switch to sink, move the jumper pairs to 1 & 2 and 5 & 6. See Figure 6.
Encoder Option Select (JP5)	⚠ **CAUTION:** Do not change the default setting of JP5 at pins 2 & 3. JP5 is for enabling encoder hardware for a future option.
Master/Remote Select (JP6)	⚠ **CAUTION:** The default setting of JP6 is Remote pins 1 & 2. The Master setting is pins 2 & 3. Connecting two Master modules together with the ribbon cable will damage the spray controllers.
CleanSpray Mode Select (JP3 of Driver Board)	Default: Wet Position (pins 1 & 2) Optional: Dry Position (pins 2 & 3)
CleanSpray Voltage Select (JP4 and JP5 of Driver Board)	Default: 24 Vdc − Position 1 & 2 on JP4 and JP5 Optional: 48 Vdc − Position 2 & 3 on JP4 and JP5

Driver and Timer Boards

See Figure 4 and Figure 6 to identify all the jumpers and switches on the driver and timer boards. See Figure 5 for a detailed view of JP4 and JP5.
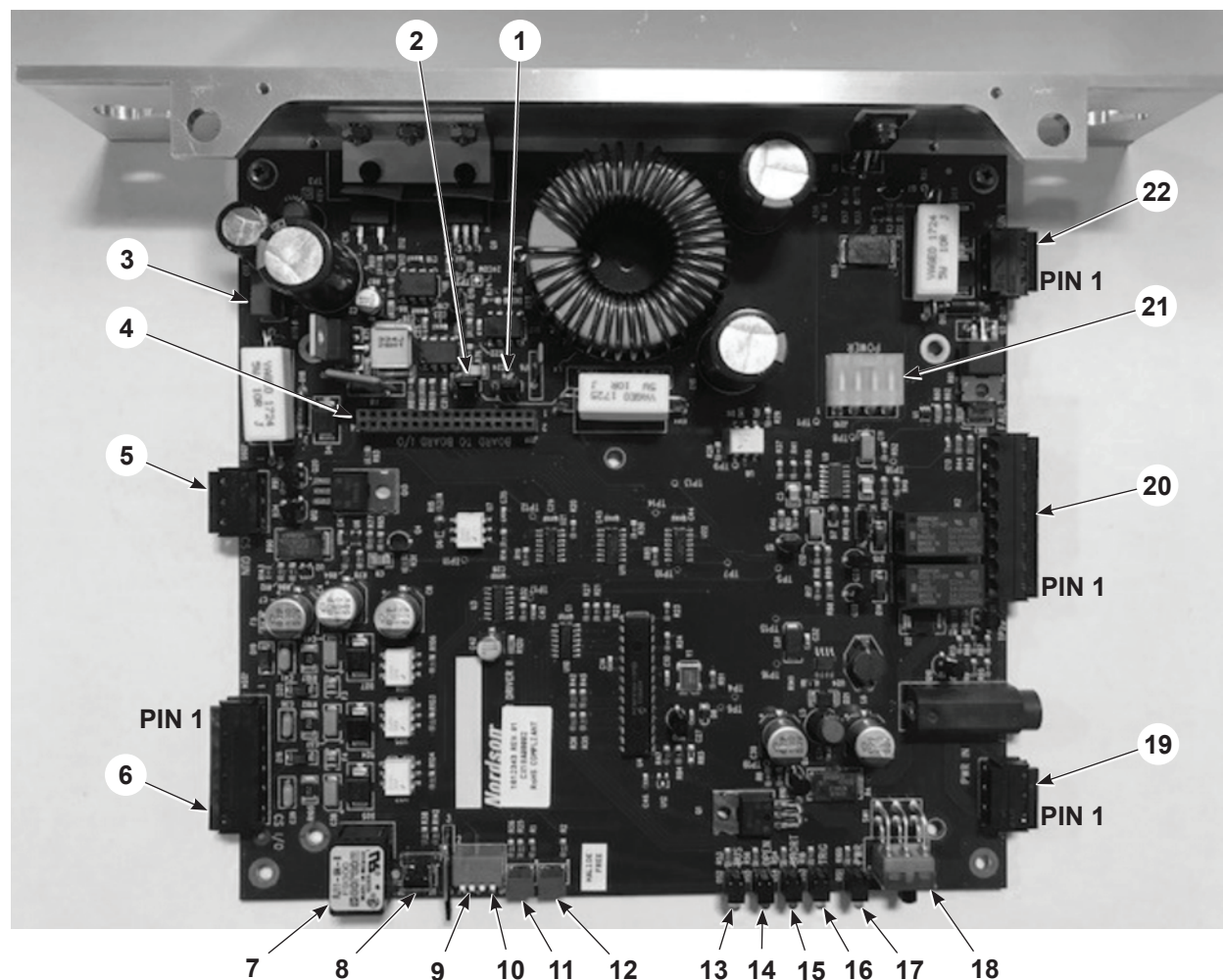
Figure 4 Spray Controller Driver Board Switches and Jumper Settings

1. JP4 CleanSpray Energy Select (+24 Vdc or +48 Vdc)

2. JP5 CleanSpray Energy Select (+24 Vdc or +48 Vdc)

3. POT1 48 V Bus Adjust*

4. P211 Board-to-Board I/O

5. P205 CleanSpray Gun

6. P204 CleanSpray I/O

7. J212 CPU Programming Port (RJ11)

8. *PB1 Test/Cal

9. JP3 Dry/Wet CleanSpray Select

10. *Mode Select

11. *POT3 Peak Adjust

12. *POT2 Hold Adjust

13. Out2

14. Open

15. Short

16. Out1

17. PWR

18. Power Switch

19. P200 Power Input

20. P203 Fault Relays

21. J210 Power to Timer

22. P201 Gun

NOTE: *: factory-set; do not change
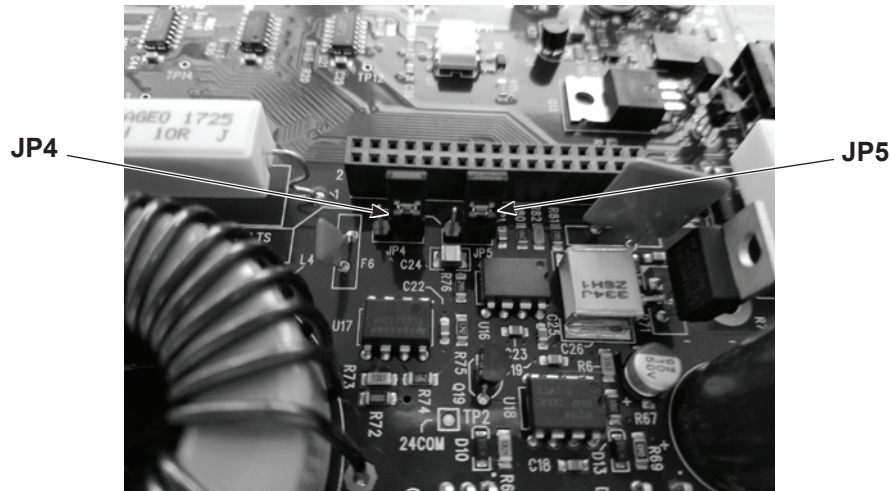
Figure 5   Detailed View of JP4 and JP5
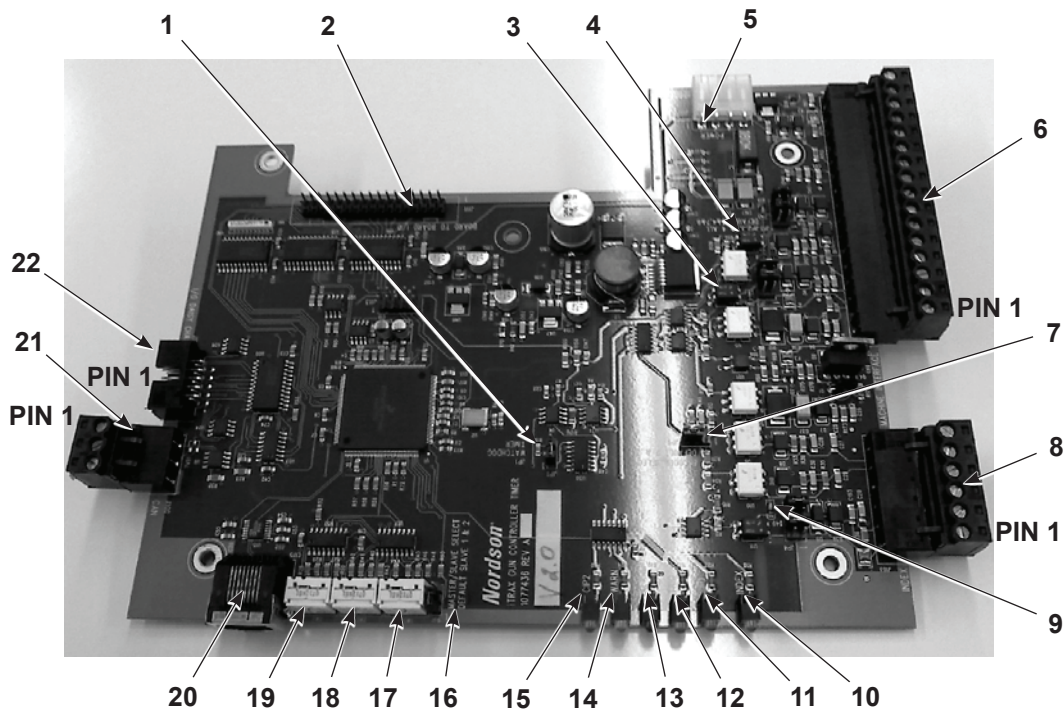
Figure 6   Spray Controller Timer Board Switches and Jumper Settings

1. *JP1 Watchdog Override Jumper

2. J111 Board-to-Board I/O

3. JP2 CIP1 Sink/Source Jumper

4. JP3 CIP2 Sink/Source Jumper

5. J110 Power from Driver

6. P101 Machine Interface

7. JP5 Encoder Select Jumper

8. P103 Index (Encoder Option)

9. JP4 Index Sink/Source Jumper

10. Index

11. CIP1

12. Trig

13. Alarm

14. Warn

15. CIP2

16. JP6 Master/Remote Select Jumper

17. SW1/100s Node Address Switch

18. SW2/10s Node Address Switch

19. SW1/1s Node Address Switch

20. J1114 Diagnostic Port (do not use)

21. P100 CAN

22. J112 Ribbon Cable Connector I/O

NOTE: *: factory-set; do not change

Spray Controller Mounting

NOTE: For compliance with the European Union Electromagnetic Compatibility Directive, refer to *EMC Directive Requirements*.

Mount the spray controller using the 2 #10 mounting screws included with the controller. The mounting area should be free of vibration, excessive dust, and moisture. Ambient temperatures must not exceed 0−40 °C (32−104 °F).

Input and Output Connections

See Figure 7 for the input and output connections for a spray controller configured as *Master*.

Customer-Supplied System Wiring

iTrax Spray Controller

Left	Driver PCA	Right
+24 VDC @ 4A, 18AWG → J200-1		J201-1 → +Spray Gun , 18AWG →
24 Vdc Return, 18AWG → J200-2		J201-2 → −Spray Gun, 18AWG →
Chassis Ground, 18AWG → J200-3		J201-3 → Spray Gun Shield →
Tank Lvl Switch 24Vdc → J204-1		J205-1 → +CleanSpray Gun, 18AWG →
Tank Level Switch Input → J204-2		J205-2 → −CleanSpray Gun, 18AWG →
Manual Wash 24 Vdc → J204-3		J205-3 → CleanSpray Gun Shield →
Manual Wash Input → J204-4		
Run/Stop 24 Vdc → J204-5		J203-1 → Alarm Contact, NO →
Run/Stop Input → J204-6		J203-2 → Alarm Relay, Pole →
		J203-3 → Alarm Contact, NC →
		J203-4 → Warning Contact, NO →
		J203-5 → Warning Relay, Pole →
		J203-6 → Warning Contact, NC →

Power J210   **Board to Board I/O J211**

J110   **J111**

Left	Timer PCA	Right
← CAN A, Belden 9841 White → J100-1		J101-8 → Timer Active Source →
← CAN B, Belden 9841 Blue → J100-2		J101-9 ← Timer Active Sink
← CAN Shield, Belden 9841 → J100-3		J101-10 → Timer Active Return →
← Index Sensor 24Vdc → J103-1		J101-14 → Trigger Output 24 Vdc →
Index Sensor Input (Source) → J103-2		J101-15 ← Trigger Output Sink
Index Sensor Return → J103-3		J101-16 → Trigger Output Return →
← Can-in-Pocket 1 & 2 24Vdc → J101-1		J101-12 → Manual Purge 24 Vdc →
Can-in-Pocket 1 Input (Source) → J101-2		
Can-in-Pocket 2 Input (Source) → J101-11		J101-13 ← Manual Purge Input
Can-in-Pocket 1&2 Return → J101-3		
Manual Spray 24Vdc → J101-4		**Version 7.4 (or later) firmware required for this feature**
Manual Spray Input → J101-5		
Inhibit Input → J101-6		
Inhibit Return → J101-7		JP6 Master J112 → Ribbon Cable I/O → JP6 Remote

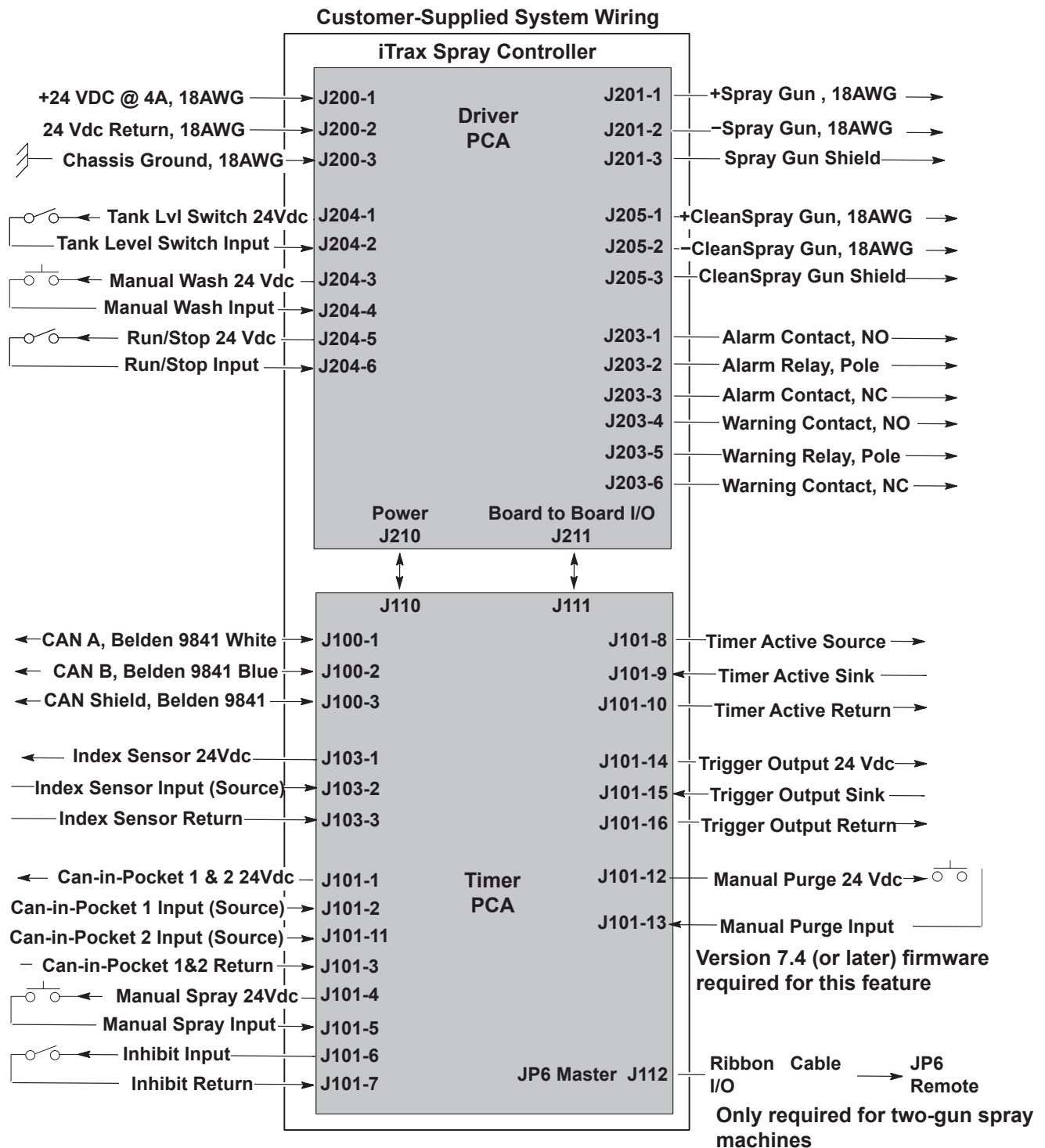**Only required for two-gun spray machines**

Figure 7 Master Spray Controller Input and Output Connectors (system wiring is customer-supplied)

System Wiring

Refer to Table 2 and Table 3 and Figure 7, Figure 8, and Figure 9.

NOTE: For compliance with the European Union Electromagnetic Compatibility Directive, refer to *EMC Directive Requirements*.

NOTE: Unless otherwise noted, all wiring is customer-supplied.

Table 2   Driver Signal List

Conn. No.	Pin No.	Name and Description	Signal Specification	Signal Type	Note
POWER INPUT					
P200	1	POWER, Module Power Input	+24 Vdc +/− 1@ 4.0 amp max	Power Input	
P200	2	POWER, Module Power Input	24 Vdc COM	Power Common	
P200	3	POWER, Module Power Input	Chassis Ground	Chassis Ground	
GUN (MEG)					
P201	1	GUN +, Gun 1 Output +	Spike Drive, 48 Vdc 3 amps for 3 msec (all are maximum values), 1 amp holding current (maximum)	Source Output	
P201	2	GUN1−, Gun 1 Output Return	Spike Drive Return	Return	
P201	3	SHIELD, Shield termination	Chassis Ground	Chassis Ground	
FAULT RELAYS					
P203	1	ALARM, Alarm Contact	30 Vdc @ 5 amp max	Normally Open Contact	A
P203	2	ALARM, Alarm Contact	30 Vdc @ 5 amp max	Relay Pole	
P203	3	ALARM, Alarm Contact	30 Vdc @ 5 amp max	Normally Closed Contact	
P203	4	WARN, Alarm Contact	30 Vdc @ 5 amp max	Normally Open Contact	A
P203	5	WARN, Alarm Contact	30 Vdc @ 5 amp max	Relay Pole	
P203	6	WARN, Alarm Contact	30 Vdc @ 5 amp max	Normally Closed Contact	
P203	7	Spare 1	Not used	Not used	
P203	8	Spare 2	Not used	Not used	
CleanSpray I/O					
P204	1	TANK, Level Switch + Excitation	+24 Vdc +/− 4@ 100mA	Excitation Output	
P204	2	TANK, Level Switch Input	Signal Input	Active High Input	
P204	3	WASH, Manual Wash Pushbutton +Excitation	+24 Vdc +/− 4@ 100mA	Excitation Output	
P204	4	WASH, Manual Wash Pushbutton Input	Signal Input	Active High Input	
P204	5	Run/Stop +Excitation	+24 Vdc +/− 4@ 100mA	Excitation Output	
P204	6	Run/Stop Input	Signal Input (24V on 1.5V or less off)	Active High Input	
CleanSpray GUN					
P205	1	CS GUN +, CleanSpray Gun Output	+24 Vdc @ 2.0A peak or +48 Vdc @ 2.5A peak	Source Output	
P205	2	CS GUN −, CleanSpray Gun Output	24 Vdc com	Power Common	
P205	3	SHIELD, Shield Termination	Chassis Ground	Chassis Ground	
NOTE: Contact position when the module is turned off. If the Failsafe mode is enabled "closed" using the OI, then contacts will close after a few seconds upon power up and open when a fault occurs. The factory default setting is Failsafe mode enabled "closed."					

Table 3   Timer Signal List

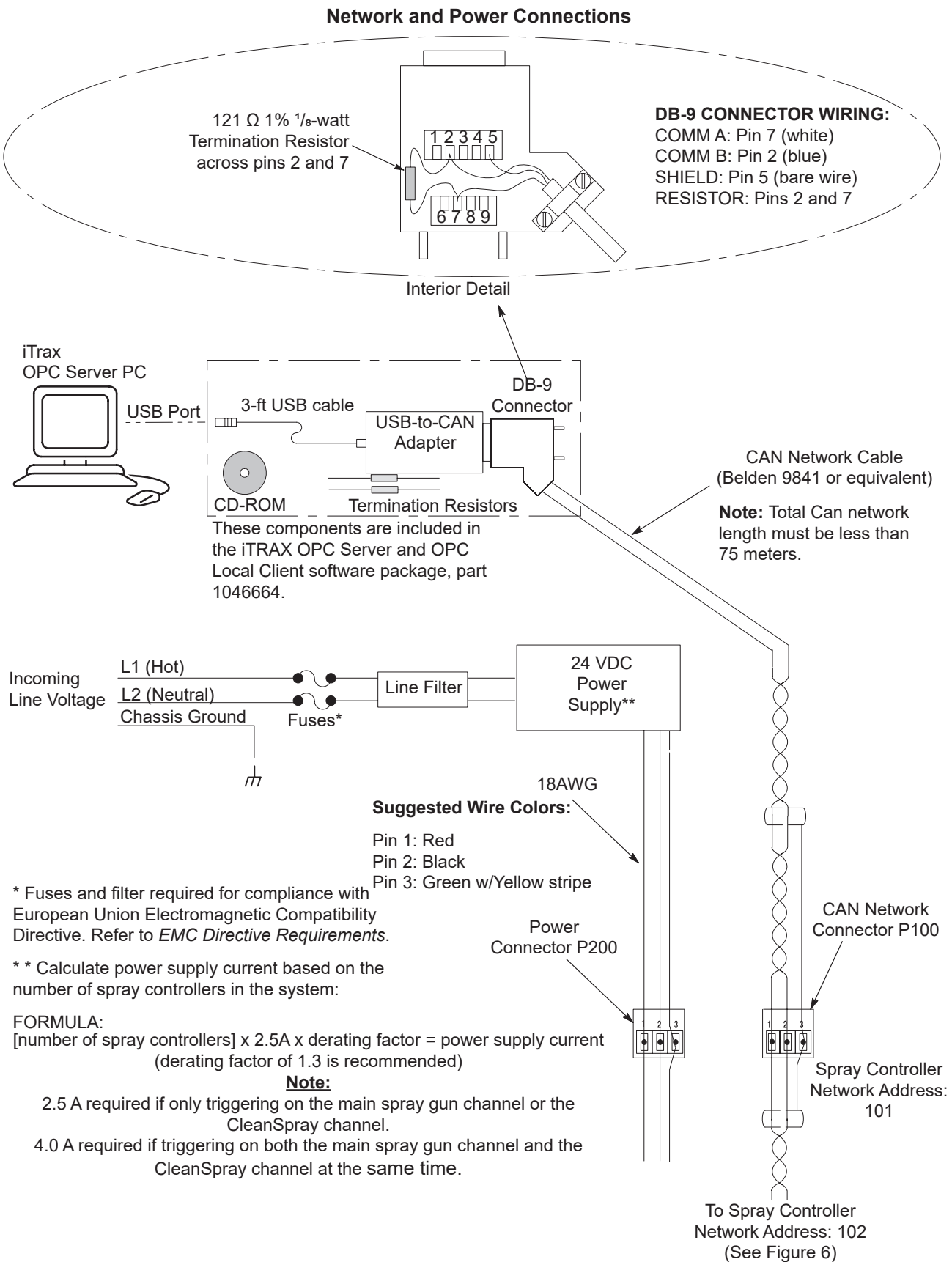| Conn. No.	Pin No.	Name and Description	Signal Specification	Signal Type
CAN BUSS				
P100	1	COMM, CAN Buss Network A	CAN Buss A (+)	CAN Network
P100	2	COMM, CAN Buss Network B	CAN Buss B (−)	CAN Network
P100	3	COMM, Shield Termination	Chassis Ground	Chassis Ground
MACHINE INTERFACE				
P101	1	POCKET, Can-in-Pocket Sensor 1&2 Excitation	+24 Vdc +/− 4@ 100m A max	Excitation Output
P101	2	POCKET, Can-in-Pocket Sensor 1 Input	Signal Input (source with 1.5V threshold, change JP2 for sink)	Active High Input
P101	3	POCKET, Can-in-Pocket Sensor 1&2 Return	Pocket Return	Power Common
P101	4	MANUAL, Manual Spray Pushbutton +Excitation	+24 Vdc +/− 4 Current limited to 24mA max	Excitation Output
P101	5	MANUAL, Manual Spray Pushbutton Input	Signal Input	Active High Input
P101	6	INHIBIT, Inhibit Switch Input	Signal Input	Active Low Input
P101	7	INHIBIT, Inhibit Switch Return	Inhibit Return	Power Common
P101	8	ACTIVE, Timer Active Output Source	+24 Vdc +/− 4@ 50 mA max	Source Output
P101	9	ACTIVE, Timer Active Output Sink	Externally limit current to 50mA max	Sink Output
P101	10	ACTIVE, Timer Active Output Return	Active Return	Power Common
P101	11	POCKET, Can-in-Pocket Sensor 2 Input	Signal Input (Default is source change JP3 for sink)	Active High Input
P101	12	MANUAL GUN PURGE Pushbutton + Excitation	+24 Vdc +/− 4 Current limited to 24mA max	Excitation Output
P101	13	MANUAL GUN PURGE Pushbutton Input	Signal Input	Active High Input
P101	14	TRIG OUT, Trigger Output +Excitation	+24 Vdc +/− 4 Current limited to 24mA max	Excitation Output
P101	15	TRIG OUT, Trigger Output	Externally limit current to 50mA max	Sink Output
P101	16	TRIG OUT, Trigger Output Return	Trigger Return	Power Common
INDEX/ENCODER				
P103	1	INDEX, Timing Sensor + Excitation	+24 Vdc +/− 4@ 0.25 A max	Excitation Output
P103	2	INDEX, Timing Sensor Input	Signal Input (Default is source change, JP4 for sink)	Active High Input
P103	3	INDEX, Timing Sensor Return	Sensor Return	Return
P103	4	INDEX, Encoder Input A (Option)	Signal Input	Active HIgh Input
P103	5	INDEX, Encoder Input B (Option)	Signal Input	Active HIgh Input
P103	6	SHIELD, Shield Termination	Chassis Ground	Chassis Ground
DAISY CHAIN I/O				
P112	1	Run/Stop	Master Output\Remote Input	Active High
P112	2	TANK, Level Switch	Master Output\Remote Input	Active High
P112	3	POCKET, Can-in-Pocket, Sensor 1	Master Output\Remote Input	Active High
P112	4	POCKET, Can-in-Pocket, Sensor 2	Master Output\Remote Input	Active High
P112	5	INDEX, Timing Sensor	Master Output\Remote Input	Active High
P112	6	TRIG OUT, Trigger Output 1	Master Output\Remote Input	Active High
P112	7	INHIBIT, Inhibit Switch	Master Output\Remote Input	Active High
P112	8	Spare	Master Output\Remote Input	Not Used
P112	9	Spare	Master Output\Remote Input	Not Used
P112	10	COMMON	Signal return	Return

Network and Power Connections

121 Ω 1% ¹/₈-watt
Termination Resistor
across pins 2 and 7

1 2 3 4 5

6 7 8 9

DB-9 CONNECTOR WIRING:
COMM A: Pin 7 (white)
COMM B: Pin 2 (blue)
SHIELD: Pin 5 (bare wire)
RESISTOR: Pins 2 and 7

Interior Detail

iTrax
OPC Server PC

USB Port

3-ft USB cable

USB-to-CAN
Adapter

DB-9
Connector

CD-ROM

Termination Resistors

These components are included in
the iTRAX OPC Server and OPC
Local Client software package, part
1046664.

CAN Network Cable
(Belden 9841 or equivalent)

Note: Total Can network
length must be less than
75 meters.

Incoming
Line Voltage

L1 (Hot)

L2 (Neutral)

Chassis Ground

Fuses*

Line Filter

24 VDC
Power
Supply**

18AWG

Suggested Wire Colors:

Pin 1: Red
Pin 2: Black
Pin 3: Green w/Yellow stripe

CAN Network
Connector P100

* Fuses and filter required for compliance with
European Union Electromagnetic Compatibility
Directive. Refer to *EMC Directive Requirements*.

* * Calculate power supply current based on the
number of spray controllers in the system:

FORMULA:
[number of spray controllers] x 2.5A x derating factor = power supply current
               (derating factor of 1.3 is recommended)

Power
Connector P200

Spray Controller
Network Address:
101

Note:
2.5 A required if only triggering on the main spray gun channel or the
CleanSpray channel.
4.0 A required if triggering on both the main spray gun channel and the
CleanSpray channel at the same time.

To Spray Controller
Network Address: 102
(See Figure 6)

Figure 8 Network and Power Connections to First Spray Controller on Network

from Spray Controller
Network Address: 101

P200   P100   Spray Controller
Network Address: 102

18AWG

CAN Network Cable
(Belden 9841 or equivalent)

Note: Total Can network
length must be less than 75
meters.

P200   P100   Spray Controller
Network Address: 103

P200   P100   Spray Controller
Network Address: 104

121 Ω 1% $^1/_8$-watt
Termination Resistor on last
iTrax Module on network

Figure 9 Network and Power Connections to Remaining Spray Controllers on Network

Operation

iTrax system operation is automatic once the spray controller is configured to the requirements of the lacquer spray machine through the operator interface. The operator interface displays current spray settings, provides warnings and alarms, and allows the operator to change time delay and spray duration settings.

Power Switch

WARNING: Turn off external power to the power supply before disconnecting power wires from connector P200. Failure to do so could result in an electrical shock.

WARNING: *Master and Remote* units must be powered down at the same time using an external switch or circuit breaker.

LED Indicators

The spray controller has 11 LEDs on the front panel.

LED	Color	Function
INDEX	Green	The Index has been asserted
CIP1	Green	Can-in-pocket input has been asserted
TRIG	Green	Timer board communicates with the driver board to turn on the spray gun.
ALARM	Red	Alarm condition has occurred
WARNING	Yellow	Warning condition has occurred
CIP2	Not Used	
POWER	Green	Power is ON the Spray Controller
OUT1	Yellow	Power is ON the spray gun
SHORT	Red	Short circuit in the spray gun
OPEN	Red	Spray gun circuit is open
OUT2	Yellow	Power is ON the CleanSpray gun

iTrax Spray Controller Module Lacquer and CleanSpray Gun Operation

Input Conditions			Lacquer Gun		CleanSpray Gun		
Inhibit	**Run/Stop**	**CIP**	**Auto**	**Manual**	**Watchdog**	**NthCan**	**Manual Wash**
On	**X**	**X**	Disabled	Disabled	Disabled	Disabled	**Enabled***
Off	Stop	**X**	Disabled	Enabled	**Enabled**	Disabled	**Enabled**
Off	Run	No can detected	**Enabled**	Disabled	Disabled**	**Enabled****	**Enabled**
Off	Run	Can detected	**Enabled**	Disabled	Disabled	**Enabled**	**Enabled**

Notes:

CIP = Can-In-Pocket proximity switch

X = Input may be either state

* Cleanspray *Manual Wash* is enabled by default for all input conditions. However, *Manual Wash* can be disabled while Inhibit is *ON* if configured in iTrax.

** By default, *Watchdog* mode is disabled and *NthCan* mode is enabled in the *Run* state. However, the iTrax operator interface may be configured to enable *Watchdog* mode when no cans have been detected. *Watchdog* mode will disable as soon as cans are detected again.

CleanSpray Configuration

The CleanSpray gun output is at connection J205. The default factory configuration sets the CleanSpray gun to operate at 24 Vdc. The SC also provides the option of operating the CleanSpray gun using 48 Vdc output.

Follow this procedure to configure the SC to operate the CleanSpray output at 48 Vdc.

1. Remove power connection from SC.

2. Remove the left-side cover of the SC.

3. Configure jumpers JP4 and JP5 so pins 2 and 2 are jumpered on both.

4. Replace the cover and turn on the SC power.

Typical Spray Machine Timing Requirements

Figure 10 shows the relationship between the CIP and index timing for a typical spray machine. Examples of the resulting spray and CleanSpray operation are also indicated.
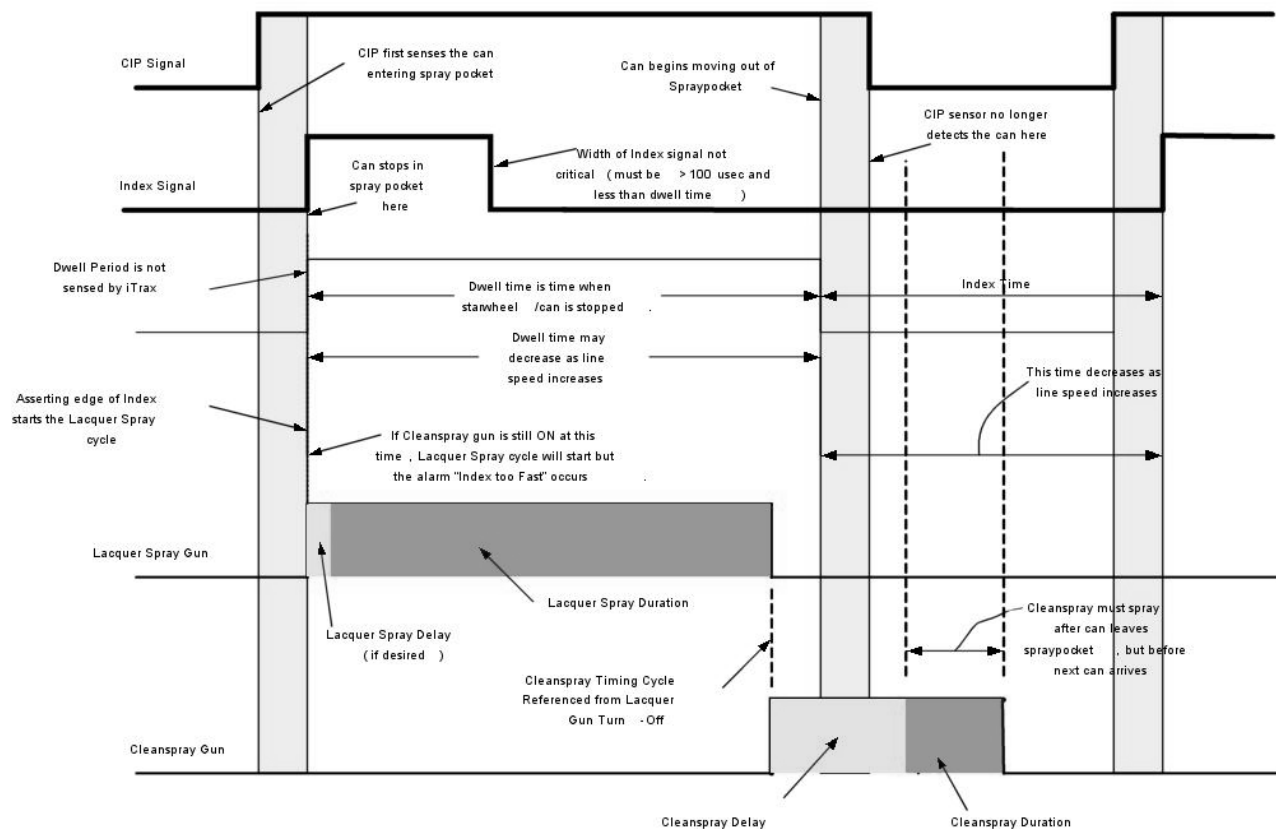

Figure 10 Spray Machine Timing Requirements

Firmware Updates

NOTE: When installing a new CANpro USB, refer to the *iTrax Software Installation Manual*.

Version Compatibility

NOTE: All new iTrax spray controller modules are shipped from Nordson with firmware version 6.8 respectively as the default to maximize compatibility with iTrax software versions.

Module	Firmware Version	iTrax Version 5.4 (and earlier)	iTrax Version 5.6 (and later)	Notes
SC Module	7.20 or later	NO	YES	A
SC Module	6.8 or Earlier	YES	YES	A
NOTE: A. The firmware update for the SC 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 Spray Control Modules* section.				

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.

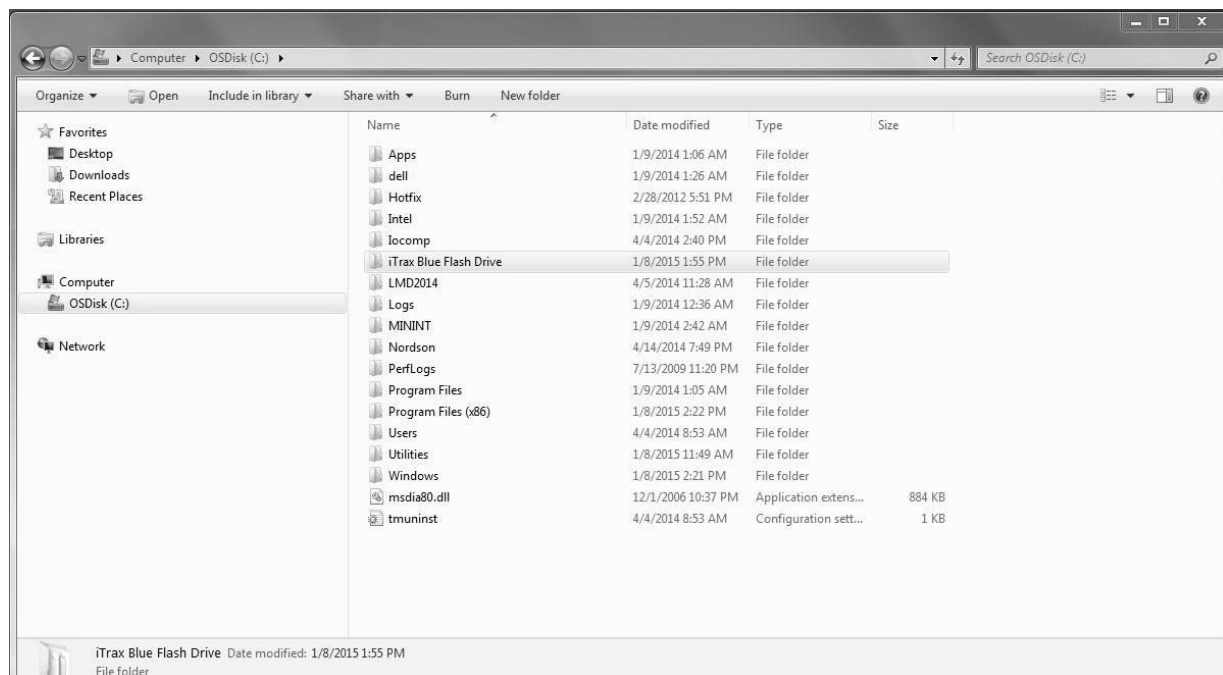2. See Figure 11. Name the folder iTrax Blue Flash Drive.

Figure 11 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 12. Verify the contents of the newly created folder match those from the flash drive.
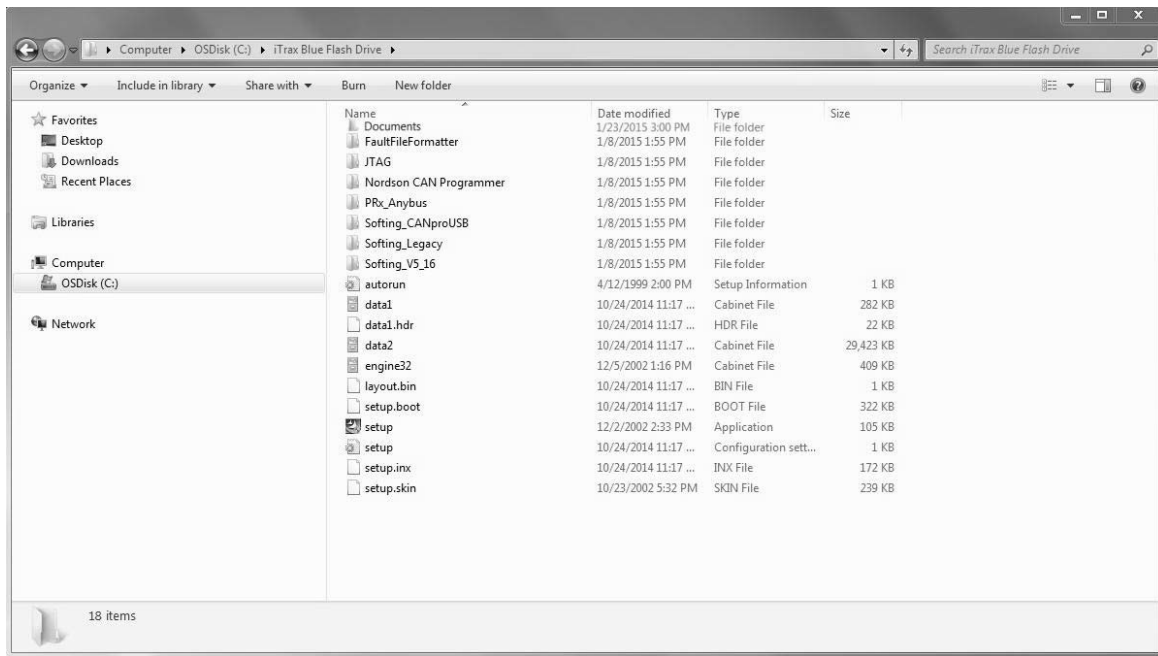

Figure 12 Contents of Blue Flash Drive

Reprogramming the iTrax Spray Control Modules

Before performing procedure:

• Verify 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. 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 13. Verify there are no active iTrax application icons on the task bar.

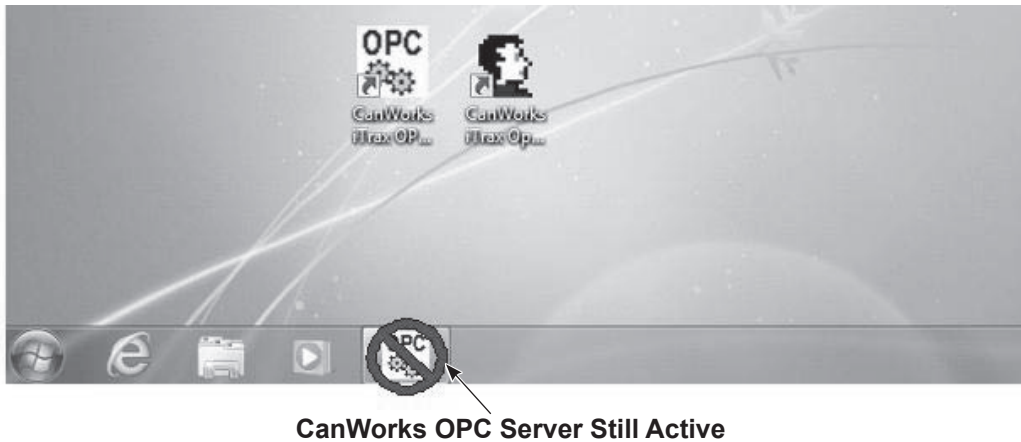4. See Figure 14. The Nordson CAN Programmer icon should appear on the desktop.

CanWorks OPC Server Still Active

Figure 13 CanWorks OPC Server Showing Active on Task Bar

Figure 14 Nordson CAN Programmer Icon

Programming the Module

See to Figure 15.

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 15. Select iTrax Spray Controller from the list box (6). Once selected, the module address listing (7) will show selections for the iTrax monitor.

4. Navigate to *C:\JTAG\SCM* folder (2).

5. Select the S-record file *SCM0720.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 one 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 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 module is configured correctly.
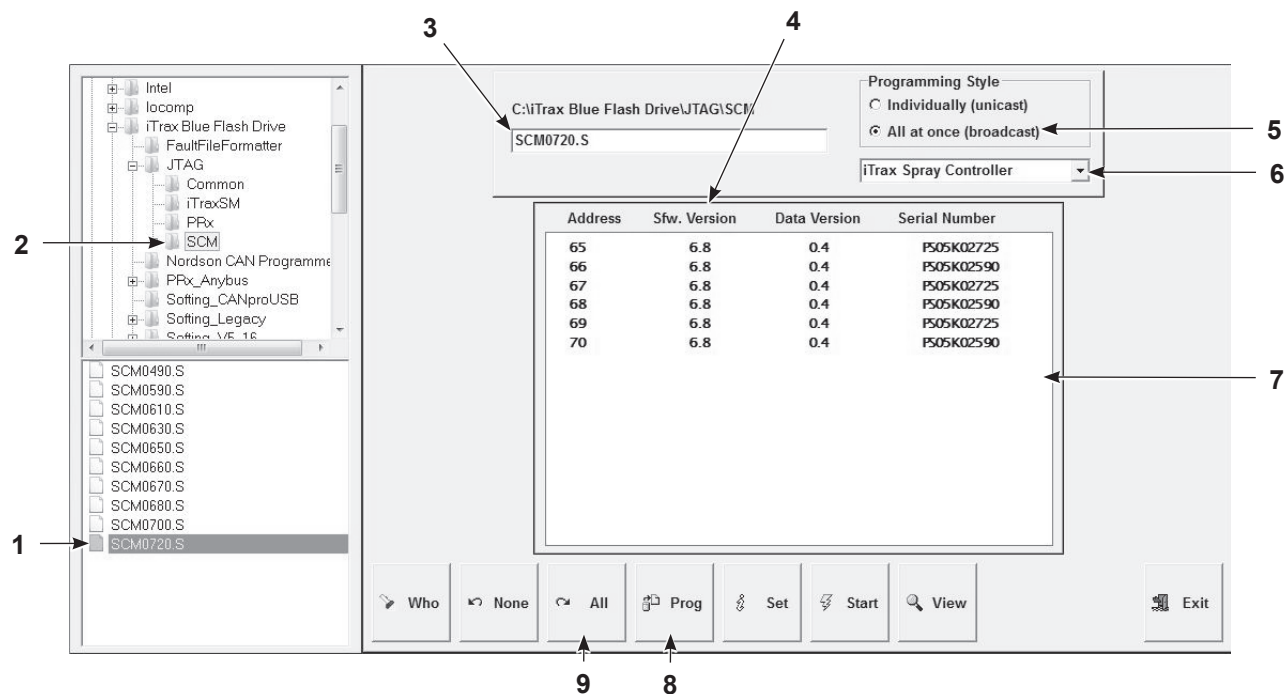

Figure 15 CAN Programmer Main Screen

1. SMC0720.S file	4. Software version	7. Module address listing
2. SMC folder	5. All at once option	8. Program button
3. SMC0720.S location field	6. Module listing	9. Select all button

Parts

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

Part	Description	Quantity	Note
1612377	CONTROLLER, iTrax, spray controller, package	1	A
1078567	• Cable IDC, ribbon cable, w/connectors, 10 contact	1	
114876	• FUSE, 4.0A, fast acting, 250V, 5 X 20MM	1	
981145	• SCREW, pan, 10-24 x 0.500 in.	2	
------	• CONTROLLER, iTrax, spray controller	1	
1065268	MODULE, Spray Monitor, iTrax	------	B
1107573	CONTROL, module, iTrax PRx-II	------	B
NOTE: A. iTrax spray controllers with part numbers 1083541 and 1610622 are no longer available. Part number 1612377 is available as a backward-compatible replacement. B. Optional part available through Nordson.			

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

⌁Nordson

UK 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 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
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