CanWorks® iTrax® Spray Monitor (without Can-In-Pocket)

Introduction

NOTE: This instruction sheet covers original CanWorks iTrax Spray Monitor modules that do not have the Can-In-Pocket (CIP) feature. For information about CanWorks iTrax Spray Monitors with the CIP feature, refer to manual 1066206.

The Nordson CanWorks iTrax System detects problems in coating application systems by monitoring the fluid pressure at the spray gun, provides warnings and alarms to the operators, and stores process data for quality control. The system consists of:

- one or more CanWorks iTrax Spray Monitor modules,
- a USB-to-CAN network adapter, and
- the CanWorks iTrax software.

The CanWorks iTrax Operator Interface runs on an IBM-compatible personal or industrial computer with the Windows 2000 or Windows XP operating system. Communications between the computer running the CanWorks iTrax Operator Interface and the Spray Monitors is through a CAN (Controller Area Network) network and the USB-to-CAN network adapter.

This instruction sheet covers

- system requirements
- installation procedures for the Spray Monitors, software, and USB-to-CAN adapter
- software setup
- Spray Monitor calibration guidelines
- Spray Monitor operation
- Spray Monitor parts

Refer to the online Help system in the iTrax Operator Interface for Spray Monitor configuration, calibration, system setup, and operation.

System Requirements

Spray Monitor Requirements

NOTE: For compliance with the European Union Electromagnetic Compatibility Directive, refer to *EMC Directive Requirements* on page 3.

The following customer-supplied hardware is required to install the Spray Monitors:

- 24 Vdc power supply: 200 mA required per Spray Monitor
- RS-485, 120 ohm, network cable
- Terminal blocks and enclosures as required
- Cable, as required, for timer input and warning/alarm outputs

Minimum System Requirements

Type	IBM-compatible personal or industrial computer
Operating System	Windows XP or 2000 with the most current Service Pack
Processor	Pentium 4 2.2 GHz (recommended) Pentium III 850 MHz (minimum)
RAM	512 Mb (minimum)
Video	SVGA, 2 Mb (minimum) 1024 x 768, 16-bit color
Free Hard Drive Space	10 Mb for program software 10 Gb for data storage
Removable Media	CD-ROM drive
Ports	USB version 1.0 or 2.0, Ethernet
Input Device	Touch screen or Keyboard and mouse
CAN Adapter	1 free USB port (version 1.0 or2.0) 1 9-pin female DB-9 adapter 1 121-ohm termination resistor

Recommended Industrial Panel Computer

Allen Bradley VersaView 1500P (6181P-15TP2KH)

Processor	Pentium III 1.2 GHz
Operating System	Windows 2000 with Service Pack 4
RAM	512 Mb
Video	15-in. Flat panel touch screen
Hard Drive	20 Gb
Removable Media	CD-ROM drive
Ports	USB version 2.0, Ethernet
Power	100-240 Vac 1.0-0.42 A, 50/60 Hz, 100 VA

Data Logging Requirement

The PC date and time must be set correctly. This information is used for the process data time stamp.

EMC Directive Compliance

See Figure 3 for electrical requirements.

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

1. Mount the Spray Monitor in an IP54 or better metal enclosure.
2. Use line filter Corcom 3EQ1, or equivalent.
3. Use Idec power supply PS5R-C24, or equivalent.
4. For general safety fuse L1 and L2 with 2-Amp fuses.
5. Cabling from the trigger signal (driver), sensor signal (applicator), and the network cable to the customer-supplied computer must all be shielded and terminated.

Hardware 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.

Spray Monitor Installation

Installation of the CanWorks iTrax Spray Monitors consists of configuration, mounting, and electrical connections. Spray Monitor 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 3.

Spray Monitor Configuration

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

Configuration should be done before the Spray Monitor is mounted.

1. Unplug the terminal blocks from both ends of the Spray Monitor.
2. Remove the Spray Monitor from its mounting, if installed.

Spray Monitor Configuration *(contd)*

3. See Figure 4. Loosen one set of end plate screws and the circuit board screw from the bottom of the enclosure.
4. Slide the circuit board and end cap out of the enclosure.
5. See Figure 1. Make the following settings:

Table 1 CanWorks iTrax Spray Monitor Switches and Settings

Setting	Function/Procedure
Network Address (SW2, SW3)	Each Spray Monitor must have a unique address, from 01-64. Rotate switch SW2 (MSB) to set the 10s, and switch SW3 (LSB) to set the 1s. For example, for address 02, set SW2 to 0 and SW3 to 2.
Network Termination (SW4)	Spray Monitor network wiring is done in a daisy chain configuration. Set SW4 (Terminator) to ON if the Spray Monitor is at the end of the network chain. Leave SW4 set to OFF for all other Spray Monitors.
Trigger (Timer) Input (J102)	Set the jumpers on J102 for Sinking or Sourcing, depending on the gun timer signal. Use these settings for 24 Vdc timer signals. Refer to the diagram on the other end of the circuit board for jumper positions.
Alarm and Warning Outputs (J103, J104)	Set the jumpers on J103 (Alarm) and J104 (Warning) for Relay (1-2) or Solid State (2-3), as desired. Your wiring connections determine whether these function as normally open or normally closed.

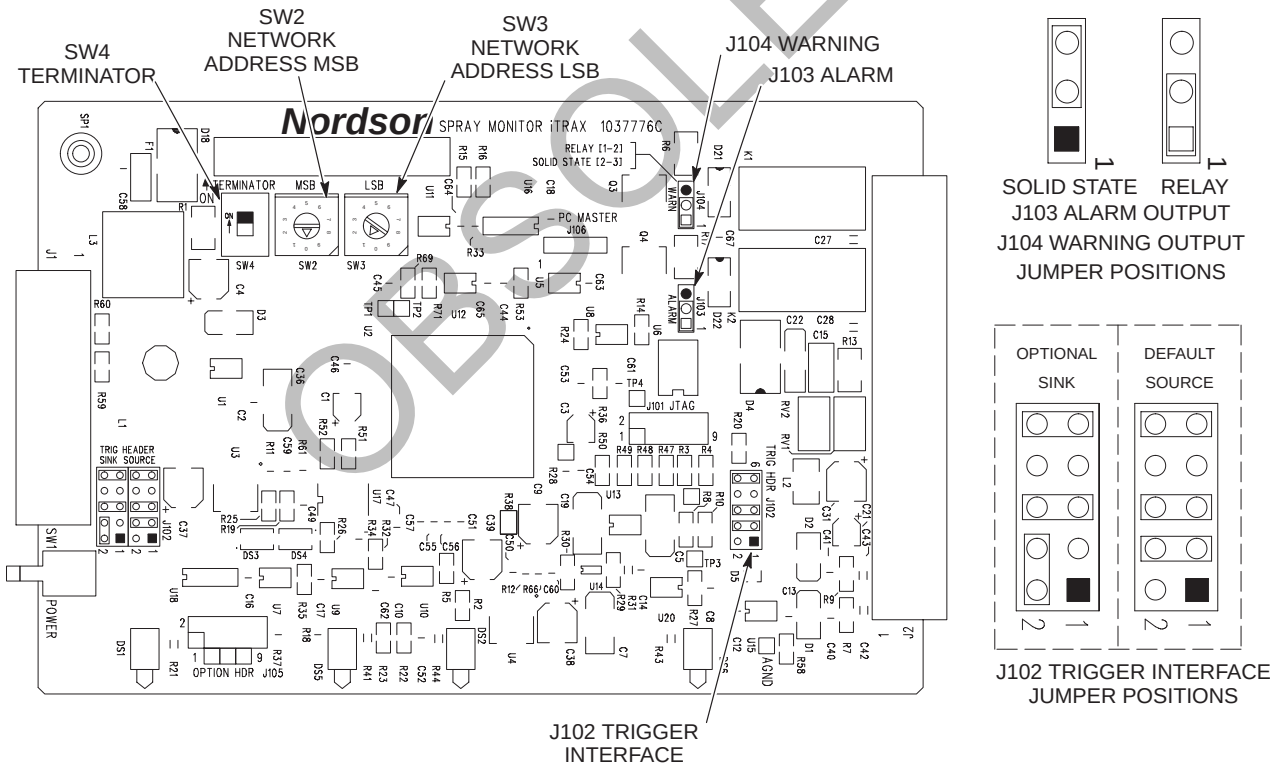

Figure 1 Spray Monitor Switches and Settings

Spray Monitor Mounting

NOTE: For compliance with the European Union Electromagnetic Compatibility Directive, refer to the EMC Directive Requirements on page 3.

See Figure 2. Mount the modules on a flat surface or a DIN rail (a DIN rail clip is provided). The mounting area should be free of vibration, excessive dust, and moisture. Ambient temperatures must not exceed 0-50 °C (32-104 °F). One DIN mounting clip and three M4 x 6 screws are shipped with each module.

If the included screws are not long enough to mount the Spray Monitor on a flat surface, use the following formula to determine the required screw length:

Panel Thickness + 6.35 mm (0.25 in.) max depth = Screw Length

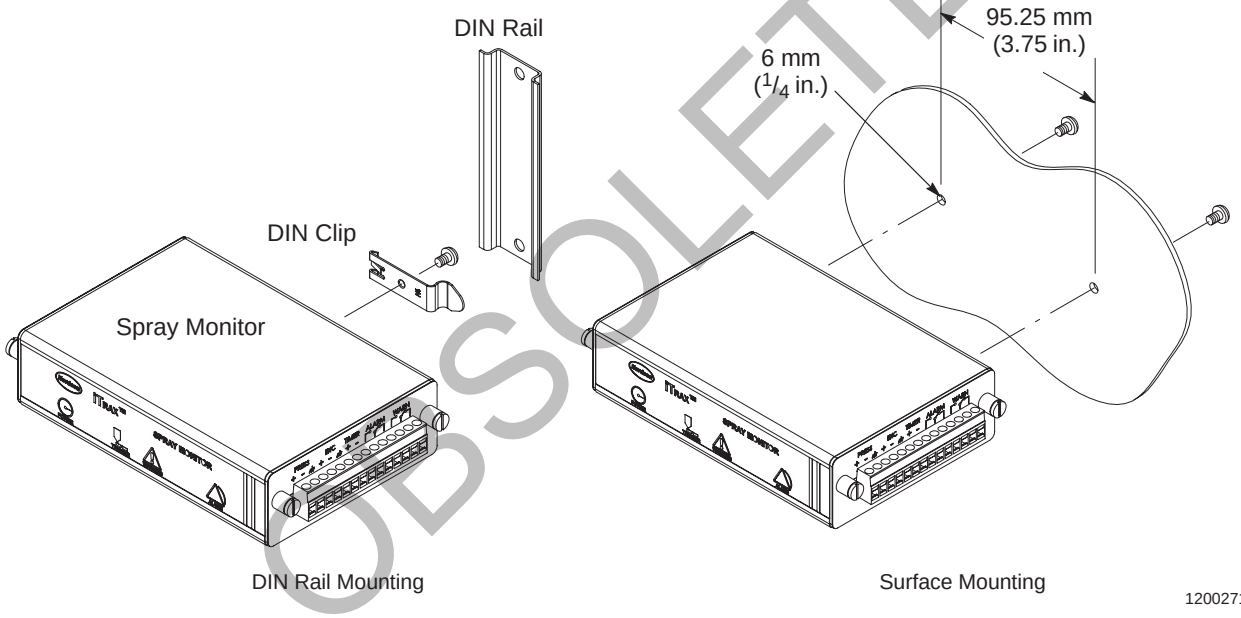

Figure 2 Spray Monitor Mounting

System Electrical Connections

Refer to Table 2 and Figure 3. Refer to *System Requirements* for cables and other hardware. The Spray Monitors are equipped with removable terminal block connectors.

NOTE: For compliance with the European Union Electromagnetic Compatibility Directive, refer to *EMC Directive Requirements* on page 3.

Table 2 System Electrical Connections

Input/Output	Connection/Terminals	Specifications/Special Instructions
Power Supply	POWER +24, GND	24 Vdc, 200 mA per Spray Monitor required (includes pressure transducer pre-amplifier and sensor)
Network	COMM A, B	CAN network, twisted pair shielded wire required (RS-485, 120 ohm, network cable)
Pressure Transducer I/O	PRESS +, -, GND	1-4 Vdc with 2.5 Vdc common mode voltage offset
	EXC +, -, GND	24 Vdc excitation signal to the pressure transducer pre-amplifier and sensor
Timer Input	TIMER +, -	5-50 Vdc, High on signal (High True), gun trigger
Alarm Contacts	ALARM No polarity	Relay (dry contacts): 5A at 250 Vac 5 A at 30 Vdc or Solid State 24 Vdc, 10 mA sinking
Warning Contacts	WARNING No polarity	

Pressure Transducer and CO-Plate Installation

The CanWorks iTrax Spray Monitor System uses a CO-plate and pressure transducer, installed in the spray gun, to accurately monitor base and fire pressures. The CO-plate has a controlled orifice that is designed to produce a pressure drop in the spray gun when it is triggered. The CO-plate is installed in the fluid path upstream from the nozzle, while the transducer is installed between the CO-plate and the nozzle.

When the spray gun is off, the pressure on either side of the CO-plate is the same. This is the base pressure. When the spray gun is triggered, the restriction provided by the CO-plate causes the pressure at the nozzle to drop. This is the fire pressure. The CO-plate restriction is not enough to starve the nozzle, but enough to produce a readable pressure difference between the base and fire pressures.

Refer to your spray gun manual for pressure transducer part numbers; CO-plate part numbers and usage guidelines; and installation instructions.

Refer to the CanWorks iTrax Operator Interface Help for information on spray monitor configuration and fault setup.

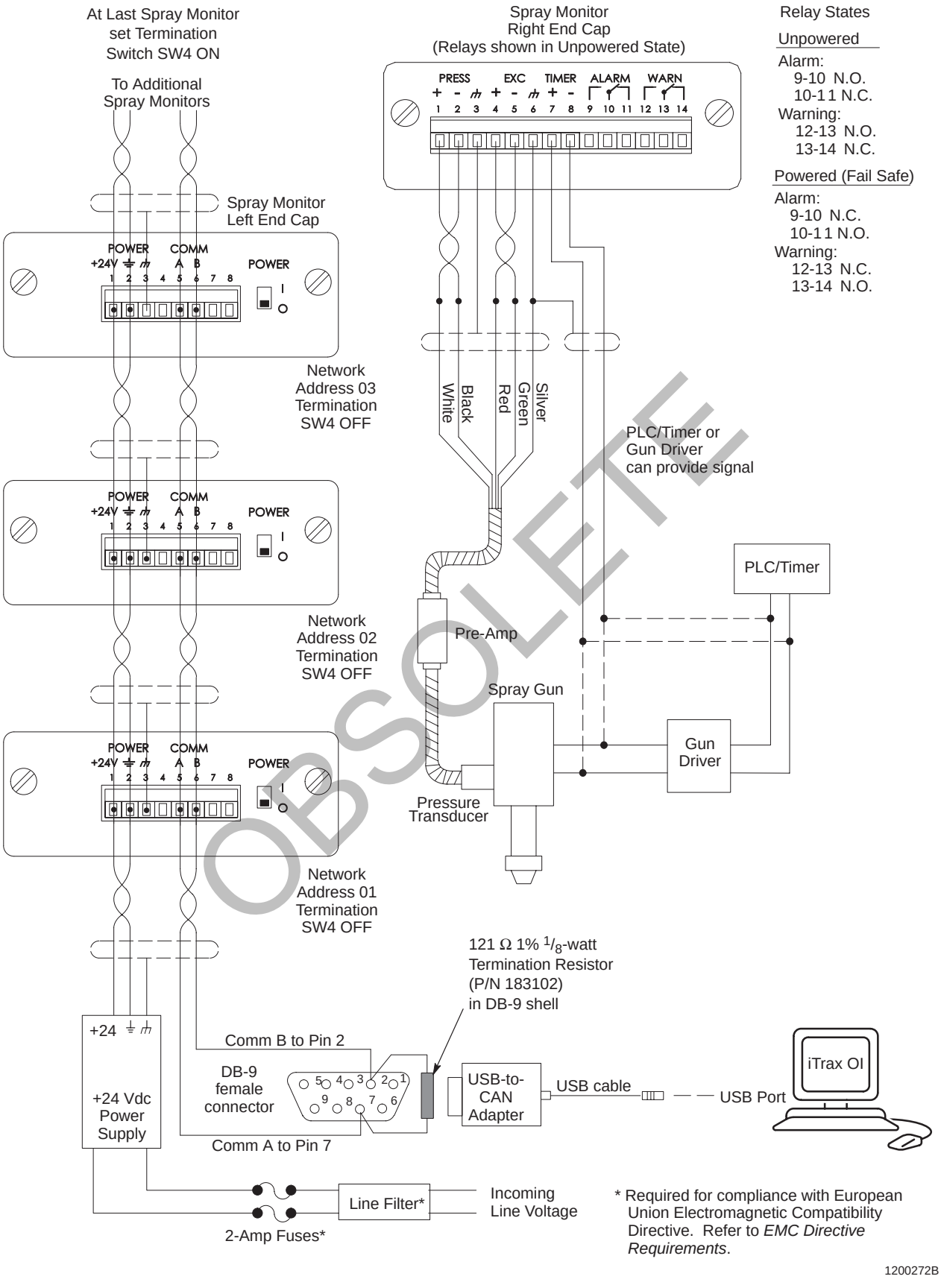

Figure 3 System Electrical Connections

iTrax Software Installation

1. With the Spray Monitor modules' power turned off, start up your Windows 2000 or XP computer.
2. Insert the CanWorks iTrax Spray Monitor System CD into your computer's CD-ROM drive and follow the prompts to install the software.

USB-to-CAN Adapter Installation

The USB-to-CAN network adapter is an external device. The adapter comes with a 91-cm (3-ft) USB cable and a CD containing the adapter drivers. The adapter gets its power from the USB port.

See Figure 3.

1. Place the adapter near the computer. If you are using an industrial computer mounted in an enclosure, install the adapter in the same enclosure.
2. Connect the supplied USB cable between the adapter and the computer.
3. The computer will prompt you to install the driver software for the adapter. Insert the CD supplied with the adapter into the computer's CD-ROM drive and follow the prompts to install the driver software.
4. The driver software installation can be tested by running \W32ApiDLL\Can_test.exe and choosing any mode. If the test program displays *Chips are running* the installation was successful and the adapter is working properly.
5. Quit the test program by pressing **q**.

   NOTE: The CAN adapter software manual is included on the CD in PDF format.

6. Connect the RS-485 network wiring:
   a. Connect one end of the RS-485 wiring to the COMM A and B connections on the first Spray Monitor module.
   b. Daisy-chain the RS-485 wiring from the COMM A and B connections on the first module to other modules as needed.

   NOTE: On the last module in the network, make sure that network termination switch SW4 is set to ON.

   c. Install the supplied DB-9 female adapter as shown in Figure 3, with the 121-ohm resistor installed inside the adapter and wired across pins 2 and 7. The resistor terminates the CAN network.
7. Turn on power to the Spray Monitor modules.

Software Setup

1. Start up the OPC server by double-clicking on the **CanWorks iTrax OPC Server** icon on the Windows desktop.
2. Set up the Data Logger:
   a. Start up the Data Logger by double-clicking on the **CanWorks iTrax Data Logger** icon on the Windows desktop.
   b. Open the Data Logger's online Help system by selecting **Help>Help** from the Data Logger toolbar.
   c. Perform the *Setup Procedure* provided in the online Help system.
3. Set up the Operator Interface:

   NOTE: Refer to the *CanWorks iTrax Spray Monitor System Operator Interface* user's guide provided with the software for a detailed description of the Operator Interface functions and icons.

   a. Start up the Operator Interface by double-clicking on the **CanWorks iTrax Operator Interface** icon on the Windows desktop.
   b. Open the Operator Interface's online Help system by selecting **Display Help** from the main button bar.
   c. Perform the *Setup Procedure* included in the *OI and Gun Setup* section of the online Help system.

Calibration

CAUTION: The coating system must be operating properly before you perform a calibration. If the coating system is not operating properly when you calibrate, the Operator Interface will allow the coating system to operate poorly and will generate inaccurate faults.

The Spray Monitor modules must be calibrated before you put the CanWorks iTrax Spray Monitor System into regular operation or enable any faults or relays through the Operator Interface.

Calibration collects operating data to use as an operational baseline. Each time a product is coated during normal operation, the actual base, fire, and delta pressures are compared to the calibrated (baseline) pressures. If the actual pressures are outside of permissible ranges around the calibrated pressures, a fault occurs.

NOTE: Refer to the *CanWorks iTrax Spray Monitor System Operator Interface* user's guide provided with the software for a detailed description of the Operator Interface functions and icons.

Open the Operator Interface's online Help system by selecting **Display Help** from the main button bar. Refer to *Calibration* in the *Operation* section of the online Help system for detailed instructions for performing a calibration.

Spray Monitor Operation

CanWorks iTrax System operation is automatic once the Spray Monitors are calibrated and the system is configured to the desired level of process monitoring through the Operator Interface. The Operator Interface displays system operation, provides warnings and alarms, and allows the operator to record responses to warnings and alarms, including corrective actions.

Power Switch

The Spray Monitor has a power switch on the left end plate. This switch is turned on by default and should be left on. Use this switch to turn off power before disconnecting the left and right terminal plugs.

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

LED Indicators

The Spray Monitor has 4 LEDs on the front panel:

Power (green)

Trigger (green)

Warning (yellow)

Alarm (red)

Spray Monitor Parts

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

Item	Part	Description	Quantity	Note
—	1042409	MODULE, spray monitor, iTrax	1	
1	- - - - - -	• HOUSING, modular, machined	1	
2	- - - - - -	• PCA, spray monitor, iTrax	1	
3	981637	• SCREW, flat head, #6-32 x 0.437, slotted, zinc	1	
4	1042663	• TERMINAL block connector, 8 position, 5.08 mm, MSTB, black	1	
5	- - - - - -	• PLATE, end cap, 8 position, iTrax	1	
6	- - - - - -	• PLATE, end cap, 14 position, iTrax	1	
7	1042664	• TERMINAL block connector, 14 position, 5.08 mm, MSTB, black	1	
8	326947	• MOUNTING CLIP, DIN, 35 mm rail	1	
9	982164	• SCREW, pan head, slotted, M4 x 6, zinc	3	

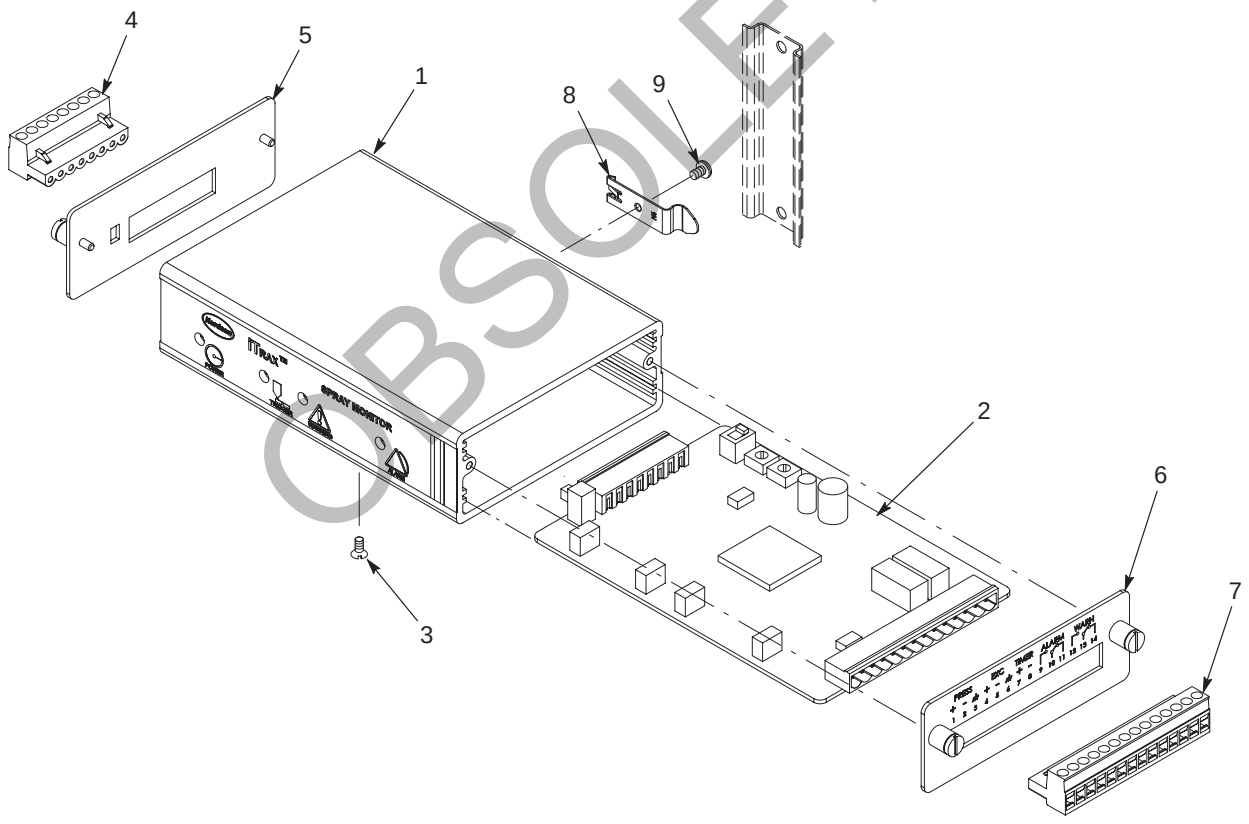

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Figure 4 Spray Monitor Parts

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DECLARATION of CONFORMITY

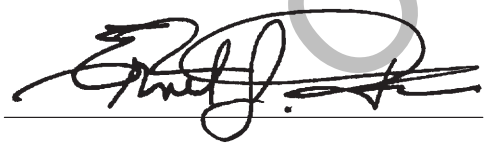
PRODUCT: CanWorks / iTrax

APPLICABLE DIRECTIVES:
73/23/EEC (Low Voltage Directive)
89/336/EEC (Electromagnetic Compatibility Directive)

STANDARDS USED FOR COMPLIANCE:
EN50081 EN50082 IEC417
EN55011 EN60204

PRINCIPLES:
This product has been manufactured according to good engineering practices.
The product specified conforms to the directives and standards described above.

CERTIFICATIONS:
ISO 9001 DNV No. 08796-2003
TUV EN60204



Ernest J. Fena
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Liquid and Container Systems Group

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