CanWorks® Operator Interface Tracking PLUS

User Guide
Part 334 696A

NORDSON CORPORATION • AMHERST, OHIO • USA

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CanWorks Operator Interface Tracking PLUS

1. Introduction

The Nordson CanWorks Operator Interface Tracking PLUS software is a PC-based graphical user interface for CanWorks systems. It can support up to 24 SM-1 spray monitor modules and 6 UI-1 display modules on a single network. Use the Operator Interface (OI) to configure the SM-1 modules, set fault warning and alarm levels, monitor system operation, and collect data for statistical process control (SPC) and maintenance scheduling.

The OI only supports CanWorks systems using SM-1 spray monitors. At least one UI-1display module must be present on the network in order for the CanWorks system to operate properly, since UI-1 display modules contain the system memory used to retain spray monitor configuration and calibration settings, plus the clock used to time- and date-stamp faults. When the system is powered up, the configuration and calibration settings are downloaded to the spray monitors from the UI-1 memory.

2. Installation

This section covers installation of the Echelon SLTA-10 network adapter and drivers and the CanWorks OI software.

Because the OI must be configured to use the network adapter before you can configure the SM-1 modules on the network, install the network adapter and drivers first.

SLTA-10 Adapter Installation

Remove the SLTA-10 adapter from its packaging. Included with the adapter is a serial cable.

Dipswitch Settings

There are 8 dipswitches on the adapter's switch block. Set the switches as follows:

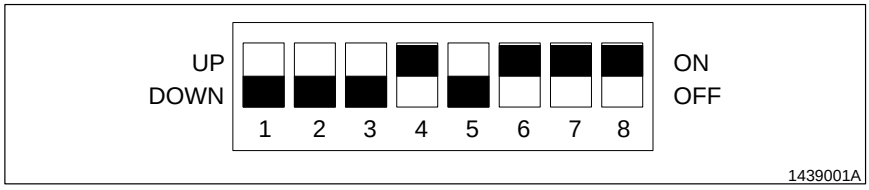

Fig. 1 Dipswitch Settings

Dipswitch Settings *(contd)*

Switch	Position
1	Off/Down
2	Off/Down
3	Off/Down
4	On/Up
5	Off/Down
6	On/Up
7	On/Up
8	On/Up

Adapter Connections

1. Plug one end of the included serial cable into the adapter's EIA-232 port and the other end into the PC's serial port (COM port). Make a note of which port you use.

2. See Figure 2. Connect the network wiring to the adapter terminal block labeled NETWORK. Use twisted-pair shielded wire (Belden 8773 or equivalent). Refer to the *CanWorks Spray Monitor I* or *CanWorks Display Module* manuals for more information.

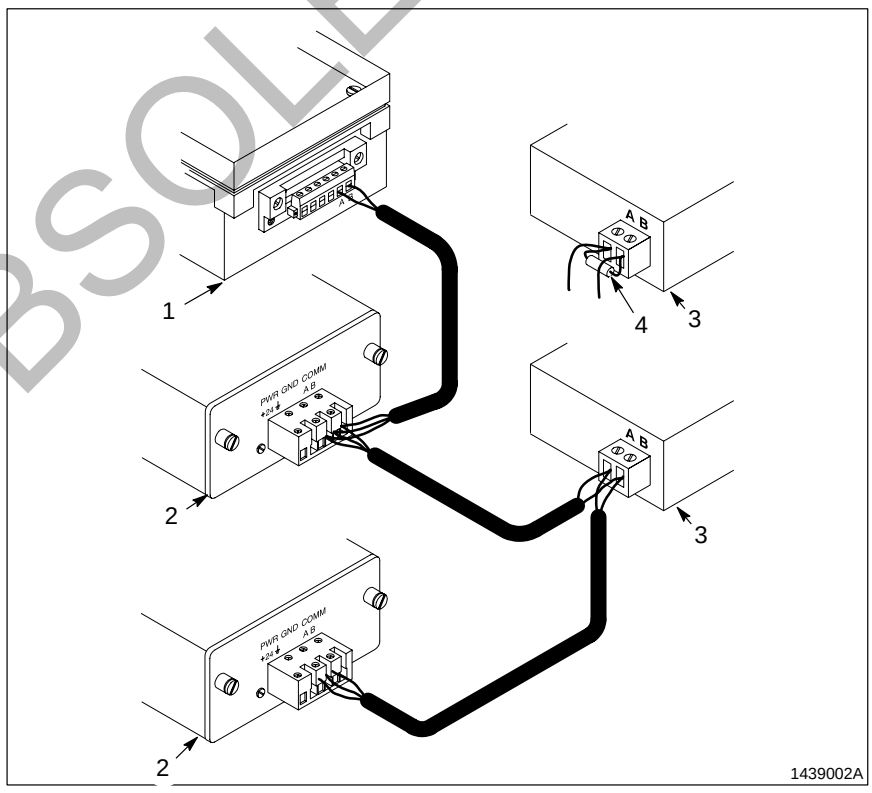

Fig. 2 Network Connections

1. Display module
2. SM-1 modules
3. SLTA-10 network adapter
4. Resistor (use only if adapter is on end of network)

NOTE: The network must be terminated at each end. If you must connect the network adapter to one end of the network, install a 121 ohm, 1%, $^1/_8$ watt metal film resistor across the network adapter terminals as shown in Figure 2.

3. Connect power leads from the CanWorks system to the adapter's POWER terminal block. The terminals have no polarity. Voltage should be 24 ± 4 Vdc.

Software Installation and Configuration

Software installation and configuration consists of installing the network adapter drivers and SLTALink Manager; and the OI, then configuring the SLTALink Manager and OI. You do not have to have the network adapter connected to the CanWorks network to install the software.

Software Installation

1. Insert the CanWorks OI CD into your CD-ROM drive. After a few seconds pause, the installation menu should appear. If it does not, enable Autoplay in Windows, then re-insert the CD. Refer to *Enabling Autoplay* in this section for instructions.

2. Click on the **Install Drivers** button to install the SLTA-10 network adapter drivers and SLTALink Manager program.

   At all prompts, click **Next** to accept and use the default settings. Answer **No** when the install program asks you if you want to install additional DOS and 16 bit drivers.

   When the install program is finished, DO NOT let it reboot Windows. Instead, exit the install program and go on to the next step.

3. Click on the **Install OI** button and follow the installation instructions. When the install program is finished, configure the SLTALink Manager.

SLTALink Manager Configuration

Before starting the OI, you must configure the SLTALink Manager program and set up link associations.

1. Start the SLTALink Manager from your **Start**>**Programs**>**Echelon SLTA-10 Network Adapter** menu.

2. Click on **Link**>**Select/Action**.

3. From the **Link Selection** dialog box, select **LOCAL SLTA-10**. Click on the **Edit** button.

SLTALink Manger Configuration (contd)

4. Click on the **Next** button and make sure the COM port you plugged the adapter serial cable into is selected, and that 115200 baud is selected. Click on the **Next** button.

5. Select **LONSLTA.0** under **Device Assignment**.

6. Click on **Finish**, then click on **OK**.

7. Click on **Devices**>**Link Associations**.

8. Make sure **LONSLTA.0** is displayed in the **Device** field.

9. Click on the down arrow in the **Default Link** field and select **LOCAL SLTA-10**.

10. Click on **OK**.

11. Reboot your PC to activate the changes before running the OI. The Link Manager and OI will start when Windows starts, and an icon for the Link Manager should appear in the Windows taskbar, at the bottom of your desktop.

OI Configuration

Before the OI can communicate with the SM-1 modules on the network, you must configure the network address and device name. The OI starts when Windows starts.

1. Log onto the OI with supervisor-level access. Click on **Help**>**Help Topics** and select **Initial Logon** under **Security Administration** to learn how to do this.

2. Click on **Tools**>**Options**. Click on the **Display** tab.

3. Select an address for the OI that is not being used by another device on the CanWorks network. Use the up and down arrows in the field to change the address number.

4. Click on the down arrow in the **Device Name** field and select **SLTALON1** for the adapter device name. It should be the only name available.

5. Click on **OK** to save the settings.

6. Click on **File**>**Exit** to exit the OI, then restart the OI from the icon on your desktop. You must restart the OI for the changes you made to take effect.

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Enabling Autoplay

Follow these instructions to make CDs play automatically when you insert them in your CD drive.

1. Open the **Control Pane**l and double-click on the **System** icon. Click on the **Device Manager** tab.
2. Click on the plus sign next to **CDROM**, right-click on your CD drive, then click on **Properties**.
3. Click on the **Settings** tab.
4. Select the **Auto insert notification** check box. A check mark appears in the box when Autoplay is enabled.
5. Click on **OK**.

3. Manual Startup

The network adapter driver and OI installation routines place shortcuts in Windows Startup so that the drivers and OI load automatically when the Windows starts. If you should remove the shortcuts from Startup, you will have to manually load the software before you can use the CanWorks OI.

Start the CanWorks system in the following order:

1. Turn on power to the CanWorks system.
2. Turn on the PC and allow Windows to start.

NOTE: You must always start the SLTALink Manager before you start the OI. If you start the OI first, it will not be able to communicate with the SM-1 modules.

3. Start the SLTALink Manager by clicking on the icon on your desktop.
4. Start the CanWorks OI by clicking on the icon on your desktop.

4. Using Help

The CanWorks OI help system can be accessed by

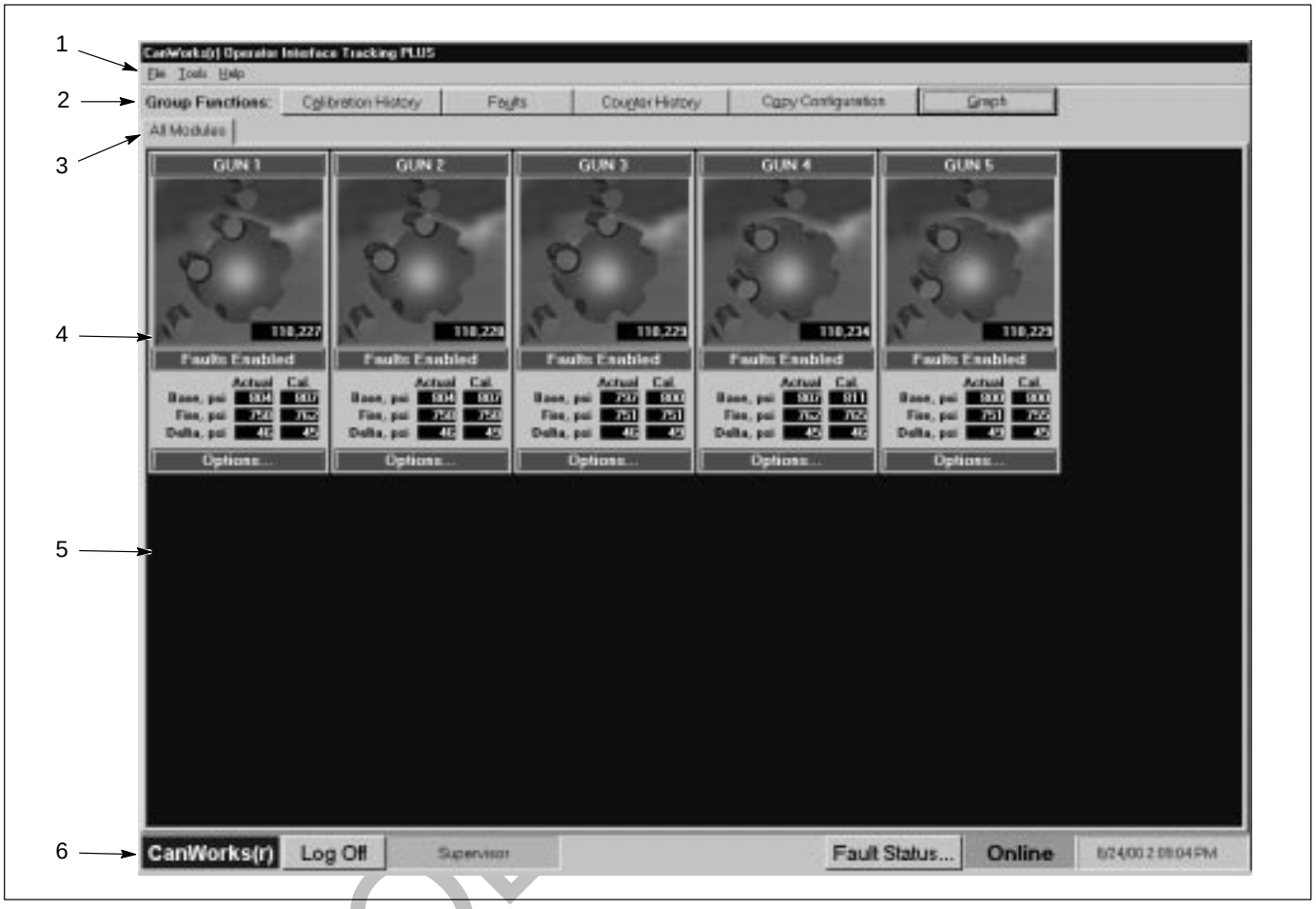
- clicking on **Help**>**Help Topics**
- pressing the **[F1]** key
- clicking on the **Fault Help** button in the **Fault History** window

The **[F1]** key opens help on the topic most likely to apply to the currently open window or dialog box. The **Fault Help** button opens the help topic specific to the current fault.

5. OI Components

The OI's main screen consists of a

- menu bar, button bar, and group tabs at the top of the screen,
- a tab window,
- SM-1 module faceplates,
- and a taskbar at the bottom.



1. Menu bar
2. Group functions button bar
3. Group tabs
4. Faceplates
5. Group window
6. Task bar

Menu Bar

The menu bar has three menus: **File**, **Tools**, and **Help**. When you click on a menu, it drops down and lists the selections available. If a selection is gray, it is not available to you until you log on with the proper security level. Clicking on the drop-down menu selections opens windows that provide access to OI functions.

Group Functions Button Bar

The **Group Functions** button bar has a series of buttons:

- **Calibration History**
- **Faults**
- **Counter History**
- **Copy Configuration**
- **Graphs**

Clicking on the buttons opens windows that allow you to view performance or operation data for the SM-1 modules, or copy a configuration from one module to another. If a button is gray, it is not available. To make it available, you must log on with the proper security access.

Group Tabs

When you create a group of modules, a tab is created for the group. Clicking on a group tab opens the group window. The **All Modules** group is always present and contains all the SM-1 modules on the network.

Faceplates

Each faceplate represents one SM-1 module. They allow the operator to visually monitor system operation. The faceplates consist of a label bar at the top; an animated picture of the operating status of the module; a fault status bar; data fields displaying actual and calibrated base, fire, and delta (psi change between base and fire) pressures; and an **Options** button. The label and fault bar and the Options button are green during normal operation. They change to yellow on a warning, or to red on an alarm.

Group Windows

Each group has a window that contains faceplates for the SM-1 modules in that group. Faceplates can be tiled in the window, or dragged and dropped to any location in the window.

Taskbar

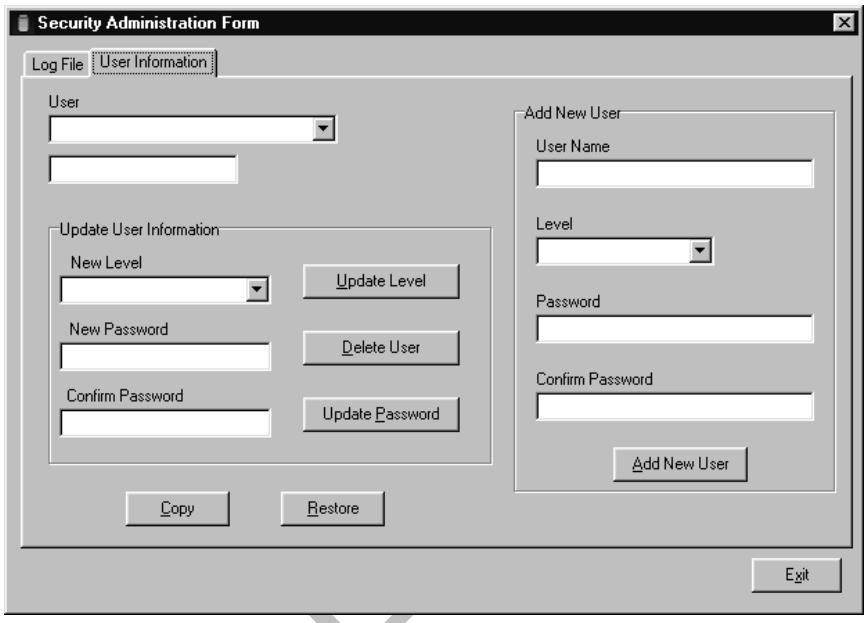
The taskbar contains OI messages and buttons. From left to right, they are:

- CanWorks logo
- **Log On/Log Off** button
- User name
- Fault status message (appears only if a fault occurs)
- **Fault Status** button
- **Online/Offline** indicator
- Date and time

NOTE: The OI is offline when it is not communicating with any SM-1 modules. The Offline indicator is red.

6. Security Administration

Security administration is provided to prevent unauthorized changes to CanWorks system settings. A user must log on to the OI to make changes. Use the **Security Administration Form** to setup or change OI security.



Security Levels

Security levels are assigned to users when the user is added to the OI. The security levels assigned to users determine the OI functions they can use.

Security Level	Functions
No Operator	Can view all data except gun on/off times. Faults can be reset.
Operator	Has all the privileges of **No Operator**, plus the ability to change spray monitor settings and perform calibrations.
Supervisor	Has all the privileges of an **Operator**, plus the ability to exit the OI, group SM-1 modules, change system options, configure data logging parameters, and perform security administration (add, modify, and delete users).

Initial Log On

When the OI is loaded, it defaults to the **No Operator** security level. Only routine CanWorks system monitoring and fault reset functions are available from this screen. To perform all other functions the user must log on to the OI as an **Operator** or **Supervisor**. Users must be set up by a **Supervisor** and given a security level and password.

Default User Name and Password

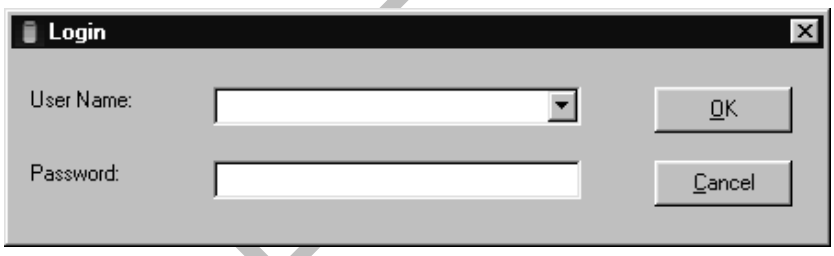
When the OI is installed, a default user is created with supervisor-level access. Log on using the following user name and password to gain access to the **Security Administration** dialog box.

User Name: Supervisor
Password: super

NOTE: User names and passwords are not case-sensitive.

Logging On as the Default User

1. Click on the **Log On** button at the bottom of the screen or **Tools**>**Log On**. The **Login** dialog box appears.

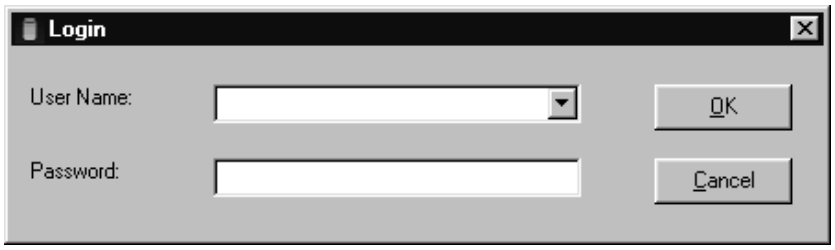


2. Click on the arrow in the **User Name** field and select **Supervisor** from the drop-down list.
3. Press the **[Tab]** key to move the cursor to the **Password** field, or click in the field.
4. Type **super** in the **Password** field.
5. Click on **OK**. The logged-on user name appears on the taskbar at the bottom of the runtime screen.
6. Click on **Tools**>**Add/Remove Users** to add users and assign them security levels and passwords. Make sure at least one user is assigned supervisor-level access. Record all user passwords. If you want to maintain security, delete the default user when you are finished setting up users.

NOTE: Users are automatically logged out when the log on timeout period expires. The default timeout period is 10 minutes. Only your Nordson field service representative can change the timeout period or disable the timeout.

Normal Log On

1. Click on the **Log On** button at the bottom of the screen, or on **Tools**>**Log On**. The **Login** dialog box appears.



2. Click on the arrow in the **User Name** field and select your user name from the drop-down list.

3. Click in the **Password** field and type in your password.

NOTE: User names and passwords are not case-sensitive.

4. Click on **OK**. The **Login** dialog box disappears and your user name appears on the taskbar. The **Log On** button on the taskbar changes to a **Log Off** button.

NOTE: Users are automatically logged out when the log on timeout period expires. The default timeout period is 10 minutes. Only your Nordson field service representative can change the timeout period or disable the timeout.

Adding a User

Security Level Required: Supervisor

1. Click on **Tools**>**Add/Remove Users** to open the **Security Administration Form**.

2. Click on the **User Information** tab.

NOTE: User names and passwords are not case-sensitive.

3. In the **User Name** field in the **Add New User** box, type in a user name.

4. Click on the arrow in the **Level** field and select the desired security level for the user.

5. In the **Password** field, type in a password.

6. In the **Confirm Password** field, type in the password again.

7. Click on the **Add New User** button. The new user is added to the OI user list.

8. To make sure you correctly entered the user, click on the  arrow in the **User** field and select the user name you just added. The security level you selected appears in the field below the **User** field.

NOTE: Make sure at least one user is assigned supervisor-level access. Record all user passwords.

Deleting a User

Security Level Required: Supervisor

1. Click on **Tools**>**Add/Remove Users** to open the **Security Administration Form**.

2. Click on the **User Information** tab.

3. Click on the  arrow in the **User** field and select the user name.

4. Click on the **Delete User** button.

5. Click on **Yes** to delete, **No** to cancel.

Modifying User Security

Security Level Required: Supervisor

1. Click on **Tools**>**Add/Remove Users** to open the **Security Administration Form**.

2. Click on the **User Information** tab.

3. Click on the  arrow in the **User** field and select the user name. The security level for the user appears in the field below the **User** field.

Changing Security Levels

1. Click on the  arrow in the **New Level** field and select the new security level.

2. Click on the **Update Level** button.

Changing Passwords

1. Type a new password in the **New Password** field. Passwords are case-sensitive.
2. Type the new password in the **Confirm Password** field.
3. Click on the **Update Password** button.

NOTE: Save your user profile when you are done modifying users. Refer to *Saving and Restoring User Profiles*.

Saving and Restoring User Profiles

Security Level Required: Supervisor

You can save and restore user profiles. When you save a user profile, the OI creates a file that contains all current user names, assigned security levels, and passwords.

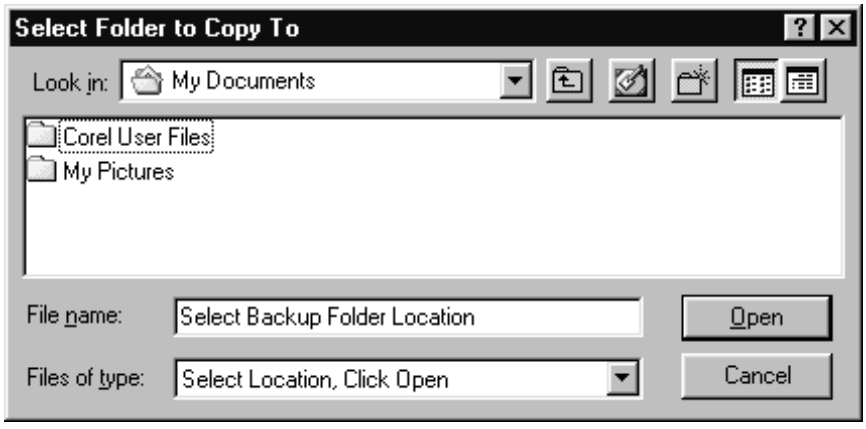
Accessing the Security Administration Form

1. Click on **Tools**>**Add/Remove Users**.
2. Click on the **User Information** tab.

Saving the User Profile

CAUTION: If you save the user profile to a drive or directory where an existing profile file is located, the new file automatically overwrites the old file.

1. Click on the **Copy** button. The **Select Folder to Copy To** dialog box appears.



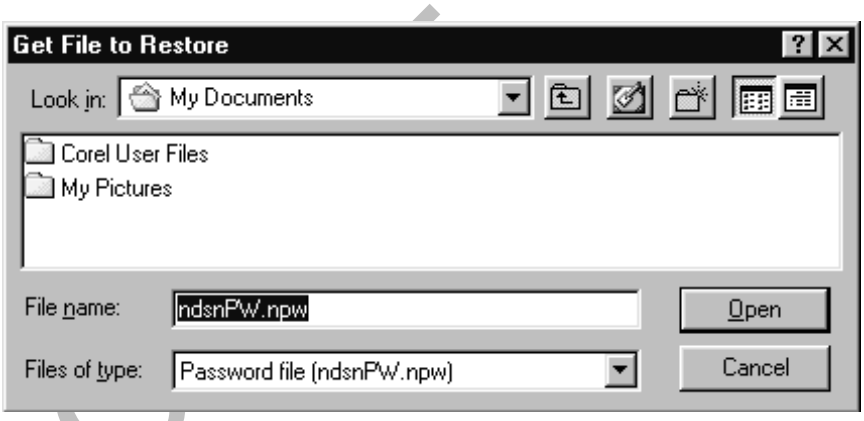
2. Use the navigation buttons and fields to select a drive and/or folder to save the profile file in. Any drive your PC can write to can be used.

3. Click on **Open**. A file named **`ndsnPW.npw`** is saved.

Restoring the User Profile

CAUTION: When you restore a user profile file, you overwrite the current user profile.

1. Click on the **Restore** button. The **Get File to Restore** dialog box appears.



2. Use the navigation buttons and fields to select the drive and/or directory on which the profile file is stored. Profile files are named **`ndsnPW.npw`**.

3. Click on **Open**. The user profiles are restored to the OI.

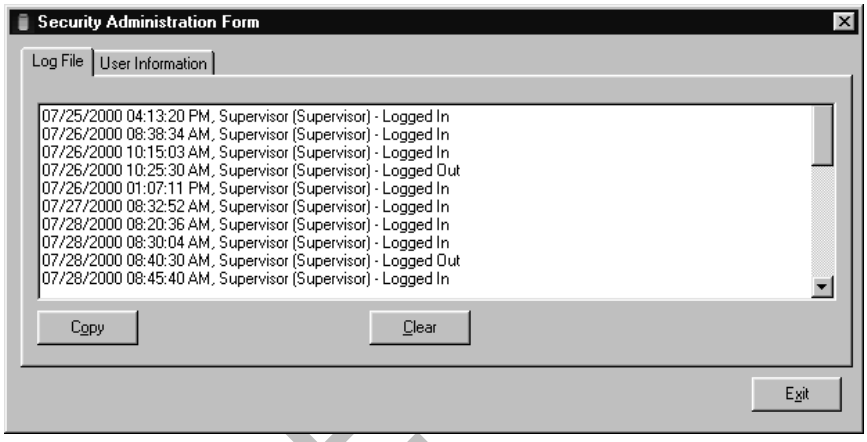
NOTE: If a user forgets their password, you can give them a new password by modifying their security.

Viewing the Log File

Security Level Required: Supervisor

The log file records the date, time, user name, security level, and transaction type for every action that affects system security.

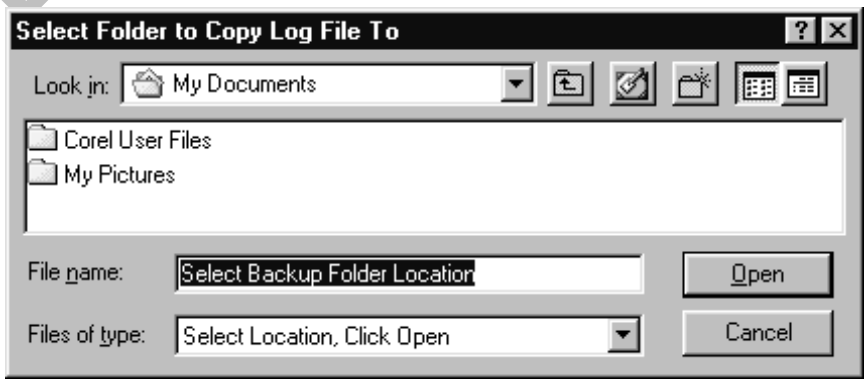
1. Click on **Tools**>**Add/Remove Users** to open the **Security Administration Form**.
2. Click on the **Log File** tab.



Exporting the Log File

Security Level Required: Supervisor

1. Click on **Tools**>**Add/Remove Users** to open the **Security Administration Form**.
2. Click on the **Log File** tab.
3. Click on the **Copy** button. The **Select Folder to Copy Log File To** dialog box appears.



4. Select a drive and/or directory. Any drive accessible to your PC can be used.

5. Click on **Open**. A file named **`ndsnSLog.dat`** is saved. This file can be imported into a spreadsheet or database program.

Clearing the Log File

Security Level Required: Supervisor

1. Click on **Tools**>**Add/Remove Users** to open the **Security Administration Form**.

2. Click on the **Log File** tab.

3. Click on the **Clear** button. All records in the current log file are deleted.

Logging Off

When you log off the OI, it reverts to **No Operator** and continues to run. To log off the OI do one of the following:

- Click on the **Log Off** button on the taskbar.
- Click on **Tools**>**Log Off**.

When no user is logged on, **No Operator** appears on the taskbar.

To exit the OI, you must log on with supervisor-level access.

Exiting the OI

Security Level Required: Supervisor

You must be logged on with supervisor-level access to exit the OI. Exiting the OI does not affect CanWorks system operation. However, no data is logged while the OI is shut down.

To exit the OI click on **File**>**Exit**. The OI shuts down and returns you to the desktop.

7. Setup Procedure Overview

Follow these procedures to setup and configure the OI and the SM-1 modules on the network:

1. Set the time and date on the UI-1 (CanWorks Display Module). Refer to the *CanWorks Display Module* manual for instructions. When finished, return the UI-1 display to a runtime screen.

NOTE: The UI-1 display must ALWAYS be set on a runtime screen while using the CanWorks OI. If you use the UI-1 display module to calibrate or configure an SM-1 module, reset the UI-1 display to a runtime screen when done. If you leave the display on a configuration or calibration screen and then attempt to configure or calibrate that SM-1 module from the OI, you will get a **Module is Busy** error message.

2. Log on to the OI with supervisor-level access.
3. Set the **OI Network Address** and **Device Name**.
4. Set up the OI:
   a. Create a **Main Screen Title**.
   b. Set the **Time** and **Date Formats**.
   c. Set the **Calibration Timeout Period**.
   d. Enable or disable the **Fault Indicator Popup**.
5. Set up data logging:
   a. Enable or disable **Data Logging**.
   b. Set the **Data Logging Rate**.
   c. Enable or disable **Auto Export**.
   d. Set a destination for exported data files.
6. Create SM-1 module groups, if desired.

7. Set up the SM-1 modules:

NOTE: You can set up one module, then copy its configuration to any or all other modules on the network.

   a. Assign each module a **Label**.

   b. Set the **Counter Status**.

   c. Set **Failsafe Status**.

   d. Set the **Transducer Range**.

   e. Enter **Nozzle** and **CO-plate** data.

8. **Calibrate** the SM-1 modules:

   a. Install the correct nozzles and CO-plates in the spray guns.

   b. Turn on the fluid pumps and set the fluid pressure.

   c. Start the can line and start spraying products.

   d. Adjust the fluid pressure and line speed until you obtain the best results.

   e. Calibrate each SM-1 module.

9. Set up **Faults** for each module:

   a. Set the **Low** and **High Flow Fault Bands**.

   b. Set the **Fault Status**.

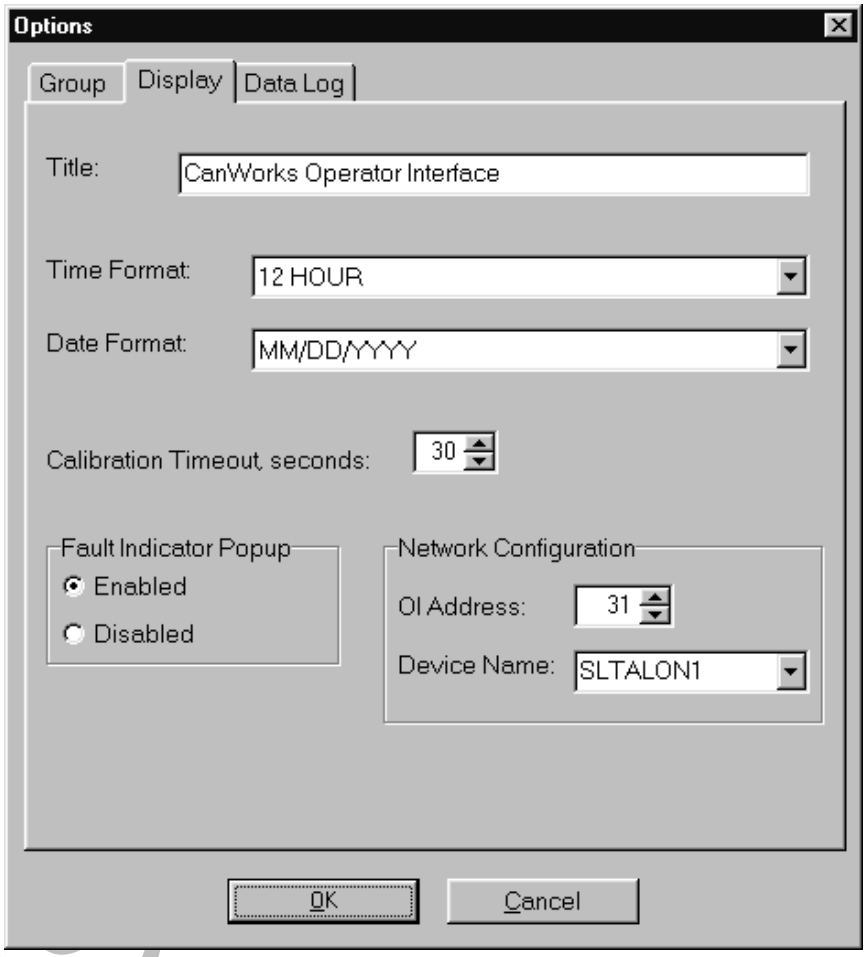
   c. Set the **Relay Status**.

   d. Set the **Fault Reset Status**.

   e. Set the **Gun Response Times**.

8. OI Setup Procedures

OI functions are set from the **Display** window.



Creating the Main Screen Title

Security Level Required: Supervisor

The main screen title is displayed at the top left of the OI window, in the title bar.

Default: CanWorks Operator Interface Tracking PLUS

1. Click on **Tools**>**Options**. Click on the **Display** tab.
2. Type a new name in the **Title** field.
3. Click on **OK**. The new name appears in the main screen title bar.

Setting the Time and Date Formats

Security Level Required: Supervisor

The time and date formats are used in the **Fault History**, **Calibration History**, and **Counter History** windows. Time can be displayed in 12-hour or 24-hour format. Dates can be displayed as Month/Day/Year (MM/DD/YYYY) or as Day-Month-Year (DD-MM-YYYY).

1. Click on **Tools**>**Options**. Click on the **Display** tab.
2. To change the time format, click on the  arrow in the **Time Format** field. Select the desired format.
3. To change the date format, click on the  arrow in the **Date Format** field. Select the desired format.
4. Click on **OK** to accept the settings and close the **Options** window.

Setting the Calibration Timeout Period

Security Level Required: Supervisor

When you open the **Calibration** dialog box for a module, the OI disables fault monitoring so a calibration can be run. The calibration timeout is the number of seconds you have to run a calibration before the OI re-enables fault monitoring and disables the calibration **Start** button. If you do not run a calibration before the timeout runs out, the OI re-enables fault monitoring and disables the calibration **Start** button. To run a calibration after a timeout, close the dialog box and re-open it.

Default: 30 seconds.

1. To change the calibration timeout, click on **Tools**>**Options**. Click on the **Display** tab.
2. Click on the  or  arrows in the **Calibration Timeout** field to increase or decrease the number of seconds.
3. Click on **OK** to accept the settings and close the **Options** window.

Setting the Fault Indicator Popup Status

Security Level Required: Supervisor

The fault indicator popup appears in the center of the main screen when the OI detects a fault. The popup flashes between red and yellow to attract attention.

Default: Enabled

1. To disable or enable the fault indicator popup, click on **Tools**>**Options**. Click on the **Display** tab.
2. Click on the **Fault Indicator Popup Enabled** or **Disabled** radio button  . When selected, a black dot  appears in the center of the radio button.
3. Click on **OK** to accept the settings and close the **Options** window.

Network Configuration

Security Level Required: Supervisor

Network configuration consists of choosing the network adapter device name and assigning it a unique network address.

Device Name

When configuring the OI you must select the device name of the network adapter so that the OI will use it to communicate with the CanWorks network.

1. Click on **Tools**>**Options**. Click on the **Display** tab.
2. Click on the  arrow in the **Device Name** field and choose the device name of the network adapter. If you are using a SLTA-10 serial adapter the device name is SLTALON1.

Network Address

Each device on the CanWorks network must have a unique address. The network address is a number from 0 to 31. You should keep a record of the network addresses for all devices on the network. Blank record sheets are provided in both the UI-1 and SM-1 manuals.

1. Click on **Tools**>**Options**. Click on the **Display** tab.
2. Click on the  or  arrows in the **OI Address** field to increase or decrease the address number.
3. Click on **OK** to accept the settings and close the **Options** window.

9. Data Logging Setup

Security Level Required: Supervisor

While the OI is running, it can record operating and fault data for all the SM-1 modules on the network. It stores this data in log files, creating a file each day for each module. This data is also used for the OI's graphing function. The data can be automatically or manually exported to Comma Separated Variable (CSV) files. The CSV files can be imported into spreadsheets or databases for statistical analysis.

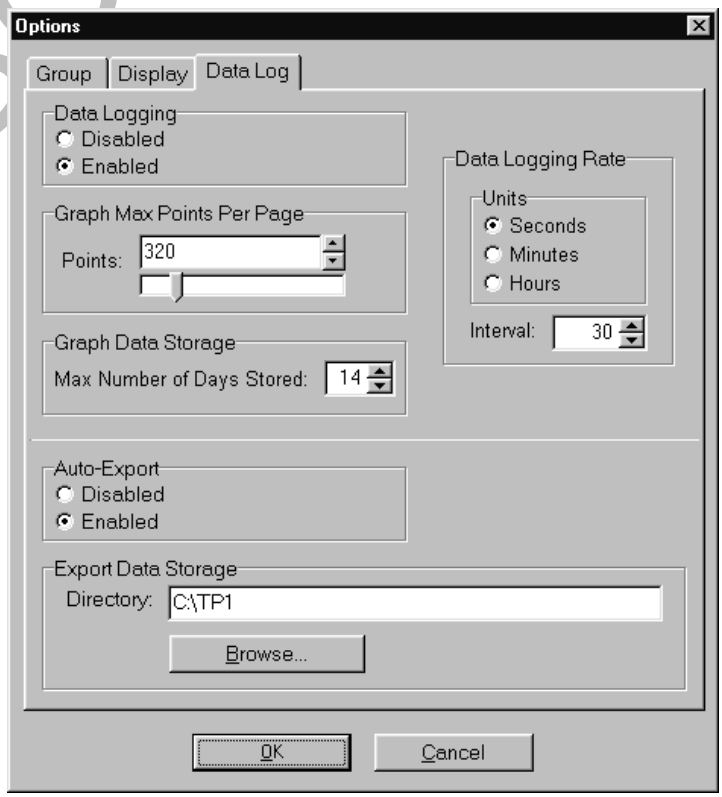
If you want the OI to log data, you must enable data logging. If you want to export the data to CSV files, enable **Auto Export** or manually export the data.

Clock Synchronization

Operating data is date- and time-stamped by the OI using the PC clock, as the data is logged. As faults occur they are date- and time-stamped by the UI-1 clock. The OI only logs faults that occur after it is started. For example, if the UI-1 clock is an hour behind the PC clock then for the first hour of OI operation any faults that occur will not be logged, since to the OI the faults occurred before it started.

To avoid losing fault data make sure the PC and UI-1 clocks are synchronized. Refer to the *CanWorks Display Module* manual for instructions on how to set the date and time on the UI-1. Use Date/Time on the Control Panel to set the PC clock.

All data logging functions are set up from the **Options**>**Data Log** window:



Data Log File Names

Each log file contains information from one SM-1 module, for one day. The file naming convention is

n m_yyyymmdd.csv

where n is the network number, m is the module number, yyyy is the year, mm the month, and dd the day.

For example, **1 1_20000616.CSV** is the log file for Network 1, Gun 1, 2000June16.

Data Log File Contents

The data logged includes:

Log Date	Date data written to the log file, from the PC clock. The log file is closed at midnight.
Log Time	Time data written to the log file, from the PC clock. The log file is closed at midnight.
Poll/Err Date	Date data polled, from the PC clock, or date fault occurred (Error Code is any number other than zero), from the UI-1 clock.
Poll/Err Time	Time data polled, from the PC clock, or time fault occurred (Error Code is any number other than zero), from the UI-1 clock.
Base Pressure	Pressure measured by the transducer when the gun is not spraying. If a fault occurs the base pressure is logged into the SM-1 modules's fault history record.
Fire Pressure	Pressure measured by the transducer when the gun is spraying. If a fault occurs the fire pressure is logged into the SM-1 module's fault history record.
Error Level	None, Warning, or Alarm.
Error Code	Numerical code representing the type of error. Refer to *Error Codes*.
Error Text	Text describing fault. Refer to *Error Codes*.
Calibrated Base Pressure	Base pressure set during calibration.
Calibrated Fire Pressure	Fire pressure set during calibration.
Base Pressure High Alarm Band	Pressure above calibrated base pressure that generates High Pressure Alarm, typically 50 psi. Alarm pressure can be customized for different applications
Base Pressure Low Alarm Band	Pressure below calibrated base pressure that generates Low Pressure Alarm, typically 50 psi. Alarm pressure can be customized for different applications
Fire Pressure (Flow) Low Alarm Band	Fire pressure that generates Low Flow Alarm.
Fire Pressure (Flow) Low Warning Band	Fire pressure that generates Low Flow Warning.
Fire Pressure (Flow) High Warning Band	Fire pressure that generates High Flow Warning.
Fire Pressure (Flow) High Alarm Band	Fire pressure that generates High Flow Alarm.
Interval	OI network data collection (polling) interval.
Interval Units	Time units for polling interval.
Label	Name given to module during setup.
Network	Network that the module is on.
Module	Network address for module.

Enabling Data Logging

Security Level Required: Supervisor

You must enable data logging if you want to view and print graphs or record and export operating and fault data to Comma Separated Variable (CSV) files.

Default: Enabled

1. Click on **Tools**>**Options**. Click on the **Data Logging** tab.
2. Click on the **Data Logging Enabled** or **Disabled** radio button  . When selected, a black dot  appears in the center of the radio button.
3. Click on **OK** to accept the settings and close the **Options** window.

Setting Data Logging Rate

Security Level Required: Supervisor

Data logging is done at intervals. The interval can be set from 5–59 seconds, 1–59 minutes, or 1–59 hours. When the interval expires, the last data read from the SM-1 is logged. This setting does not affect the OI polling rate, which is not user-configurable, or the recording of faults. All faults are recorded, regardless of the data logging rate.

Default: 30 Seconds

1. To set the data logging rate, click on **Tools**>**Options**. Click on the **Data Logging** tab.
2. Click on the **Seconds**, **Minutes**, or **Hours** radio button  to choose the interval **Units**. When selected, a black dot  appears in the center of the radio button.
3. Click on the  or  arrows in the **Interval** field to increase or decrease the interval.
4. Click on **OK** to accept the settings and close the **Options** window.

Enabling Auto Export

Security Level Required: Supervisor

The logged data is automatically exported to a Comma Separated Variable (CSV) file when **Auto Export** is enabled. If it is disabled, no CSV file is created, but the OI continues to log data. The logged data can be manually exported by the operator.

Enabling Auto Export (contd)

1. To enable or disable **Auto Export**, click on **Tools**>**Options**. Click on the **Data Logging** tab.

2. Click on the **Auto Export Enabled** or **Disabled** radio button . When selected, a black dot appears in the center of the radio button.

3. Click on **OK** to accept the settings and close the **Options** window.

NOTE: You must configure **Export Data Storage** to use **Auto Export**. The current day's data cannot be exported.

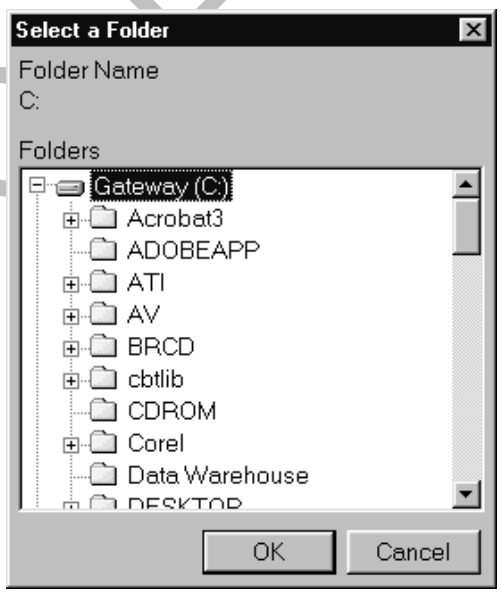
Setting a Destination for Exported Data

Security Level Required: Supervisor

To use **Auto Export**, you must specify a drive and/or folder for the data files. Any drive or folder that the PC can write to can be used.

1. Click on **Tools**>**Options**. Click on the **Data Logging** tab.

2. Click on the **Browse** button. The **Select a Folder** dialog box appears.



NOTE: The **Browse** button is not enabled unless **Auto Export** is enabled.

3. Find the drive and folder on which you want to store the data files.

4. Select the folder by clicking on it, then click on **OK**. The path name (drive:\folder) is displayed in the **Directory** field.

5. Click on **OK** to accept the settings and close the **Options** window.

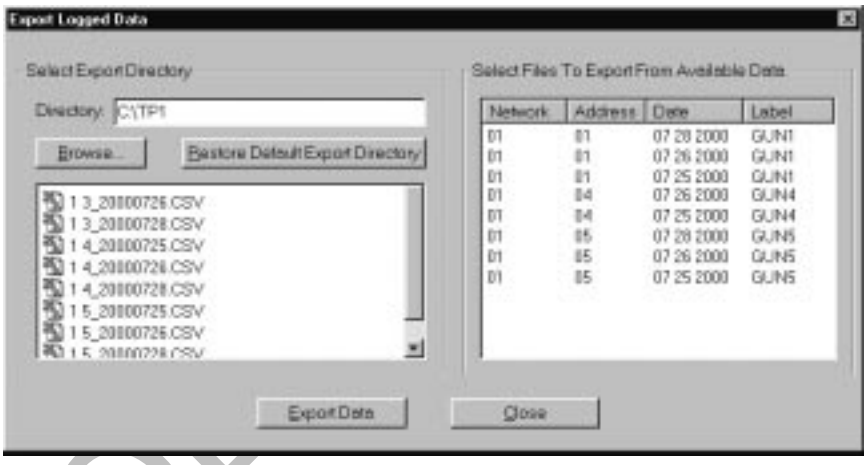
Manually Exporting Data

Security Level Required: Supervisor

In addition to the **Auto Export** function, you can manually export data as Comma Separated Variable (CSV) files from any SM-1 module at any time, to any drive or folder (directory) your PC can write to.

NOTE: The current day's data is not available for export until the OI closes the log file and opens a new file. This happens at midnight if the OI is running, or the next time you start the OI.

1. To manually export an SM-1 data file click on **File**>**Export**. The **Export Logged Data** dialog box appears.



2. The export destination defaults to the Export Data Storage setting. If you want to export to a different drive or folder, click on the **Browse** button, select the drive and folder to which you want to export the data file, and click on **OK**. The path name (drive:\folder) is displayed in the **Directory** field.

3. Select the file you want to export from the list in the right-hand window (**Select Files To Export From Available Data**).

4. Click on the **Export Data** button. The exported data file is displayed in the left-hand window, along with any previously exported data files.

NOTE: Clicking on the **Restore Default Export Directory** button reverts the export destination to the **Export Data Storage** setting.

10. SM-1 Module Setup

The OI allows you to make the same settings to the SM-1 modules as you can from a UI-1 display module.

Copying Configurations

Security Level Required: Operator

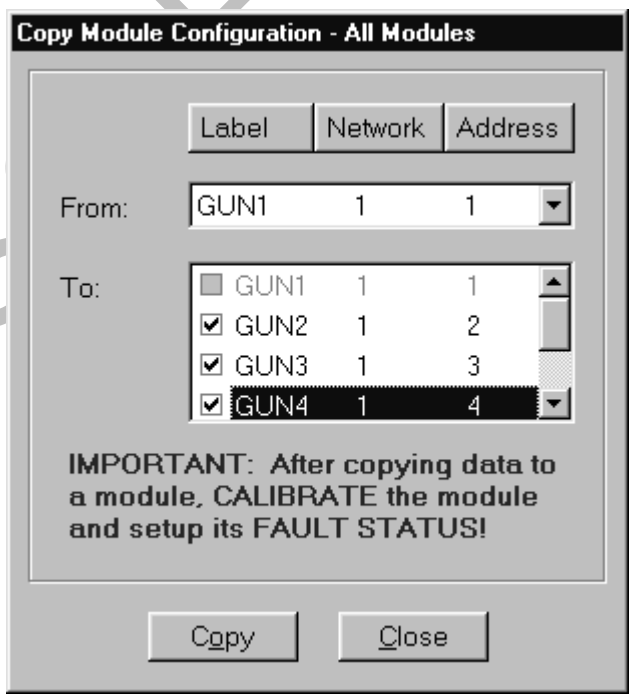
To make module setup easier and quicker, you can copy configurations from one module (the donor) to another (the recipient).

NOTE: You can only copy configurations within groups. To copy the configuration of a module in one group to a module in another group, click on the **All Modules** tab before opening the **Copy Module Configuration** dialog box.

To copy a configuration:

1. Click on the **All Modules** group tab, or if both the donor and recipient modules are in the same group, the specific group tab.

2. Click on the **Copy Configuration** button in the button bar. The **Copy Module Configuration** dialog box opens, with the group name in the title bar.



3. Click on the  arrow in the **From** field and select the donor module.

4. Select the recipient modules listed in the **To** field by clicking on the check boxes to the left of the module names.

5. Click on the **Copy** button.

6. Click on the **Close** button.

NOTE: Before starting production, you must assign the recipient module a label, run a calibration, and set fault status. Faults are disabled on the recipient module. Always run the calibration before enabling faults.

7. To finish setting up the recipient modules do the following, from the **Options** menu on each module's faceplate:

   a. Assign a new label.

   b. Set the fault status.

   c. Run a calibration.

Spray Monitor Grouping

Security Level Required: Supervisor

When you start the OI, it polls the network and finds all SM-1 modules on the network. It creates an animated faceplate, in the **All Modules** group window, for each module it finds. You can create groups of SM-1 modules for easier management and monitoring. For example, if your CanWorks network connects SM-1 modules installed on two or more production lines, you can create a group for each line. The OI creates a tab on the main screen for each group you create.

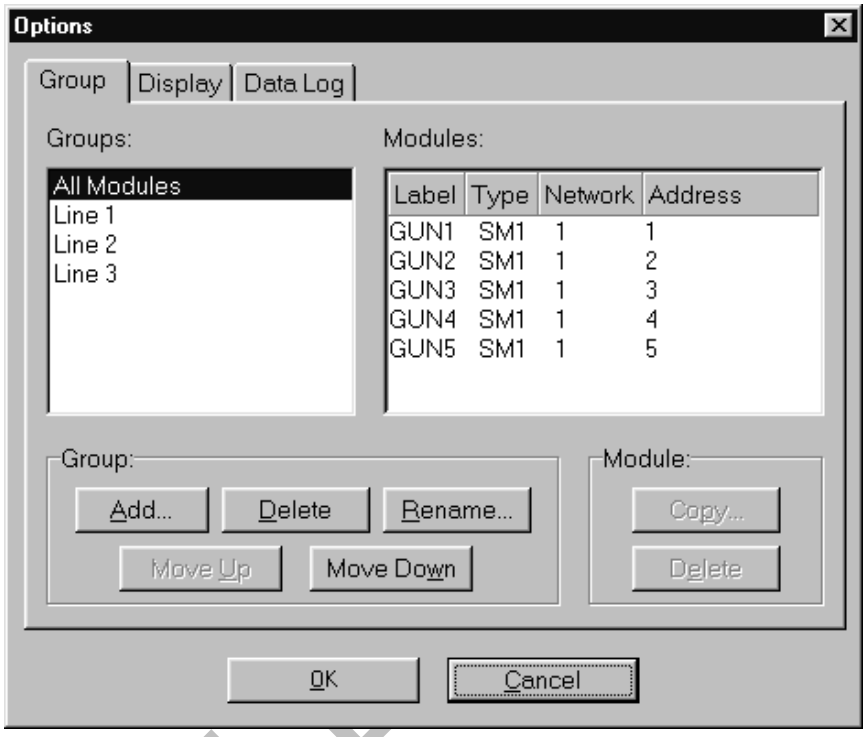
1. To access the grouping functions click on **Tools**>**Options**. The **Options** window opens.

2. Click on the **Group** tab.

The **Group** window includes two lists. The left-hand list shows the existing groups, in the order in which their tabs appear on the main screen. The right-hand list shows the modules assigned to the currently selected group. The **All Modules** group is created by the OI and lists all the modules detected on the network. The **All Modules** group can never be deleted or renamed.

Spray Monitor Grouping

(contd)



Creating a Group

Security Level Required: Supervisor

1. Click on **Tools**>**Options**. Click on the **Group** tab.
2. Click on the **Add** button. The **Add Group** dialog box appears.
3. Type a name for the group in the **Group Name** field, then click on **OK**. The group you created is added to the **Groups** list.

Adding a Module to a Group

Security Level Required: Supervisor

1. Click on **Tools**>**Options**. Click on the **Group** tab.
2. Select the **All Modules** group on the **Groups** list.
3. Select the module that you want to add to your group from the **Modules** list.

4. Click on the **Copy** button. The **Copy Module** dialog box appears.

5. Click on the ▼ arrow in the **To Group** field and select the group to which you want to add the module.

6. Click on **OK**. The module is added to the group. Repeat these steps to add more modules to the group.

7. To view the modules in the group, select the group from the **Groups** list.

Deleting a Module from a Group

Security Level Required: Supervisor

1. Click on **Tools**>**Options**. Click on the **Group** tab.

2. Select the group from the **Groups** list.

3. Select the module you want to delete from the **Modules** list.

4. Click on the **Delete** button in the **Module** box. The module is removed from the **Modules** list.

Deleting a Group

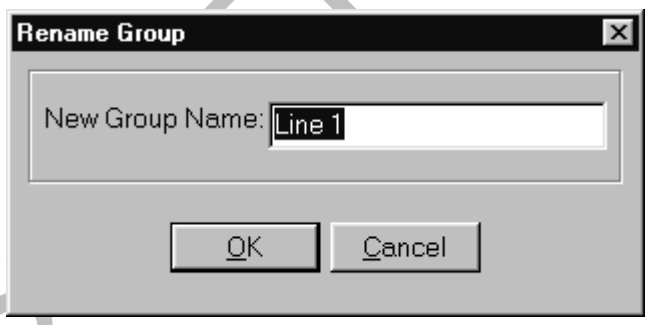
Security Level Required: Supervisor

1. Click on **Tools**>**Options**. Click on the **Group** tab.
2. Select the group from the **Groups** list.
3. Click on the **Delete** button in the **Group** box. The group is deleted.

Renaming a Group

Security Level Required: Supervisor

1. Click on **Tools**>**Options**. Click on the **Group** tab.
2. Select the group from the **Groups** list.
3. Click on the **Rename** button. The **Rename Group** dialog box appears.



4. Type a new name for the group in the **New Group Name** field.
5. Click on **OK**. The group is renamed.

Changing the Group Tab Order

Security Level Required: Supervisor

The order in which groups appear on the **Groups** list determines the order in which their tabs appear on the main screen.

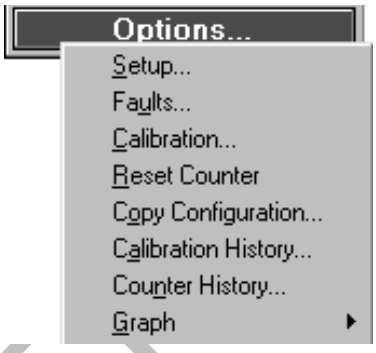
1. Click on **Tools**>**Options**. Click on the **Group** tab.
2. Select the group whose tab you want to move.

3. Click on the **Move Up** or **Move Down** button. The group is moved once for each click.

4. When the group is in the desired position, click on **OK**. The group tab now appears in the position you selected.

SM-1 Module Configuration

SM-1 module configuration is performed from the **Options**>**Setup** button on the module faceplate.

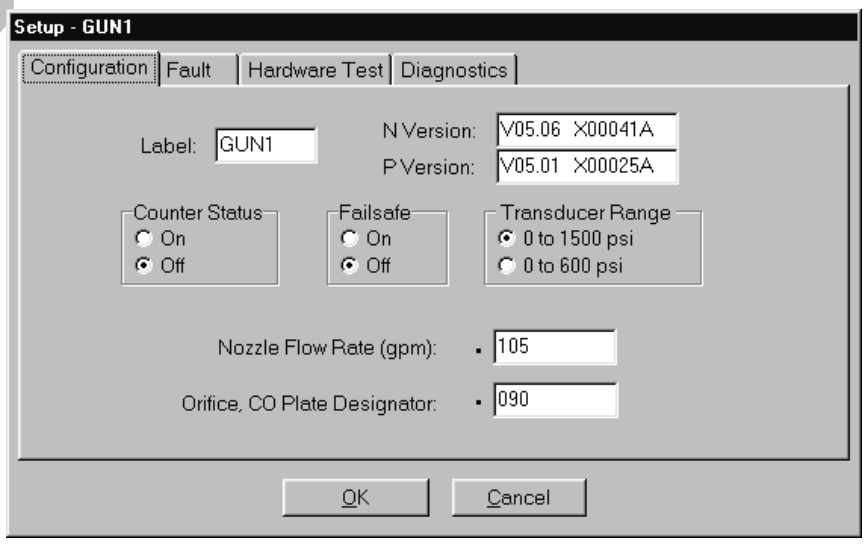


Assigning Labels

Security Level Required: Operator

SM-1 module labels appear at the top of the module faceplates and on the tabs for various OI windows. Assign each SM-1 module a unique label to avoid any confusion.

1. Click on **Options**>**Setup** on the module faceplate. Click on the **Configuration** tab.



Assigning Labels *(contd)*

2. Click in the **Label** field.

3. Type in a label for the module.

4. Click on **OK** to accept the setting and close the **Setup** window. The label appears in the label bar at the top of the faceplate.

SM-1 Chip Versions

Security Level Required: No Operator

SM-1 modules use a network chip and a program chip. These chips can be replaced to upgrade CanWorks programming and communications. If you call your Nordson representative for technical support, you may be asked to provide the version numbers of the chips in your SM-1 modules.

1. To view chip versions click on **Options**>**Setup** on the module faceplate. Click on the **Configuration**.

2. The chip version numbers are displayed in the two fields in the upper right corner of the window. The **N Version** is the network chip version; the **P Version** is the program chip version.

Setting Counter Status

Security Level Required: Operator

The counter maintains a running count of spray gun trigger inputs (gun firings). The counter is displayed on the module faceplates. The counter can be reset from the OI and is automatically reset when the SM-1 module is powered off. You can turn the counter on or off.

Default: Off

1. Click on **Options**>**Setup** on the module faceplate. Click on the **Configuration** tab.

2. Click on the desired **Counter Status On** or **Counter Status Off** radio button  . When selected, a black dot  appears in the center of the radio button.

3. Click on **OK** to accept the setting and close the **Setup** window.

Setting Failsafe Status

Security Level Required: Operator

The default behavior of the warning and alarm LEDs and relays in the SM-1 modules default to normally off and normally open (**Failsafe Off**). You can change their operation to normally on and normally closed (**Failsafe On**). With **Failsafe On**, the warning and alarm relays stay closed and LEDs on the SM-1 module remain on until a fault occurs, when the relays open and the LEDs turn off.

Default: Off

1. Click on **Options**>**Setup** on the module faceplate. Click on the **Configuration** tab.

2. Click on the desired **Failsafe On** or **Off** radio button. When selected, a black dot appears in the center of the radio button.

3. Click on **OK** to accept the setting and close the **Setup** window.

Setting Transducer Range

Security Level Required: Operator

Pressure transducers are available in 0–600 psi or 0–1500 psi (0–41 or 0–103 bar) ranges. Each transducer includes an amplifier. The part number of the transducer is stamped on the amplifier.

Part Number	Pressure Range
771220	0–600 psi
332768	0–600 psi
333055	0–1500 psi

For proper SM-1 module operation you must set the pressure range of the pressure transducer mounted on the spray gun.

1. Click on **Options**>**Setup** on the module faceplate. Click on the **Configuration** tab.

2. Click on the desired **Transducer Range** radio button. When selected, a black dot appears in the center of the radio button.

3. Click on **OK** to accept the setting and close the **Setup** window.

Entering Nozzle and CO-Plate Data

Security Level Required: Operator

The SM-1 modules use the nozzle and CO-plate specifications to calculate the expected pressure drop at the transducer when the spray gun fires. Nozzle flow rate is shown as gallons per minute based on water at 500 psi at ambient temperature. The CO-plate designator is a 3-digit number that identifies the CO-plate. The flow rate and designator are stamped on the nozzle and CO-plate.

NOTE: The nozzle flow rate and CO-plate designator must be entered into the OI before running a calibration.

1. Click on **Options**>**Setup** on the module faceplate. Click on the **Configuration** tab.
2. Click in the **Nozzle Flow Rate (gpm)** field and enter the flow rate.
3. Click in the **Orifice, CO Plate Designator** field and enter the designator.
4. Click on **OK** to accept the settings and close the **Setup** window.

SM-1 Module Calibration

Security Level Required: Operator

Calibration creates a profile for a spray gun that is used as an operational baseline. Each time a can is coated during normal spray operations, the operating data is compared to the baseline. If the operating data falls outside the permissible ranges around the baseline, a fault occurs. During calibration, the SM-1 records the base and firing pressures and determines valid warning and alarm conditions depending on the settings made during setup.

Perform a calibration when you

- clean or modify the fluid system
- change the nozzle size
- change the CO-plate
- change the base pressure
- change the spray duration
- replace a spray gun

NOTE: Before you calibrate an SM-1 module, you must enter the nozzle flow rate and CO-plate designator and set the transducer range in the module **Setup** window.

To calibrate a SM-1 module:

1. Install the desired nozzle and CO-plate on the spray gun.

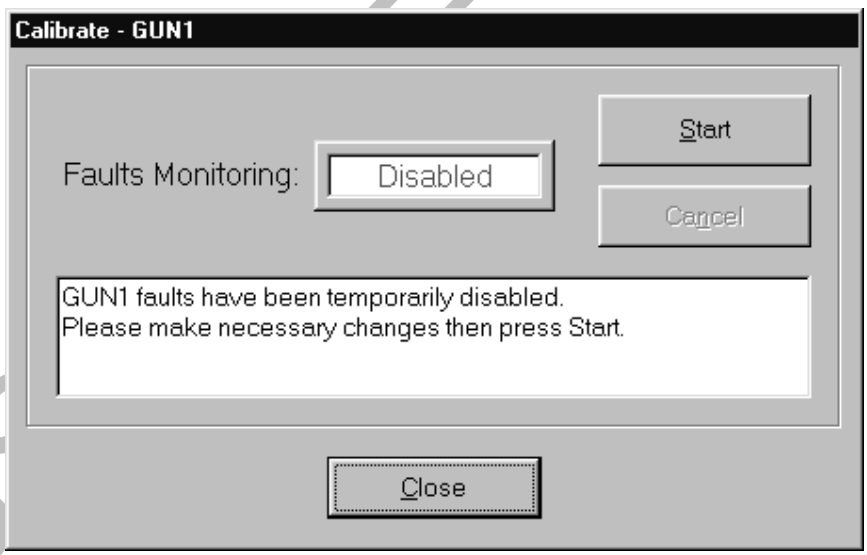
2. Click on **Options**>**Setup** from the module faceplate. Click on the **Configuration** tab. Enter the nozzle flow rate and CO-plate designator, and the transducer range.

3. Start the fluid pump and adjust fluid pressure.

4. Start the can line and start spraying product.

5. Adjust fluid pressures and line speed for best results.

6. Click on **Options**>**Calibration** on the module faceplate. The **Calibrate** window opens and fault monitoring for the module is disabled.

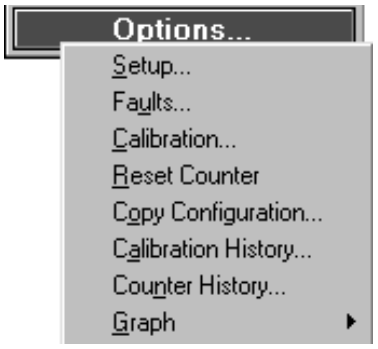


7. Click on the **Start** button. The calibration process takes only a few seconds. When complete, the **Calibrate** window closes automatically.

NOTE: If the **Calibration Timeout** expires before you click on the **Start** button, an error message will appear and faults will be enabled. To restart calibration, click on the **Close** button, then reopen the **Calibrate** window.

SM-1 Module Fault Setup

SM-1 module fault setup is performed from the **Options**>**Setup** button on the module faceplate.



Setting Fault Bands

Security Level Required: Operator

The fault band settings allow you to set threshold levels for **Low** and **High Flow Warnings** and **Alarms**. Each band is a percentage of the expected pressure drop when the spray gun fires. The difference between base and fire pressure is defined as 100%.

A pressure drop less than that expected indicates a low flow condition, which could mean that not enough coating was sprayed. A pressure drop greater than that expected indicates a high flow condition, which could mean that too much coating was sprayed.

Defaults:

Low Flow Alarm	30%
Low Flow Warning	60%
High Flow Warning	140%
High Flow Alarm	170%

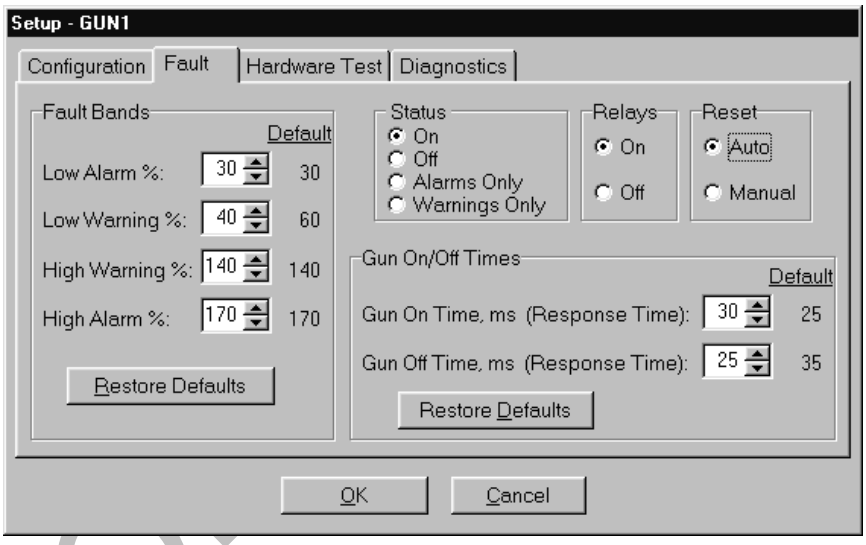
For example, if the base pressure is 800 psi and the fire pressure is 750, then the expected pressure drop when the gun fires is 50 psi. The fault band pressures would be:

Low Flow Alarm:	785 psi	If the pressure does not drop below 785 psi, an alarm is activated.
Low Flow Warning:	770 psi	If the pressure does not drop below 770 psi, a warning is activated.
High Flow Warning:	730 psi	If the pressure drops below 730 psi, a warning is activated.
High Flow Alarm:	715 psi	If the pressure drops below 715 psi, an alarm is activated.

NOTE: High and **Low Pressure Alarms** are not configurable. The alarm bands are calculated at calibration as plus or minus a preset value from the base pressure. Typically, the preset value is ± 50 psi. SM-1 modules can be ordered with a different preset value.

Setting Fault Bands

1. Click on **Options**>**Setup** on the module faceplate. Click on the **Fault** tab.



2. Click on the ▲ or ▼ arrows in the **Fault Bands** fields to increase or decrease the percentages.

3. Click on **OK** to accept the settings and close the **Setup** window.

To restore the fault bands to the default settings, click on the **Restore Defaults** button.

Setting Fault Status

Security Level Required: Operator

Four status settings are available for fault warnings and alarms:

- **Off:** Alarms and warnings are disabled
- **On:** Alarms and warnings are enabled
- **Alarms Only:** Alarms are enabled, warnings are disabled
- **Warnings Only:** Warnings are enabled, alarms are disabled

Default: Off

Setting Fault Status *(contd)*

1. To set fault status click on **Options**>**Setup** on the module faceplate. Click on the **Fault** tab.

2. Click on the desired **Status** radio button  . When selected, a black dot  appears in the center of the radio button.

3. Click on **OK** to accept the settings and close the **Setup** window.

Setting Relay Status

Security Level Required: Operator

SM-1 modules have two sets of relays available for customer use. The relays open or close on warning or alarm faults. You can turn the relays on or off.

NOTE: When the relays are turned off, only the LEDs on the SM-1 modules and the OI fault indicators alert the operator to a system fault.

Default: On

1. To turn the relays on or off click on **Options**>**Setup** on the module faceplate. Click on the **Fault** tab.

2. Click on the **Relays On** or **Off** radio button  . When selected, a black dot  appears in the center of the radio button.

3. Click on **OK** to accept the settings and close the **Setup** window.

NOTE: Relays can be set to normally open or normally closed by setting the Failsafe Status.

Setting Fault Reset

Security Level Required: Operator

A fault activates the SM-1 relays and LEDs and turns on the OI fault indicators and fault messages. The fault reset feature allows you to determine the way the relays are reset.

Default: Manual

NOTE: Open the Fault History window to reset faults.

Manual Fault Reset

If you set the reset to **Manual**, you must correct the fault condition and reset the fault to de-activate the relays and LEDs and turn off the OI fault indicators.

Automatic Fault Reset

If you set the reset to **Auto**, the relays are automatically reset after 10 milliseconds. The LEDs, OI fault indicators, and fault status messages stay on until the fault condition is corrected and the fault is reset. This prevents a transient, one-time fault from shutting down the system.

NOTE: If a **Low Pressure Alarm** occurs and fault reset is set to **Auto**, the relay is activated (latched) and remains latched until the base pressure increases above the alarm setpoint.

Setting the Fault Reset

1. Click on **Options**>**Setup>Fault** tab on the module faceplate.
2. Click on the **Manual** or **Auto Reset** radio button . When selected, a black dot appears in the center of the radio button.
3. Click on **OK** to accept the settings and close the **Setup** window.

Setting Gun Response Times

Security Level Required: Operator

Gun response time is the time it takes for the gun valve to open or close after receiving a timer signal. The **Gun On/Gun Off Times** settings provide you with a way to generate a Gun Open Too Slow warning if spray gun performance starts to deteriorate due to gun wear or other problems.

Setting Gun Response Times *(contd)*

Defaults:

Gun On	25 milliseconds (ms)
Gun Off	35 milliseconds (ms)

Actual response times vary and are typically less than the default times. If your application requires more sensitivity to gun response times, decrease the on and off times until you start generating warnings consistently, then increase the on and off times until the warnings stop.

1. To change gun response times, click on **Options**>**Setup** on the module faceplate. Click on the **Fault** tab.

2. Click on the ▲ or ▼ arrows in the **Gun On Time** and **Gun Off Time** fields to increase or decrease the time.

3. Click on **OK** to accept the settings and close the **Setup** window.

To restore the response times to the default settings, click on the **Restore Defaults** button.

11. Operation

The OI is used to monitor can coating and gather statistical data on system operation.

Startup

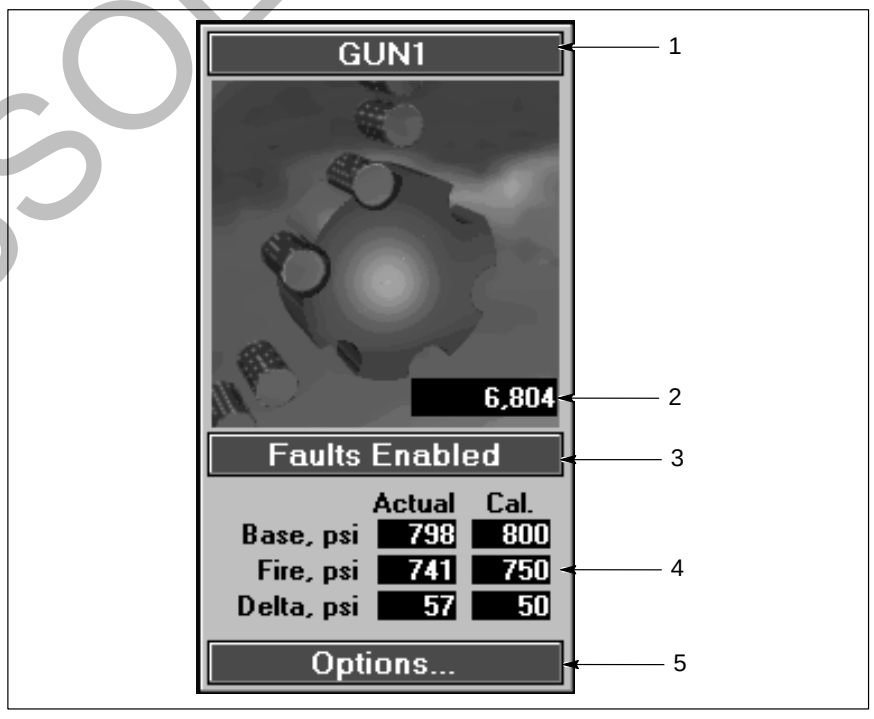
The Echelon SLTALink Manager and CanWorks Operator Interface Tracking PLUS installation programs install shortcuts in Windows Startup so that both programs are started when Windows starts. The SLTALink Manager MUST be running in order to run the OI.

NOTE: If you remove the startup icons from Windows Startup, make sure you start the SLTALink Manager before starting the OI. If you shut down the SLTALink Manager while the OI is running, you will lose communications with the network. To restore communications, you must shut down the OI, then restart the SLTALink Manager, then the OI.

Faceplates

When the OI is started, it polls the network and creates a faceplate for each SM-1 module on the network. Each faceplate displays the operating status and operating pressures for the spray gun connected to the SM-1 module.

The faceplates can be organized into groups. By clicking on a group tab, you can view all the faceplates in a group. If you click on the **All Modules** tab, you can view the faceplates for all SM-1 modules in the system at once.



1. Label bar
2. Counter
3. Fault status bar
4. Data window
5. Options button

Label Bar

The faceplate label is assigned during module configuration. Although two or more modules can have the same label, each module should be given a unique label to avoid confusion.

Counter

The counter increments each time the timer sends a Gun On signal to the SM-1 module. The counter can be reset from the **Counter History** window.

The current count does not display in the **Counter History** window until the counter is reset.

NOTE: The counter resets automatically if power to the SM-1 module is turned off.

Fault Status Bar

During normal operation, the fault status bar is green and fault status is displayed as **Enabled** or **Disabled**. If the SM-1 module is turned off, the fault status changes to **Offline**.

If a warning fault occurs, the bar changes to yellow and the fault text changes to **Warning**. If an alarm fault occurs, the bar changes to red and the fault text changes to **Alarm**. Clicking on the fault status bar opens the **Fault History** window.

Data Window

The data window shows actual and calibrated base, fire, and delta pressures, in psi. Delta pressure is the pressure drop when the spray gun fires.

NOTE: The OI polls the SM-1 modules for base and fire pressures at intervals several seconds in length, depending on the number of modules on the network. Therefore, the actual base and fire pressures are average pressures for the last sample period.

Options Button

Clicking on the **Options** button opens a drop-down menu. From this menu you can

- open the SM-1 module's **Setup** window,
- open the SM-1 module's **Fault History** window,
- perform a **Calibration** or **Counter Reset**,
- use **Copy Configuration** to copy the SM-1 module's configuration settings to another SM-1 module,
- open the SM-1 module's **Calibration History**, **Counter History**, and **Graphing** windows.

Right-clicking anywhere on the faceplate (except the **Fault Bar)** will also open the drop-down menu.

Faceplate Positions

You can position faceplates anywhere within a group window either by dragging and dropping or by tiling.

Drag and Drop

To drag and drop a faceplate, left-click on the faceplate label bar. Hold down the mouse button and drag the faceplate. Drop the faceplate in the desired position by releasing the mouse button.

Tiling

To tile faceplates, click on **Tools**>**Tile Modules**. The faceplates will be arranged automatically starting in the upper left corner of the group window.

Calibration History

Security Level Required: No Operator

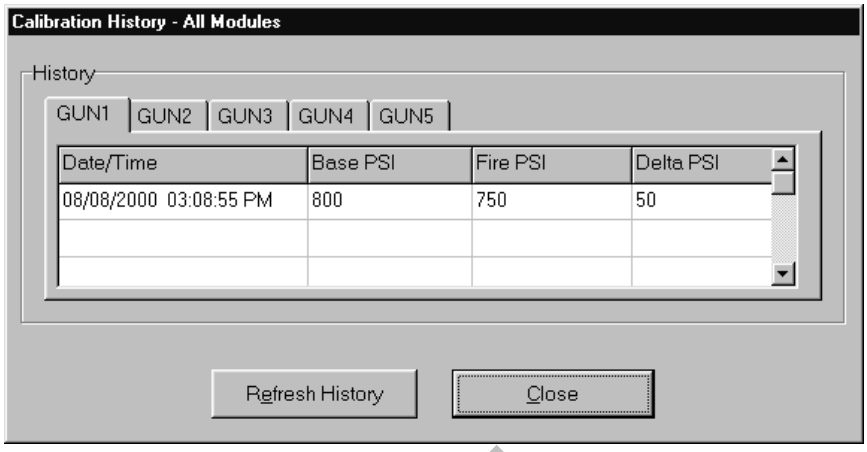
The **Calibration History** window allows you to view the

- date and time of each SM-1 module calibration
- base, fire, and delta pressure for each calibration

Do one of the following to open the window:

- Click on the **Calibration History** button on the **Group Functions** button bar.
- Click on **Options**>**Calibration History** from a module faceplate.

Calibration History *(contd)*



With the window open, click on an SM-1 module's tab to view its calibration history.

If you run a calibration while the window is open, it will not appear on the history list. Click on the **Refresh History** button to cause the new calibration to appear.

Counter History

Security Level Required: No Operator

NOTE: The **Counter Status** must be set to **On** to count cans.

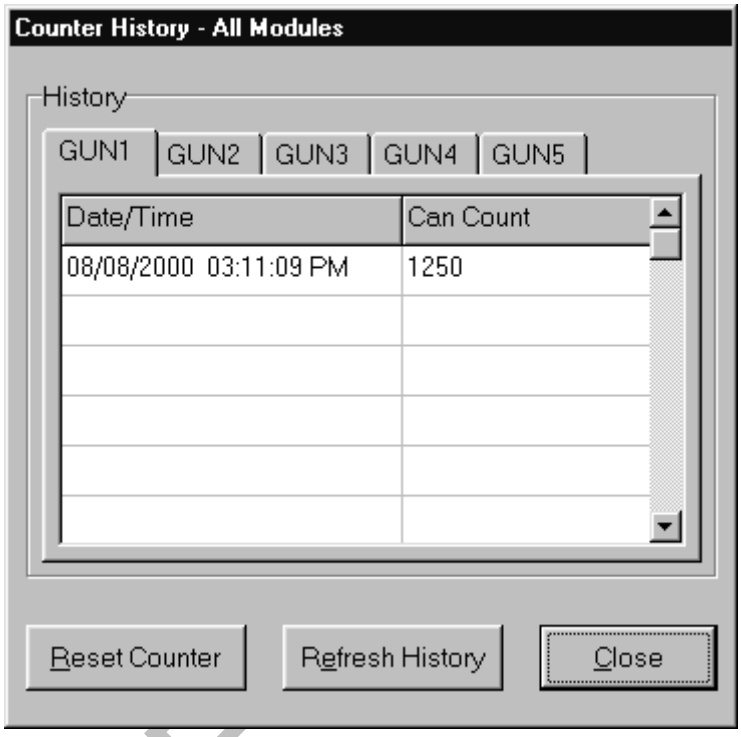
The **Counter History** window allows you to view the

- date and time of each count
- the count total

Do one of the following to open the window:

- Click on the **Counter History** button on the **Group Functions** button bar.
- Click on **Options**>**Counter History** from an SM-1 module faceplate.

334 696A
Issued 8/00



With the window open, click on an SM-1 module's tab to view its counter history.

NOTE: A count total will not appear until the counter has been reset to zero.

Counter Reset

Security Level Required: Operator

To reset the counter, click on the **Reset Counter** button.

NOTE: The counter will automatically reset if the SM-1 module is powered off.

Graphs

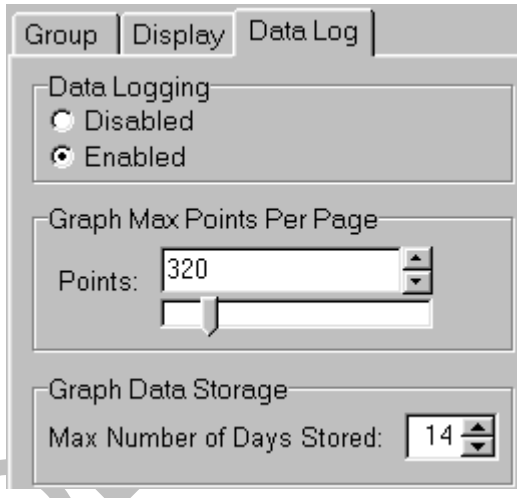
Graphs show system performance and events. They can be scaled and printed as desired.

Graph Setup

Security Level Required: Supervisor

To set up graphing:

1. Click on **Tools**>**Options**. Click on the **Data Log** tab.



2. Make sure Data Logging is **Enabled**.

3. Set the maximum number of points per page (**Graph Max Points Per Page**) by clicking on the ▲ or ▼ arrows in the **Points** field or moving the slider bar under the field. Use the slider bar to change the value in large increments; use the arrows to change the value in small increments.

NOTE: The data logging rate affects the time scale for a graph page. For example, if you have points set at 120 and the interval set at 30 seconds, each page will display 60 minutes of data (120 points x 30 seconds = 3600 seconds ÷ 60 seconds per minute = 60 minutes).

4. Set the maximum number days to store graph data (**Graph Data Storage**) by clicking on the ▲ or ▼ arrows in the **Max Number of Days Stored** field.

Viewing and Printing Graphs

Security Level Required: No Operator

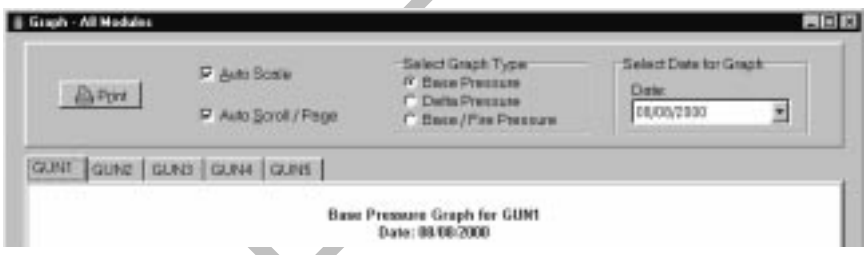
NOTE: Data logging must be enabled for the OI to create graphs.

To view graphs, do one of the following:

- Click on the **Graphs** button on the **Group Functions** button bar.
- Click on **Options**>**Graphs** from an SM-1 module faceplate.

Select **Base Pressure**, **Delta Pressure**, or **Base/Fire Pressure**.

NOTE: You can view graphs for any SM-1 module by clicking on the module's tab at the top of the graph window.



Graph Types

Three types of graphs are available:

Base Pressure — Base pressure over time, with high and low pressure alarm bands, and high and low pressure alarm faults.

Delta Pressure — Pressure drop from base over time, with high and low warning and alarm bands, and high and low flow warning and alarm faults.

Base/Fire Pressure — Base and fire pressure over time.

To display the desired graph type, click on one of the radio buttons under **Select Graph Type**.

The legend under the graph shows the color codes used for pressures and events (warnings, alarms, and calibrations).

Auto Scale

The **Auto Scale** feature scales the vertical axis of the graph (pressure) for better readability. To turn auto scaling off, click on the **Auto Scale** check box to clear the checkmark.

Auto Scroll/Page

The **Auto Scroll/Page** feature automatically scrolls the displayed page as new data is graphed. To stop auto scrolling, click on the **Auto Scroll/Page** check box to clear the checkmark.

Dates and Pages

When you open the **Graph** window, it displays the last page of a graph of the current day's data. To display other pages or graphs for other days, do one of the following:

- To display other pages of the graph for the same day, click on the **First**, **Prev**, **Next**, or **Last** buttons at the bottom of the graph. If one or more of these buttons are grayed out, no additional pages are available.

- To display graphs for a specific day, click on the  arrow in the **Date** field under **Select Date for Graph**. Scroll through the list until you find the date you want and click on it.

- To scroll through the graphs for previous or later dates, click on the or buttons at the bottom of the graph. If one or both of these buttons are grayed out, no graph is available for previous or later dates.

NOTE: Graph data is only stored for a user-configurable number of days. Refer to *Graph Setup*.

Printing

To print a graph, click on the **Print** button. The PC must be connected to a printer, and the printer must be set up in Windows.

12. Troubleshooting

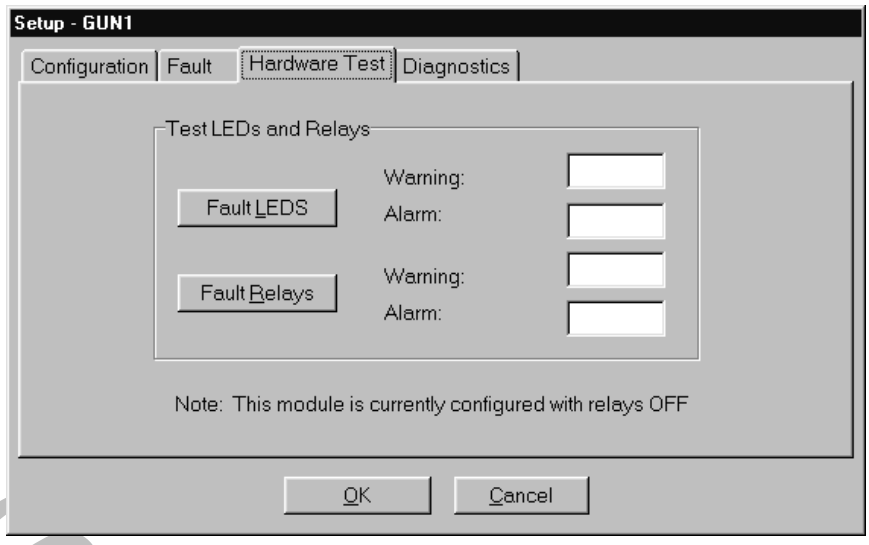
This section covers both the SM-1 module hardware tests and diagnostics as well as spray system troubleshooting using the fault messages.

Hardware Tests

Security Level Required: No Operator

The hardware tests check the functioning of the SM-1 module warning and alarm LEDs and relays. To run a hardware test:

1. Click on **Options**>**Setup** on the module faceplate. Click on the **Hardware Test** tab.



2. Click on the **Fault LEDS** button. Each click of this button toggles a LED. Click until both **LED** fields display ON. Make sure the LEDs on the SM-1 module are lit (depending on the Failsafe status setting).

3. Click on the **Fault Relays** button. Each click of this button toggles a relay. Click until both **Relay** fields display ON. Make sure the relays are opening or closing (depending on the **Failsafe Status** setting) properly.

NOTE: The **LED** fields must display ON before you can turn on the relays.

Timer Diagnostics

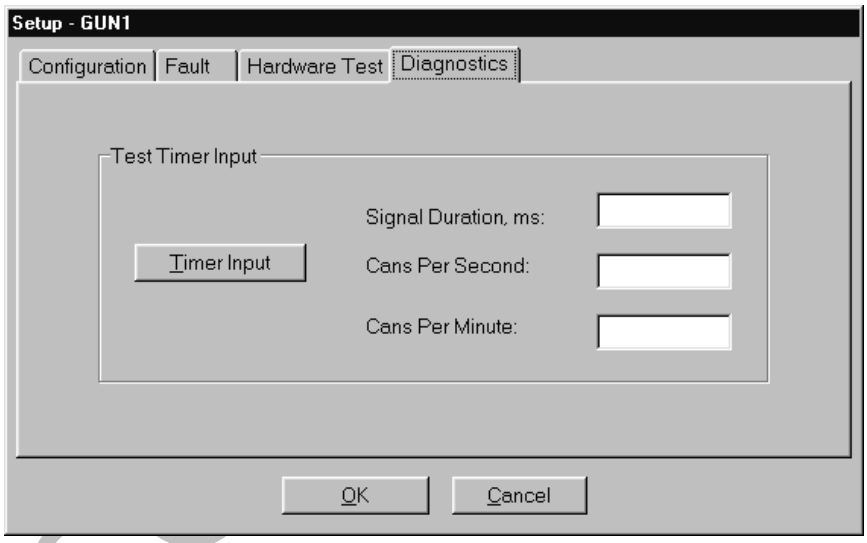
Security Level Required: No Operator

The **Diagnostics** window checks the timer signal to the SM-1 module and returns values for:

- Signal duration in milliseconds
- Cans per second
- Cans per minute

To view these values:

1. Click on **Options**>**Setup** on the module faceplate. Click on the **Diagnostics** tab.



2. Click on the **Timer Input** button. The values will appear in the fields after a brief pause.

Faults

If a fault occurs, a **Fault Indicator Popup** (if enabled) appears in the center of the screen. The faceplate bars of the affected SM-1 module(s) change from green to yellow (warnings) or to red (alarms). The faceplate fault bar text changes to **Warning** or **Alarm**. On the SM-1 module affected, the yellow warning LED or the red alarm LED lights. If the warning or alarm fault relay is enabled, it is activated.

NOTE: Fault Status must be set to **On** for a fault to generate a warning or alarm.

Fault History

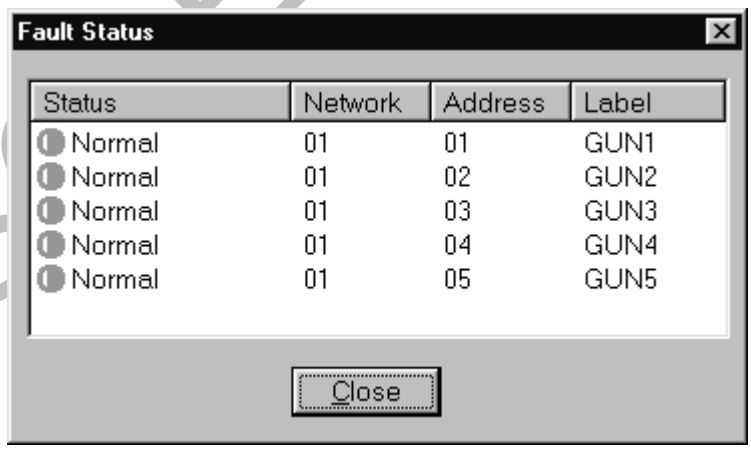
The Fault History window allows you to

- view the current fault status; the fault message; the date and time it occurred; the base, fire, and delta pressures at the time of the fault; and Fault Help for the current fault.
- reset the current fault for a module, all current faults for a module, or all current faults for all modules.

Fault Status

Security Level Required: No Operator

Clicking on the **Fault Status** button on the taskbar opens a window (see below) that you can use to monitor the status on all SM-1 modules, no matter what group the main window is displaying. If a fault should occur, the green bullets will change color: yellow for warnings, red for alarms.



Viewing and Resetting Faults

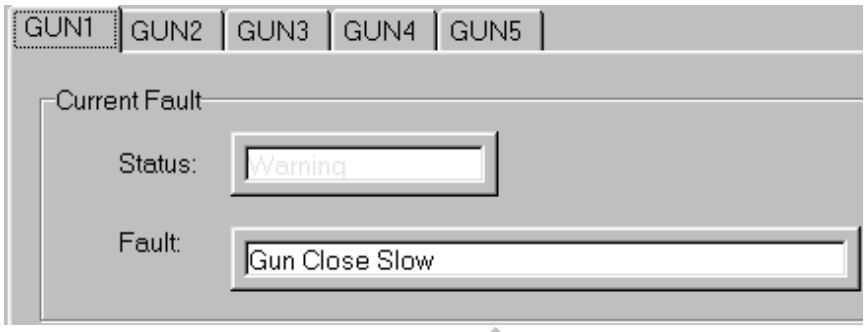
Security Level Required: No Operator

Use one of the following methods to open the **Fault History** window:

- Click on the **Faults** button on the **Group Functions** button bar, then click on the module's tab.
- Click on the fault bar on the module's faceplate.
- Click on **Options**>**Faults** on the module's faceplate.

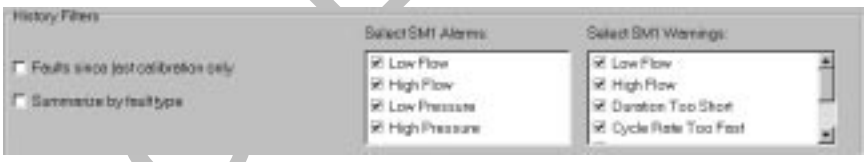
Viewing Faults

- To view the **Current Fault** and **History** for a module, click on the module's tab at the top of the window. If more than one fault is current (not reset), the first fault that occurred is shown.



- To view a new fault if one occurs while the **Fault History** window is open, click on the **Refresh Faults** button.

- To view only the faults that have occurred since the last calibration, click on the **Faults since last calibration only** checkbox, then click on the **Refresh Faults** button.



- To list the faults by fault type, click on the **Summarize by fault type** checkbox, then click on the **Refresh Faults** button.

- To limit the types of faults shown in the **History** list, uncheck the faults you do not want listed by clicking on the check boxes in the **Select SM1 Alarms** and **Select SM1 Warnings** lists, then click on the **Refresh History** button.

Resetting Faults

NOTE: Correct the condition that caused the fault before resetting the fault. If you do not, the fault will re-occur.

- To reset the **Current Fault**, click on the **Reset Fault** button.

- To reset all current faults for a module if more than one fault is current, click on the **Reset All Faults This Module** button.

- To reset all current faults for all modules, click on the **Reset All Faults All Modules** button.

Fault Help

To view a list of possible causes of the current fault, open the **Fault History** window and click on the **Fault Help** button. This will open the help topic specific to the current fault. Possible causes for the fault are provided, along with ways to correct the fault.

Problem	Possible Cause	Corrective Action
Low Flow Alarm Pressure did not drop below low flow alarm band setting when spray gun fired.	Spray gun nozzle clogged	Remove and clean nozzle. Replace if necessary. Recalibrate module after replacing nozzle.
	Spray gun valve did not open, or opened only partially	Make sure gun is getting trigger signal and coil is functioning properly. Disassemble and clean gun. Replace worn parts.
	CO-plate orifice or O-ring worn or installed incorrectly, allowing too high a fluid flow	Remove CO-plate and check O-ring. Replace O-ring if damaged. Replace CO-plate if worn.
Low Flow Warning Pressure did not drop below low flow warning band setting when spray gun fired.	Spray gun nozzle clogged	Remove and clean nozzle. Replace if necessary. Recalibrate module after replacing nozzle.
	Regulated system pressure too low	Reset pressure to calibrated pressure.
	Spray gun valve did not open, or opened only partially	Make sure gun is getting signal and coil is functioning properly. Disassemble and clean gun. Replace worn parts.
	Clogged fluid return system	Clean or replace fixed orifice. Clean and flush devices and fluid lines in return system.
	CO-plate orifice or O-ring worn or installed incorrectly, allowing too much fluid to flow to nozzle	Remove CO-plate and check O-ring. Replace O-ring if damaged. Replace CO-plate if worn.
High Flow Alarm Pressure dropped below high flow alarm band setting when spray gun fired.	Spray gun nozzle worn, loose, or wrong size	Remove and clean nozzle. If worn, replace. Re-install correctly. Recalibrate module after replacing nozzle.
	CO-plate clogged	Remove CO-plate and clean. Replace if necessary.
	Blocked fluid supply to spray gun	Clean or replace fluid filter screens, flush heater and fluid lines.
	Pump output too low	Increase pump output. Check fluid supply to pump.
	Spray gun defective	Disassemble and clean spray gun. Replace parts as necessary.

Problem	Possible Cause	Corrective Action
High Flow Warning Pressure dropped below high flow warning band setting when spray gun fired.	Spray gun nozzle worn, loose, or wrong size	Remove and clean nozzle. If worn, replace. Re-install correctly. Recalibrate module after replacing nozzle.
	CO-plate clogged or wrong size	Remove CO-plate and clean. Replace if necessary.
	Regulated system pressure too high	Reset pressure to calibrated pressure.
	Air in fluid system	Purge air from fluid system.
	Defective spray gun	Disassemble and clean spray gun. Replace parts as necessary.
Low Pressure Alarm Static base pressure has fallen 50 psi or more below base pressure established during calibration. (Your SM-1 modules may be programmed for a different low pressure alarm setting.)	Regulated system fluid pressure too low	Reset pressure to calibrated pressure, or recalibrate module at new pressure. Make sure product quality is acceptable at new pressure.
	Blockage in supply upstream from spray gun	Clean or replace fluid filter screens, clean heater, flush fluid lines.
	Air in fluid system	Purge air from system.
	Fixed orifice in fluid system worn or wrong size	Replace fixed orifice or install correctly sized orifice.
	Leak in fluid system	Fix leak.
	Pump output too low	Increase pump output. Check fluid supply to pump.
High Pressure Alarm Static base pressure has risen 50 psi or more above base pressure established during calibration. (Your SM-1 modules may be programmed for a different high pressure alarm setting.)	Regulated system fluid pressure too high	Reset pressure to calibrated pressure, or recalibrate module at new pressure. Make sure product quality is acceptable at new pressure.
	Clogged fluid return system	Clean or replace fixed orifice. Clean and flush downstream devices and fluid lines.
	Leak in fluid system	Fix leak.
	Pump output too high	Decrease pump output.
Duration Too Short Warning Timer turns off before spray gun completes a minimum spray cycle.	Short or open in electrical connections	Check wiring between timer, spray gun, and SM-1 module.
	Timer settings incorrect	Increase spray time above minimum.
	Spray gun opening too slow	Make sure correct spray gun driver/timer is used. Disassemble and clean spray gun. Replace worn parts.

Problem	Possible Cause	Corrective Action
Cycle Rate Too Fast Warning Timer turns on before spray gun can complete a minimum delay cycle. Spray gun off time is less than the minimum requirement of 15 milliseconds.	Spray duration too long	Reduce spray duration, by using nozzle with higher flow rate or increasing base pressure. Recalibrate after changing nozzle or base pressure.
	Short or open in electrical connections	Check wiring between timer, spray gun, and SM-1 module.
Gun Open Slow Warning Fire pressure does not fall below a preset percentage of the calibrated pressure drop in the time period set in Gun On Time fault setting.	Spray gun nozzle clogged	Remove and clean nozzle. Replace if necessary. Recalibrate module after replacing nozzle.
	CO-plate missing or worn, or O-ring leaking	Check CO-plate and gasket. Install CO-plate or replace worn CO-plate. Replace gasket if necessary.
	Defective spray gun	Disassemble and clean spray gun. Replace parts as necessary.
	Timer/driver defective or incorrect	Check timer/driver output. Make sure voltage and amperage are adequate to operate spray gun.
Gun Close Slow Warning Base pressure does not rise above a preset percentage of calibrated base pressure in the time period set in Gun Off Time fault setting.	Defective spray gun or solenoid valve	Disassemble and clean spray gun. Replace parts as necessary. If using an air-operated spray gun, make sure the solenoid valve exhaust port is clear.
	Timer/driver defective	Check timer/driver output. Make sure voltage and amperage are adequate to operate spray gun.
Electrical/Mechanical Noise Warning Electrical or mechanical noise in the spray system is affecting the SM-1 spray monitor.	Pressure transducer malfunction	Check pressure transducer wiring. Make sure twisted pair wiring is connected properly. Check for correct voltage on excitation circuit. Refer to *Troubleshooting* in the SM-1 manual. Replace pressure transducer if necessary.
	Electrical connections shorted, loose, or incorrect; interference from other power sources or wires	Check all CanWorks system electrical connections. Check and relocate possible sources of interference.
	Fluid supply system	Make sure vibrations in the fluid supply system are dampened. Minimize pressure fluctuations.

Error Codes

Error codes are written to the exported data files.

Error Code	Error Level	Error Text
0	None	None
1	Warning	Elec/Mech Noise
2	Warning	Gun Close Slow
3	Warning	Gun Open Slow
4	Warning	Duration Too Short
5	Warning	Cycle Rate Too Fast
6	Warning	High Flow
7	Warning	Low Flow
8	Alarm	High Pressure
9	Alarm	Low Pressure
10	Alarm	High Flow
11	Alarm	Low Flow
12	Alarm	Internal Error 01
13	Alarm	Internal Error 02
14	Alarm	Internal Communication Error
15 and above	Unknown	Unknown

13. Specifications

This section lists the CanWorks system and PC requirements for the OI.

CanWorks System Requirements

The following table lists the CanWorks Operator Interface Tracking PLUS system requirements.

Minimum CanWorks System Hardware	1 CanWorks Display Module (UI-1) 1 CanWorks Spray Monitor I (SM-1) 1 network adapter (SLTA-10 serial adapter) CanWorks Operator Interface Tracking PLUS software **NOTE:** The CanWorks OI does not support CanWorks Spray Monitor II (SM-2) modules.
Maximum CanWorks System Hardware	6 CanWorks Display Modules (UI-1) 24 CanWorks Spray Monitor I (SM-1) modules 1 network adapter (SLTA-10 serial adapter) CanWorks Operator Interface Tracking PLUS software **NOTE:** The CanWorks OI supports only one 78Kbps network interface device. Therefore, all SM-1 modules monitored and controlled by the OI must be on the same network.
CanWorks Network Connections	Power and network wiring must be installed correctly. Network wiring must be connected in a daisy chain configuration and terminated on each end. The best practice is to terminate the network at the UI-1 module and at the last SM-1 module, connecting the OI network adapter in the middle. Refer to your UI-1 and SM-1 manuals for wiring and termination instructions, and to the network card or adapter manual for connection instructions. **NOTE:** If you connect the network adapter to either end of the CanWorks network, you must terminate the adapter by installing a 121 ohm, 1%, 1/8 watt metal film resistor across the network wiring terminals.
Required SM-1 Module Version	All SM-1modules on the network must be at version NV05.06 or higher and PV05.00 or higher. Use the Test screen on the UI-1 display module to check the version numbers before installing the software.
Data Logging Requirements	Date and time must be set correctly on the UI-1 display module. Refer to the *CanWorks Display Module* manual for instructions.

Minimum PC Requirements

The following table lists the PC hardware and operating system requirements.

Operating System	Windows 98, Windows NT 4 (Service Pack 4), Windows 2000
Processor	Windows 98 and NT 4: Pentium 233MMX with 512 KB cache Windows 2000: Pentium II 450MMX with 512 KB cache
RAM	Windows 98: 32 MB Windows NT4.0 and 2000: 64 MB
Video	SVGA, with 2 MB memory
Hard Drive	2 GB
Removable Media	CD-ROM drive
Monitor	15-in. color, SVGA
Keyboard	101 key AT
Mouse	Two-button serial or bus
Network Interface Device	Echelon SLTA-10 serial adapter and drivers. **NOTE:** Adapter drivers must be installed and configured properly installing and running the OI.
Display Settings	**Colors:** High Color (16 bit) **Resolution:** 1024 x 768 **Font Size:** Small Fonts **NOTE:** To set your display, double-click on the **Display** icon in the **Windows Control Panel** or right-click on the desktop and select **Properties**. Click on the **Settings** tab. Click on the **Advanced** button to set fonts.