Central Office Server Reference Guide

EUD-2021029-00
Rev. 2
20 February 2026

Because products evolve and system configurations change, this manual may not be an exact representation of the products and systems that you are using.

STC assumes no responsibility for errors or omissions in this document. Nor does STC make any commitment to update the information contained herein.

Product and company names mentioned herein are trademarks or registered trademarks of their respective owners.

STC's web site is www.southern-tech.com

their email address is stcemail@southern-tech.com

their fax number is 423-499-0045

their phone number is 423-892-3029

Contents

This section lists the headings of this guide in sequential order with their page references.

1.0 — Introduction

This section summarizes the purpose of this guide, describes the Central Office Server, tells how to comment on this guide, and tells how to order more copies of this guide.

1.1 Purpose of This Guide

The technical staff at Southern Technologies Corporation (STC) created the Central Office Server. This guide describes that system.

This guide is for those who purchase, install, maintain, manage, or use the Central Office Server.

1.2 System Overview

The STC Central Office Server system provides for monitoring the status of Southern Technology Corporation's (STC) defect detectors. The server software communicates with the remote defect detector devices to collect and display near real-time status of the detectors and the trains processed by them. The server also collects detailed train data from the remote detectors and provides for viewing that data. The Central Office Server system currently supports communications with STC's SmartScanNG² Hotbox Detector and the iCube Dragging Equipment Detector.

The main display window of the server application provides near real-time information for each remote device being monitored. This display provides an overview of detector status, insight into alarms detected by the detectors, and summary information for the most recent train processed by the devices.

The STC Central Office Server communicates with the remote detectors over an Ethernet network. Where the server and the remote detectors are on the same network subnet, the Remote Device Discovery function of the software can be used to identify and import the required information from the detectors. Otherwise, the IP addresses, etc., of the remote devices can be entered manually.

The STC Central Office Server periodically polls each remote detector for the device's current status. The response from the remote detectors to server polls includes:

- current ambient temperature
- current battery voltage
- an indication of whether a train is currently being processed
- summary information regarding the most recent train

The remote detectors transmit unsolicited messages to the Central Office Server when certain events occur. These include:

- a train arrives at the site
- a train departs the site
- an alarm is detected on a train (real-time alarm)

The STC Central Office Server system is provided as a complete package consisting of the desktop minicomputer hardware and the Central Office Server software. The desktop minicomputer runs the Ubuntu distribution of the Linux operating system.

1.3 How to Comment on This Guide

We want to hear from you. Tell us what you like or don't like about this guide. Send your comments to:

Southern Technologies Corporation
Technical Publications Department
6145 Preservation Drive
Chattanooga, Tennessee 37416-3638
USA

All comments become the sole property of STC, and none will be returned.

1.4 How to Order More Copies of This Guide

When placing an order for more copies of this guide, refer to the order number shown on the cover of this guide. To request pricing and delivery, call 423-892-3029, fax 423-499-0045, or send an email to stcemail@southern-tech.com. Electronic copies of this guide are also available.

2.0 — Installation

Upon receipt of the Central Office Server system, some hardware assembly will be required. In addition, some preliminary software configuration will be required to establish communications on the user's Ethernet network.

Central Office Server System

2.1 Hardware Setup

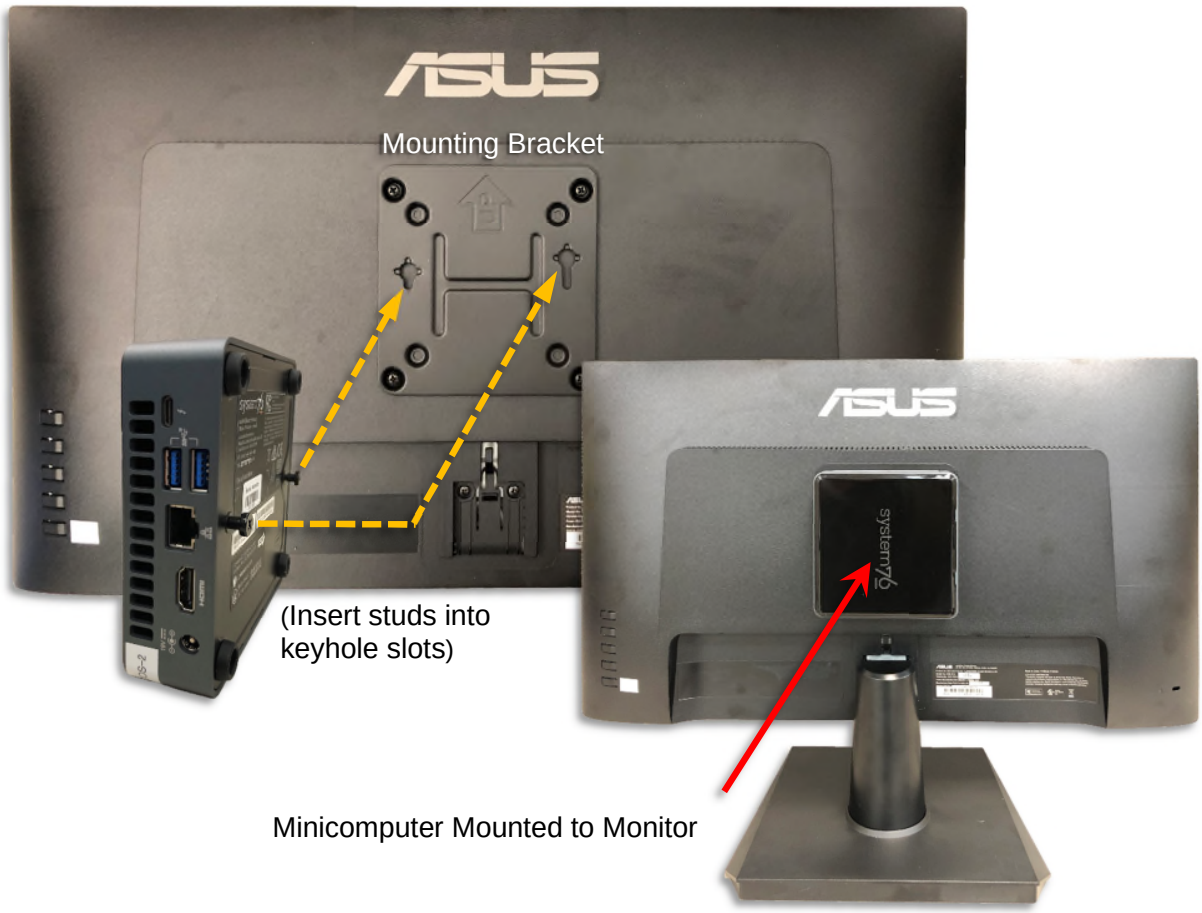
The Central Office Server system consists of the following components:

- minicomputer (mounted on the back of the monitor and not visible in the above picture)
- monitor
- keyboard
- mouse
- speakers
- Ethernet, HDMI, and all necessary power cables

The following procedure provides detailed information for system setup.

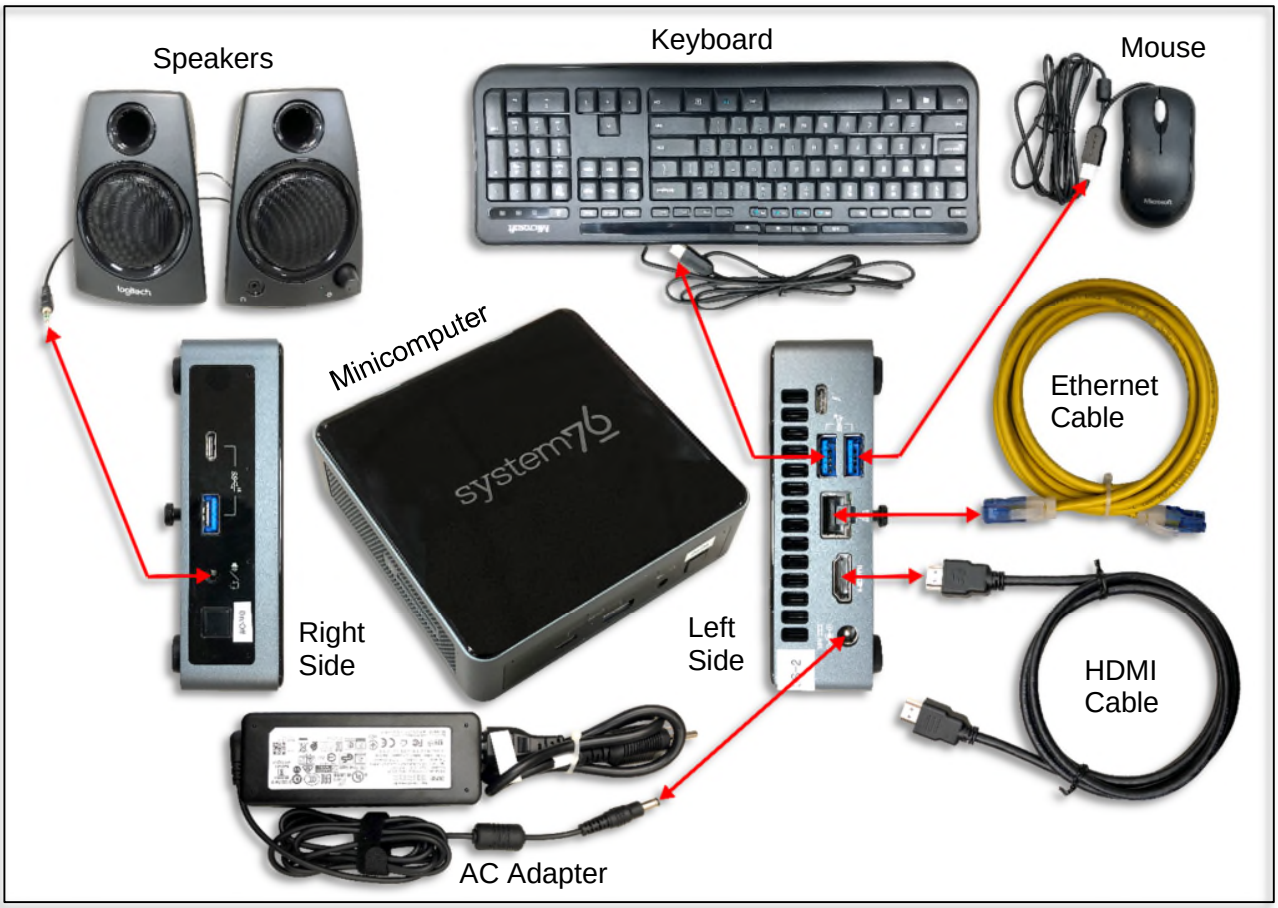
1 Unbox all received components in the designated workspace.

2 (Optional) Mount the minicomputer to the back of the monitor. Studs on the back of the minicomputer insert into keyhole slots on the monitor's mounting bracket. Twist slightly and slide down to snug into place. The minicomputer's SD card slot should be oriented upwards when mounted.



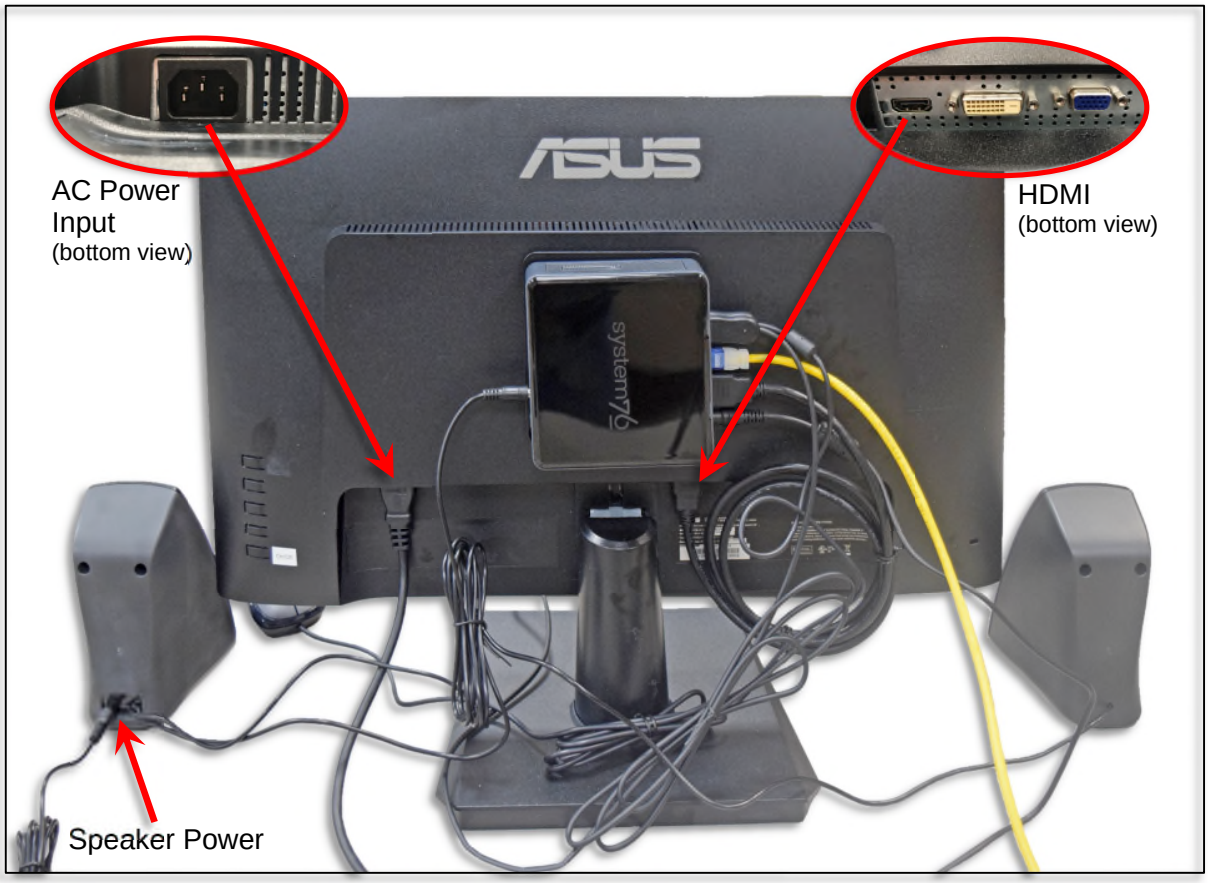
3 As depicted below, complete the cable connections to the minicomputer:

- Connect the keyboard to the USB port.
- Connect the mouse to the USB port.
- Connect the AC adapter to the 19 VDC input and the opposite end to a 110 VAC or 220 VAC outlet.
- Connect one end of the HDMI cable to the HDMI output.
- Connect one end of the Ethernet cable to the minicomputer's Ethernet port and the other end to the user's network connection.
- Connect the speaker cable to the speaker/headphone jack. (Some minicomputers require the use of USB connected speakers.)



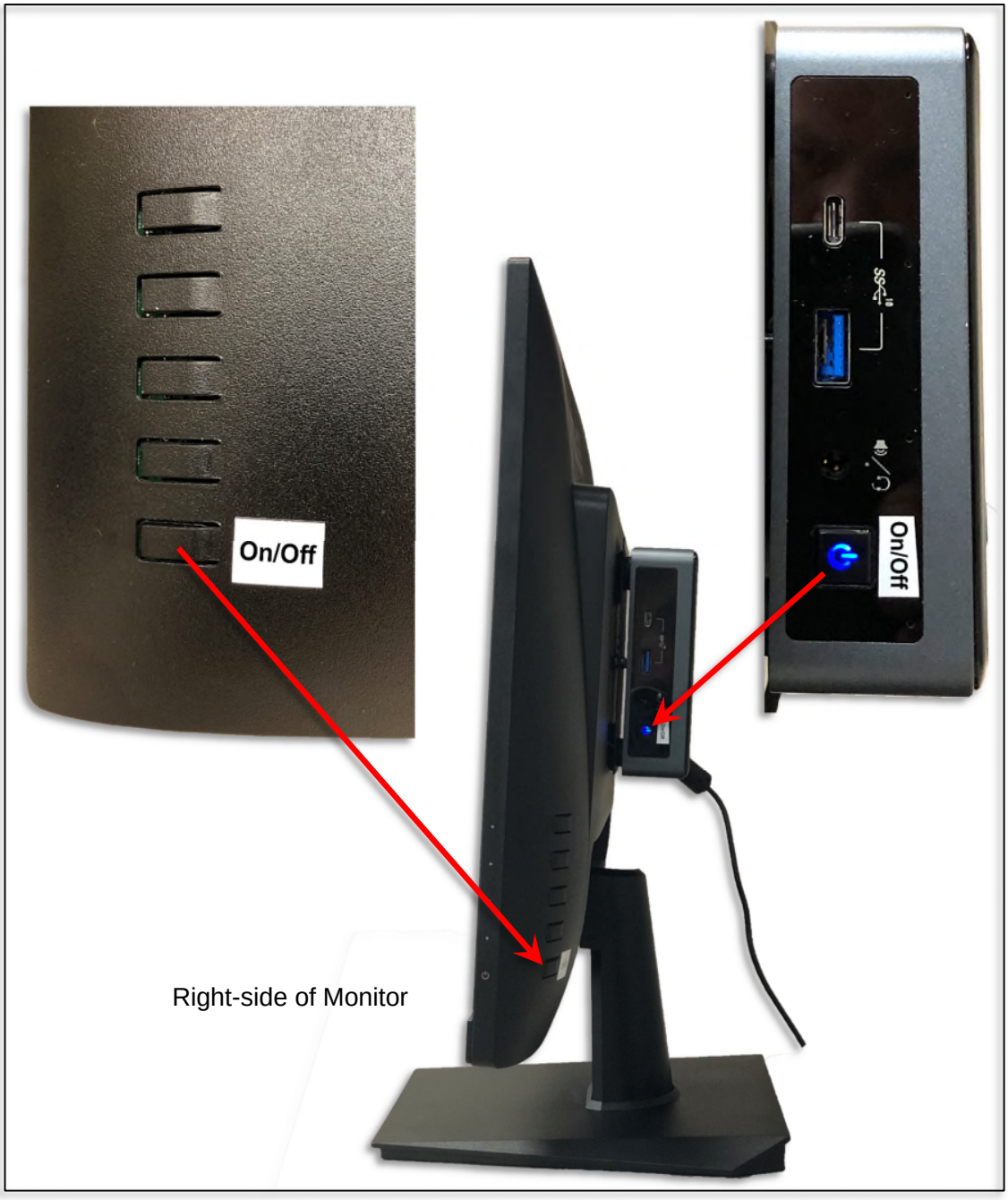
Central Office Server System Wiring

4 As depicted below, connect the monitor's AC power cord to the bottom of the monitor, then connect the plug end into a 110 VAC or 220 VAC outlet. Connect the HDMI cable from the minicomputer to the HDMI input on the bottom of the monitor. Connect the power cable from the speakers into a 110 VAC or 220 VAC outlet.



Central Office Server System Rear View

5 Apply power to the system (both monitor and minicomputer). Power switch locations are depicted below. The minicomputer's power switch illuminates blue when powered on.



Central Office Server System Power Switches

6 The hardware setup is now complete.

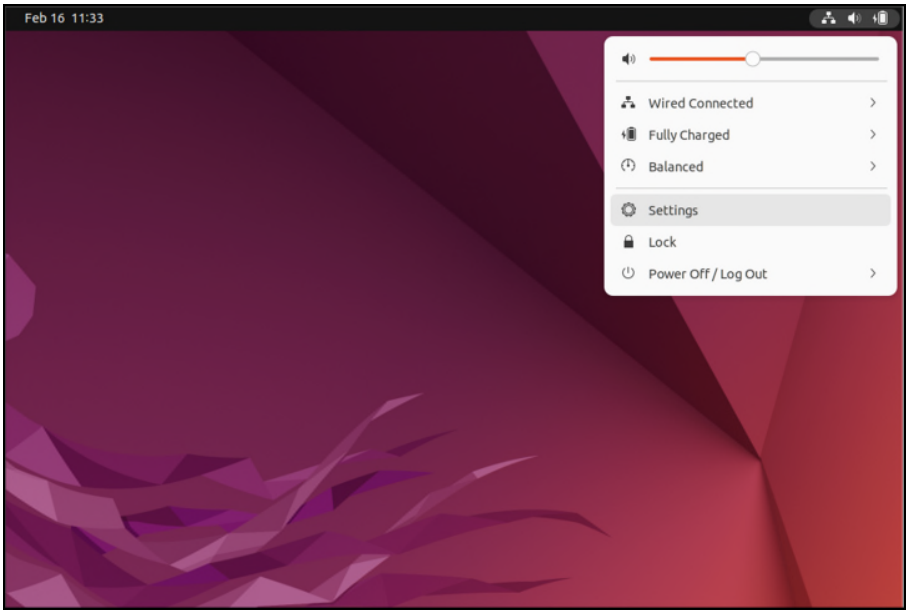
2.2 Network Configuration

Once the Central Office System server is up and running, the computer's network IP address and other network parameters will need to be configured so that they are compatible with the network to which the server is connected.

The Central Office Server computer must be assigned a static IP address. When the server application makes its initial connection with a remote detector, it sends the detector this address. The detector sends all subsequent unsolicited messages to the address supplied by the application.

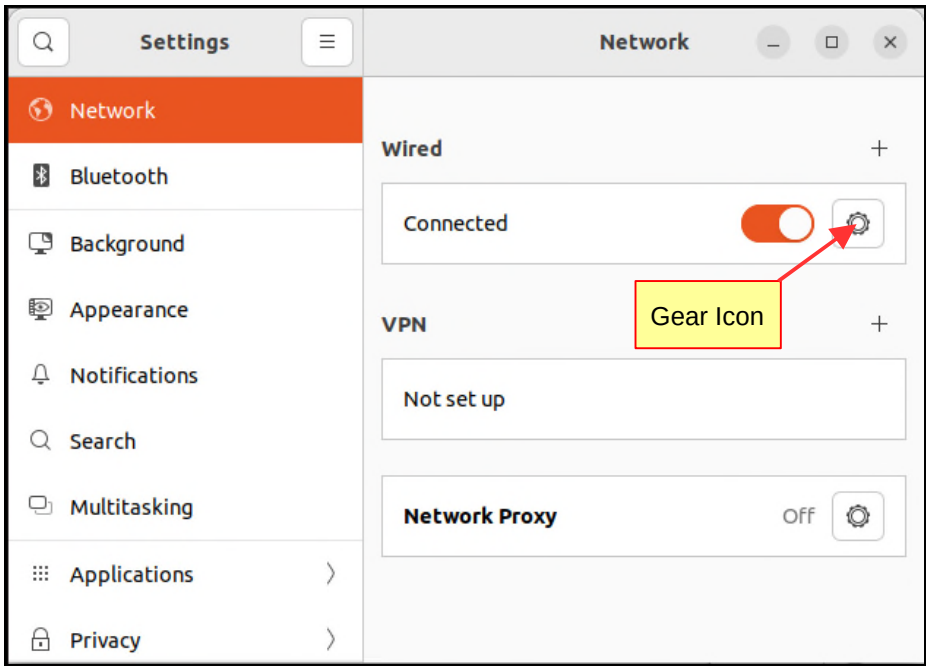
To assign a static IP address, follow these steps:

1. Open the System Settings application by clicking on the top-right system menu and selecting Settings**.**



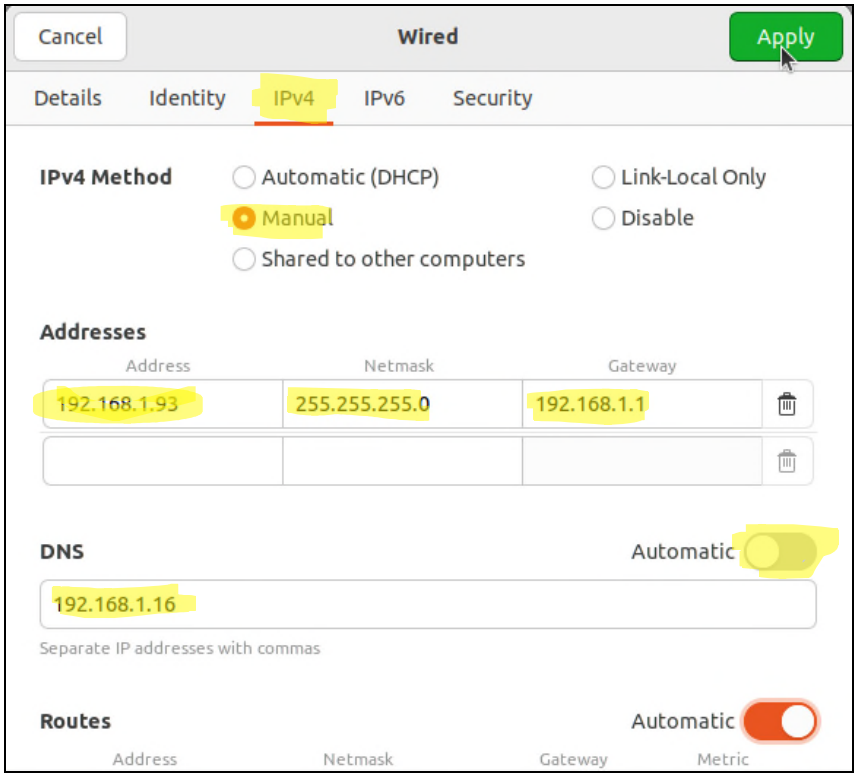
System Menu

2. In the Settings categories on the left, select the Network tab. Then select the Gear icon for the Wired network entry on the right.



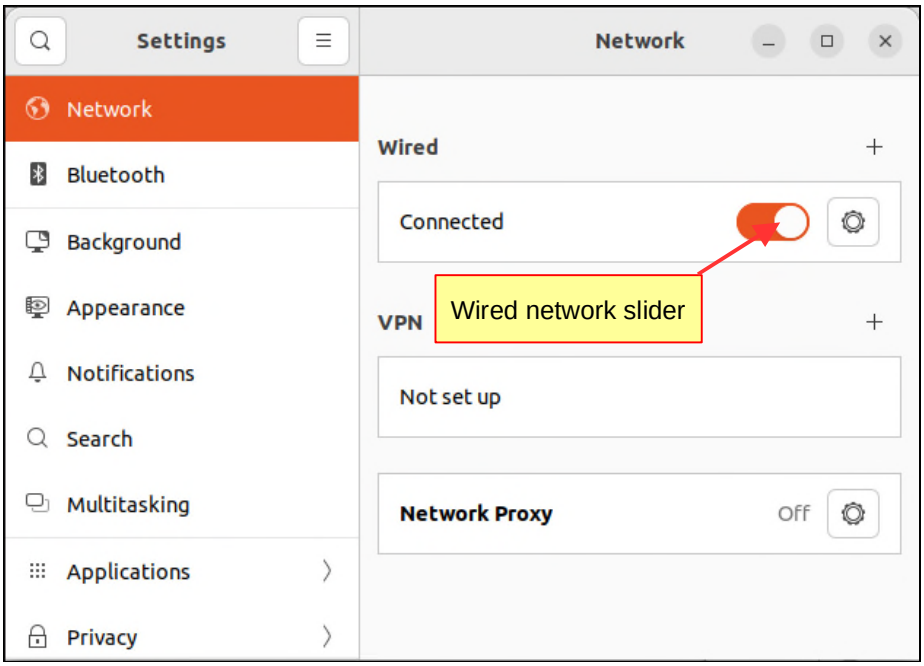
System Settings application – Network tab

3. In the Wired network dialog box:
    - Select the **IPv4** tab.
    - Change the **IPv4 Method** to **Manual**.
    - In the **Addresses** section, enter **Address**, **Netmask**, and **Gateway** numbers that are compatible with your network.
    - In the **DNS** section, turn off the **Automatic** slider and enter the address of a DNS server on your network.
    - Click the **Apply** button in the upper right-hand corner of the Wired network dialog box. You will return to the main screen of the System Settings application.



Wired network dialog – IPv4 tab

4. Activate the IP address changes by turning off and on the Wired network slider. Or activate the IP address changes by restarting the server PC.



System Settings application – Network tab

2.3 Admin Account

The Central Office Server computer and the server application itself each come with default administrative accounts and passwords. Once the system hardware and software have been initially configured, the passwords for these accounts should be changed from their default settings.

When the Central Office Server starts up, the operating system automatically logs into the user account stc and starts the Central Office Server application. By default, the server application runs within the context of the stc account. This is an operating system (Linux) level account.

Server Computer Admin User Account

Default Username: stc

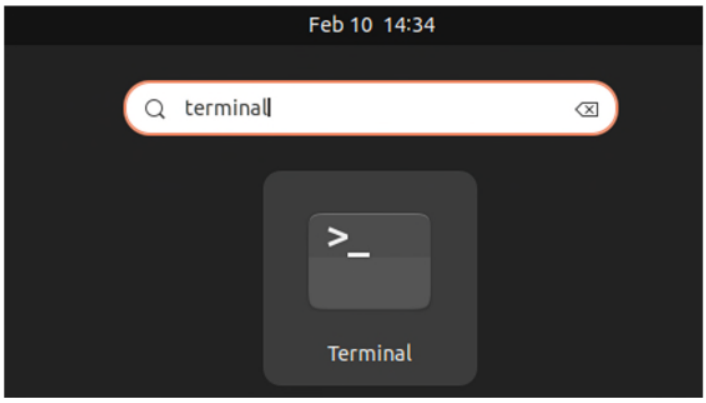
Default Password: trains123

With the stc login credentials, one can:

- modify the computer's configuration (e.g. network configuration parameters)
- login to the server computer from a remote PC (remote desktop access)

To modify the stc account's password, follow these steps:

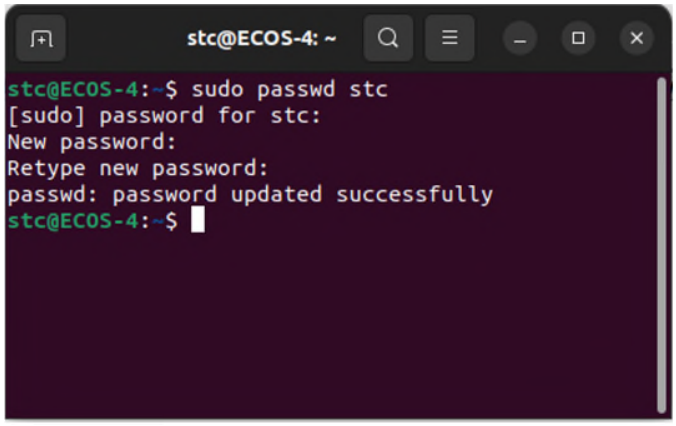
1. Open a terminal window by pressing the "Super" key (Windows key) and typing terminal at the resulting prompt.



2. At the command prompt, type: **`sudo passwd stc`**

   A prompt for entry of the current stc account password appears. The default password for the stc account is: **`trains123`**

3. When prompted, enter a new password and then retype that password for confirmation (you'll enter the same password twice). An example of this entire process appears below. Note that the passwords do not display as you type them.



Example – Changing the stc account password

Central Office Server Application Admin Account

Default Username: admin

Default Password: admin

To change the server application's administrative account/user, access the application's Add / Remove Users dialog and edit the **admin** user account. See section 4.2 for more information regarding the application's Add / Remove Users dialog.

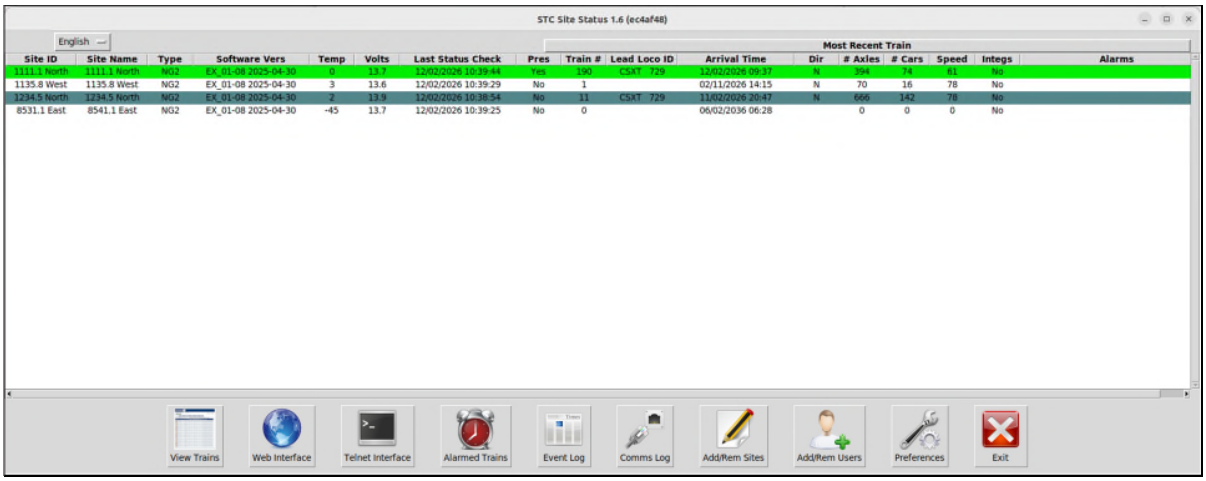
With the server application's admin account credentials, one can:

- modify the application configuration (System Preferences).
- add and remove application users.
- add and remove detector sites from the application.

3.0 — Main Display

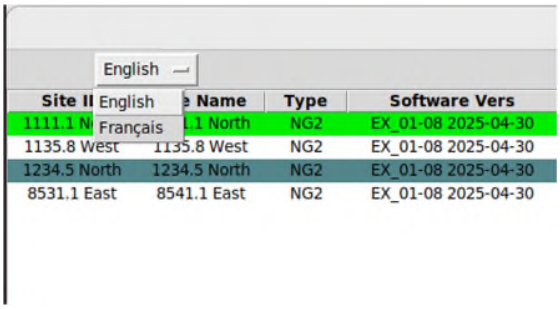
3.1 Main Display Window

The Central Office Server application's main display window shows a snapshot of the current status of all actively monitored detectors. Each table row corresponds to a monitored detector and lists site identification and status information alongside summary information regarding each detector's most recently recorded train. Buttons along the window's bottom edge provide for system configuration and direct connections with detectors.



Application Main Display Window

In the top-left corner of the main display window is the language selection drop-down menu.



The selected option on this menu determines in which language – English or French – items on the main display window are displayed. This selection affects the site status table column labels and the labels on the buttons at the bottom of the display.

Language Selection Drop-down Menu

Each row in the main display table contains information specific to one detector. The background colors indicate whether alarms were detected on the most recent train or whether a train is currently crossing the site. At any time, a row in the table can be selected by clicking it with the mouse pointer or by using the up arrow and down arrow keyboard keys. The background color of a row will be modified depending upon whether it is the currently selected row.

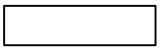
Precedence	Currently Selected Detector	Not Selected	Meaning
1			Indicates detector has not responded to the last three polls.
2			Indicates detection of a detector alarm on the most recent train.
3			Indicates detection of an Integrity Failure on the most recent train.
4			Indicates that a train is crossing the detector.
5			Default background color for the table rows – nothing to report

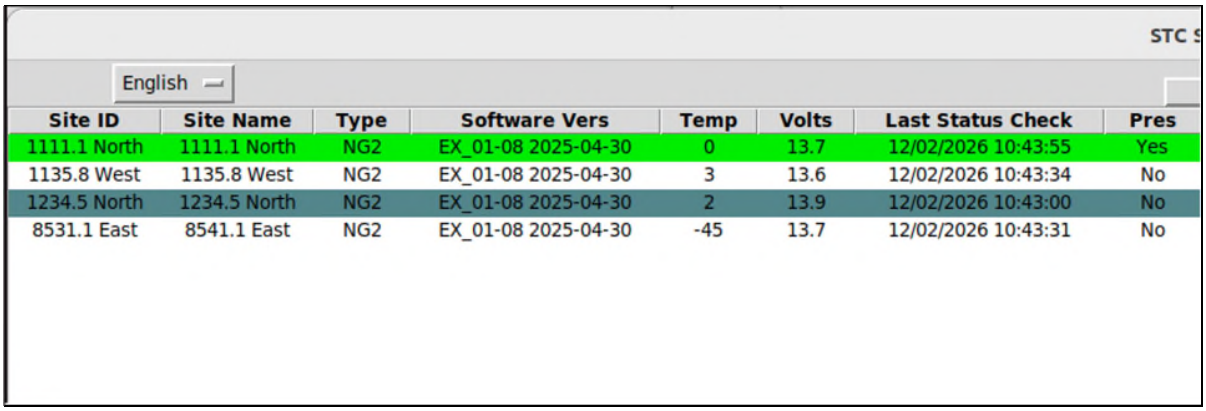
Table Row Background Colors

As shown in the table above, the detector state that has the highest precedence is the communications failure state. The lowest precedence is assigned to the default state. So, regardless of other factors, a table row will be orange for a site where communications have failed. The table row will be red if communications are okay, but the most recent train recorded had exception alarms. The table row will be yellow if the most recent train had integrity failures, but no exception alarms, and communications are okay. A table row will be green if a train is currently present.

3.2 Main Display Table Section

The main display window table is functionally broken into two sections. The left side of the window presents site status information, while the right side presents information pertaining to the site's most recent train.

3.2.1 Site Status Information Section



Main Display Window – Site Status Section (left side)

The table fields for this section of the main display are:

Site ID
This field is the primary identifier for a remote detector and contains the detector's milepost and track identifier settings. A detector's response to a server poll automatically populates this field.

Site Name
This field offers an alternative identifier for the detector – a nickname or a location reference. The user enters this data in the Add/Remove Sites dialog.

Type
This field specifies the detector type and will contain either "NG2" or "iCube." Poll responses automatically populate this field.

Software Vers
This field shows the software version running on the remote detector. Poll responses automatically populate this field.

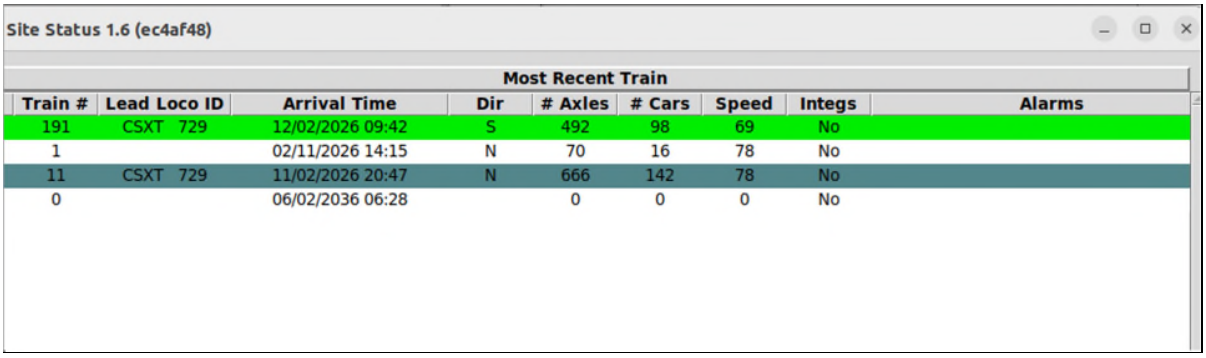
Temp
This field shows the current ambient temperature at the detector location.

Volts
This field shows the battery voltage at the detector.

Last Status Check
This field contains the date and time of the remote detector's last poll response. Note that the contents of the Temp, Volts, and Pres fields are only as current as the date and time shown here.

Pres
This field shows whether a train is present at the detector.

3.2.2 Most Recent Train Information Section



Main Display Window – Most Recent Train Information Section (right side)

The table fields for this section of the main display are:

Train #
The number assigned by the remote detector to the most recent train. This number is assigned in sequence, from 1 to 9999.

Lead Loco ID
If the detector includes an AEI tag reader and supplies AEI information, this field displays the vehicle identification (owner and car number) read on the train's first vehicle.

Arrival Time
The date and time at which the most recent train arrived at the detector site.

Dir
The direction in which the most recent train traveled.

 # Axles
The number of axles recorded on the most recent train.

 # Cars
The number of cars recorded on the most recent train.

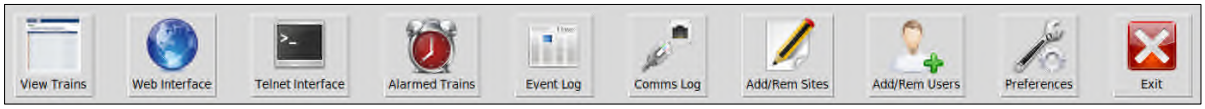
Speed
The exit speed of the most recent train.

Integs
This field shows whether there were any Integrity Failures recorded on the most recent train.

Alarms
This field lists any alarms (hot-bearing, dragging equipment, etc.) detected on the most recent train.

3.3 Buttons

Across the bottom of the server's main display window is a collection of buttons that provide access to the application's features and functions.



Main Display Window Buttons

View Trains
From each detector, the server application receives a data file for each train recorded. These train data files are stored in the server's file system. Clicking the "View Trains" button provides access to these files. When this button is clicked, the application presents a summary view of the available data is presented. Clicking on a row in the displayed train data produces a detailed train data report.

Web Interface
If the currently selected site is an NG^2, clicking the "Web Interface" button opens a web browser, initiates a connection with the selected detector, and displays the detector's web page. Note, if the selected detector is not currently reachable via the network, the web browser displays an error message after attempting to connect. See section 9.1 for more information on accessing remote sites via a Web browser.

Telnet Interface
Clicking the "Telnet Interface" button opens a Telnet client, initiates a connection, and displays the detector's serial menu interface. Note, if the selected detector is not currently reachable via the network, the terminal application opens but quickly closes. See section 9.2 for more information on accessing remote sites via Telnet connection.

Alarmed Trains
Clicking the "Alarmed Trains" button displays the Alarmed Trains History dialog. This dialog presents summary information for trains having alarms, as reported by the detectors. When first opened, the history of alarmed trains for the selected site appears. Additionally, the dialog supports displaying the history for any, or all, of the detectors represented in the table. See section 6.0 for more information on the Alarmed Trains History dialog.

Event Log
Clicking the "Event Log" button brings up the Event Log dialog. The server application logs events such as train arrivals and departures as reported by the remote detectors. The Event Log dialog displays the Event Log messages recorded for each detector independently or for all detectors in one chronological display. See section 7.1 for more information on the Event Log dialog.

Comms Log
Clicking the "Comms Log" button brings up the Communications Log dialog. The server application logs events related to network communications in the Communications Log. This log primarily represents the responsiveness of the remote detectors to the polls transmitted by the server application. The Communications Log dialog displays communications-related messages recorded for each detector independently or for all detectors in one chronological display. See section 7.2 for more information on the Communications Log dialog.

Add/Rem Sites
Clicking the "Add/Rem Sites" button produces the Add/Remove Sites dialog. This dialog allows adding new detectors to the detectors monitored by the Central Office Server or removing detectors currently appearing in the main display table. Detectors can be added by using the "Auto Discovery" option (where detectors are on the same network subnet as the server) or by manually entering IP number and Site Name information. See section 4.3 for more information on the Add/Remove Sites dialog.

Add/Rem Users
Clicking the "Add/Rem Users" button produces the Add/Remove Users dialog. This dialog allows adding new users to, and removing existing users from, the Central Office Server application. A registered user of the application has the ability to acknowledge real-time alarm dialogs displayed on the screen. A registered user can also have the ability to add and remove monitored sites and to add and remove other users. See section 4.2 for more information on the Add/Remove Users dialog.

Preferences
Clicking the "Preferences" button produces the Preferences dialog. This dialog allows configuration of system parameters such as the rate at which detectors are polled and whether to use Metric or English units. See section 4.1 for more information on the Preferences dialog.

Exit
Clicking the "Exit" button closes the server application's main display window. Note that, even with the main display window closed, the server application continues communicating with the detectors (in the background).

4.0 — Configuring The System

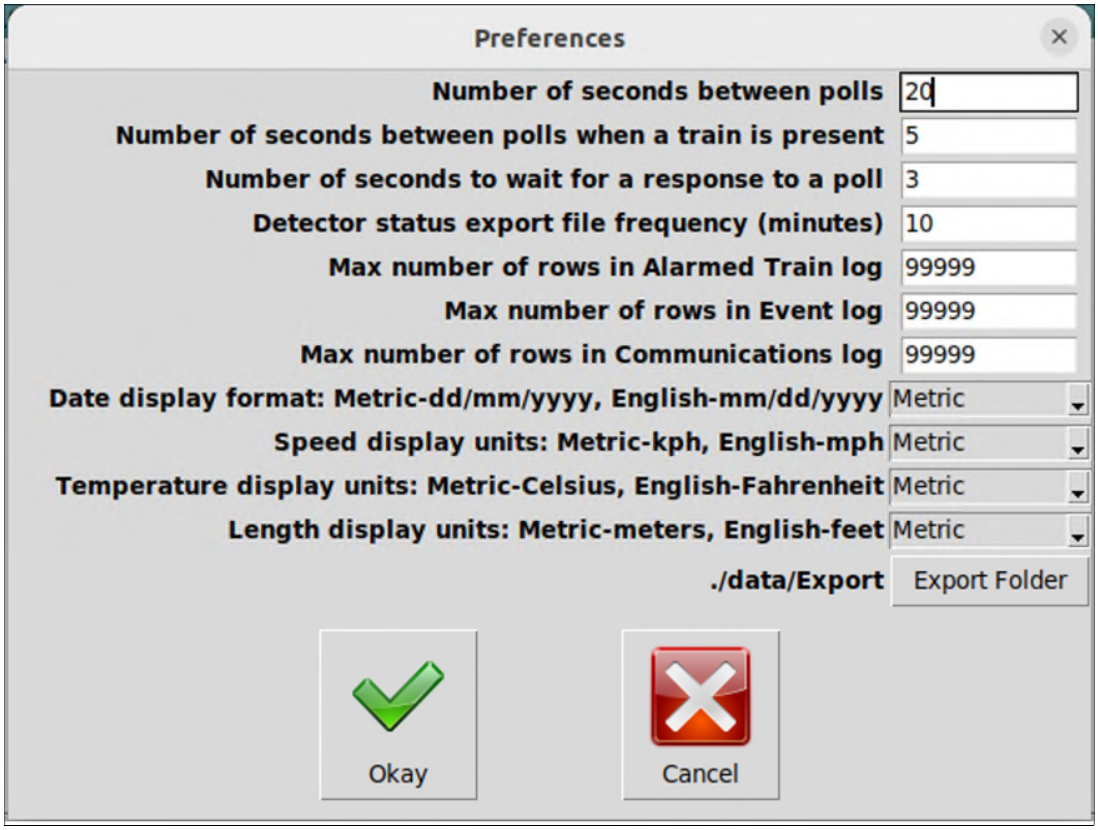
Configuring the Central Office Server application involves:

- Setting up system-wide operational and display parameters
- Setting up system users and access permissions
- Adding detectors for monitoring

4.1 System Preferences

Clicking the Preferences Button displays the server application's Preferences dialog. The Preferences dialog allows configuration of system operations and visual displays.

Preferences Button



System Preference Dialog

Number of seconds between polls
This parameter determines how often the server application polls the detectors while they are in standby mode (no train present). Since each detector forces unsolicited messages to the server for events like train arrival, train departure, real-time alarms, the polling of detectors does not need to be all that frequent. However, the larger this number is, the longer it will take to know if the server is having problems communicating with the site. The minimum delay between polls is 5 seconds. The maximum delay between polls is 99 seconds.

Number of seconds between polls when a train is present
This parameter determines how often the server application polls the detectors while they actively scan a train. The minimum delay between polls is 5 seconds. Polling the detector while a train is present results in updates to the "Most Recent Train" information in the application's main display table. This includes updates to fields such as "Lead Loco ID", # axles, # cars, speed, etc. Having a separate, more aggressive polling frequency when a train is present allows this "Most Recent Train" information to be updated in a closer to real-time fashion. The larger this number is, the less frequent the "Most Recent Train" information will be updated while a train is present. The maximum delay between polls is 99 seconds.

Number of seconds to wait for a response to a poll
This parameter determines how long the server application waits for a detector's poll response. If the specified wait-for-response time expires without a response, the server application retransmits the poll and posts an error message to the Comms log. Five seconds is probably an appropriate wait time for most networks. However, if the server is connected to a network that is known to be slow, this parameter could be increased to as much as nine seconds. The minimum response wait period is 2 seconds. The maximum response wait period is 9 seconds.

Detector status export file frequency (minutes)
This parameter determines how often a snapshot of the status of all monitored detectors is acquired and written to the application's data export directory. See section 11.0, Exported Data, for more information regarding the data export functions. The minimum frequency is once every three minutes. The maximum frequency is once every 99 minutes.

Max number of rows in Alarmed Train log
This parameter controls the number of records maintained for display in the Alarmed Train History dialog. The server application manages the log's size to prevent it from becoming too large. The minimum number of train records retained is 100. The maximum number of train records retained is 99999.

Max number of rows in Event log
This parameter controls the number of records maintained for display in the Event Log dialog. The server application maintains the size of the Event Log to prevent it from becoming excessively large. The minimum number of event records retained is 100. The maximum number of event records retained is 99999.

Max number of rows in Communications log
This parameter controls the number of records maintained for display in the Communications Log dialog. The server application manages the log's size to prevent it from becoming too

large. The minimum number of comms event records retained is 100. The maximum number of comms event records retained is 99999.

Date display format: Metric-dd/mm/yyyy, English-mm/dd/yyyy
This parameter selects the date format. Clicking the arrow to the right of the field presents a drop-down list from which to select the preferred date format. Available options are mm/dd/yyyy (English) and dd/mm/yyyy (Metric).

Speed display units: Metric-kph English-mph
This parameter selects the units of measure used when displaying speed. Clicking the arrow to the right of the field presents a drop-down list from which to select the preferred units. Available options are Miles Per Hour (English) and Kilometers Per Hour (Metric).

Temperature display units: Metric-Celsius, English-Fahrenheit
This parameter selects the units of measure used when displaying **ambient temperature**. Clicking the arrow to the right of the field presents a drop-down list from which to select the preferred units. Available options are Fahrenheit (English) and Celsius (Metric).

Length display units: Metric-meters, English-feet
This parameter selects the units of measure used when displaying length. Clicking the arrow to the right of the field presents a drop-down list from which to select the preferred units. Available options are feet (English) and meters (Metric).

4.2 Add/Remove Users

Add/Rem Users Button

Application users must be set up in the system to provide personnel with the ability to clear train alarm notifications and to configure application settings. To add users to the application, click the "Add/Rem Users" button on the application's main display.

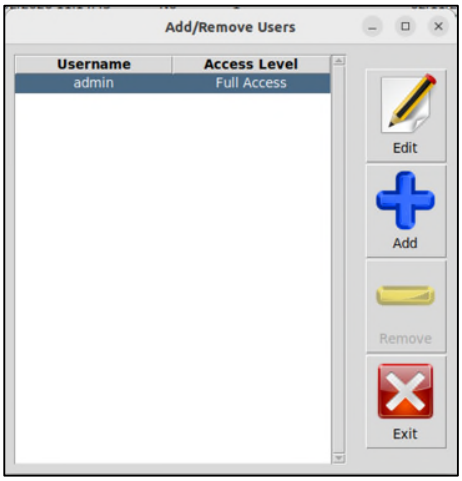
Two access levels are available for managing user permissions.

User Access Levels

Acknowledge Only	A user assigned this access level can clear real-time train alarm notifications but cannot configure application settings.
Full Access	A user assigned this access level can clear real-time train alarm notifications and edit the application's configuration options – System Preference, Add/Remove Sites, Add/Remove Users

Only a user who has been assigned "Full Access" can add or remove users. After clicking the "Add/Rem Users" button on the application's main screen, a prompt to confirm access level appears:

Confirm access level prompt



Add/Remove Users Dialog

If the user has full access, the Add Remove Users dialog appears.

The buttons on this dialog allow:

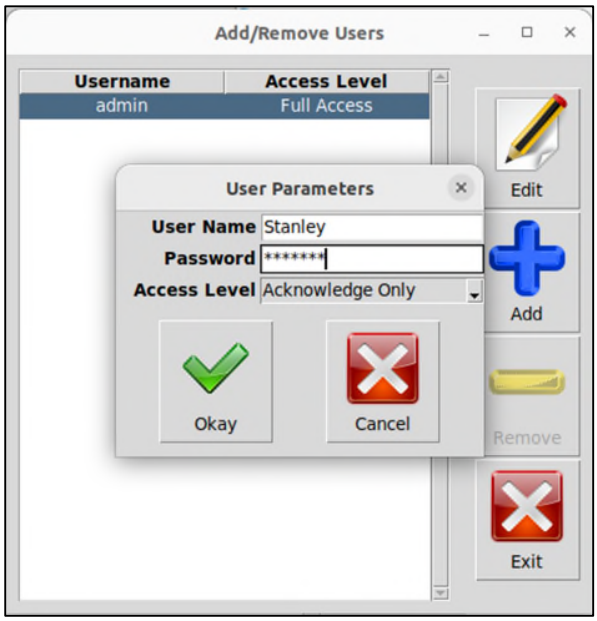
Edit – Modifying the settings for an existing user.

Add – Adding a new user.

Remove – Removing an existing user. Note: the "admin" user cannot be removed.

Edit

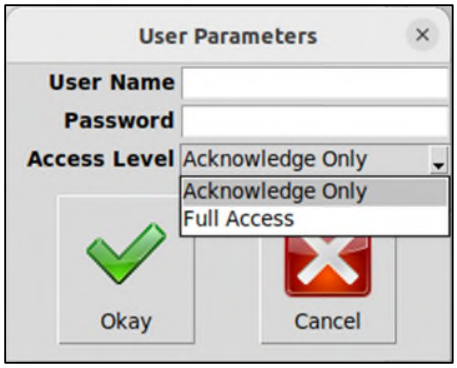
To edit the parameters associated with an existing user, select the user to edit by clicking on the user's name in the Add/Remove Users dialog, then click the "Edit" button. In the example below, the user "Stanley" was selected, then the Edit button clicked.



Editing the parameters for the existing user "Stanley"

Add

Clicking the Add button presents an empty "User Parameters" dialog.

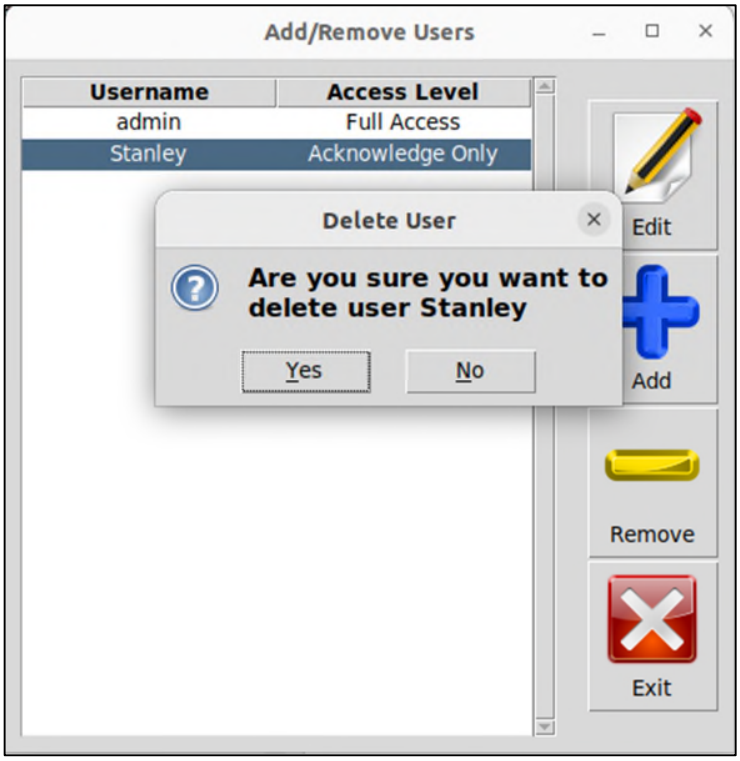


Adding a new user - Access Level options displayed

Enter the user's name and password and select the desired access level. Click the Okay button to save the new user's information.

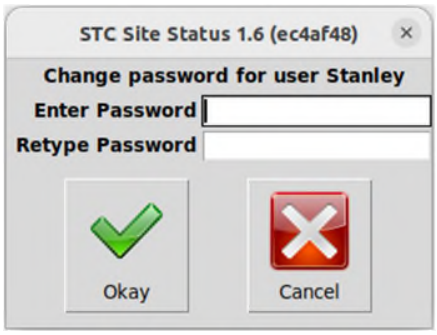
Remove

Clicking the Remove button presents a confirmation prompt.
The example below depicts a confirmation prompt for the removal of user "Stanley."



Remove user confirmation prompt

4.2.1 Change Password – User With Acknowledge Only Access



A user who has been granted Acknowledge Only access can can change their login password by clicking the Add/Rem Users Button and entering their username and current password at the prompt. This will cause the Change Pasword dialog to display. In the Change Password dialog the user enters the desired password twice, and then clicks the Okay button to update their password.

The Change Password Prompt

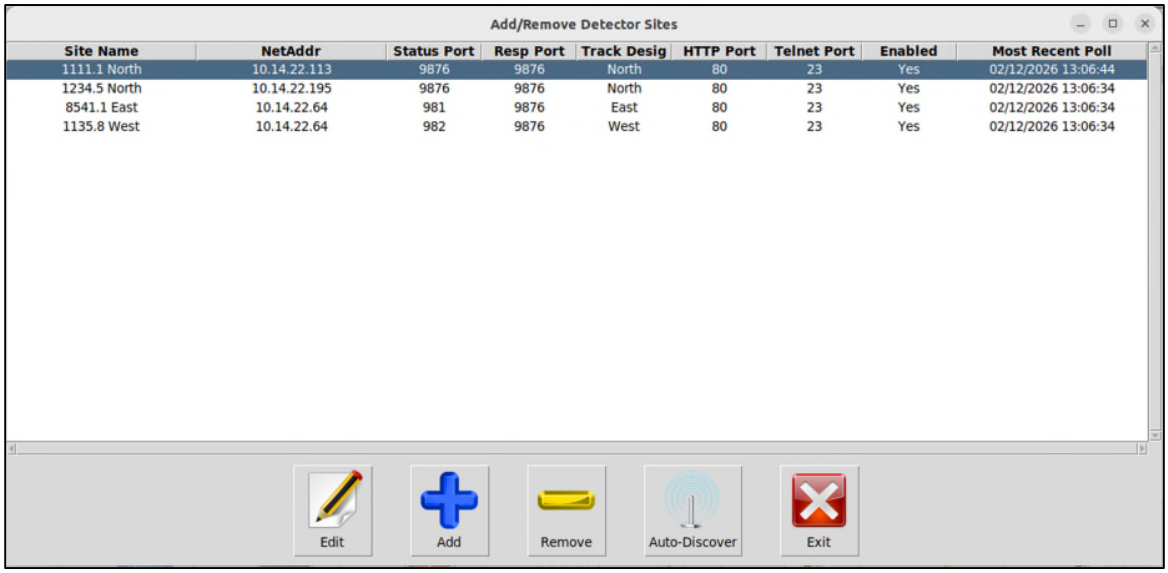
4.3 Add/Remove Detector Sites

Detector sites must be registered with the Central Office Server for the application to monitor them and display status information. To add detectors to the application, click the "Add/Rem Sites" button on the application's main display window.

Add/Rem Sites Button

The Detector List dialog allows:

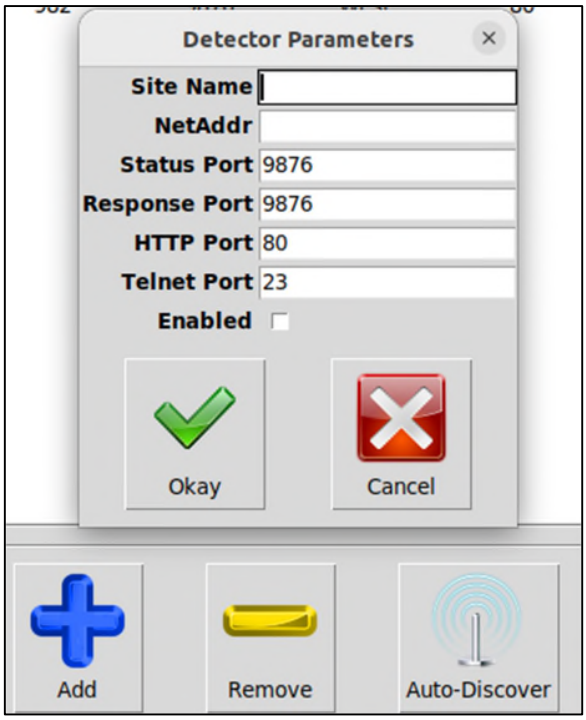
- Editing the options for existing detectors.
- Manually adding new detectors to the list of monitored detectors.
- Automatically adding detectors to the monitored detector list using the Auto Discover function.
- Removing detectors from the list of monitored detectors.



The Detector List dialog

Add a New Detector Site

To add a new detector manually, click the "Add" button on the "Detector List" dialog (shown above). This displays the Detector Parameters dialog.



The Detector Parameters dialog

For the **Site Name** parameter, enter the reference name to appear in the "Site Name" column of the application's main display of monitored detectors.

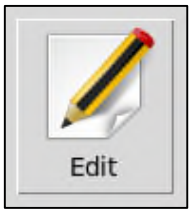
For the **NetAddr** field, enter the IP address of the detector.

The port numbers shown in the **Status Port, HTTP Port, and Telnet Port** fields are the default values. These represent the TCP ports through which the remote detector communicates. For most installations, these values should not change.

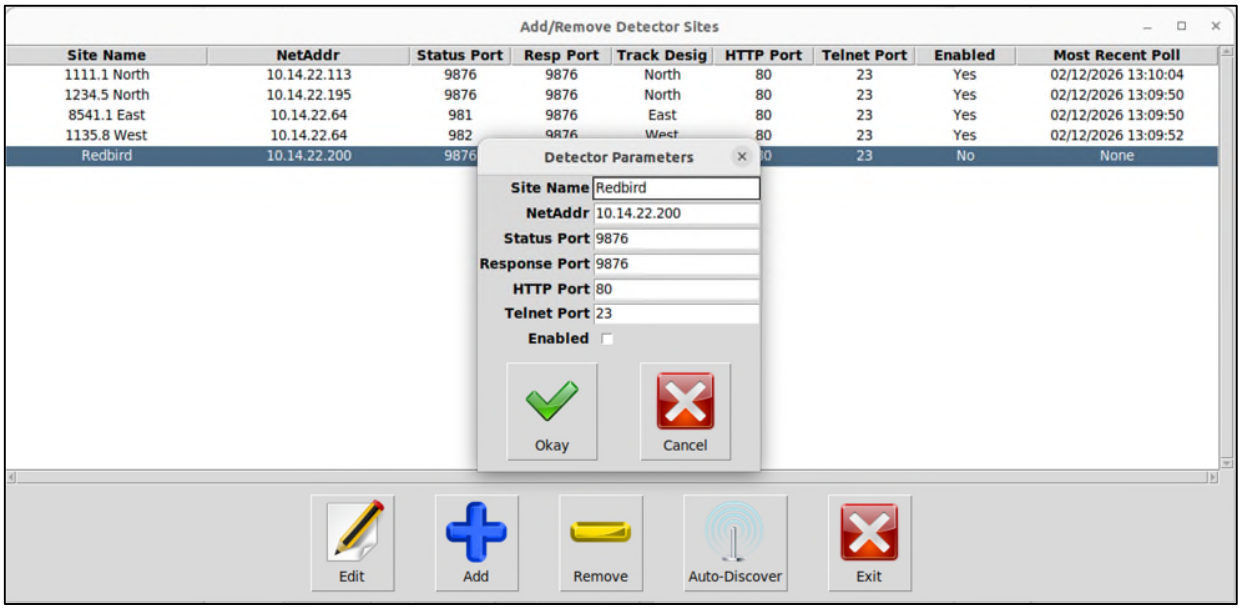
The **Enabled** checkbox must be checked in order for the information from the newly-added site to appear in the server application's main display list of detectors.

When the **SiteName** and **NetAddr** fields have been entered and the **Enabled** checkbox checked, click the Okay button to save the changes.

Edit the Configuration Of An Existing Detector



To edit the parameters associated with an existing detector, select the detector in the Detector List dialog by clicking on it, then click the **Edit** button.



Editing the detector parameters for the Redbird site

All parameter values in the Detector Parameters dialog can be modified. Note that, for the server application to monitor a detector, the **Enabled** checkbox must be checked.

When all modifications are complete, click the Okay button to save the changes.

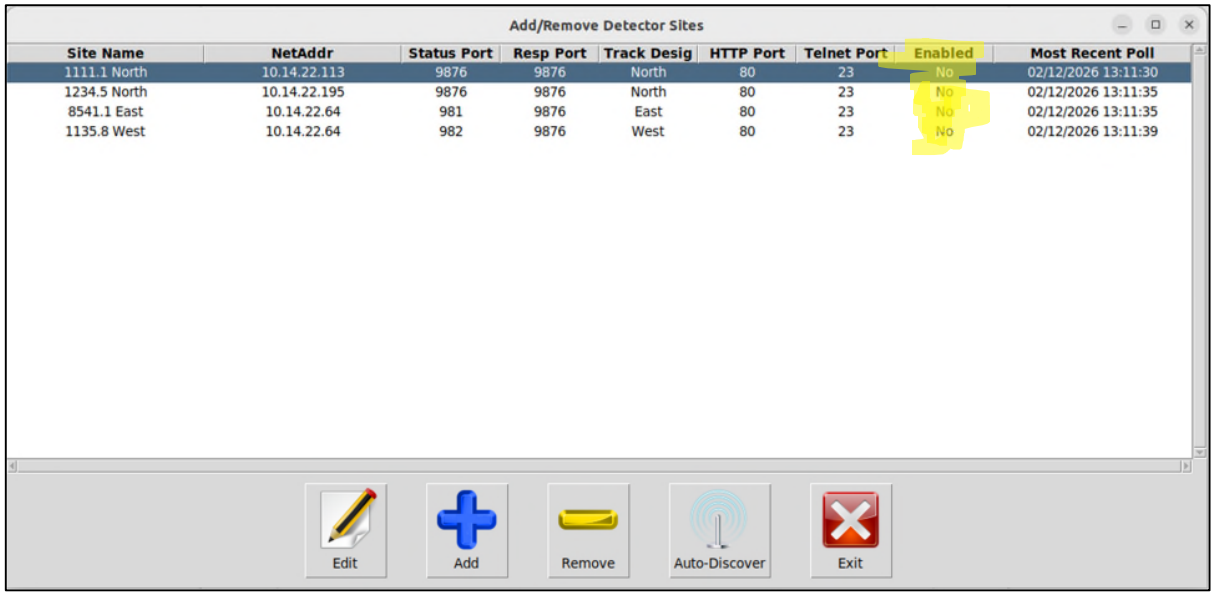
Auto-Discover

If detectors are on the same network subnet as the Central Office System computer, the Auto-Discover function can automatically add them to the server application.

Auto-Discover Button

When clicking the **Auto-Discover** button, the server application broadcasts a message on the Ethernet network to which it is connected. The remote devices (SmartScanNG²s and iCubes) listen for this message and respond with their IP addresses, etc. The server application uses these responses to populate the site list shown in the Detector List dialog.

Note that although the Auto-Discover function automatically adds detectors to the detector list, monitoring of these detectors is disabled by default. To enable monitoring of a new detector, highlight it in the Detector List dialog, click the **Edit** button, click the "Enabled" checkbox, then click the Okay button to save the change.

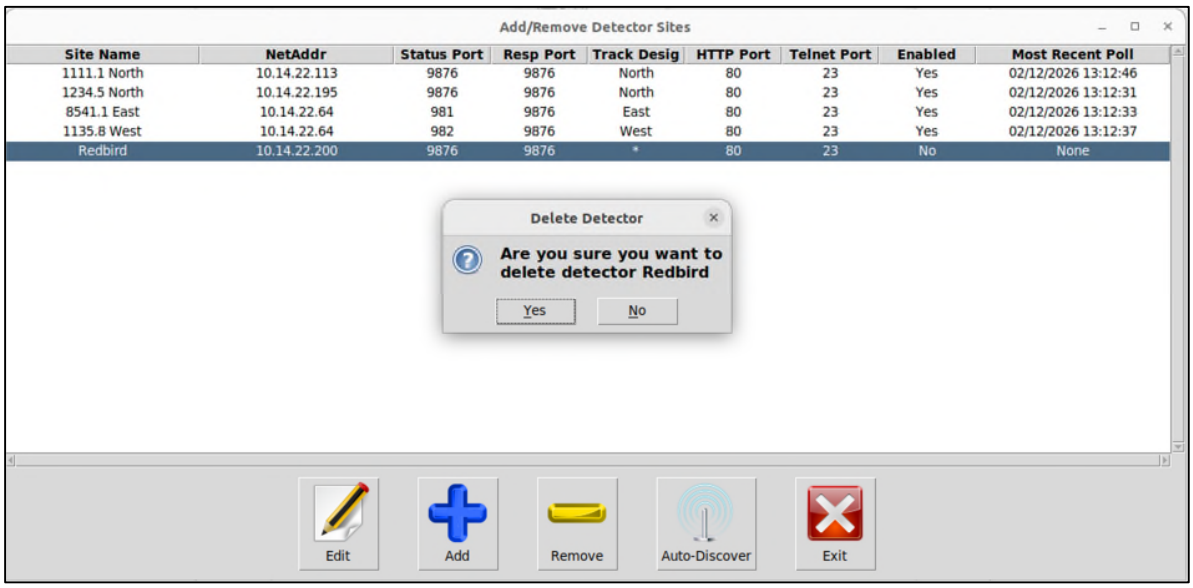


Detector List site list after running Auto-Discover – added sites must be enabled

Remove

To remove a detector from the server application, select it in the Detector List, then click the **Remove** button. A prompt appears for confirmation of the detector's removal.

Remove Button

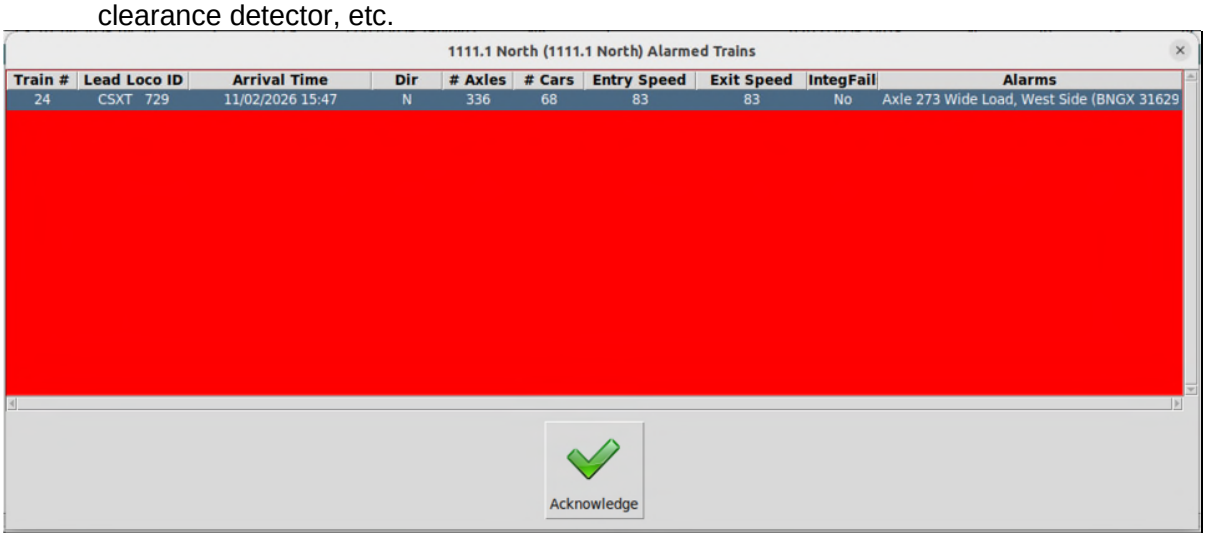


Confirmation prompt for removal of site Redbird

5.0 — Alarm Dialogs

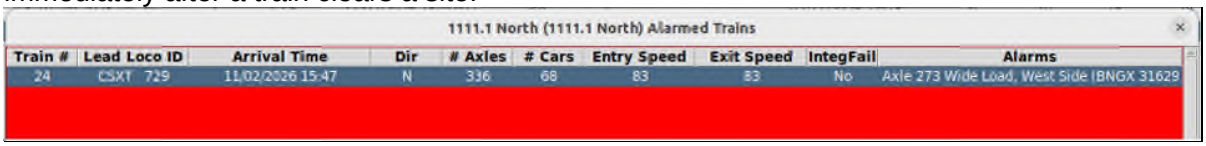
The Alarmed Trains Dialog notifies operators of alarms detected by a detector during train passage. An Alarmed Trains Dialog appears when either of two alarm types occur:

- **Detector Alarms**
  Detector alarms include hotbox alarms, hotwheel alarms, dragging equipment alarms, and clearance alarms (high-load, wide-load)
- **Integrity Failure Alarms**
  Integrity Failure alarms include consecutive cold scanner resistors, transducer miscounts, low battery voltage, stuck dragging equipment detector (DED), stuck clearance detector, etc.



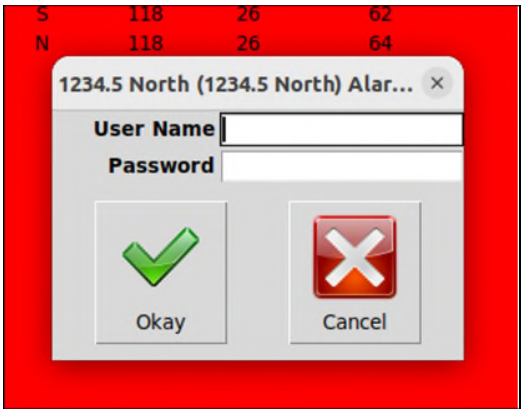
Alarmed Trains Dialog

Detector alarms are forwarded to the server application at the moment they are detected. A site-status message with details of the detected alarm is transmitted to the server application. The information associated with Integrity Failure alarms is forwarded to the server application immediately after a train clears a site.



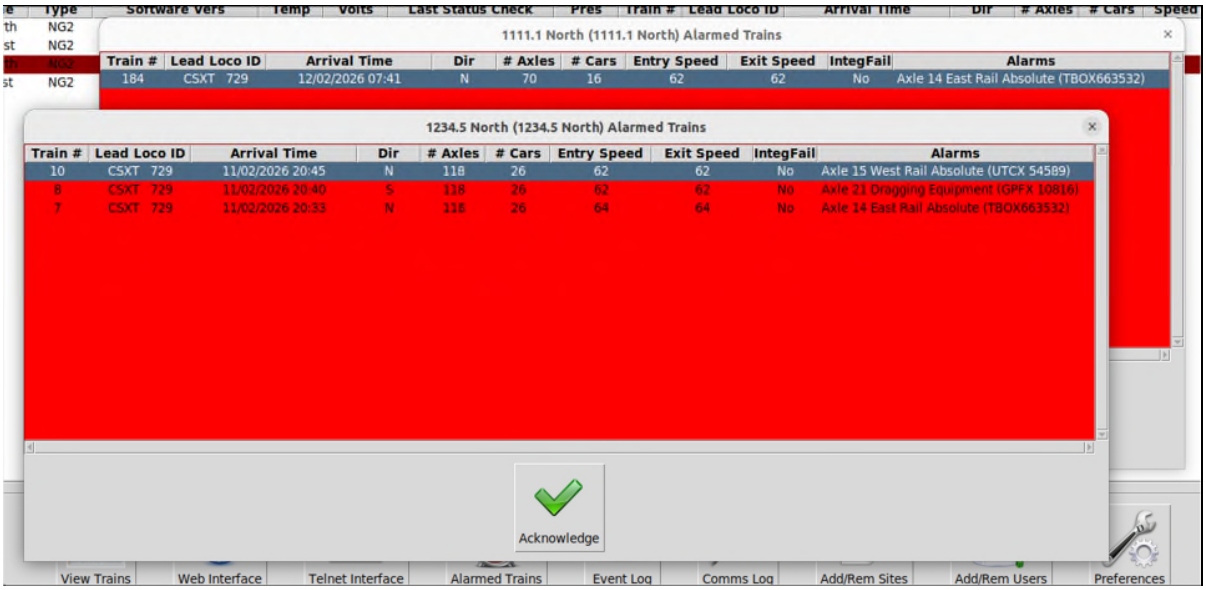
Alarmed Trains dialog - Details

After receiving either a detector alarm or an integrity failure alarm, the server application highlights the detector's status line in the main display window (red for detector alarms, yellow for integrity failure alarms), displays an Alarmed Trains dialog, and sounds an audible alarm. To clear the Alarmed Trains dialog from the screen and halt the audible alarm, an authorized user must acknowledge the alarm(s) by clicking the Acknowledge button at the bottom of the dialog window and then entering a user name and password.



Alarmed Trains dialog excerpt with acknowledgment credentials prompt.

Where multiple detectors have flagged alarms (detector alarms or integrity failures), the alarms for each detector will be displayed in separate dialogs windows. If the Alarmed Trains dialog associated with a detector goes unacknowledged, status lines associated with each alarmed train accumulate in the dialog.



Alarmed Trains dialogs active for multiple detector sites – Multiple alarms displayed on each.

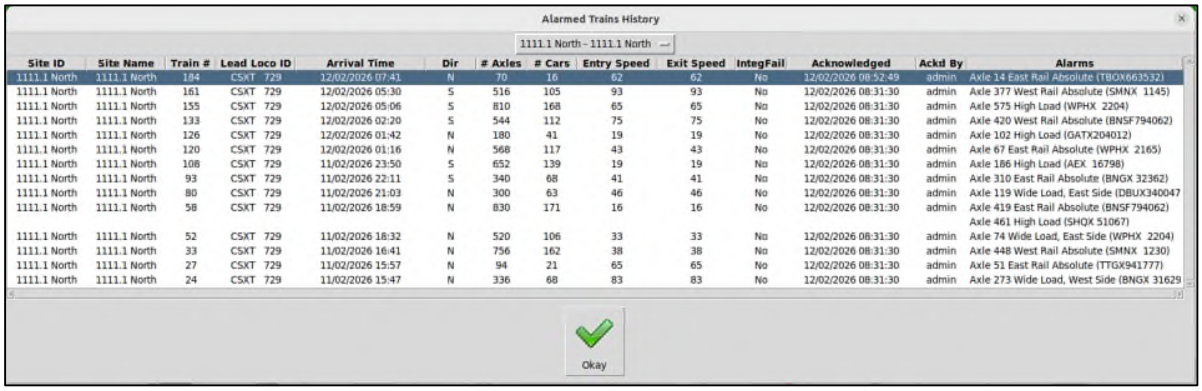
When multiple alarm dialogs (for multiple detectors) are displayed, all must be acknowledged to halt the audible alarm.

6.0 — Alarmed Trains History

The Alarmed Trains History display provides a historical summary of the alarmed trains reported by the remote detector. Clicking the Alarmed Trains button at the bottom of the server application's main display activates the Alarmed Trains History list for the detector currently highlighted.

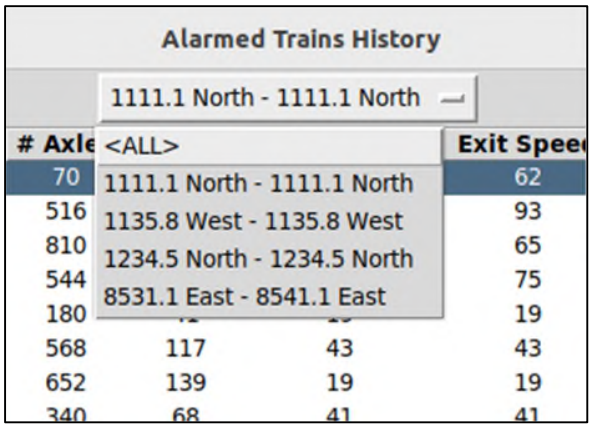
Alarmed Trains Button

In the image below, the Alarmed Trains History list for the Tyner Track 2 detector appears.



Site ID	Site Name	Train #	Lead Loco ID	Arrival Time	Dir	# Axles	# Cars	Entry Speed	Exit Speed	IntegFail	Acknowledged	Ackd By	Alarms
1111.1 North	1111.1 North	184	CSXT 729	12/02/2026 07:41	N	70	16	62	62	No	12/02/2026 08:52:49	admin	Axle 14 East Rail Absolute (TBOX663532)
1111.1 North	1111.1 North	161	CSXT 729	12/02/2026 05:30	S	516	105	93	93	No	12/02/2026 08:31:30	admin	Axle 377 West Rail Absolute (SMNX 1145)
1111.1 North	1111.1 North	155	CSXT 729	12/02/2026 05:06	S	810	168	65	65	No	12/02/2026 08:31:30	admin	Axle 575 High Load (WPHX 2204)
1111.1 North	1111.1 North	133	CSXT 729	12/02/2026 02:20	S	544	112	75	75	No	12/02/2026 08:31:30	admin	Axle 420 West Rail Absolute (BNSF794062)
1111.1 North	1111.1 North	126	CSXT 729	12/02/2026 01:42	N	180	41	19	19	No	12/02/2026 08:31:30	admin	Axle 102 High Load (GATX204012)
1111.1 North	1111.1 North	120	CSXT 729	12/02/2026 01:16	N	568	117	43	43	No	12/02/2026 08:31:30	admin	Axle 67 East Rail Absolute (WPHX 2165)
1111.1 North	1111.1 North	108	CSXT 729	11/02/2026 23:50	S	652	139	19	19	No	12/02/2026 08:31:30	admin	Axle 186 High Load (AEX 16798)
1111.1 North	1111.1 North	93	CSXT 729	11/02/2026 22:11	S	340	68	41	41	No	12/02/2026 08:31:30	admin	Axle 310 East Rail Absolute (BNGX 32362)
1111.1 North	1111.1 North	80	CSXT 729	11/02/2026 21:03	N	300	63	46	46	No	12/02/2026 08:31:30	admin	Axle 119 Wide Load, East Side (DBUX340047
1111.1 North	1111.1 North	58	CSXT 729	11/02/2026 18:59	N	830	171	16	16	No	12/02/2026 08:31:30	admin	Axle 419 East Rail Absolute (BNSF794062) Axle 461 High Load (SHQX 51067)
1111.1 North	1111.1 North	52	CSXT 729	11/02/2026 18:32	N	520	106	33	33	No	12/02/2026 08:31:30	admin	Axle 74 Wide Load, East Side (WPHX 2204)
1111.1 North	1111.1 North	33	CSXT 729	11/02/2026 16:41	N	756	162	38	38	No	12/02/2026 08:31:30	admin	Axle 448 West Rail Absolute (SMNX 1230)
1111.1 North	1111.1 North	27	CSXT 729	11/02/2026 15:57	N	94	21	65	65	No	12/02/2026 08:31:30	admin	Axle 51 East Rail Absolute (TTGX941777)
1111.1 North	1111.1 North	24	CSXT 729	11/02/2026 15:47	N	336	68	83	83	No	12/02/2026 08:31:30	admin	Axle 273 Wide Load, West Side (BNGX 31629

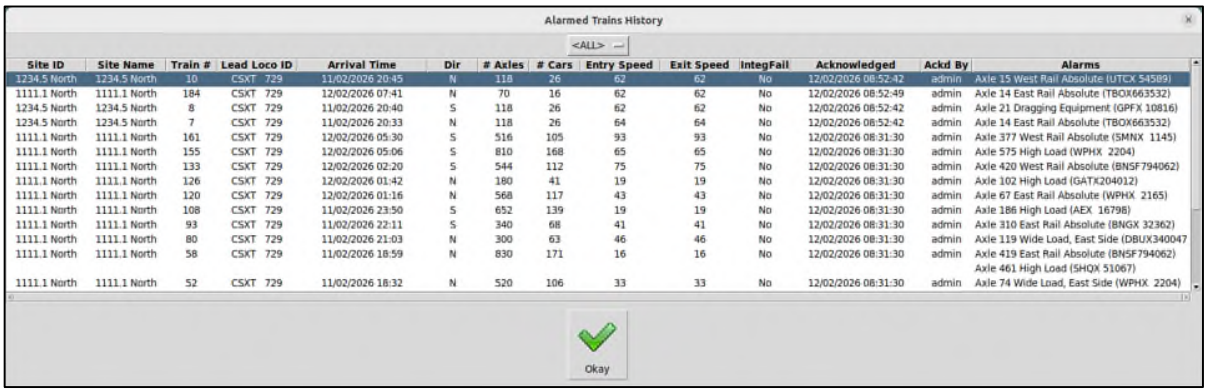
Alarmed Trains History List – Alarmed trains history show for one detector site.



Alarmed trains site selection drop-down list

With the Alarmed Trains History List displayed, a drop-down list at the top-center of the window chooses whether to display alarmed train records for a specific detector or for "All" detectors.

In the Alarmed Trains History List, Alarmed Train records appear chronologically based upon arrival time, with the most recent records at the top of the list.



Site ID	Site Name	Train #	Lead Loco ID	Arrival Time	Dir	# Axles	# Cars	Entry Speed	Exit Speed	IntegFail	Acknowledged	Ackd By	Alarms
1234.5 North	1234.5 North	10	CSXT 729	11/02/2026 20:45	N	118	26	62	62	No	12/02/2026 08:52:42	admin	Axle 15 West Rail Absolute (UTCX 54589)
1111.1 North	1111.1 North	184	CSXT 729	12/02/2026 07:41	N	70	16	62	62	No	12/02/2026 08:52:49	admin	Axle 14 East Rail Absolute (TBOX663532)
1234.5 North	1234.5 North	8	CSXT 729	11/02/2026 20:40	S	118	26	62	62	No	12/02/2026 08:52:42	admin	Axle 21 Dragging Equipment (GPFX 10816)
1234.5 North	1234.5 North	7	CSXT 729	11/02/2026 20:33	N	118	26	64	64	No	12/02/2026 08:52:42	admin	Axle 14 East Rail Absolute (TBOX663532)
1111.1 North	1111.1 North	161	CSXT 729	12/02/2026 05:30	S	516	105	93	93	No	12/02/2026 08:31:30	admin	Axle 377 West Rail Absolute (SMNX 1145)
1111.1 North	1111.1 North	155	CSXT 729	12/02/2026 05:06	S	810	168	65	65	No	12/02/2026 08:31:30	admin	Axle 575 High Load (WPHX 2204)
1111.1 North	1111.1 North	133	CSXT 729	12/02/2026 02:20	S	544	112	75	75	No	12/02/2026 08:31:30	admin	Axle 420 West Rail Absolute (BNSF794062)
1111.1 North	1111.1 North	126	CSXT 729	12/02/2026 01:42	N	180	41	19	19	No	12/02/2026 08:31:30	admin	Axle 102 High Load (GATX204012)
1111.1 North	1111.1 North	120	CSXT 729	12/02/2026 01:16	N	568	117	43	43	No	12/02/2026 08:31:30	admin	Axle 67 East Rail Absolute (WPHX 2165)
1111.1 North	1111.1 North	108	CSXT 729	11/02/2026 23:50	S	652	139	19	19	No	12/02/2026 08:31:30	admin	Axle 186 High Load (AEX 16798)
1111.1 North	1111.1 North	93	CSXT 729	11/02/2026 22:11	S	340	68	41	41	No	12/02/2026 08:31:30	admin	Axle 310 East Rail Absolute (BNGX 32362)
1111.1 North	1111.1 North	80	CSXT 729	11/02/2026 21:03	N	300	63	46	46	No	12/02/2026 08:31:30	admin	Axle 119 Wide Load, East Side (DBUX340047
1111.1 North	1111.1 North	58	CSXT 729	11/02/2026 18:59	N	830	171	16	16	No	12/02/2026 08:31:30	admin	Axle 419 East Rail Absolute (BNSF794062) Axle 461 High Load (SHQX 51067)
1111.1 North	1111.1 North	52	CSXT 729	11/02/2026 18:32	N	520	106	33	33	No	12/02/2026 08:31:30	admin	Axle 74 Wide Load, East Side (WPHX 2204)

Alarmed Trains History List – Alarmed trains history showing for all detectors.

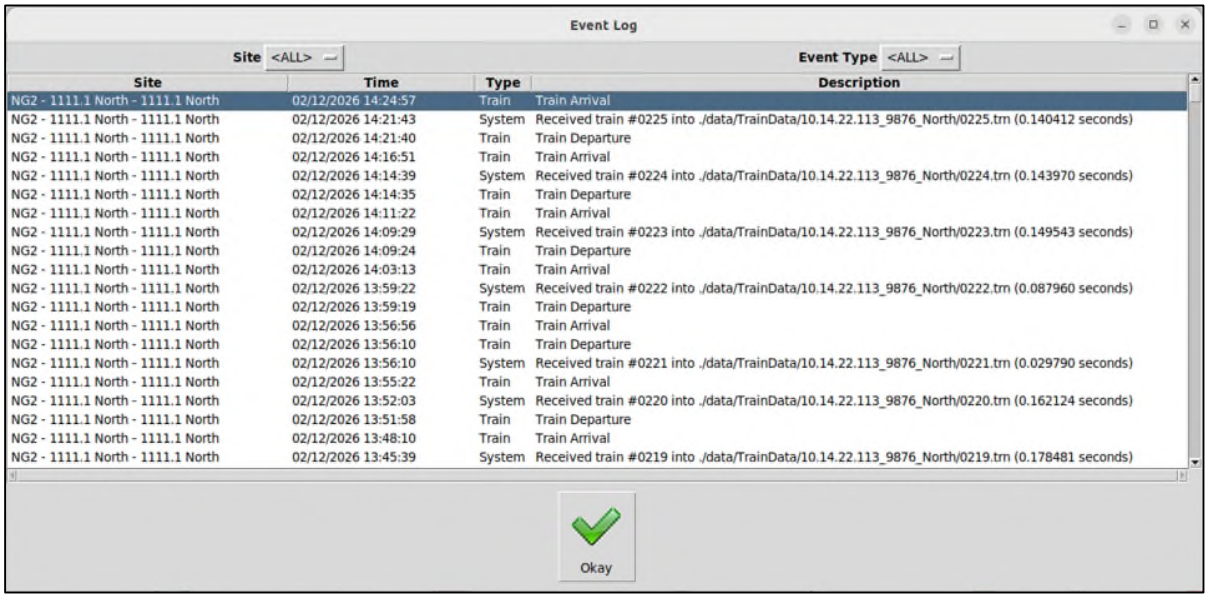
7.0 — Logs

The server application maintains two logs reflecting the status of the application and the interactions occurring between the application and the remote detectors. The Event Log records specific events occurring at the detector sites or on the application server. The Comms Log reflects the health of the communications links between the application and the detectors.

7.1 Event Log

Clicking the Event Log button at the bottom of the application's main display window displays the Event Log. Event records appear chronologically, with the most recent event at the top of the list.

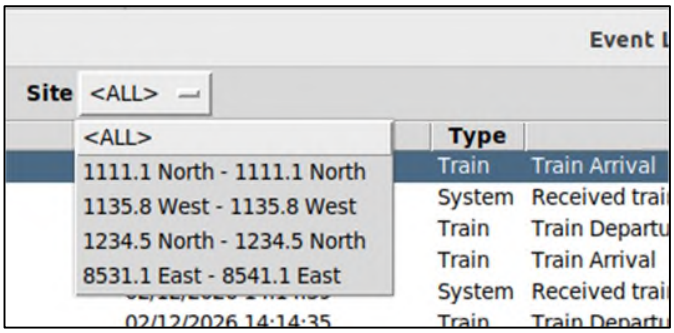
Event Log Button



Event Log Example – Events for ALL monitored sites included

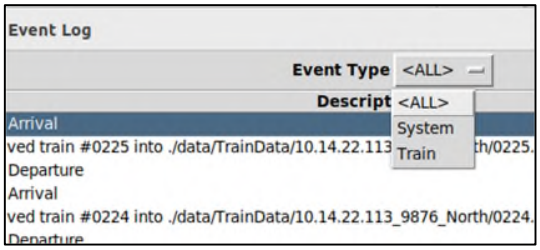
Each entry in the Event Log includes:

- The detector corresponding to the event
- The date and time of the event
- The event type
- A brief description of the event



The drop-down list labeled "Site" (at the top-left of the Event Log display) selects whether to display the events associated with a specific detector or all events for all monitored detectors.

Event Log – Site Selection List



The drop-down list labeled "Event Type" (at the top-right of the Event Log display) selects whether to display all recorded event types or just events of a specific type. The table below summarizes the event type categories.

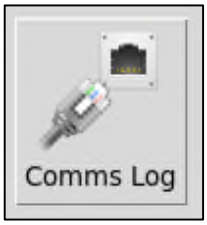
Event Log – Event Type Selection List

The Event Log message type filters are defined in the table below.

Event Log – Message Type Categories

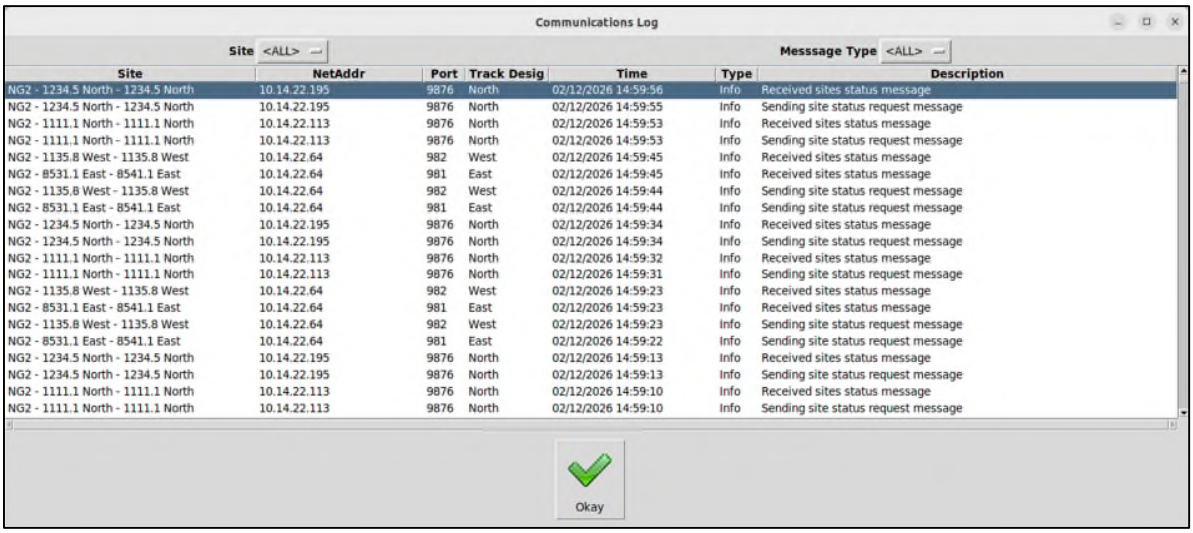
Events	Message Types	Originator
Train Arrival	Train	Detector
Train Departure	Train	Detector
Alarm Detected	Train	Detector
Integrity Failure Occurred	Train	Detector
Alarm Dialog Cleared	System	Server Application
Receipt of Train Data	System	Server Application

7.2 Comms Log



Clicking the Comms Log button at the bottom of the application's main display window displays the Communications Log. Event records appear chronologically, with the most recent event at the top of the list.

Comms Log Button



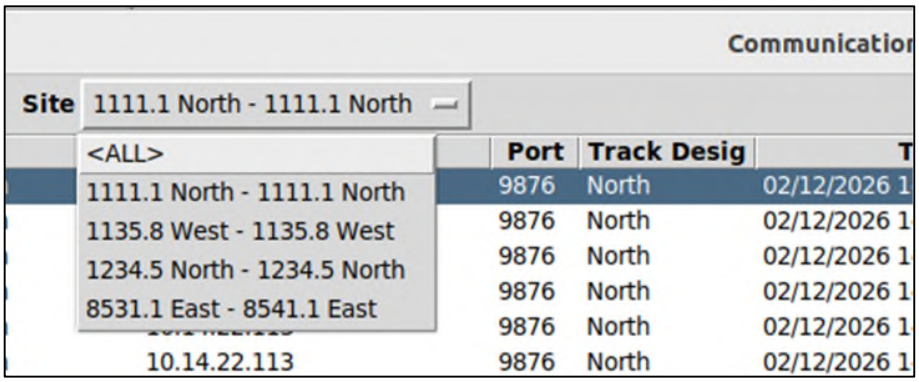
Site	NetAddr	Port	Track Desig	Time	Type	Description
NG2 - 1234.5 North - 1234.5 North	10.14.22.195	9876	North	02/12/2026 14:59:56	Info	Received sites status message
NG2 - 1234.5 North - 1234.5 North	10.14.22.195	9876	North	02/12/2026 14:59:55	Info	Sending site status request message
NG2 - 1111.1 North - 1111.1 North	10.14.22.113	9876	North	02/12/2026 14:59:53	Info	Received sites status message
NG2 - 1111.1 North - 1111.1 North	10.14.22.113	9876	North	02/12/2026 14:59:53	Info	Sending site status request message
NG2 - 1135.8 West - 1135.8 West	10.14.22.64	982	West	02/12/2026 14:59:45	Info	Received sites status message
NG2 - 8531.1 East - 8541.1 East	10.14.22.64	981	East	02/12/2026 14:59:45	Info	Received sites status message
NG2 - 1135.8 West - 1135.8 West	10.14.22.64	982	West	02/12/2026 14:59:44	Info	Sending site status request message
NG2 - 8531.1 East - 8541.1 East	10.14.22.64	981	East	02/12/2026 14:59:44	Info	Sending site status request message
NG2 - 1234.5 North - 1234.5 North	10.14.22.195	9876	North	02/12/2026 14:59:34	Info	Received sites status message
NG2 - 1234.5 North - 1234.5 North	10.14.22.195	9876	North	02/12/2026 14:59:34	Info	Sending site status request message
NG2 - 1111.1 North - 1111.1 North	10.14.22.113	9876	North	02/12/2026 14:59:32	Info	Received sites status message
NG2 - 1111.1 North - 1111.1 North	10.14.22.113	9876	North	02/12/2026 14:59:31	Info	Sending site status request message
NG2 - 1135.8 West - 1135.8 West	10.14.22.64	982	West	02/12/2026 14:59:23	Info	Received sites status message
NG2 - 8531.1 East - 8541.1 East	10.14.22.64	981	East	02/12/2026 14:59:23	Info	Received sites status message
NG2 - 1135.8 West - 1135.8 West	10.14.22.64	982	West	02/12/2026 14:59:23	Info	Sending site status request message
NG2 - 8531.1 East - 8541.1 East	10.14.22.64	981	East	02/12/2026 14:59:22	Info	Sending site status request message
NG2 - 1234.5 North - 1234.5 North	10.14.22.195	9876	North	02/12/2026 14:59:13	Info	Received sites status message
NG2 - 1234.5 North - 1234.5 North	10.14.22.195	9876	North	02/12/2026 14:59:13	Info	Sending site status request message
NG2 - 1111.1 North - 1111.1 North	10.14.22.113	9876	North	02/12/2026 14:59:10	Info	Received sites status message
NG2 - 1111.1 North - 1111.1 North	10.14.22.113	9876	North	02/12/2026 14:59:10	Info	Sending site status request message

Communications Log Example – Entries for ALL monitored sites included

Each entry in the Communications Log includes:

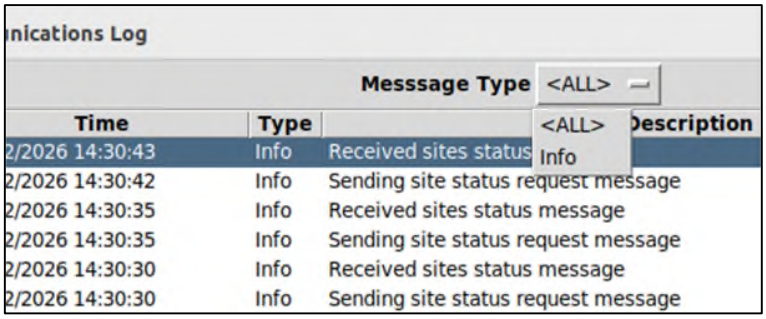
- The detector corresponding to the event
- The IP address and TCP port of the detector
- The track designator of the detector (this uniquely identifies each detector at multi-track locations)
- The date and time of the event
- The event type
- A brief description of the event

The drop-down list labeled "Site" (at the top-left of the Communications Log display) selects whether to display the event messages associated with a specific detector or all messages for all monitored detectors.



Communications Log – Site selection list

The drop-down list labeled "Message Type" (at the top-right of the Communications Log display) filters the types of messages included in the communications log display.



Communications Log – Message type selection list.

The Communications Log message type filters are defined in the table below.

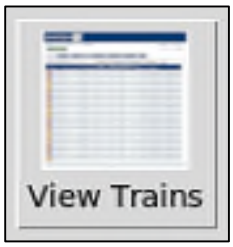
Communications Log – Message Types

Message Type	Description
Info	A general status message reflecting normal operations.
Error	Indicates a failure to communicate with a detector.
Warning	Communications link is okay, but inconsistencies found in transmitted packet contents.

8.0 — Viewing Train Data

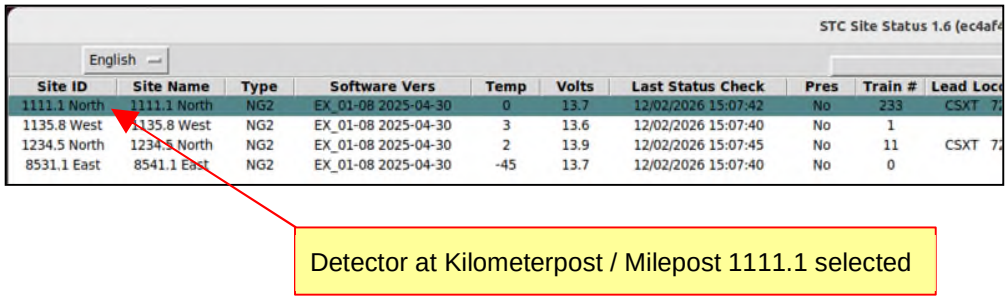
The Central Office Server application includes reports for viewing stored train data at the summary level, by site, and at the train detail level, for an individual train.

8.1 Train Summary Display

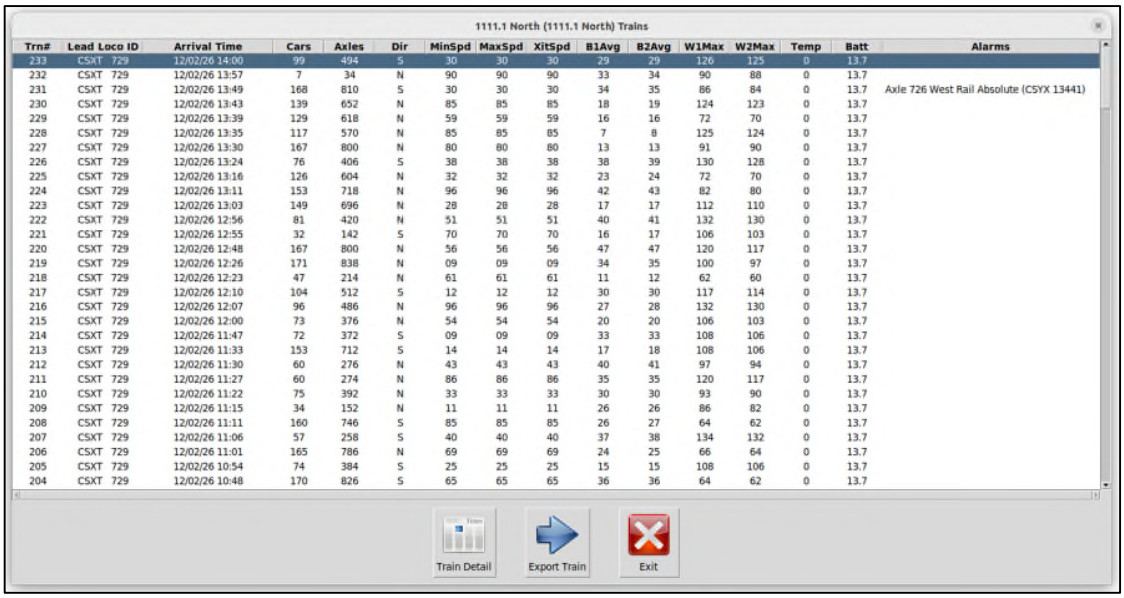


View Trains Button

To view summary data for trains recorded by a detector, click on a detector in the application's main screen list of detectors, then click the View Trains button at the bottom of the main screen.



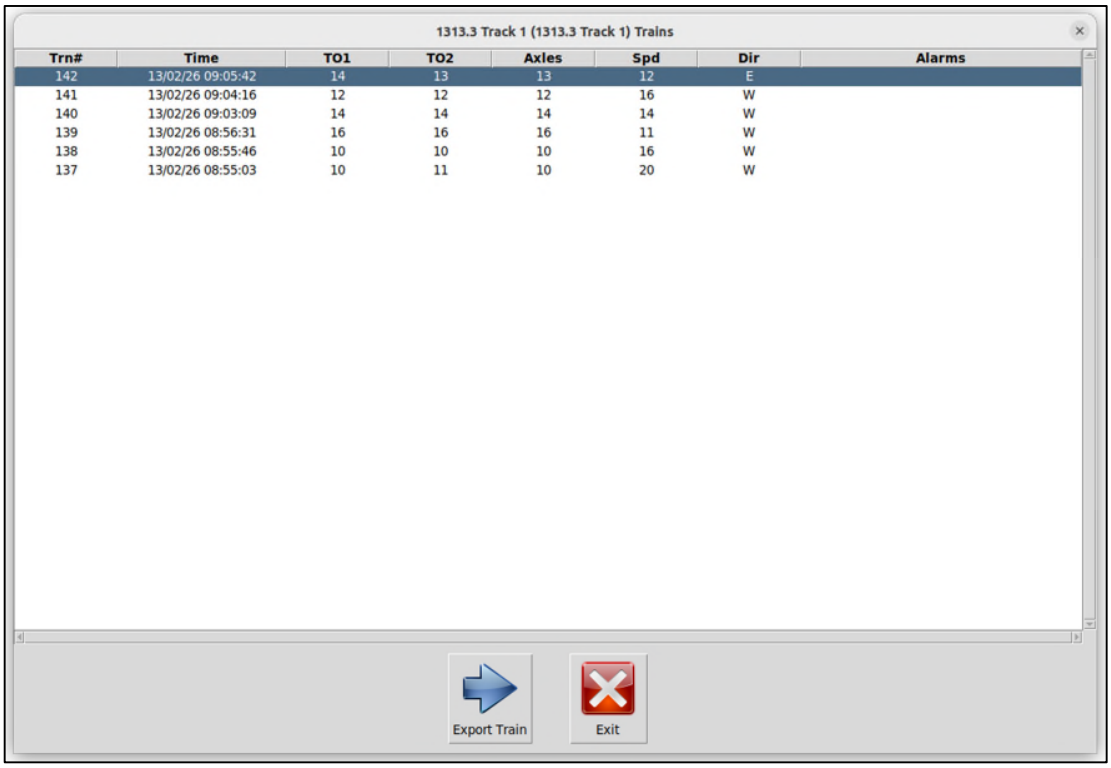
Clicking the View Trains button displays the Trains list screen for the selected detector. This display provides a summary level view of all trains recorded by the detector and forwarded to the Central Office Server. Use the scroll bar on the right to scroll through the data.



Trn#	Lead Loco ID	Arrival Time	Cars	Axles	Dir	MinSpd	MaxSpd	XitSpd	B1Avg	B2Avg	W1Max	W2Max	Temp	Batt	Alarms
233	CSXT 729	12/02/26 14:00	99	494	S	30	30	30	29	29	126	125	0	13.7	
232	CSXT 729	12/02/26 13:57	7	34	N	90	90	90	33	34	90	88	0	13.7	
231	CSXT 729	12/02/26 13:49	168	810	S	30	30	30	34	35	86	84	0	13.7	Axle 726 West Rail Absolute (CSYX 13441)
230	CSXT 729	12/02/26 13:43	139	652	N	85	85	85	18	19	124	123	0	13.7	
229	CSXT 729	12/02/26 13:39	129	618	N	59	59	59	16	16	72	70	0	13.7	
228	CSXT 729	12/02/26 13:35	117	570	N	85	85	85	7	8	125	124	0	13.7	
227	CSXT 729	12/02/26 13:30	167	800	N	80	80	80	13	13	91	90	0	13.7	
226	CSXT 729	12/02/26 13:24	76	406	S	38	38	38	38	39	130	128	0	13.7	
225	CSXT 729	12/02/26 13:16	126	604	N	32	32	32	23	24	72	70	0	13.7	
224	CSXT 729	12/02/26 13:11	153	718	N	96	96	96	42	43	82	80	0	13.7	
223	CSXT 729	12/02/26 13:03	149	696	N	28	28	28	17	17	112	110	0	13.7	
222	CSXT 729	12/02/26 12:56	81	420	N	51	51	51	40	41	132	130	0	13.7	
221	CSXT 729	12/02/26 12:55	32	142	S	70	70	70	16	17	106	103	0	13.7	
220	CSXT 729	12/02/26 12:48	167	800	N	56	56	56	47	47	120	117	0	13.7	
219	CSXT 729	12/02/26 12:26	171	838	N	09	09	09	34	35	100	97	0	13.7	
218	CSXT 729	12/02/26 12:23	47	214	N	61	61	61	11	12	62	60	0	13.7	
217	CSXT 729	12/02/26 12:10	104	512	S	12	12	12	30	30	117	114	0	13.7	
216	CSXT 729	12/02/26 12:07	96	486	N	96	96	96	27	28	132	130	0	13.7	
215	CSXT 729	12/02/26 12:00	73	376	N	54	54	54	20	20	106	103	0	13.7	
214	CSXT 729	12/02/26 11:47	72	372	S	09	09	09	33	33	108	106	0	13.7	
213	CSXT 729	12/02/26 11:33	153	712	S	14	14	14	17	18	108	106	0	13.7	
212	CSXT 729	12/02/26 11:30	60	276	N	43	43	43	40	41	97	94	0	13.7	
211	CSXT 729	12/02/26 11:27	60	274	N	86	86	86	35	35	120	117	0	13.7	
210	CSXT 729	12/02/26 11:22	75	392	N	33	33	33	30	30	93	90	0	13.7	
209	CSXT 729	12/02/26 11:15	34	152	N	11	11	11	26	26	86	82	0	13.7	
208	CSXT 729	12/02/26 11:11	160	746	S	85	85	85	26	27	64	62	0	13.7	
207	CSXT 729	12/02/26 11:06	57	258	S	40	40	40	37	38	134	132	0	13.7	
206	CSXT 729	12/02/26 11:01	165	786	N	69	69	69	24	25	66	64	0	13.7	
205	CSXT 729	12/02/26 10:54	74	384	S	25	25	25	15	15	108	106	0	13.7	
204	CSXT 729	12/02/26 10:48	170	826	S	65	65	65	36	36	64	62	0	13.7	

Train Summary Example – SmartScanNG² - Detector at Kilometerpost / Milepost 1111.1 North

For SmartScanNG² detectors, the Train Summary display includes buttons for displaying the detailed data for a train and for exporting the train data in the format described in section 11.0 - Exported Data. See the section below for more information regarding the Train Detail display.



Trn#	Time	TO1	TO2	Axles	Spd	Dir	Alarms
142	13/02/26 09:05:42	14	13	13	12	E	
141	13/02/26 09:04:16	12	12	12	16	W	
140	13/02/26 09:03:09	14	14	14	14	W	
139	13/02/26 08:56:31	16	16	16	11	W	
138	13/02/26 08:55:46	10	10	10	16	W	
137	13/02/26 08:55:03	10	11	10	20	W	

Train Summary Example – iCube Wayside Detector – Kilometerpost / Milepost 1313.3 Track 1

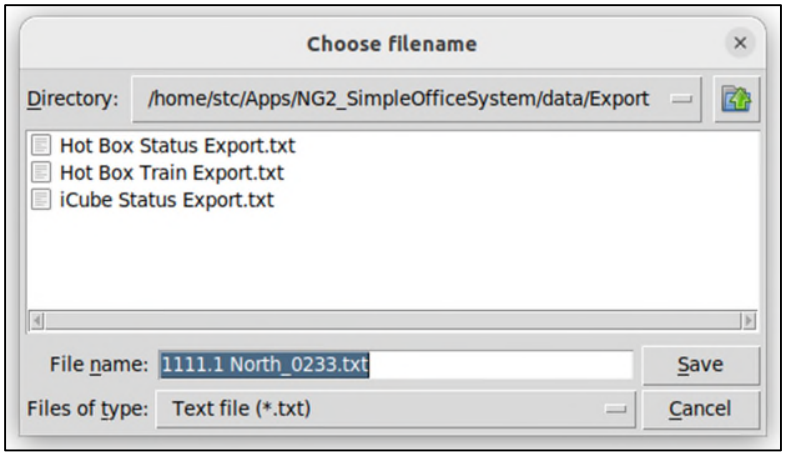
For iCube detectors, the Train Summary display includes a button for exporting the train data in the format described in section 11 of this document.

8.1.1 Exporting Train Data

For both NG2 and iCube detectors, to export the data for a train, select it in the Trains list display, then click the Export Train button to display the Choose Filename dialog. Use the Directory drop-down menu to navigate to the file system location at which the exported train data file should be saved, and modify the suggested filename, if necessary. Click the Save button to save the file.

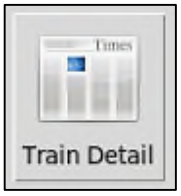
Export Train Button

Train data exported in this is written to a file in a comma-delimited form that can be readily imported into other applications. The format of the data is defined in section 11.0 - Export Data.



Choose Filename dialog – Train #233, Kilometerpost 1111.1, North

8.2 Train Detail Display



To view the detailed data for trains recorded by a SmartScanNG², select the desired train in the detector's Trains list using the keyboard's arrow keys, or by clicking on it, then click the Train Detail button. Alternatively, double-click on the desired train in the Trains list.

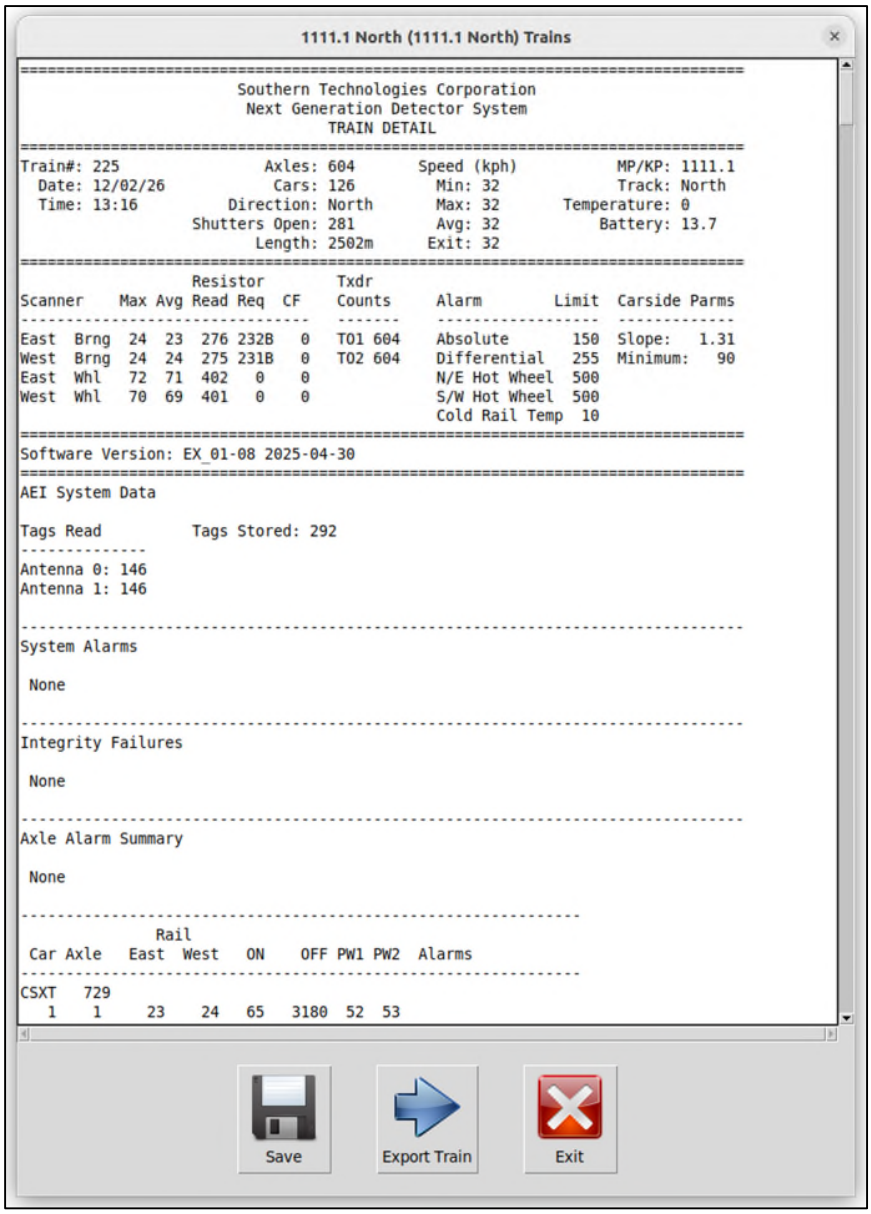
Train Detail Button

1111.1 North (1111.1 North) Trains

Trn#	Lead Loco ID	Arrival Time	Cars	Axles	Dir	MinSpd	MaxSpd	XitSpd	B1Avg	B2Avg	W1M
233	CSXT 729	12/02/26 14:00	99	494	S	30	30	30	29	29	12
232	CSXT 729	12/02/26 13:57	7	34	N	90	90	90	33	34	90
231	CSXT 729	12/02/26 13:49	168	810	S	30	30	30	34	35	86
230	CSXT 729	12/02/26 13:43	139	652	N	85	85	85	18	19	12
229	CSXT 729	12/02/26 13:39	129	618	N	59	59	59	16	16	72
228	CSXT 729	12/02/26 13:35	117	570	N	85	85	85	7	8	12
227	CSXT 729	12/02/26 13:30	167	800	N	80	80	80	13	13	91
226	CSXT 729	12/02/26 13:24	76	406	S	38	38	38	38	39	13
225	CSXT 729	12/02/26 13:16	126	604	N	32	32	32	23	24	72
224	CSXT 729	12/02/26 13:11	153	718	N	96	96	96	42	43	82
223	CSXT 729	12/02/26 13:03	149	696	N	28	28	28	17	17	11
222	CSXT 729	12/02/26 12:56	81	420	N	51	51	51	40	41	13
221	CSXT 729	12/02/26 12:55	32	142	S	70	70	70	16	17	10
220	CSXT 729	12/02/26 12:48	167	800	N	56	56	56	47	47	12

Train #225 selected in Trains list

Clicking the Train Detail button displays the Train Detail report for the selected train.



Train Detail Display Excerpt – SmartScanNG² Detector

For the iCube detectors, there is not a separate train details display. This is because the summary data display includes all of the information available for each train.

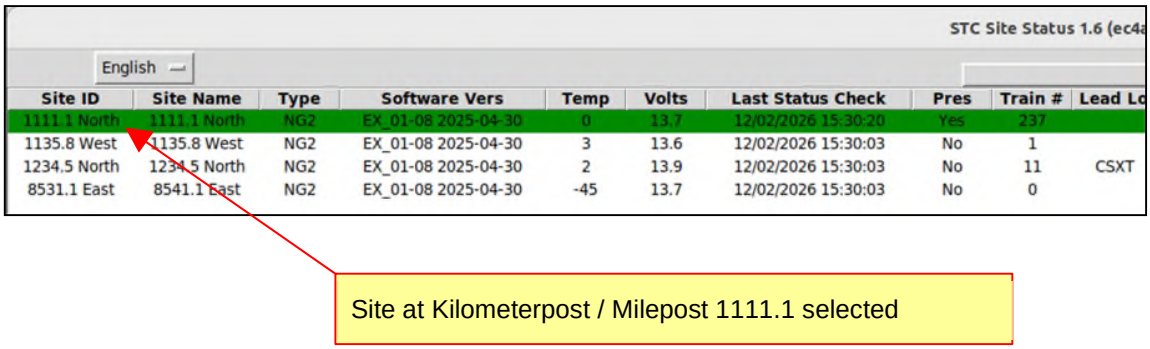
9.0 — Accessing Remote Sites

The Central Office Server application provides shortcuts for connecting directly to the monitored detectors. Once connected, the data stored on a remote detector can be reviewed, and the detector's configuration reviewed and modified. SmartScanNG² detectors support HTTP / Web browser and Telnet connections. The iCube detectors provide Telnet connections only.

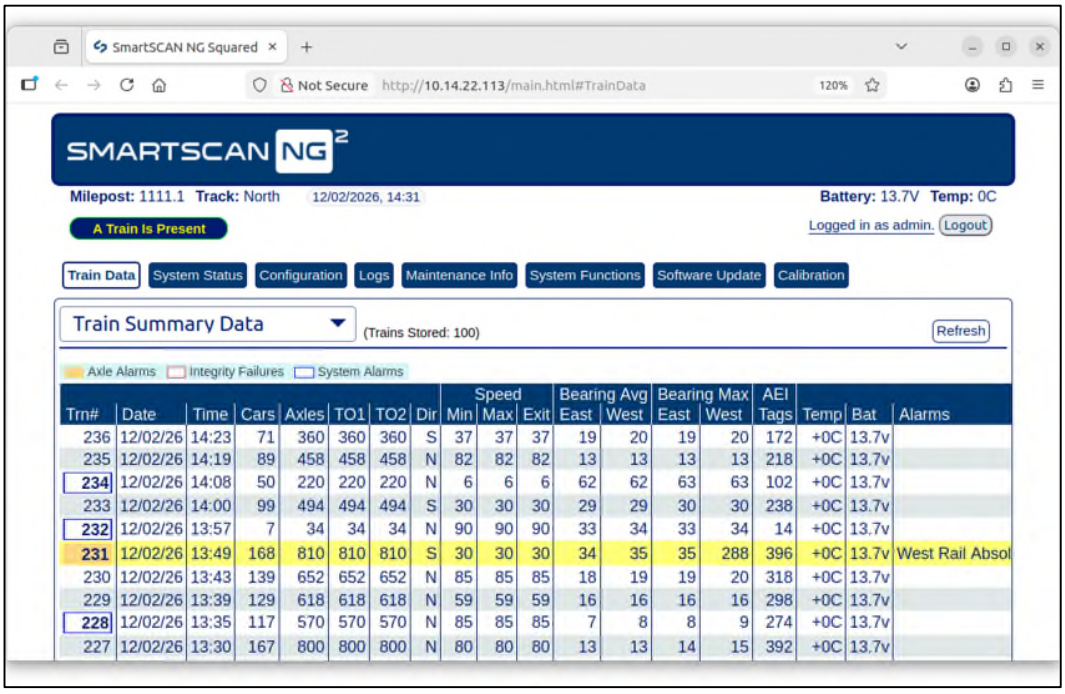
9.1 Web Interface – SmartScanNG²

Web Interface Button

To connect to a SmartScanNG² detector's web page interface, select an NG² detector in the application's main screen list of detectors by clicking on it, then click the Web Interface button at the bottom of the main screen.



Clicking the Web Interface button opens the server's Web browser and attempts to connect to the selected NG^2 detector. Note, if the detector is unreachable via the network, the web browser displays an error message after attempting to connect.



Trn#	Date	Time	Cars	Axles	TO1	TO2	Dir	Speed Min	Speed Max	Speed Exit	Bearing Avg East	Bearing Avg West	Bearing Max East	Bearing Max West	AEI Tags	Temp	Bat	Alarms
236	12/02/26	14:23	71	360	360	360	S	37	37	37	19	20	19	20	172	+0C	13.7v	
235	12/02/26	14:19	89	458	458	458	N	82	82	82	13	13	13	13	218	+0C	13.7v	
234	12/02/26	14:08	50	220	220	220	N	6	6	6	62	62	63	63	102	+0C	13.7v	
233	12/02/26	14:00	99	494	494	494	S	30	30	30	29	29	30	30	238	+0C	13.7v	
232	12/02/26	13:57	7	34	34	34	N	90	90	90	33	34	33	34	14	+0C	13.7v	
231	12/02/26	13:49	168	810	810	810	S	30	30	30	34	35	35	288	396	+0C	13.7v	West Rail Absol
230	12/02/26	13:43	139	652	652	652	N	85	85	85	18	19	19	20	318	+0C	13.7v	
229	12/02/26	13:39	129	618	618	618	N	59	59	59	16	16	16	16	298	+0C	13.7v	
228	12/02/26	13:35	117	570	570	570	N	85	85	85	7	8	8	9	274	+0C	13.7v	
227	12/02/26	13:30	167	800	800	800	N	80	80	80	13	13	14	15	392	+0C	13.7v	

SmartScanNG² Web Page Example

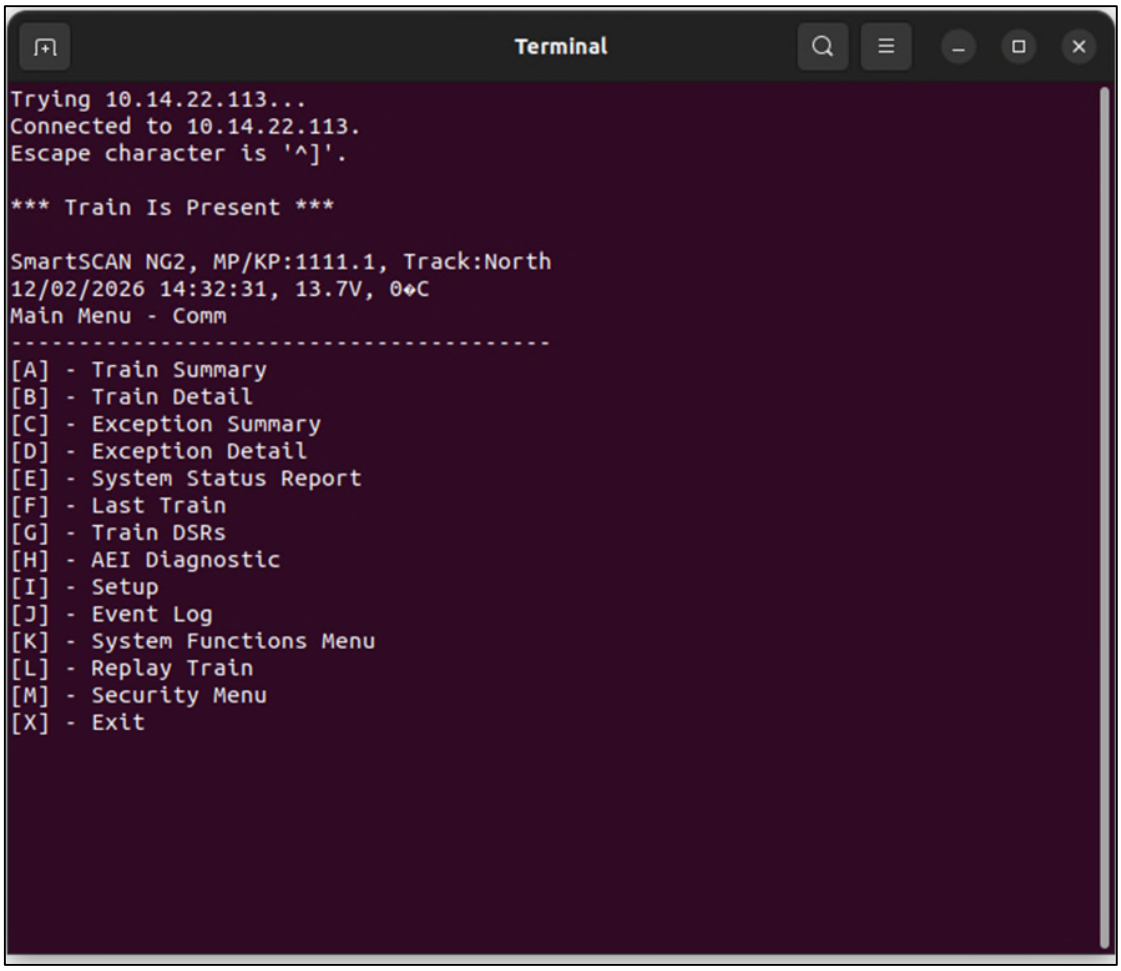
For more information regarding the Web interface, see the Operator's Guide for the SmartScanNG².

9.2 Telnet Interface

Telnet Interface Button

To connect to a SmartScanNG²'s or iCube's Telnet interface, select a detector in the application's main screen list of detectors by clicking on it, then click the Telnet Interface button at the bottom of the main screen.

Clicking the Telnet Interface button opens a terminal and initiates a Telnet connection with the selected detector. Both the SmartScanNG² and the iCube present a collection of menus through the Telnet connection. These menus allow reviewing stored data and modifying the detector's configuration. Note, if the detector is unreachable via the network, the terminal application opens but quickly closes.



Example Telnet connection with a SmartScanNG² site – Main menu displayed

For more information regarding the Telnet interface menus, see the corresponding user guides for the SmartScanNG² and the iCube.

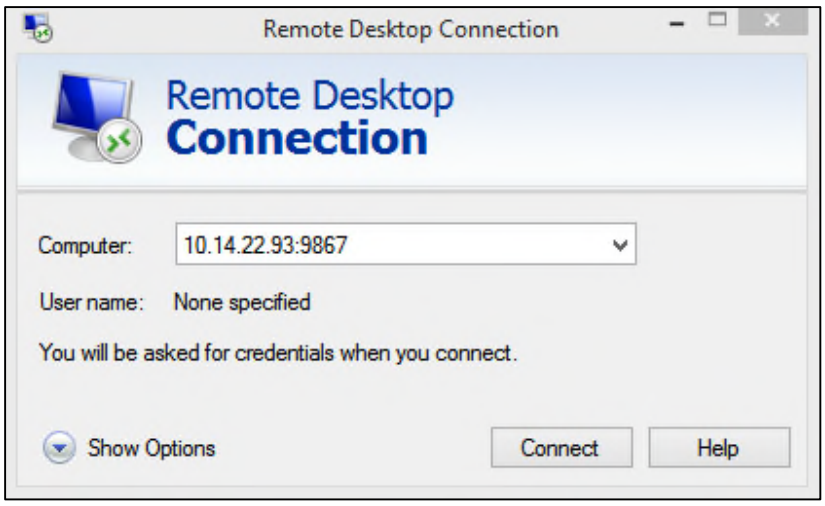
10.0 — Remotely Accessing Server

The Central Office Server computer supports remote connections for viewing and interacting with the server's GUI desktop. When connected in this manner, you can open an instance of the Central Office Server application for a real-time view of remote detector status.

The remote desktop server function of the Central Office server is compatible with the Microsoft Remote Desktop Protocol (MRDP). This should allow a remote connection from any computer running Windows 8, 10, or 11. Some Windows 7 installations may include a remote desktop client.

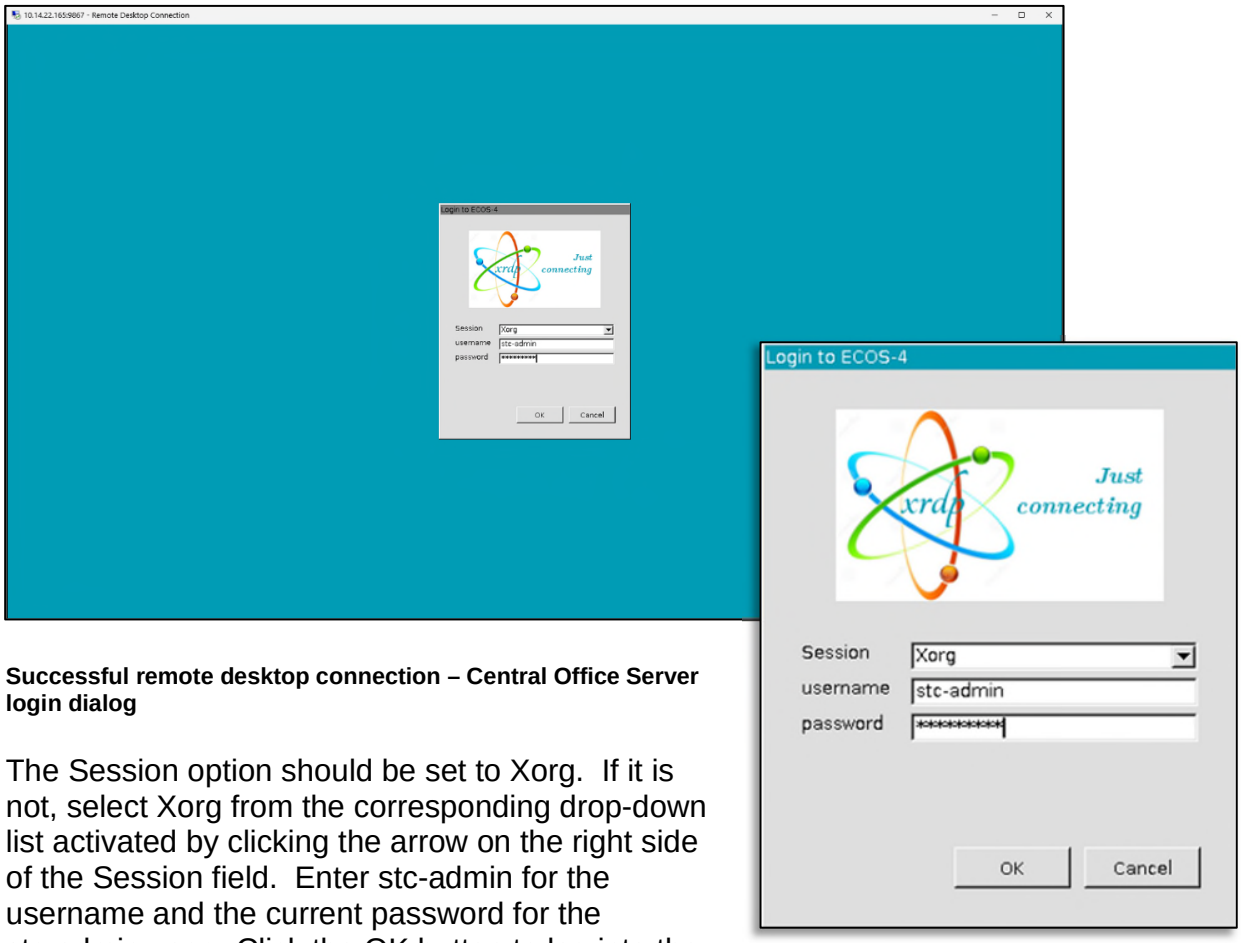
The server supports only one remote connection at a time.

To initiate a remote connection from a computer running a Microsoft operating system, click on Start or press and hold the Windows key and press S to access the Search function. Start typing "remote" and choose the "Remote Desktop Connection" result when it appears. This should produce a dialog similar to the one below.



Remote Desktop Client connection dialog - example

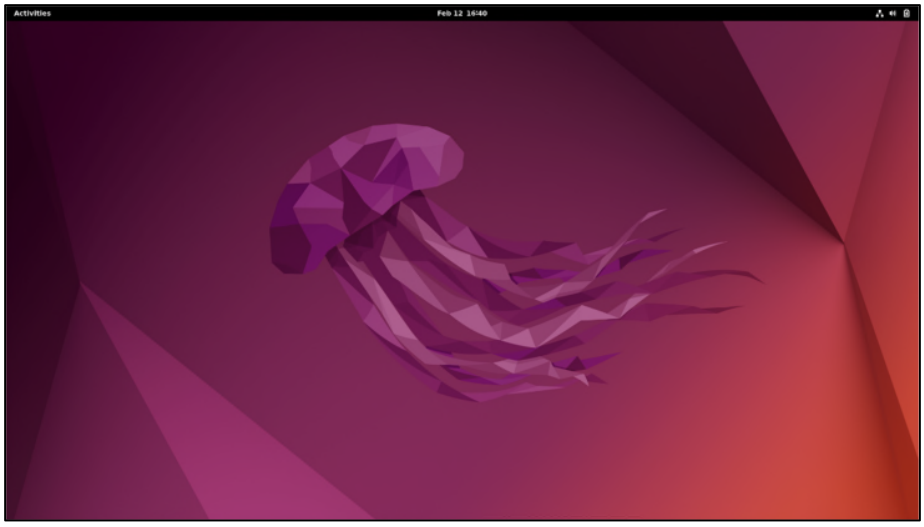
Enter the IP address of the remote server followed by a colon and then the port number 9867. The Central Office Server listens for remote connections on port 9867. Click the "Connect" button. The Remote Desktop Client attempts to connect to the server at the IP address provided. If a connection succeeds, a screen similar to the one below should appear.



Successful remote desktop connection – Central Office Server login dialog

The Session option should be set to Xorg. If it is not, select Xorg from the corresponding drop-down list activated by clicking the arrow on the right side of the Session field. Enter stc-admin for the username and the current password for the stc-admin user. Click the OK button to log into the server.

Upon successfully logging into the server, the remote desktop client should display an instance of the Central Office Server desktop similar to that shown below. Note that, in the image below, the Central Office server software application is **not** currently running.

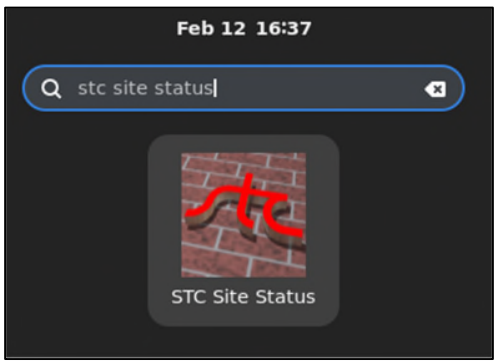


Central Office Server desktop displayed in the remote desktop client

If the Central Office Server application is already running when you connect remotely, close the application by clicking on the Exit button in the lower right-hand corner of the main window. Then, restart the application. The previous instance of the program, left from a prior remote access session, has been in hibernation mode during the time in which no remote connection existed. The displayed data was most likely stale, and the real-time update functionality inoperable. When exiting a remote access session, close the Central Office Server application.

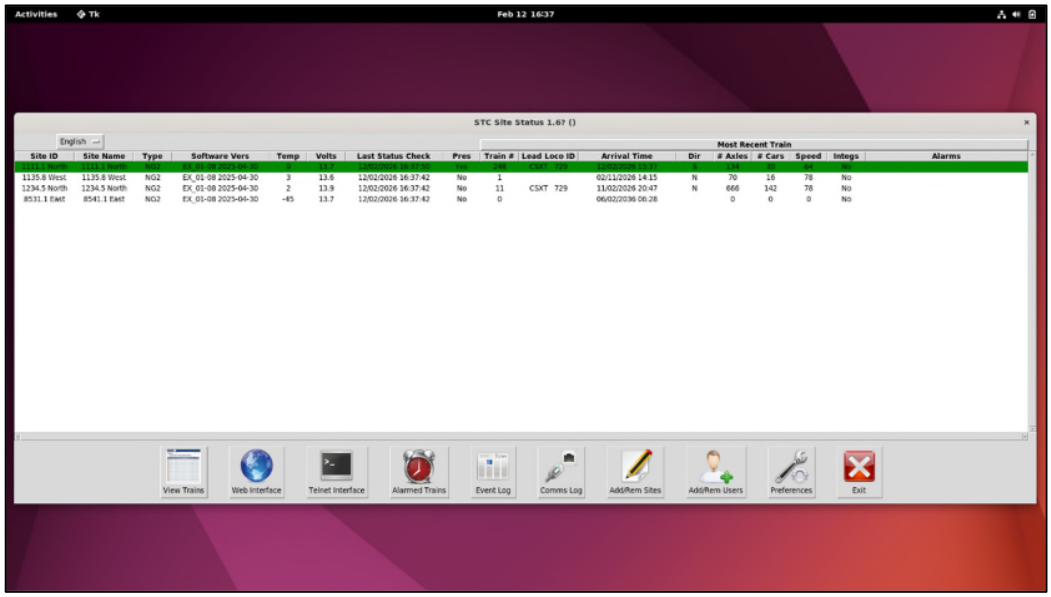
Exit Button

Open the application by pressing the "Super" key (Windows key) and typing "STC Site Status" at the resulting prompt.



Starting the server application

Below is an example of the Central Office Server application running in the remote desktop environment.



Central Office Server Application in the remote desktop environment

Before disconnecting from the Central Office Server (to end a remote session), close the server GUI application by clicking on the Exit button  at the bottom-right of the main application screen.

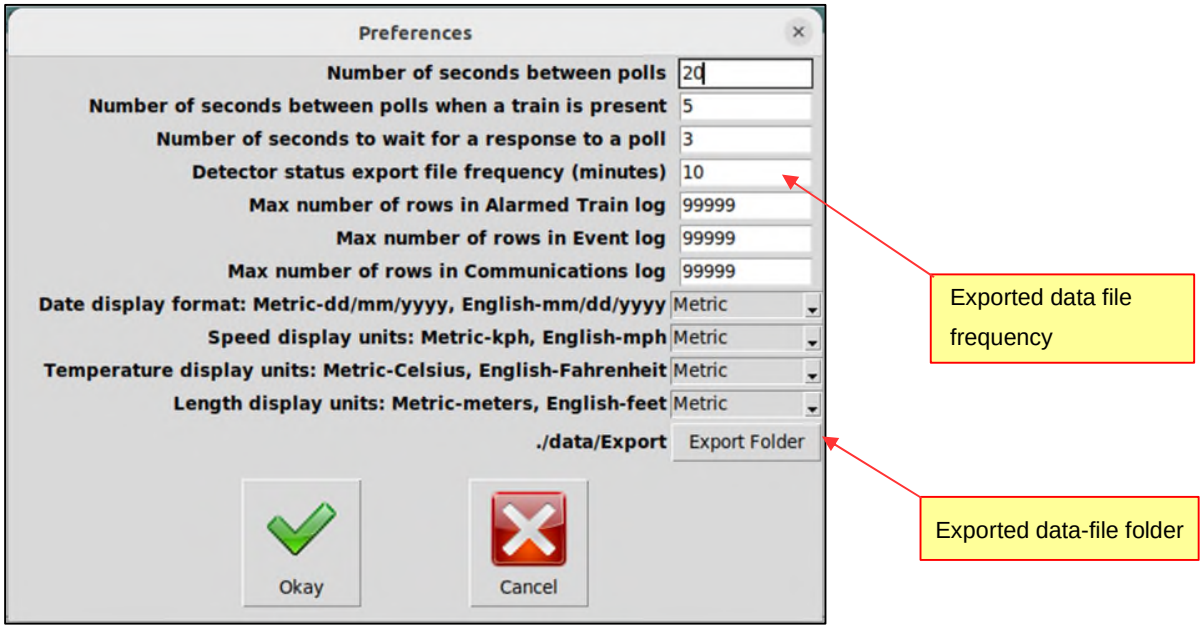
11.0 — Exported Data

To allow other programs to access data stored by the Central Office Server application, the program automatically creates two types of comma delimited text files. It also allows the operator to manually generate a comma limited text file for a particular train record.

11.1 Automatically Generated Export Files

The first type of automatically generated export file contains information about the current status of all the hotbox detectors or iCube units. The second type of file contains data on the last twenty train records for each SmartScanNG[2] or iCube unit. These files are placed in a folder that can be specified by the system manager. To specify this folder, click on the Export File Folder menu item under the setup menu.

The Detector Status files are generated at a frequency that can be set by the user via the "Detector status export file frequency" option on the Preferences display. The minimum frequency allowed is every three minutes, the maximum is every ninety-nine minutes.



Preferences Dialog – Detector Status Export Frequency and Folder Fields

A separate Detector Status export file is maintained for each detector type - one for the SmartScanNG² type and one for the iCube type. By default, these files are written to the folder/directory: /home/Apps/NG2_SimpleOfficeSystem/Export. An alternative location can be specified via the Export Folder option on the Preferences dialog.

The most-recent-trains data files are generated after each train arrival message is received by the server application. A separate train data file is maintained for each detector type.

The following paragraphs describe the two types of automatically generated hotbox detector and iCube unit export files.

11.1.1 Hotbox Status Export File

The SmartScan Central Office Server will periodically create a file called "Hotbox Status Export.txt" which contains status information on all of the SmartScanNG²'s connected to the system.

This file is a comma delimited text file and can be displayed with any word processing program such as Notepad, WordPad or Word. All records (segments) in the file are terminated with a line feed character (Hex 0A).

Each record in the file is called a segment. There are three segment types. The following table defines the segment types and their associated codes:

Segment Code	Maximum Number In File	Description
START	1	Message Header Segment
HOTBOX	100	Hotbox Segment
END	1	Message Trailer Segment

A segment code is at the beginning of each segment. The segment code is separated from the other fields in the segment by a comma. All fields within the segment with the exception of the segment code are in quotations. The following is the general layout of all types of segments:

Segment code, "field 1", "field 2", " field 3", ... <line feed character>

The first segment in the file is the START Message Header. The last segment in the file will be the END Message Trailer. All other segment types must be positioned in the file between the START and END segments.

The HOTBOX segments may be in any order after the START Message Header segment and before the END Message Trailer segment. The following is the general order of the segments within the file:

START
HOTBOX
HOTBOX
HOTBOX
HOTBOX
HOTBOX
HOTBOX
END

Each of the following tables describes the fields for each segment type and includes an example:

START Message Header Segment

Field Number	Data Name	Data Format	Description
ST1	Version	Numeric 1 to 4 digits	Version number of the file format
ST2	Date/Time	MM/DD/YYYY<space>HH:MM:SS	Date and time the file was created MM = month DD = day of month YYYY = year HH = hour MM = minute SS = second

Example:

```
START,"0001","02/08/2003 11:24:37"
```

HOTBOX Segment

Field Number	Data Name	Data Format	Description
HB1	Milepost	Alpha/Numeric 1 to 8 characters	Milepost
HB2	Train Presence	Alpha/Numeric 13 to 16 characters	Indicates with one of the following messages whether (or not) a train is currently present: Train Present No Train Present
HB3	Alarm	Alpha/Numeric 5 to 8	Indicates with one of the following messages whether (or not) the train at the site has an alarm: Alarm No Alarm
HB4	Train Data Queued	Alpha/Numeric 17 to 20	Indicates with one of the following messages whether (or not) the site has a train message queued to be sent to the office: Train Data Queued No Train Data Queued
HB5	Last Message Date/Time	MM/DD/YYYY<space>HH:MM	Date and time the last message was received by the office from the field MM = month DD = day of month YYYY = year HH = hour MM = minute
HB6	Last Train Date/Time	MM/DD/YYYY<space>HH:MM	Date and time the last train data message was received by the office from the field MM = month DD = day of month YYYY = year HH = hour MM = minute
HB7	Battery Voltage	XX.X where X is a digit	Battery voltage in tenths of volts
HB8	Axle Alarm	Alpha/Numeric 6 to 40 characters	Description of axle alarm for the current train. This field will contain None if there is no alarm
HB9	Axle Alarm Date/Time	MM/DD/YYYY<space>HH:MM or None	Date and time the current axle alarm was received or None if no current alarm MM = month DD = day of month YYYY = year HH = hour MM = minute
HB10	Acknowledged By	Alpha/Numeric 1 to 20 characters	Operator name of the individual at the office who acknowledged the alarm

(HOTBOX Segment cont.)

Field Number	Data Name	Data Format	Description
HB11	Acknowledged Date/Time	MM/DD/YYYY<space>HH:MM or None	Date and time the current axle alarm was acknowledged by someone at the office or None if the alarm has not been acknowledged MM = month DD = day of month YYYY = year HH = hour MM = minute
HB12	Last Axle Alarm	Alpha/Numeric 6 to 40 characters	Description of axle alarm for the last alarm received by the office that is not the current alarm. This filed will contain None if there was no last alarm or one of the following: [North][South][East][West] Rail Absolute [North][South][East][West] Rail Differential [North][South][East][West] Hot Wheel [North][South][East][West] Rail Pyro Saturation Carside Slope [North][South][East][West] Side Wide Load [North][South][East][West] Side Dragging Equipment High Load
HB13	Last Axle Alarm Date/Time	MM/DD/YYYY<space>HH:MM or None	Date and time the last axle alarm (not the current axle alarm) was received or None if no last alarm MM = month DD = day of month YYYY = year HH = hour MM = minute
HB14	Hotbox Detector Enable	Enabled or Disabled	Indicates whether the operator has enabled disabled communications
HB15	IP Address	IP address in the form: xxx.xxx.xxx.xxx	The IP address of the NG^2 detector
HB16	TCP Port	Numeric, four digits in the range 1000 to 9999	The TCP port on which the detector listens for polls from the Central Office Server

Example:

```
HOTBOX,"1233.8","No Train Present","Alarm","No Train Data
Queued","01/28/2021 11:46:35","01/28/2021 11:11:35",
"14.9","None","None","Unknown","None","Pre-train Stuck
Dragger","01/27/2021 14:27:18","Enabled","10.14.22.176",
"9876"
```

END Message Trailer Segment

Field Number	Data Name	Data Format	Description
END1	Number of Segments	Numeric 1 to 4 digits	Number of segments in the file not including the START and END segments

Example:

```
END,"1"
```

11.1.2 Hotbox Train Export File

The SmartScan Central Office Server will periodically create a file called "Hotbox Train Export.txt" which contains the last 20 train records from each hotbox detector connected to the system.

This file is a comma delimited text file and can be displayed with any word processing program such as Notepad, WordPad or Word. All records (segments) in the file are terminated with a line feed character (Hex 0A).

Each record in the file is called a segment. There are four segment types. The following table defines the segment types and their associated codes:

Segment Code	Maximum Number In File	Description
START	1	Message Header Segment
TRAIN	2000	Train Header Segment
AXLE	120000	Axle Record Segment
END	1	Message Trailer Segment

A segment code is at the beginning of each segment. The segment code is separated from the other fields in the segment by a comma. All fields within the segment, with the exception of segment code, are in quotations. The following is the general layout of each segment:

Segment code, "field 1", "field 2"," field 3", …<line feed character>

The first segment in the file is the START Message Header. The last segment in the file will be the END Message Trailer. All other segments types must be positioned in the file between the START and END segments.

The TRAIN segment is always followed by the AXLE segments associated with the train. After the last AXLE segment for a train, a new TRAIN segment may follow. The following is the general order of the segments within this type of file:

START
TRAIN
AXLE
AXLE
AXLE
.
.
.
AXLE
TRAIN
AXLE
AXLE
AXLE
.
.
.
AXLE
END

Each of the following tables describes the fields for each segment type and includes an example:

START Message Header Segment

Field Number	Data Name	Data Format	Description
ST1	Version	Numeric 1 to 4 digits	Version number of the file format
ST2	Date/Time	MM/DD/YYYY<space>HH:MM:SS	Date and time the file was created MM = month DD = day of month YYYY = year HH = hour MM = minute SS = second

Example:

```
START,"0001","02/08/2003 11:24:37"
```

TRAIN Segment

Field Number	Data Name	Data Format	Description
TRN1	Train Number	Numeric 1 to 3 digits	Each hotbox unit assigns a unique train number to each train record
TRN2	Milepost	Alpha/Numeric 1 to 8 characters	Milepost of the hotbox detector that reported the train
TRN3	Track Designator	Alpha/Numeric 1 to 21 characters	The identifier of the track the hotbox detector is monitoring
TRN4	Train Status	Hexadecimal 8 digits (0 to F) representing 32 bits. Bit 0 is the least significant bit. Bit 31 is the most significant bit.	This is a 32-bit field with each bit representing an alarm status for the train. Multiple alarms may occur. The following is a list of alarms and their assigned bits: **Bit Alarm** 0 Cold [North][East] Rail 1 Cold [South][West] Rail 2 Cold [North][East] Resistor 3 Cold [South][West] Resistor 4 Dead [North][East] Resistor 5 Dead [South][West] Resistor 6 Successive Cold Rails Exceeded 7 VERY Slow Train 8 Short Train 9 Cold [North][East] Wheel Scanner 10 Successive Cold Resistors Exceeded 11 Successive Cold Wheels Exceeded 12 Successive Cold Wheel Resistors Exceeded 13 Low Battery 14 Dead [South][West] Wheel Scanner Resistor 15 Integrity Failure 16 Stuck Dragger Pretrain 17 Dead Battery 18 Track Circuit Enabled, No Gates 19 Midrange Transducer Miscounts 20 High Range Transducer Miscounts 21 Stuck Dragger During Train Passage 22 Stuck Dragger Recovered 23 Stuck High Load Detector 24 Stuck Wide Load Detector Pretrain [North][East] Side 25 Stuck Wide Load Detector Pretrain [South][West] Side 26 No Approach Track 27 Cold [South][West] Wheel Scanner 28 Cold [North][East] Wheel Scanner Resistor 29 Cold [South][West] Wheel Scanner Resistor 30 Dead [North][East] Wheel Scanner Resistor 31 Test Train

Field Number	Data Name	Data Format	Description
TRN5	Train Date/Time	MM/DD/YYYY <space> HH:MM or "None"	Date and time the train passed the hotbox detector. MM = month DD = day of month YYYY = year HH = hour MM = minute
TRN6	Axle Count	Numeric 1 to 3 digits	Number of axles in the train
TRN7	Car Count	Numeric 1 to 3 digits	Number of cars in the train
TRN8	Ambient Temperature	Numeric 1 to 3 digits with negative sign if negative temperature	Ambient outside temperature in Fahrenheit
TRN9	Train Speed	Numeric 1 to 3 digits	Train's exit speed in miles per hour
TRN10	Battery Voltage	XX.X where X is a digit	Battery voltage in tenths of volts
TRN11	Maximum Heat Rail 1	Numeric 1 to 3 digits	Maximum temperature for Rail 1 in Fahrenheit
TRN12	Maximum Heat Rail 2	Numeric 1 to 3 digits	Maximum temperature for Rail 2 in Fahrenheit
TRN13	Average Heat Rail 1	Numeric 1 to 3 digits	Average temperature for Rail 1 in Fahrenheit
TRN14	Average Heat Rail 2	Numeric 1 to 3 digits	Average temperature for Rail 2 in Fahrenheit
TRN15	Average Resistor Rail 1	Numeric 1 to 3 digits	Average resistor temperature for Rail 1 in Fahrenheit
TRN16	Average Resistor Rail 2	Numeric 1 to 3 digits	Average resistor temperature for Rail 2 in Fahrenheit
TRN17	Maximum Wheel Rail 1	Numeric 1 to 3 digits	Maximum hot wheel temperature for Rail 1 in Fahrenheit
TRN18	Average Wheel Rail 1	Numeric 1 to 3 digits	Average hot wheel temperature for Rail 1 in Fahrenheit
TRN19	Direction	Alpha 4 to 5 characters	Train's direction of travel. The field has one of the following values: North South East West
TRN20	Transducer 1 Count	Numeric 1 to 3 digits	Number of hits on wheel sensor 1
TRN21	Transducer 2 Count	Numeric 1 to 3 digits	Number of hits on wheel sensor 2
TRN22	Two Axle Car Count	Numeric 1 to 3 digits	Number of two axle cars
TRN23	Absolute Limit	Numeric 1 to 3 digits	Absolute temperature limit in Fahrenheit
TRN24	Differential Limit	Numeric 1 to 3 digits	Differential temperature limit in Fahrenheit
TRN25	NE Hot Wheel Limit	Numeric 1 to 3 digits	Hot wheel temperature limit in Fahrenheit for trains heading North or East

Field Number	Data Name	Data Format	Description
TRN26	SW Hot Wheel Limit	Numeric 1 to 3 digits	Hot wheel temperature limit in Fahrenheit for trains heading South or West
TRN27	CS Limit	Numeric 1 to 3 digits	Carside temperature limit in Fahrenheit
TRN28	Carside Slope	X.XX where X is a digit	Carside slope
TRN29	Carside Minimum	Numeric 1 to 3 digits	Carside minimum
TRN30	Maximum Wheel Rail 2	Numeric 1 to 3 digits	Maximum hot wheel temperature for Rail 2 in Fahrenheit
TRN31	Average Wheel Rail 2	Numeric 1 to 3 digits	Average hot wheel temperature for Rail 2 in Fahrenheit
TRN32	Hot Wheel Resistor Rail 1	Numeric 1 to 3 digits	Hot wheel resistor temperature for Rail 1 in Fahrenheit
TRN33	Hot Wheel Resistor Rail 2	Numeric 1 to 3 digits	Hot wheel resistor temperature for Rail 2 in Fahrenheit
TRN34	Cold Rail Temperature	Numeric 1 to 3 digits	Cold rail temperature limit in Fahrenheit
TRN35	Alarm Count	Numeric 1 to 3 digits	Number of alarmed axles
TRN36	Rail 1 Side	Alpha 4 to 5 characters	Rail 1 side designator. The field has one of the following values: North East
TRN37	Rail 2 Side	Alpha 4 to 5 characters	Rail 2 side designator. The field has one of the following values: South West

Example:

```
TRAIN,"139","1233.8","West","00000000","01/28/2021
08:31:00","364","89","57","49","14.90","22","22","22","22","0
","0","26","26","South","364","364","0","150","255","500","50
0","1.00","90","30","29","0","4","10","0","East","West"
```

AXLE Segment

Field Number	Data Name	Data Format	Description
AXLE1	Axle Number	Numeric 1 to 3 digits	Number of the axle from the front of the train. The first axle is 1.
AXLE2	Car Identification	4 alpha characters and 6 numeric digits	Car identification number if the hotbox detector is equipped with an AEI reader and the rail car is tagged
AXLE3	Car Number	Numeric 1 to 3 digits	Number of the car the axle is on. The first car in the train is 1.
AXLE4	Axle Alarm	Alpha/Numeric 6 to 40 characters	Description of axle alarm. This field will contain "None" if there is no alarm or one of the following: [North][East] Rail Absolute [South][West] Rail Absolute [North][East] Rail Differential [South][West] Rail Differential [North][East] Hot Wheel [South][West] Hot Wheel [North][East] Rail Pyro Saturation Alarm [South][West] Rail Pyro Saturation Alarm Carside Slope [North][East] Side Carside Slope [South][West] Side Wide Load [North][East] Side Wide Load [South][West] Side Dragging Equipment High Load
AXLE5	Time On	Numeric 1 to 3 digits	Time in milliseconds the axle was between sensors
AXLE6	Time Off	Numeric 1 to 3 digits	Time in milliseconds it takes for the next axle to hit the first sensor after the previous axle left the last sensor
AXLE7	Rail 1 Temperature	Numeric 1 to 3 digits	Rail 1 temperature in Fahrenheit
AXLE8	Rail 2 Temperature	Numeric 1 to 3 digits	Rail 2 temperature in Fahrenheit
AXLE9	Hot Wheel Rail 1 Temperature	Numeric 1 to 3 digits	Hot wheel temperature on Rail 1 in Fahrenheit
AXLE10	Hot Wheel Rail 2 Temperature	Numeric 1 to 3 digits	Hot wheel temperature on Rail 2 in Fahrenheit

Example:

```
AXLE,"1","","1","None","25","0","22","21","6","6"
```

END Message Trailer Segment

Field Number	Data Name	Data Format	Description
END1	Number of Segments	Numeric 1 to 4 digits	Number of segments in the file not including the START and END segments

Example:

```
END,"1"
```

11.1.3 iCube Status Export File

The SmartScan Central Office Server will periodically create a file called "iCube Status Export.txt" which contains status information on all of the iCube units connected to the system.

This file is a comma delimited text file and can be displayed with any word processing program such as Notepad, WordPad or Word. All records (segments) in the file are terminated with a line feed character (Hex 0A).

Each record in the file is called a segment. There are three segment types. The following table defines the segment types and their associated codes:

Segment Code	Maximum Number In File	Description
START	1	Message Header Segment
ICUBE	100	iCube Segment
END	1	Message Trailer Segment

A segment code is at the beginning of each segment. The segment code is separated from the other fields in the segment by a comma. All fields within the segment with the exception of the segment code are in quotations. The following is the general layout of all types of segments:

Segment code, "field 1", "field 2"," field 3", ... <line feed character>

The first segment in the file is the START Message Header. The last segment in the file will be the END Message Trailer. All other segment types must be positioned in the file between the START and END segments.

The ICUBE segments may be in any order after the START Message Header segment and before the END Message Trailer segment. The following is the general order of the segments within the file:

START
ICUBE
ICUBE
ICUBE
ICUBE
ICUBE
ICUBE
END

Each of the following tables describes the fields for each segment type and includes an example:

START Message Header Segment

Field Number	Data Name	Data Format	Description
ST1	Version	Numeric 1 to 4 digits	Version number of the file format
ST2	Date/Time	MM/DD/YYYY<space> HH:MM:SS	Date and time the file was created MM = month DD = day of month YYYY = year HH = hour MM = minute SS = second

Example:

```
START,"0001","01/28/2021 11:24:37"
```

ICUBE Segment

Field Number	Data Name	Data Format	Description
SM1	Milepost	Alpha/Numeric 1 to 8 characters	Milepost
SM2	Train Presence	Alpha/Numeric 13 to 16 characters	Indicates with one of the following messages whether (or not) a train is currently present: Train Present No Train Present
SM3	Alarm	Alpha/Numeric 5 to 8 characters	Indicates with one of the following messages whether (or not) the train at the site has an alarm: Alarm No Alarm

Field Number	Data Name	Data Format	Description
SM4	Train Data Queued Channel A	Alpha/Numeric 17 to 20 characters	**This field is not implemented in the iCube.** It is included to keep the message structure compatible with the (legacy) implementation for the SmallTalk Defect Detector. The field contents is always: No Data Queued
SM5	Train Data Queued Channel B	Alpha/Numeric 17 to 20 characters	**This field is not implemented in the iCube.** It is included to keep the message structure compatible with the (legacy) implementation for the SmallTalk Defect Detector. The field contents is always: No Data Queued
SM6	Battery Status	Alpha/Numeric 10 to 11 characters	Indicates with one of the following messages the battery status: Low Battery Battery Ok
SM7	Last Message Date/Time	MM/DD/YYYY<space> HH:MM	Date and time the last message was received by the office from the field MM = month DD = day of month YYYY = year HH = hour MM = minute
SM8	Last Train Date/Time	MM/DD/YYYY<space> HH:MM	Date and time the last train data message was received by the office from the field MM = month DD = day of month YYYY = year HH = hour MM = minute
SM9	Axle Alarm	Alpha/Numeric 4 to 22 characters	Description of axle alarm for the current train. This field will contain "None" if there is no alarm, or one of the following: Dragging Equipment High Load Wide Load North Rail Wide Load South Rail Wide Load East Rail Wide Load West Rail

Field Number	Data Name	Data Format	Description
SM10	Axle Alarm Date/Time	MM/DD/YYYY<space> HH:MM	Date and time the current axle alarm was received or "None" if no current alarm MM = month DD = day of month YYYY = year HH = hour MM = minute
SM11	Acknowledged By	Alpha/Numeric 1 to 20 characters	Operator name of the individual at the office who acknowledged the alarm
SM12	Acknowledged Date/Time	MM/DD/YYYY<space> HH:MM	Date and time the current axle alarm was acknowledged by someone at the office or "None" if the alarm has not been acknowledged MM = month DD = day of month YYYY = year HH = hour MM = minute
SM13	Last Axle Alarm	Alpha/Numeric 4 to 22 characters	Description of axle alarm for the last alarm received by the office that is not the current alarm. This field will contain "None" if there is no last alarm, or one of the following: Dragging Equipment High Load Wide Load North Rail Wide Load South Rail Wide Load East Rail Wide Load West Rail
SM14	Last Axle Alarm Date/Time	MM/DD/YYYY<space> HH:MM	Date and time the last axle alarm (not the current axle alarm) was received or "None" if no last alarm MM = month DD = day of month YYYY = year HH = hour MM = minute
SM15	iCube Enable	Alpha/Numeric 7 to 8 characters	Indicates whether the operator has enabled or disabled communications and will contain one of the following: Enabled Disabled
SM16	IP Address	IP address in the form: xxx.xxx.xxx.xxx	The IP address of the NG^2 detector
SM17	TCP Port	Numeric, four digits in the range 1000 to 9999	The TCP port on which the detector listens for polls from the Central Office Server

Example:

```
ICUBE,"3141.5","No Train Present","Alarm","No Train Data
Queued","No Train Data Queued","Battery Ok","01/28/2021
11:52:56","01/28/2021 11:11:52","None","None","Unknown",
"None","Dragging Equipment","01/28/2021 09:20:36","Enabled",
"10.14.22.238","9876"
```

END Message Trailer Segment

Field Number	Data Name	Data Format	Description
END1	Number of Segments	Numeric 1 to 4 digits	Number of segments in the file not including the START and END segments

Example:

```
END,"1"
```

11.1.4 iCube Train Export File

The SmartScan Central Office Server will periodically create a file called "iCube Train Export.txt" which contains the last 20 train records from each iCube unit connected to the system.

This file is a comma delimited text file and can be displayed with any word processing program such as Notepad, WordPad or Word. All records (segments) in the file are terminated with a line feed character (Hex 0A).

Each record in the file is called a segment. There are four segment types. The following table defines the segment types and their associated codes:

Segment Code	Maximum Number In File	Description
START	1	Message Header Segment
TRAIN	2000	Train Header Segment
AXLE	120000	Axle Record Segment
END	1	Message Trailer Segment

A segment code is at the beginning of each segment. The segment code is separated from the other fields in the segment by a comma. All fields within the segment with the exception of segment code are in quotations. The following is the general layout of each segment:

Segment code, "field 1", "field 2"," field 3", …<line feed character>

The first segment in the file is the START Message Header. The last segment in the file will be the END Message Trailer. All other segments types must be positioned in the file between the START and END segments.

The TRAIN segments is always followed by the AXLE segments associated with the train. **AXLE segment will only be created for axles that have alarms**. After the last AXLE segment for a train, a new TRAIN segment may follow. The following is the general order of the segments within this type of file:

START
TRAIN
AXLE
AXLE
AXLE
.
.
.
AXLE
TRAIN
AXLE
AXLE
AXLE
.
.
.
AXLE
END

Each of the following tables describes the fields for each segment type and includes an example:

START Message Header Segment

Field Number	Data Name	Data Format	Description
ST1	Version	Numeric 1 to 4 digits	Version number of the file format
ST2	Date/Time	MM/DD/YYYY<space> HH:MM:SS	Date and time the file was created MM = month DD = day of month YYYY = year HH = hour MM = minute SS = second

Example:

```
START,"0001","01/28/2021 11:24:37"
```

Train Segment

Field Number	Data Name	Data Format	Description
TRN1	Channel		**This field is not implemented in the iCube.** It is included to keep the message structure compatible with the (legacy) implementation for the SmallTalk Defect Detector. The field contents is always an empty string.
TRN2	Train Number	Numeric 1 to 3 digits	Each iCube unit assigns a unique train number to each train record on each channel
TRN3	Milepost	Alpha/Numeric 1 to 8 characters	Milepost of the hotbox detector that reported the train
TRN4	Track Designator	Alpha/Numeric 1 to 21 characters	The identifier of the track with which the train is associated.
TRN5	Train Status	Hexadecimal 4 digits (0 to F) representing 16 bits. Bit 0 is the least significant bit. Bit 15 is the most significant bit.	This is a 16-bit field with each bit representing an alarm status for the train. Multiple alarms may occur. The following is a list of alarms and their assigned bits: **Bit** **Alarm** 0 Wide Load Detector Malfunction 1 Not Assigned 2 Stuck Dragger Recovered 3 Stuck Dragger Pretrain 4 Test Train 5 Maximum Alarms Exceeded 6 Stuck Dragger During Train Passage 7 Low Battery 8 Not Assigned 9 Not Assigned 10 Not Assigned 11 Not Assigned 12 Not Assigned 13 Not Assigned 14 Not Assigned 15 Not Assigned
TRN6	Train Date/Time	MM/DD/YYYY<space>HH:MM or "None"	Date and time the train passed the iCube. MM = month DD = day of month YYYY = year HH = hour MM = minute
TRN7	Axle Count	Numeric 1 to 3 digits	Number of axles in the train
TRN8	Alarm Counter	Numeric 1 to 3 digits	Number of alarmed axles

Example:

```
TRAIN,"","139","3141.5","Track 2","0000","01/28/2021
11:11:52","180","2"
```

AXLE Segment

Field Number	Data Name	Data Format	Description
AXLE1	Axle Number	Numeric 1 to 3 digits	Number of the axle from the front of the train. The first axle is 1.
AXLE2	Axle Alarm	Alpha/Numeric 9 to 22 characters	Description of axle alarm. This field will contain "None" if there is no alarm or one of the following: Dragging Equipment High Load Wide Load North Rail Wide Load South Rail Wide Load East Rail Wide Load West Rail
AXLE3	Alarm Time	MM/DD/YYYY<space> HH:MM or "None"	Date and time the alarm was stored. MM = month DD = day of month YYYY = year HH = hour MM = minute

Example:

```
AXLE,"26","High Load","01/28/2021 11:11:52"
```

END Message Trailer Segment

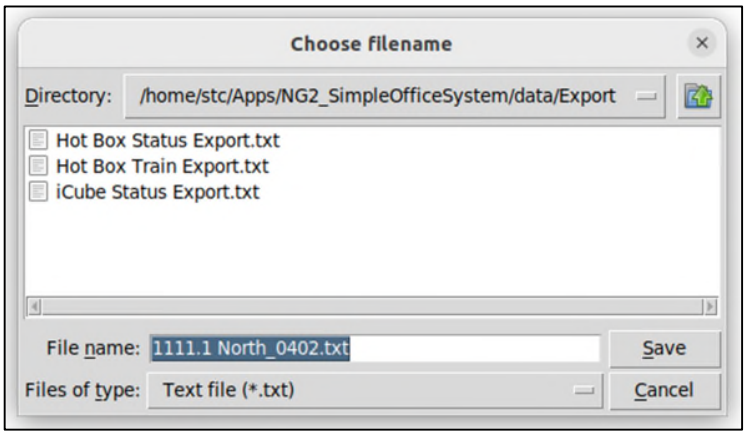
Field Number	Data Name	Data Format	Description
END1	Number of Segments	Numeric 1 to 4 digits	Number of segments in the file not including the START and END segments

Example:

```
END,"1"
```

11.2 Manually Generated Export Files

The operator can manually generate an export file for a particular train by clicking the Export Train button on the detector Trains list display (see section 8.1.1), or on the SmartScanNG² Train Details display (see section 8.2). The Choose Filename dialog will then appear and prompt the operator to enter a file name and choose a file-system folder. Once entered, the file will be created and will have the same format as the Hotbox Train Export file or iCube Export file (as described above) with the exception that only one train will be reported.



The Choose Filename dialog – Exporting a data file for train #402

12.0 Customer Service

At STC, the customer is number one. STC is committed to products that work and customers that are satisfied. Nothing less is acceptable. This section tells how to get answers for questions, fixes for problems, and parts for spares.

12.1 Reaching STC

You can reach STC by mail, phone, fax, and email. By *mail*, you can reach STC at:

Southern Technologies Corporation
6145 Preservation Drive
Chattanooga, Tennessee 37416-3638

Mail and shipments are replied to as soon as possible, normally within one working day. Equipment repair may take longer.

By *telephone,* except on major holidays, you can reach STC at 423-892-3029, Monday through Friday, from 8:00 a.m. until 5:00 p.m. EST. After business hours, a machine answers the calls. These calls are returned promptly the next business day. By *fax*, you can reach STC at 423-499-0045. The fax machine can receive faxes at all times. Faxes are replied to as soon as possible, normally within one working day. By E*mail,* you can reach STC at stcemail@southern-tech.com. Email is replied to as soon as possible, normally within one working day.

12.2 Returning Equipment for Repair

Return any defective or malfunctioning equipment to STC for repair or replacement. You don't need a return authorization number. You don't even need to make a phone call first. Just ship it directly to the **Repair Department** at the address above.

With the returned equipment, include:

- complete address where the equipment is to be returned;
- name and phone number of the person who should be contacted to answer questions about the equipment;
- a written explanation of the equipment defect or malfunction;
- any reports or other data that would help diagnose the problem;
- if out of warranty, Purchase Order number for the order *or* credit card number (to be charged) with its expiration date.

12.3 Reporting Problems or Suggestions

If you have any problems, suggestions, or questions related to STC equipment, phone the **Engineering Department** at the phone number above. When calling, state the equipment you are calling about. Your call will then be directed to the right person.

12.4 Ordering Spare Parts

If you need any spare parts to support STC equipment, phone or fax the **Sales Department** at the phone numbers provided.

When calling, state that you are calling to order parts. Your call will then be directed to the right person. When placing the order, reference the STC part numbers listed in this guide. However, if you don't have the part numbers, the sales staff can obtain them for you and provide you with current pricing and availability.

When faxing, include:

- Purchase Order number for the order *or* credit card number (to be charged), with its expiration date;
- complete address where the parts are to be shipped;
- complete address where the invoice is to be mailed;
- name and phone number of the person who should be contacted to answer questions about the order;
- your fax number, if available;
- for each item ordered, part number, complete description, and quantity needed.

12.5 Checking on Shipments and Orders

If you need to check on the status of any shipment or order, phone or fax the **Sales Department** at the phone numbers above.

When calling, state that you are checking the status of a shipment or order. Your call will then be directed to the right person. Have your Purchase Order Number ready when you call. However, if you don't have the order number, the sales staff can obtain it for you and provide you with the status of the shipment or order.

When faxing, include:

- Purchase Order number for the shipment or order being checked;
- name and phone number of the person who should be contacted after the order status is checked;
- your fax number, if available.

Index

This section lists the page numbers for keywords and phrases used in this guide.

S

T

U

W