



XSD-1000 Scrap Monitoring System

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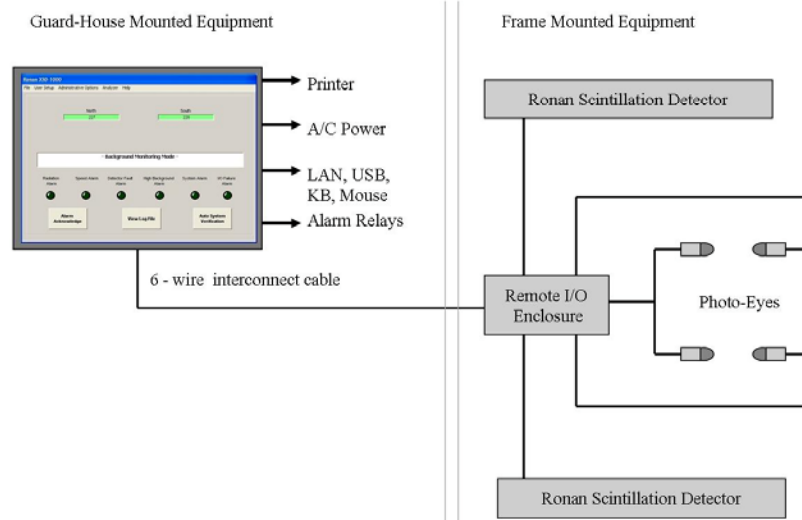
Notices

NOTICE

It is illegal to run Microsoft® Office Automation and Personal Computing Functions on this system, except for network/Internet browsing functionality.

Overview

The Ronan XSD-1000 Series Scrap Detectors are designed to be the most sensitive units on the market. The units will self-calibrate to the background radiation during power up and require little maintenance thereafter.



The picture above defines the major components of the Ronan XSD-1000 System:

Monitor Panel – This is the computer, display screen, touch panel, alarm relay, and communications panel. The touch screen is for acknowledging alarms and performing a System Verify function. Setup and options selection is via a keyboard and mouse and requires key-lock access.

6-Wire Interconnect Cable – This cable supplies power and communications to the Remote I/O modules, detectors, and photo-eyes.

Remote I/O Enclosure – This is a small NEMA 4 enclosure that houses the Remote I/O modules. There is one module for each detector, and one or two digital modules for the photo-eyes (depending on how many photo-eyes you have), and one or two relay output modules for optional controls.

Scintillator Detectors – These are the large, crystal and electronics packages. They detect nuclear radiation and report the results to the Scintillation Input Remote I/O modules.

Photo-Eyes – These are in pairs. Each pair has one Transmitter and one Receiver. Typical systems have two pairs of photo-eyes, one pair at each end of the Scintillation Detectors. They are wired to the Digital Input Remote I/O modules.

Operational Overview

The XSD-1000 Monitoring System executes on a Microsoft Windows® XP Embedded-based operating system. The embedded software is intended for use strictly as a monitoring device. The hard disk is divided into two partitions: one for the operating system and associated programs (Drive C) and one for the XDS-1000 data files (Log, Configuration, and History files, Drive D). The primary partition (operating system and associated program files) is typically write-protected. This ensures that unauthorized re-configuration of the operating system or unauthorized driver installation will be discarded at the next system boot (power off and on cycle).

If you wish to configure the system see the appendix section Operating System Configuration for hard disk access (Drive C: is write-protected and contains Windows and the XDS-1000 program files). This access will permit you to configure the system (LAN/WAN connections, Windows printer selection, etc.), then reboot to save your configuration settings and re-enable the disk-write protection function. For security reasons, this appendix should be removed and stored separately from the manual to prevent unauthorized writes to your hard disk.

The system is designed for a no-logon-required boot, and to auto-start the XSD-1000 software. Configuration changes to the XSD-1000 system do not require that the above procedure be performed, as the configuration settings for the XSD-1000 are stored on the non-write protected partition. A password is required to exit the XSD-1000 software.

The data files for the XSD-1000 (Log Files, and AssetMgmt file) are stored on the D: drive of your system. These files are Microsoft Access (.MDB) standard files. If you plan to access these files over your local network, you may want to configure the D: drive (and/or just the Log sub-directory) as a shared drive/directory. This will allow you to consolidate any number of XSD-1000 files into a host system running Microsoft Access. Make sure you use a unique System ID (set in the XSD-1000 menus) for each system to identify the file source.

When updates to your XSD-1000 system become available, you will be notified by e-mail. They will be made accessible on the Ronan web site. Following is a typical scenario for updating your system.

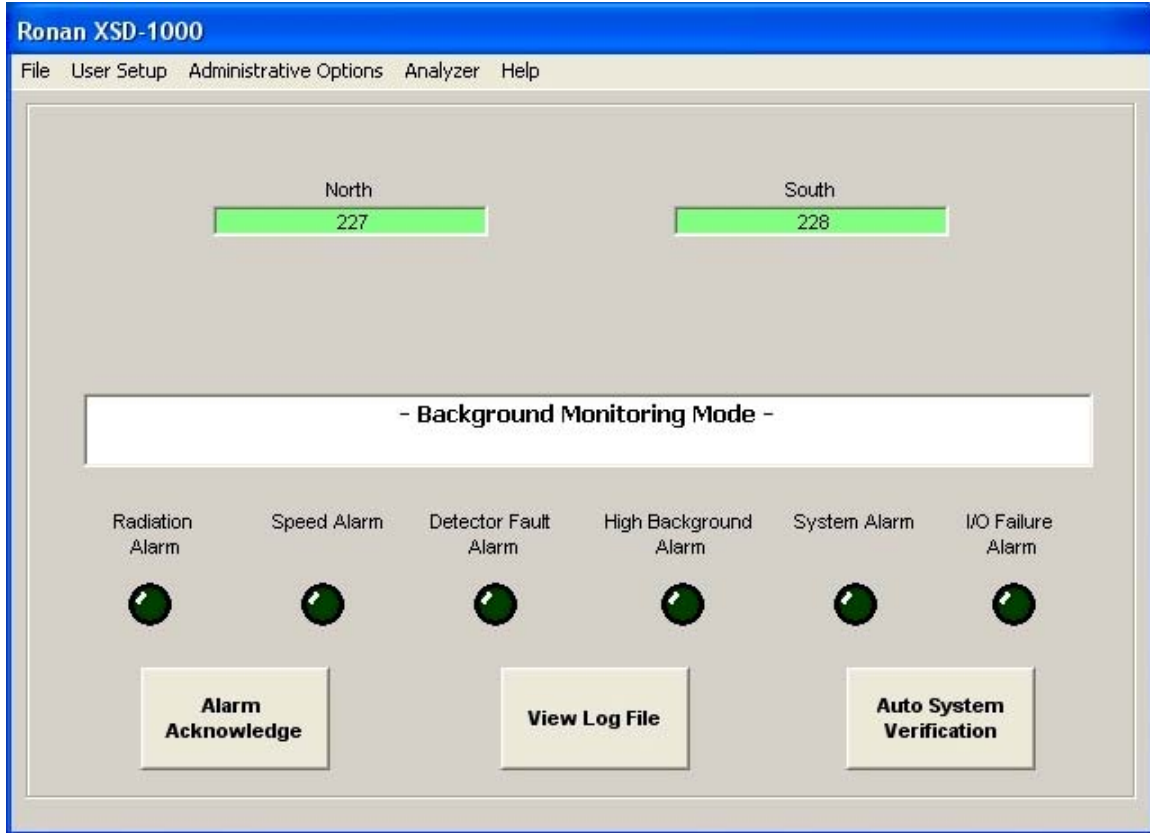
- You will need to download the file (typical file name: Update mm-dd-yy.exe) from the Ronan web site into the directory: 'C:\XSD-1000Update' on the XSD-1000 system.
- Once downloaded, make sure you exit the XSD-1000 software and that no other programs are running.
- Browse to the C:\XSD-1000Update directory and click on the file you just downloaded. This will cause the downloaded file to self-extract the contained files. Allow the system to extract the files into the current directory.
- Exit the extraction windows and explorer.

- Within one minute, the system will recognize the files, display a prompt, save the current files, perform the update, then re-boot the system.
- At this point, the XSD-1000 system has been updated and restarted.

Instructions for obtaining a particular update will appear in the e-mail, and be posted on the web site.

A number of printer support files are included with the system. The XSD-1000 system will use the printers selected in your Windows setup. Should you need to load additional printer drivers, follow the instructions in the appendix to first disable the write-protection manager, then install your files and re-boot the system to re-enable the write-protection manager.

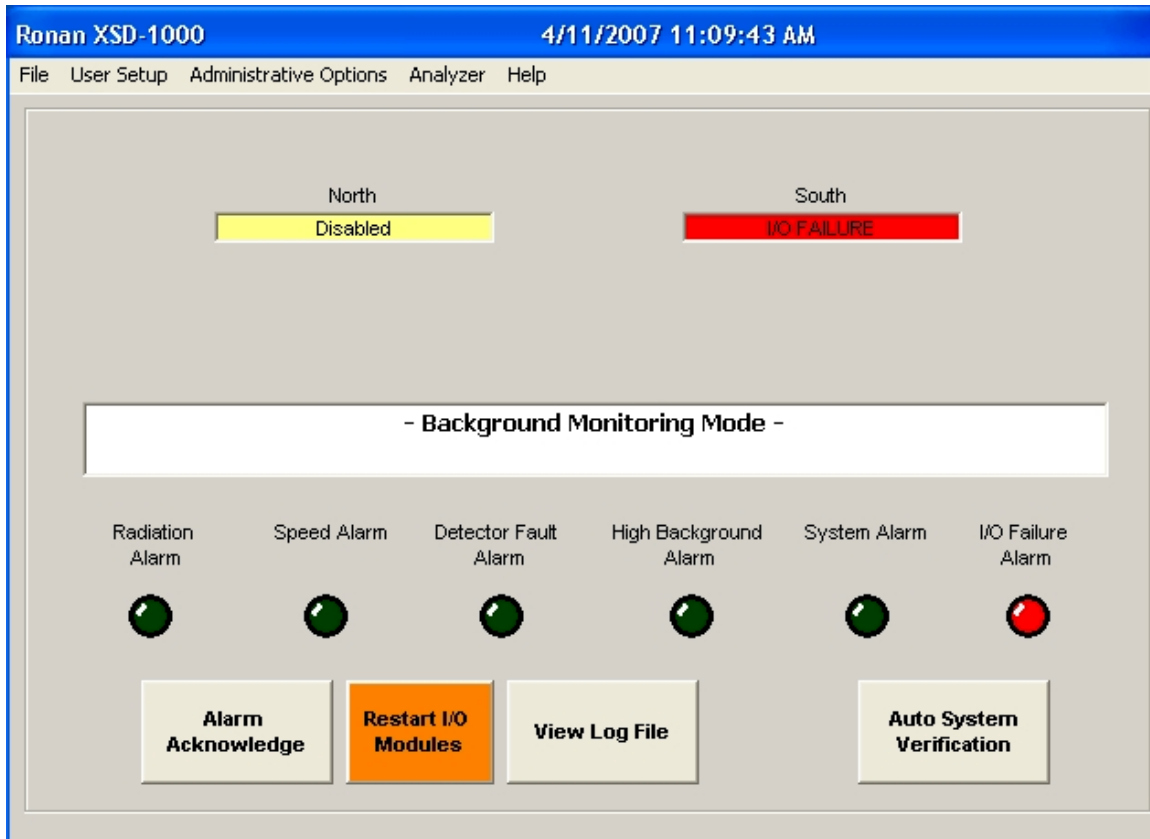
Main Screen



The System Title is displayed at the very top. Below the title is the Main Screen Menu Bar. This menu bar is only displayed if the key-locked access switch is off. Clicking on the active menu bar items grants access to the options and software setup.

Below the Menu Bar is the Detector Status box. There is a green box in this area available for each detector position (up to 12). If a detector is enabled and functional, the associated box will be green with the average counts displayed during Background mode or the raw counts during Truck Present mode. If a detector is enabled, but fails, the box will turn red with a message 'I/O Failure', and trigger an alarm. If you disable a detector, its associated box will display yellow with the message 'Disabled' in it.

Below the Detector Status box is the System Status Bar. This bar displays the current mode (Background or Truck Present), status, error messages, etc. It also acts as a progress bar during startup and detector stabilization.



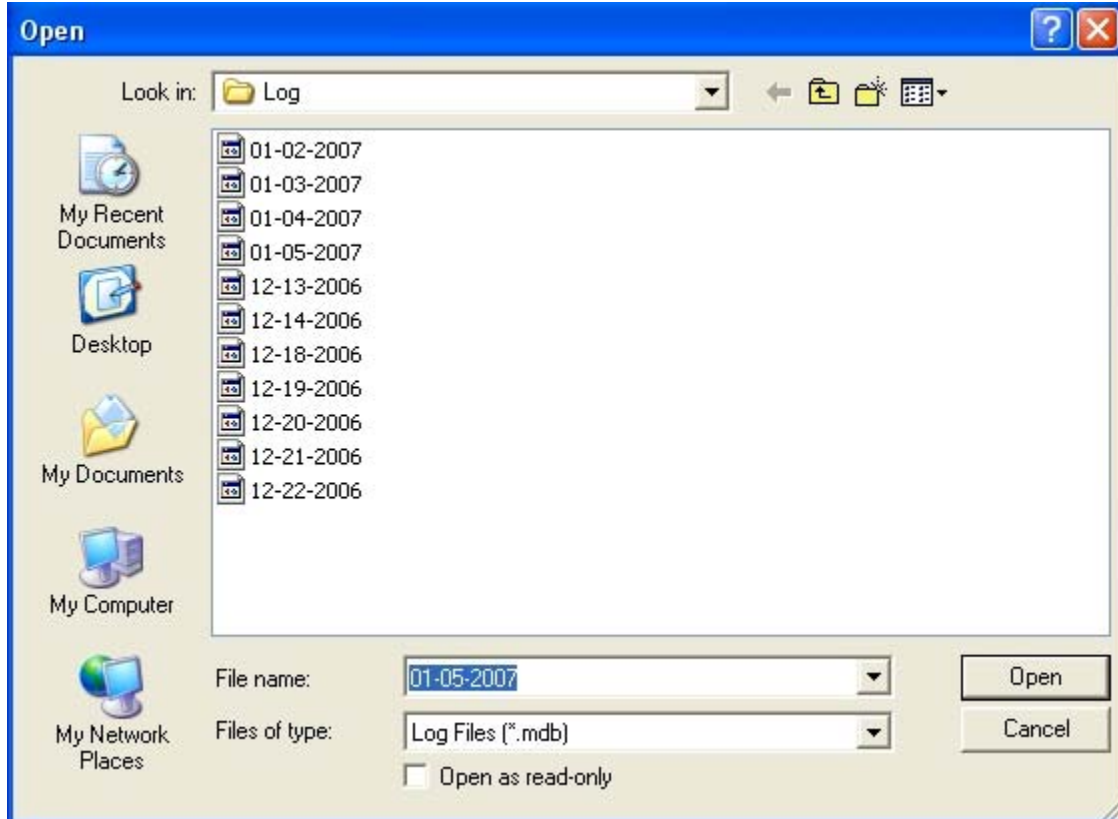
Below the System Status Bar are the Alarm LEDs. If an alarm is triggered, the associated LED will turn red. Touch the Alarm Acknowledge button to turn the alarm off. Some alarms, such as Detector Failure, will re-trigger on the next communications cycle, and will require that you disable that detector to stop the alarm.

The button next to the Alarm Acknowledge is the Restart I/O Modules button. This button will appear on an I/O failure to permit restarting the communications when the failure is remedied.

Next is the View Log File. Pressing this button will bring up the current Log File. To view other Log Files, use the mouse to access the File – View Log File menu item.

The last button is the Auto System Verification touch button. This is for activating the Automatic System Verification function periodically and performing integrity tests on the detectors, photo-eyes and alarm relays. This Auto System Verification function will automatically progress through the tests (if each one is successful) for one-man operation.

Log File Viewing



The Log File is a hard disk file that is written to based on the events you have enabled in the User Setup-Events Logging options. All selected events will be written to the file if and when they occur. This is a Microsoft® Access file that can be printed, viewed outside the XSD-1000 software, and/or sent over a communications line to another computer.

Selecting the File-View Log File menu entry brings up the above display of all log files stored on your system. You can select which file to display.

If you select the View Log File hot button on the main screen, only the current active log file will be displayed.

File View

\\Ronan\vol1\USERS\ENGINEER\CHUCKB\Interceptor\Interceptor\Interceptor\Log\12-20-

EventTime	EventDescription	TruckID
13:48:19	Truck Scan Starting; Forward Direction	18
13:48:20	Speed Alarm: 12KPH	18
13:48:28	Truck Scan Complete	18
13:48:37	Truck Scan Starting; Forward Direction	19
13:48:38	Speed Alarm: 27KPH	19
13:48:49	Radiation Alarm 8, Detector South	19
13:48:49	Radiation Alarm 3, Detector North	19
13:48:49	Radiation Alarm 4, Detector North	19
13:48:49	Radiation Alarm 5, Detector North	19
13:48:49	Radiation Alarm 6, Detector North	19
13:48:49	Radiation Alarm 7, Detector North	19
13:48:49	Radiation Alarm 8, Detector North	19

Print Close

The current Log File name will be the current system date. For example: 05-25-2006.mdb. The file will be created when the system is initially powered up, and when the expiration time elapses. The expiration time is set up in the Administrative Options – File – Log Files Creation menu.

If the system is powered down, then powered back up in the same day, the system will re-open the same file and append to it. The current Log File is the default.

Use the scroll bar on the right side of the display to view events beyond what the screen is displaying. If you have the Image Capture option, there will be a window to the right of the data display. This window is for viewing captured images from a camera when a particular alarm event has been selected.

If an alarm condition is listed for a particular Truck ID, you can click (or touch) the Truck Scan Starting entry to display the Approximate Source Location picture as displayed after a Truck Present Cycle when an alarm occurs.

User Setup

This set of menus allows non-password protected options. These options (other than the Detector Status) typically do not affect local system operation.

Detector Names/Status

Detector Names and Status	
Detector Enabled	Detector Names
<input checked="" type="checkbox"/> Detector 1A	North
<input checked="" type="checkbox"/> Detector 2A	South
<input type="button" value="Done"/>	

NOTE: the number of detectors displayed here is defined in the Administration Menus under Configure – Detectors. This should be done before enabling any detectors.

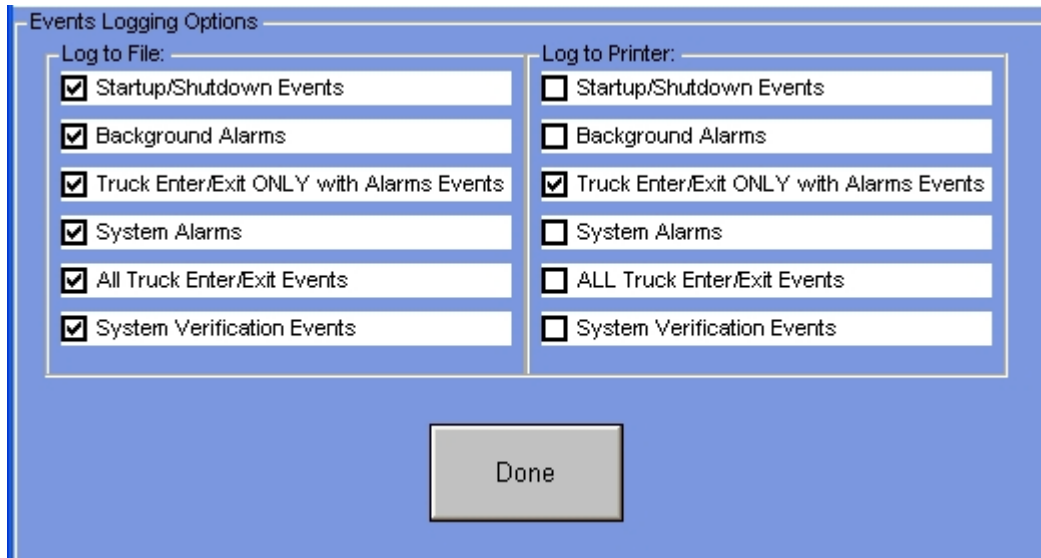
Enter the names of each detector for clarity (North, Top, etc.), and each detector's status (Enabled/Disabled). Each detector should have a unique name for identification purposes. The names you select will appear over the green box displaying that detector's averaged counts during Background mode, and the raw counts for that detector during Truck Present mode. The names will also appear in the Log File report if an alarm occurs for that detector. To change the Detector Names, highlight the name in the box, and type in the new name.

All operational detectors' status should be 'Enabled'. Use the 'Disable' function if a detector fails in order to disable constantly triggering the I/O Failure Alarm, until the detector problem is resolved.

To change a detector's status (Enabled/Disabled), click on the box. A check mark means Enabled, a blank box means Disabled.

The detector values next to each check-box under the 'Detector Enabled' column are the names used to wire the detectors to the proper Remote I/O modules (1A, 2A, etc.).

Events Logging



The dialog box titled "Events Logging Options" is divided into two main sections: "Log to File:" and "Log to Printer:". Each section contains a list of event types with checkboxes. In the "Log to File:" section, all checkboxes are checked. In the "Log to Printer:" section, only the checkbox for "Truck Enter/Exit ONLY with Alarms Events" is checked. A "Done" button is located at the bottom center of the dialog.

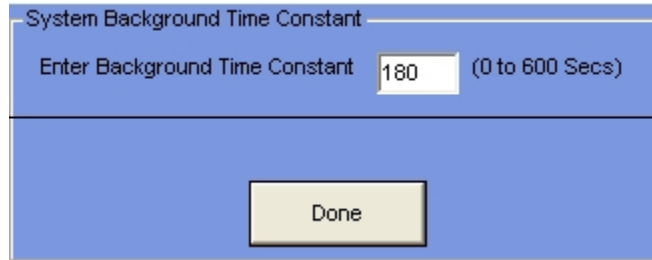
Log to File:	Log to Printer:
<input checked="" type="checkbox"/> Startup/Shutdown Events	<input type="checkbox"/> Startup/Shutdown Events
<input checked="" type="checkbox"/> Background Alarms	<input type="checkbox"/> Background Alarms
<input checked="" type="checkbox"/> Truck Enter/Exit ONLY with Alarms Events	<input checked="" type="checkbox"/> Truck Enter/Exit ONLY with Alarms Events
<input checked="" type="checkbox"/> System Alarms	<input type="checkbox"/> System Alarms
<input checked="" type="checkbox"/> All Truck Enter/Exit Events	<input type="checkbox"/> ALL Truck Enter/Exit Events
<input checked="" type="checkbox"/> System Verification Events	<input type="checkbox"/> System Verification Events

Done

Use this menu to setup which events are to be logged to the Log File and which are to be logged to the Printer. To change your choices, click on the boxes next to each choice.

A checked box enables logging the selected event to the device.

Time Constant



System Background Time Constant

Enter Background Time Constant (0 to 600 Secs)

Done

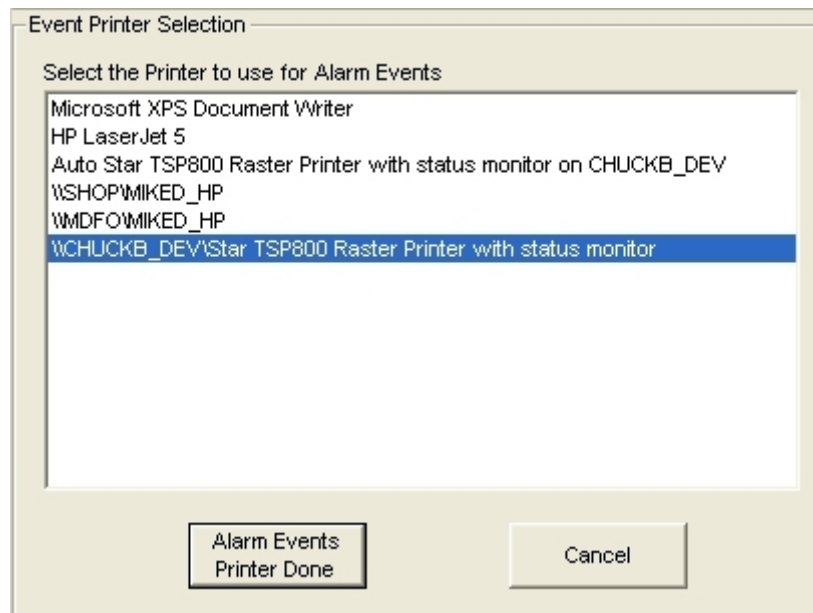
This is the Time Constant for Background Averaging. This number is usually about 180 seconds (3 minutes). Background radiation changes are slight and slow, and a long time constant is required to reduce the statistical noise.

It acts as a digital filter on the raw counts to establish the baseline for all detection activities. The long time constant value filters the raw signal, yet permits the system to constantly calibrate itself through background changes between day/night and seasons.

Select Printers

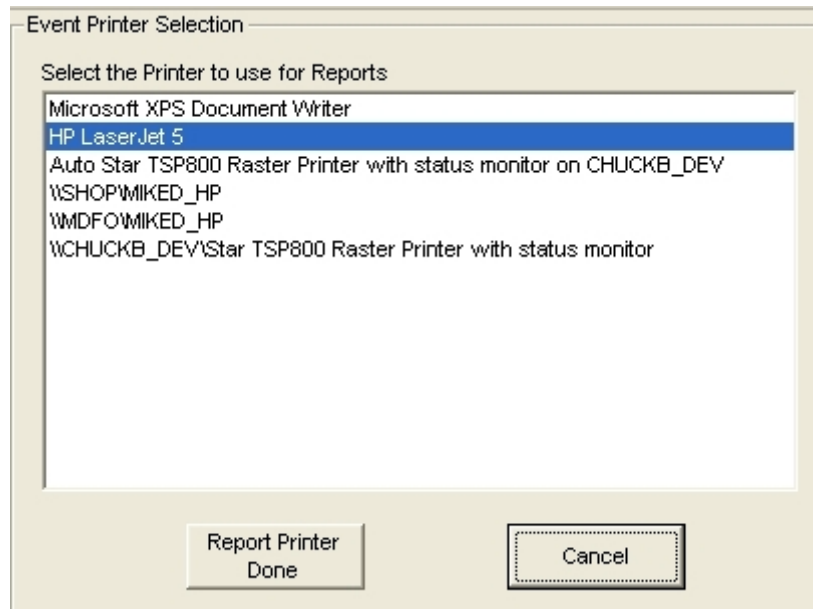
In this menu you can select the printer to be used for Alarm Events, typically during a Truck Present cycle. This could be a ticket-style printer since each truck event can have its own ticket. A separate printer can also be selected for your reports. Either of these selections can use local or networked printers.

At power up, if no printers have been selected or your previous selection is not available, the system will assign the printer(s) to the Windows default printer. A warning block will appear at startup if your previous selection is no longer available.



On the first frame, you select the printer to use for Alarm Events. This includes all alarm events enabled in the Events Logging user menu. Click on your choice and then click on the Alarm Events Printer Done button to continue. Clicking on the Cancel button aborts with no action being taken.

The same menu will appear and but now expect you to select the printer for reporting.



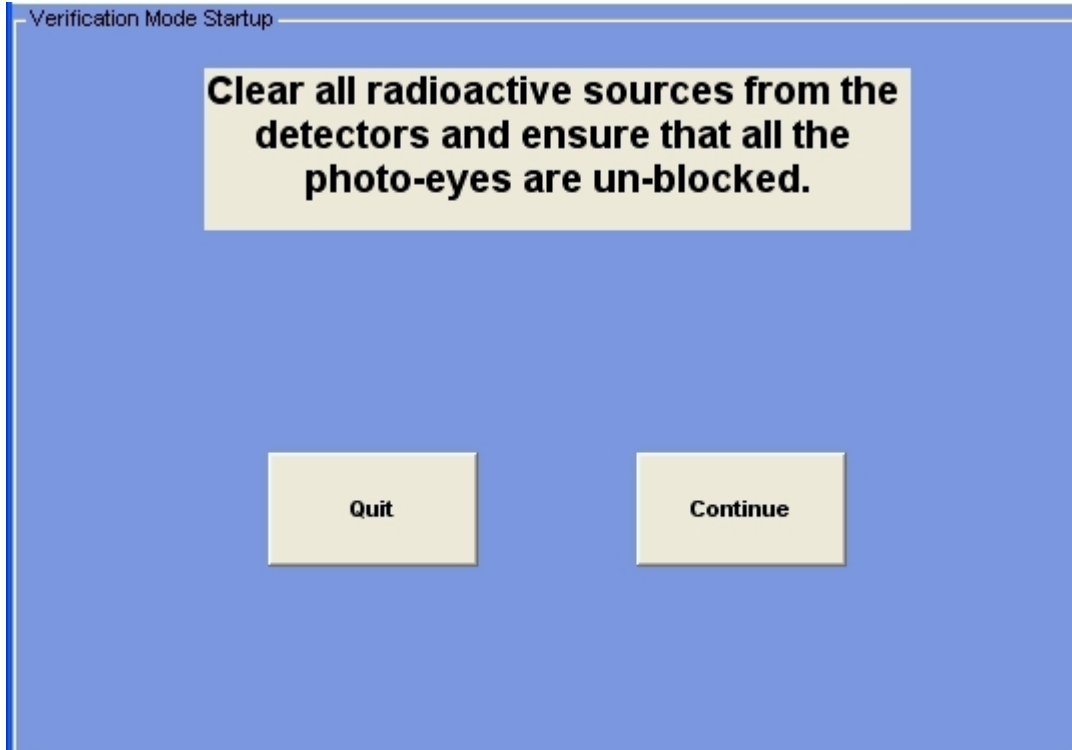
You can select any printer from the list (including the same one used for Alarm Event printing). Click on one of the selections in the list then click on the Report Printer Done button to save your selection.

This selection is used for reports such as the Log Files, Analyzer graphs, and the reports available in the Quality Assessment section.

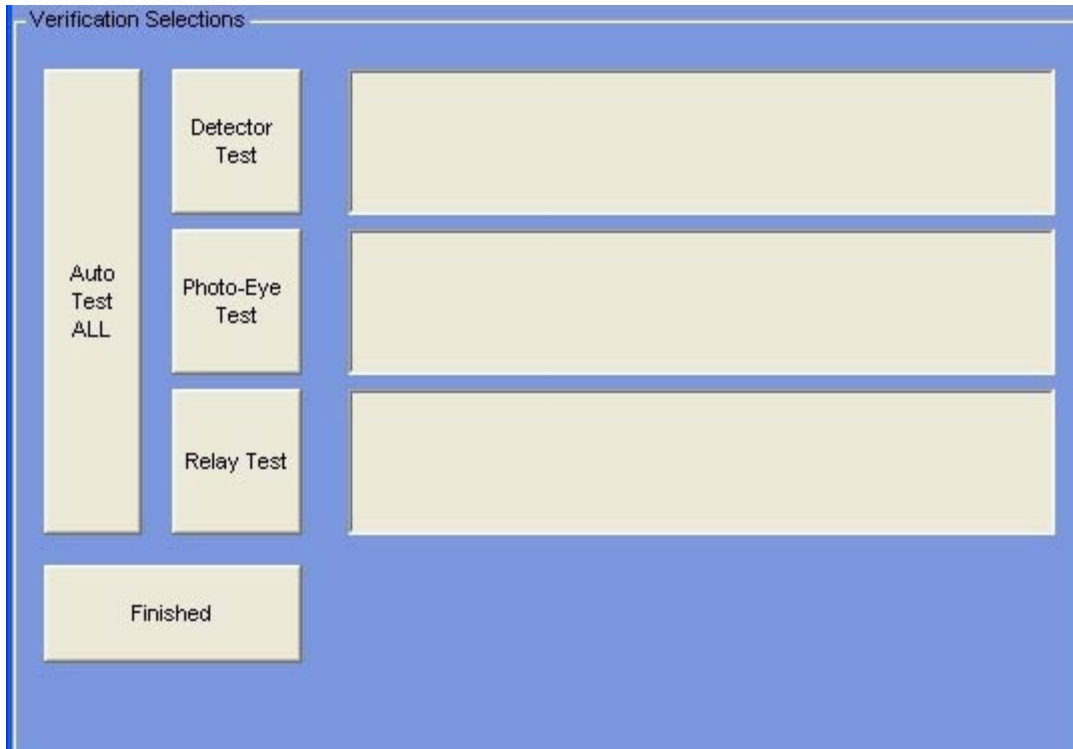
Manual System Verification

The major components of the system can be periodically checked with this function. It should be performed regularly to ensure the integrity of the monitoring system. This selection allows you to select the parts of the system you wish to verify:

- Detectors
- Photo-eyes
- Relays and internal beeper



The first screen you encounter is the above with preparation instructions. Clicking on the Quit option will abort the function.

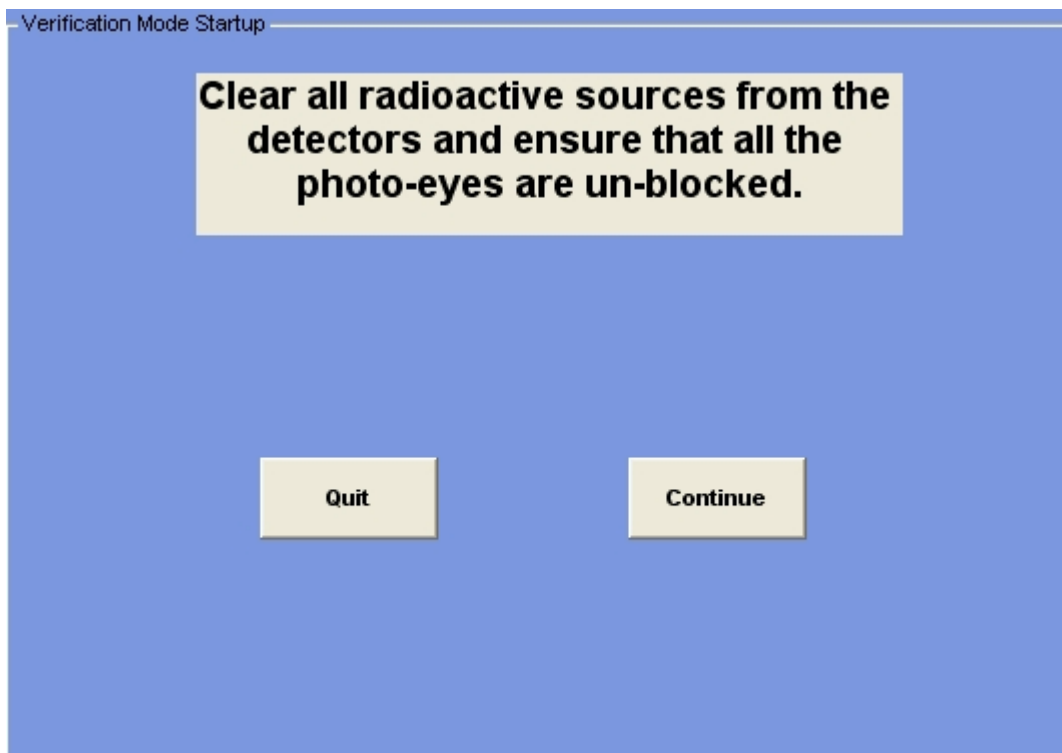


This is the selection screen. You can select the parts of the system you wish to verify here. Each selection will test one of the three functions. Clicking on the Auto Test ALL button will run an Auto-Test on all three functions (the same as the touch-button "AutoVerify" on the Main Screen).

Auto System Verification

When you select the Auto Verification function (right-most touch-button on the Main Screen), the system will auto-finish the Detector and Photo-Eye Verifications if all functions in these categories pass. This allows you to start the Verification, go to the Truck Path, test each detector, test each photo-eye, then return to the Monitor Panel, test the Alarm Relays, and ensure that each function passed.

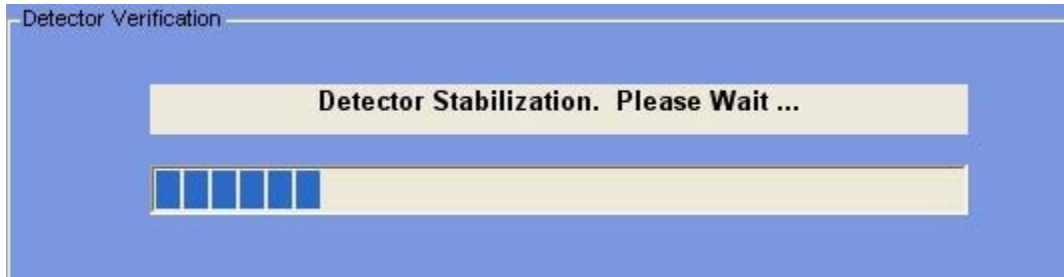
An optional relay output at the detector frame is available when the detector frame is not located conveniently to the Monitor Panel. This output will energize for a few seconds when all detectors have passed, and when all photo-eyes have passed (in Auto Verification mode), to allow an audible or visual indication of the Auto Verification process. This output is on the Relay Output Remote I/O Module, Output Number 1.



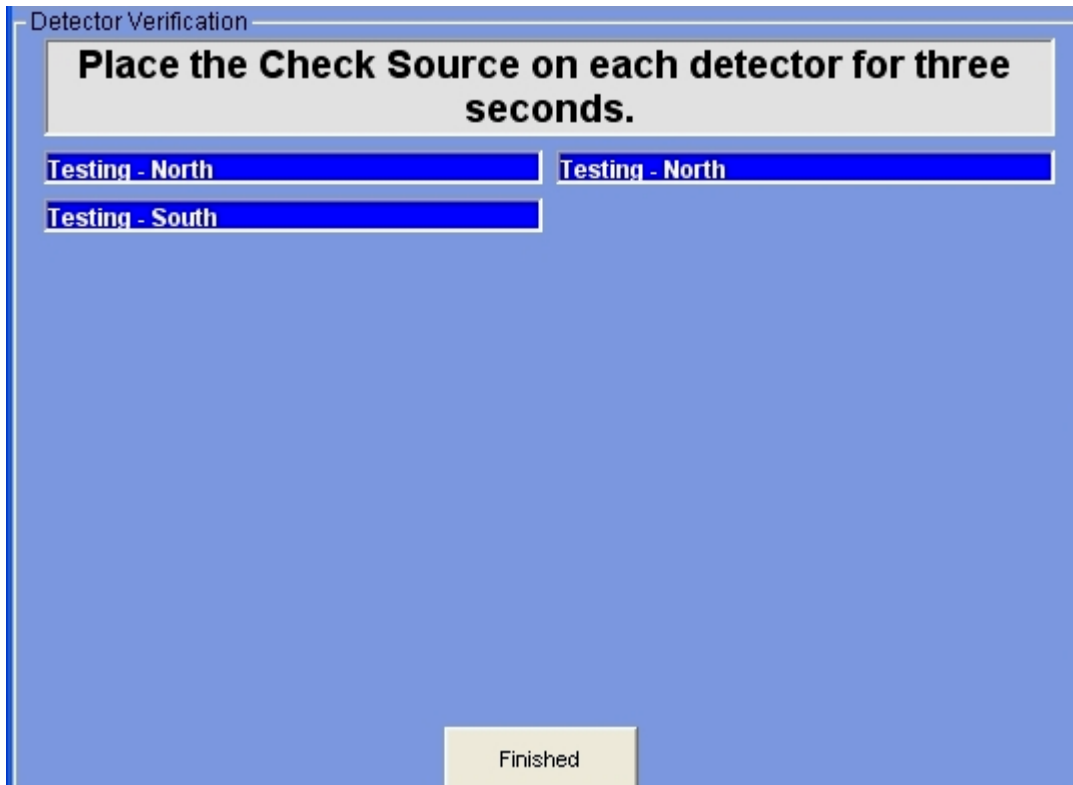
This screen allows you to continue or abort the Auto Verification process. If you click (or touch) the Continue button, the system will begin the Detector Stabilization process, then start the Detector Verification process.

Verify Detectors

When you select Verify Detectors from the Manual Verify screen, or press the AutoVerify button on the Main Screen, you will be presented with the following screen:



In order to perform any detector test, the system must get a stabilized value from each detector. The progress bar will inform you of the time remaining before testing can begin.



Once the stabilization has completed, each detector that has been activated and is enabled will be available for testing. You must place the Test Source supplied with your system on each detector for three seconds. If the detector is working correctly, the displayed box for that detector will change to a green color and read "Passed". In Manual Verification, you must click on the Finished button to continue, when all detectors have been tested. In Auto Verification, if all detectors Pass, the system will continue to the Photo-Eye

Verification automatically. The results of the verifications will also be recorded in the Log File and Printer if selected in the Events Logging menu.

Verify Photo-Eyes

This function ensures the correct operation for each of the Photo-Eyes in your system.



As you walk through the Truck Path, each photo-eye will be blocked, then unblocked. The blocking and unblocking will be recorded on this screen. When a photo-eye is blocked, its associated LED on the screen will turn Red. After being blocked, when a photo-eye is unblocked, its associated LED on the screen will turn Green.

If you are Manually verifying the system, click on the Finish button when done. If you have selected Auto Verification, the system will move on to the Relay Verification automatically after toggling the Verification Annunciator relay for a second or two, if all photo-eyes pass (turn Red, then Green).

Verify Relays

This verification function will allow you to test each of the relay outputs.

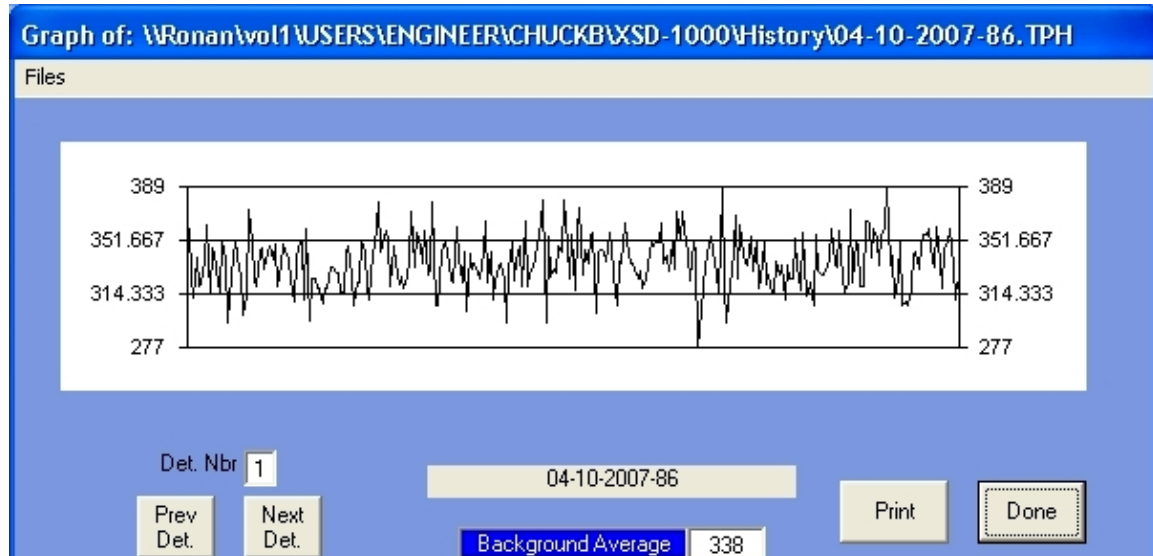


Each Green relay (or beeper) box you click on will initially turn Red (and energize the relay or internal beeper). Any annunciators you have tied to the relay should also be activated. Clicking on a Red box will turn the relay (or beeper) box to Green (and de-energize the relay or beeper).

Whether you have selected Manual Verification or Auto Verification, you will need to click (or touch) the Finished button here to complete the Verification Process (or return to the Manual Selection screen).

Analyzer

The Analyzer function allows you to graphically view the Truck Present cycle counts from the detectors. This is primarily used for system tuning on special applications.



When a file is opened (if the Truck Present History is enabled) or the previous Truck Present cycle is viewed, the counts from the detector (default is Detector 1) are graphically displayed.

By clicking on specific points on the graph, the bottom list boxes will scroll to that point (as indicated by the horizontal bar next to the lists). When you click on a point in the graph, notice the second list box from the left. If any alarms occurred on that point, a '1' will appear under the appropriate alarm (1-8 or 11-18). You can select other detectors by selecting the Previous Detector button or the Next Detector button. The graph can also be printed by clicking on the Print button.

There is a natural attenuation in counts due to the truck bed blocking the background counts, so a Truck Present Average is generally lower than the Background Average.

Actual Counts		Alarms				PhotoEye Img		Truck Present Average					
		1 - 8						#	Cts	Alarm Point L	#	Cts	Alarm Point H
Record Nbr 4	321	0000	0000	0000	0000	1000	0000	01	00312	0417.0545	11	00312	0414.9188
	320	0000	0000	0000	0000	1000	0000	02	00640	0787.8000	12	00640	0783.6596
	340	0000	0000	0000	0000	1000	0000	03	00999	1150.9265	13	00999	1144.8031
	312	0000	0000	0000	0000	1000	0000	04	01371	1510.1091	14	01371	1502.0138
	328	0000	0000	0000	0000	1000	0000	05	01743	1866.7713	15	01743	1856.7113
	359	0000	0000	0000	0000	1000	0000	06	02115	2221.6433	16	02115	2209.6237
	372	0000	0111	0000	1111	1000	0000	07	02487	2575.1587	17	02487	2561.1832
								08	02859	2927.6000	18	02859	2911.6718

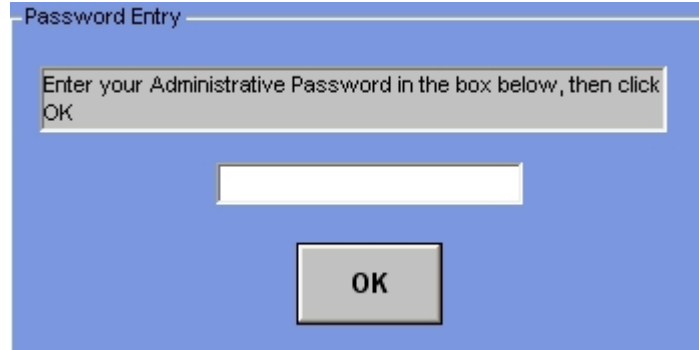
As you select different points on the graph, the record number in the far left of the bottom portion will change. A record represents one sample period of time. The actual counts for this detector is listed next.

There are 16 possible alarms per detector. The first 8 alarms are based on the Background Average, and the next 8 are based on the Truck Present Average. A '1' in any row in the Alarms box represents the level of alarm in that column.

The next box represents the photo-eye image from the photo-eyes. A '1' in a column represents that photo-eye being blocked, and a '0' represents the photo-eye unblocked. The leftmost digit is photo-eye number 1.

The last box lists the alarm number (1-8 and 11-18), the counts from the detector (and the summed counts over time for alarms greater than 1 or 11), and the alarm point for each alarm. Obviously, a count greater than its alarm point is an alarm condition.

Administrative Options



These menus are password protected. Entering a valid password will gain you access to the Administrative options.

These options are primarily used for initial setup or system upgrades. Once setup, there is little need for future access.

The Administrative Options permit changing the number of detectors, photo-eye configuration, background and truck present alarm functions, passwords, speed alarm options and the Quality Assessment functions. The history sampling can also be changed from the Administrative Options menus.

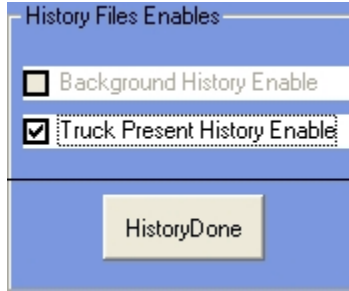
One important function in the Administrative Options is saving your current configuration. After setting up the User Options and the Administrative Options, you should access the Administrative Options – File – Save Current Settings to Disk File and save the current configuration settings. This can be important for later use in upgrades, repairs, restoration, etc.

The default passwords for the Administrative Functions are:

- admin
- password
- access

These can be changed and managed in the Administrative Options menus.

History Files



History Files Enables

☐ Background History Enable

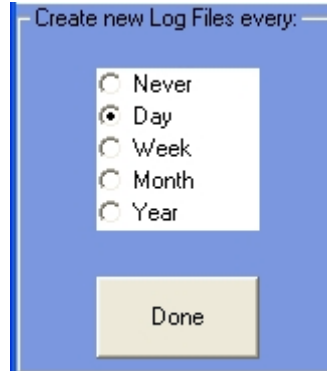
☒ Truck Present History Enable

HistoryDone

These selections determine if the system will record the files of counts received during Background and/or Truck Present mode. This is normally a diagnostic function used by field service in the event of a problem. Enabling these options will require substantial disk space over time. Click on the box to enable (checked) or disable (unchecked) the option.

If you do not know if you need these options, disable them. If you plan to use the Analyzer function described elsewhere, you will need the Truck Present History function enabled. With the Truck Present History function disabled, you can still use the Analyzer function, but you can only display the last Truck Present cycle activity. When the next Truck Present cycle begins, the previous contents will be lost.

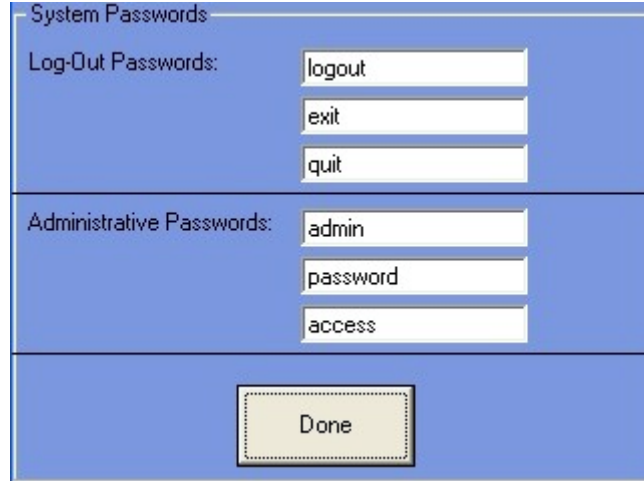
Log Files Creation



You can select when the system should create new log files here. If you select:

- Never – the system will create a Log File at initial startup, and never create another as long as the original one exists. **Note:** this file can get very large over time.
- Day – a new Log File will be created daily.
- Week – a new Log File will be created weekly
- Month – a new Log file will be created at a change of month.
- Year – a new Log file will be created at a change of year.

Password Maintenance



The image shows a 'System Passwords' dialog box with a blue background. It is divided into three horizontal sections. The top section is labeled 'Log-Out Passwords:' and contains three text input fields with the default values 'logout', 'exit', and 'quit'. The middle section is labeled 'Administrative Passwords:' and contains three text input fields with the default values 'admin', 'password', and 'access'. The bottom section contains a single 'Done' button with a dashed border.

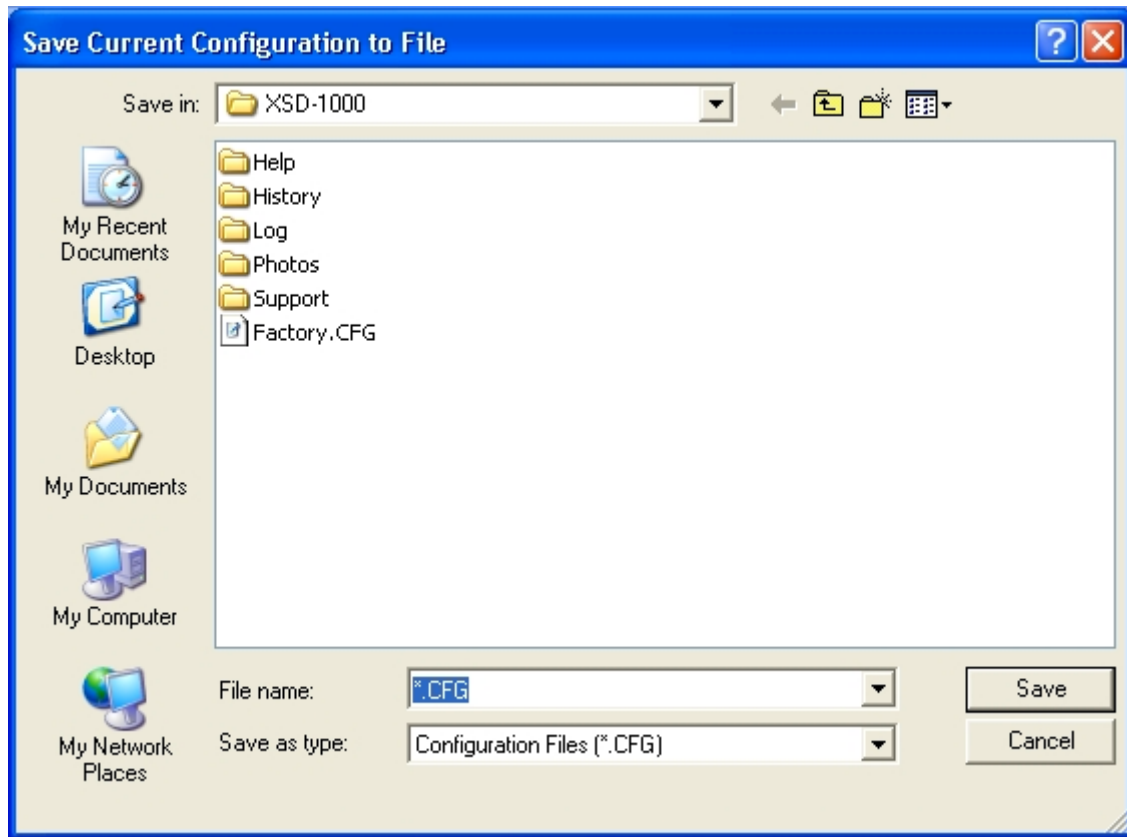
Section	Field 1	Field 2	Field 3
Log-Out Passwords:	logout	exit	quit
Administrative Passwords:	admin	password	access

This menu allows you to set up to 3 passwords for Administrative Options access and up to 3 passwords for user-logout (system shutdown). The passwords can be letters and/or numbers and can be up to 15 characters long. The passwords are case sensitive and must be input exactly as listed in the password boxes above.

The Log Out passwords permit the user to exit the XSD-1000 software package (File – Exit), and the Administrative passwords permit access to the Administrative Options in the menus.

The passwords listed in the example above are the system default passwords.

Save Current Settings to Disk File

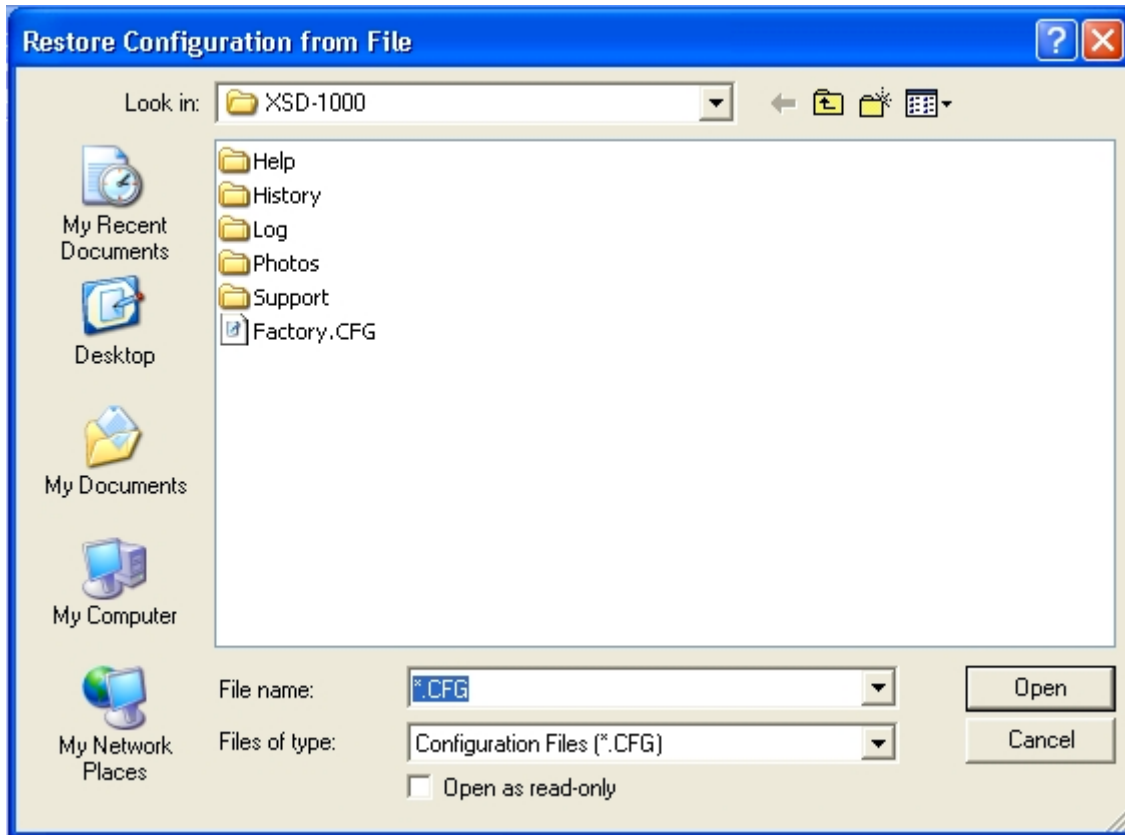


This menu permits you to store your current User and Administrative options to a disk file. Once saved, you can use the File – Restore Settings from Disk File menu item to retrieve these settings.

You can save multiple configurations by using unique file names for each one.

Note: Do NOT overwrite the Factory.CFG file. This is the factory setup file and allows you to recover the safe values stored by the factory.

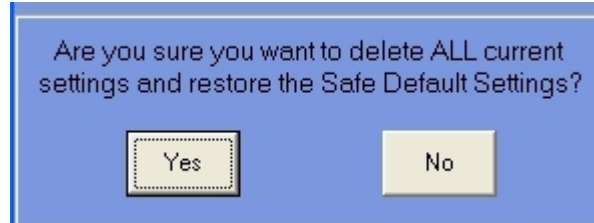
Restore Settings from Disk File



This function will restore a previously saved configuration from a disk file. Caution: the current settings in the system will be overwritten by these values.

The Factory.CFG file contains the settings for the system that was set at the Ronan Facility before being shipped to you.

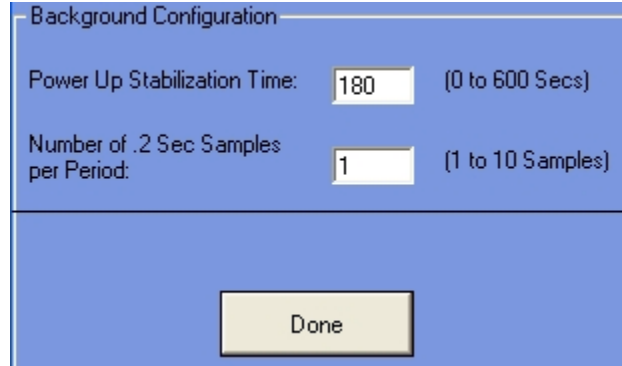
Restore Safe Default Settings



Use this option if all else fails. Initially, try restoring the settings you saved. If this fails, restore the factory settings (Factory.CFG file). If the Factory.CFG file is not present or fails, you can use this option (Safe Defaults).

Caution: this option will over-write any settings you have changed including the Factory settings.

Background Mode

A screenshot of a software dialog box titled "Background Configuration". The dialog has a blue background. It contains two rows of configuration options. The first row is "Power Up Stabilization Time:" followed by a text input field containing the number "180" and a label "(0 to 600 Secs)". The second row is "Number of .2 Sec Samples per Period:" followed by a text input field containing the number "1" and a label "(1 to 10 Samples)". At the bottom center of the dialog is a yellow button with the text "Done".

Background Configuration	
Power Up Stabilization Time:	180 (0 to 600 Secs)
Number of .2 Sec Samples per Period:	1 (1 to 10 Samples)
<div>Done</div>	

You set the Power Up Stabilization Time here. When you start up the XSD-1000 software, the system will average the detector counts for a period of time. This is the Power Up Stabilization Period that the system calibrates to. This value should be at least 3 minutes (180 seconds) to allow proper statistical averaging and a stable value for each detector.

The Number of .2 Second Period Samples value should NOT be changed unless you consult the factory first. This value represents how often the system samples the detector readings. This value also affects the overall detector sensitivity and the number of 'looks' the detector has during a Truck Present cycle.

Detectors

The image shows a software window titled "Detector Configuration (Select Active Detectors)". It contains a 6x2 grid of detector settings. Each row represents a detector number (1 through 12) and a "Dual Option" checkbox. The first two columns are for detectors 1-6, and the next two columns are for detectors 7-12. A "Done" button is located at the bottom center of the window.

Detector	Dual Option	Detector	Dual Option
<input checked="" type="checkbox"/> Detector 1	<input checked="" type="checkbox"/> Dual Option	<input type="checkbox"/> Detector 7	<input type="checkbox"/> Dual Option
<input checked="" type="checkbox"/> Detector 2	<input type="checkbox"/> Dual Option	<input type="checkbox"/> Detector 8	<input type="checkbox"/> Dual Option
<input type="checkbox"/> Detector 3	<input type="checkbox"/> Dual Option	<input type="checkbox"/> Detector 9	<input type="checkbox"/> Dual Option
<input type="checkbox"/> Detector 4	<input type="checkbox"/> Dual Option	<input type="checkbox"/> Detector 10	<input type="checkbox"/> Dual Option
<input type="checkbox"/> Detector 5	<input type="checkbox"/> Dual Option	<input type="checkbox"/> Detector 11	<input type="checkbox"/> Dual Option
<input type="checkbox"/> Detector 6	<input type="checkbox"/> Dual Option	<input type="checkbox"/> Detector 12	<input type="checkbox"/> Dual Option

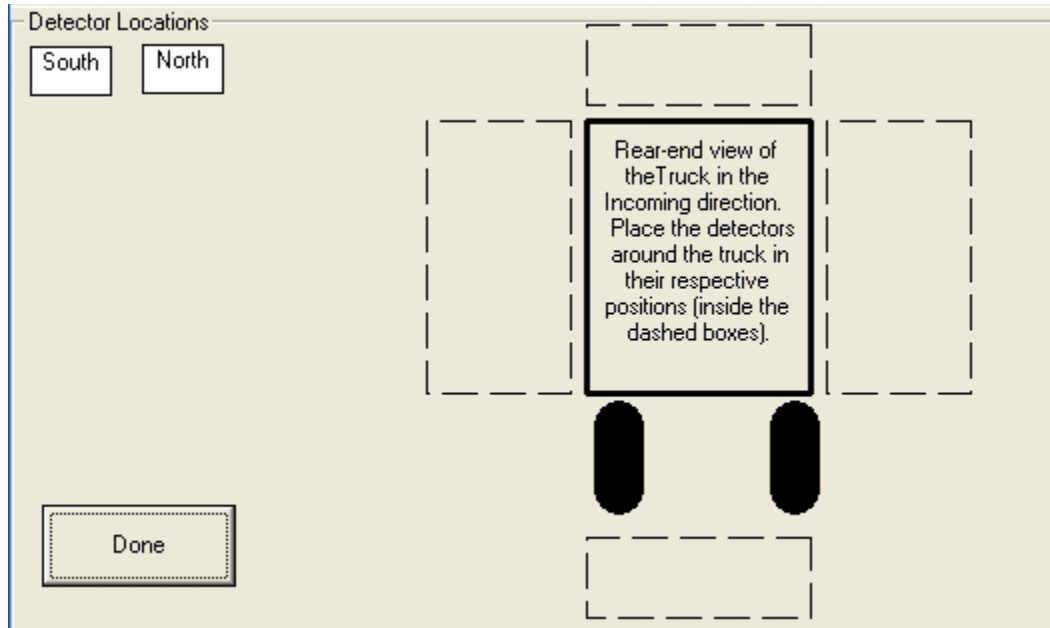
Done

You can select which detectors you have in your system with this screen. Each detector number is associated with a Remote I/O Module Address. If you activate a detector that has no Remote I/O Module currently active, the system will warn you. Unless you are upgrading your system, you should not activate detectors with no Remote I/O Module present.

The Dual Option means that you have two detectors at that position. This is normally a special detector with two electronic heads that act as one (or two detectors end-to-end). Do not enable this option if you do not have actual Dual Detectors with your system.

Detector Locations

In this menu, you position the detectors as they are mounted around the Truck Path. This will permit the system to approximate where on the truck a Radiation Alarm occurred.



Initially, the detectors are listed in the upper left corner of the screen. As you view the back of a truck in the 'Incoming' direction through the Truck Path. Move the mouse over one of the detector boxes, hold down the left mouse button, and 'drag' the detector to its position around the truck. It is not important how close to the truck you get (stay within the dotted boxes). If you have a two detector system, try to get the detector boxes as close to the vertical center of the dotted box as possible. For top or bottom-mounted detectors, try to get as close as you can horizontally to the center of the box. A four detector system will mean that you should try to get each detector box about 1/3 of the way away from the top or bottom of the dotted boxes.

The following is an illustration of a two detector system:

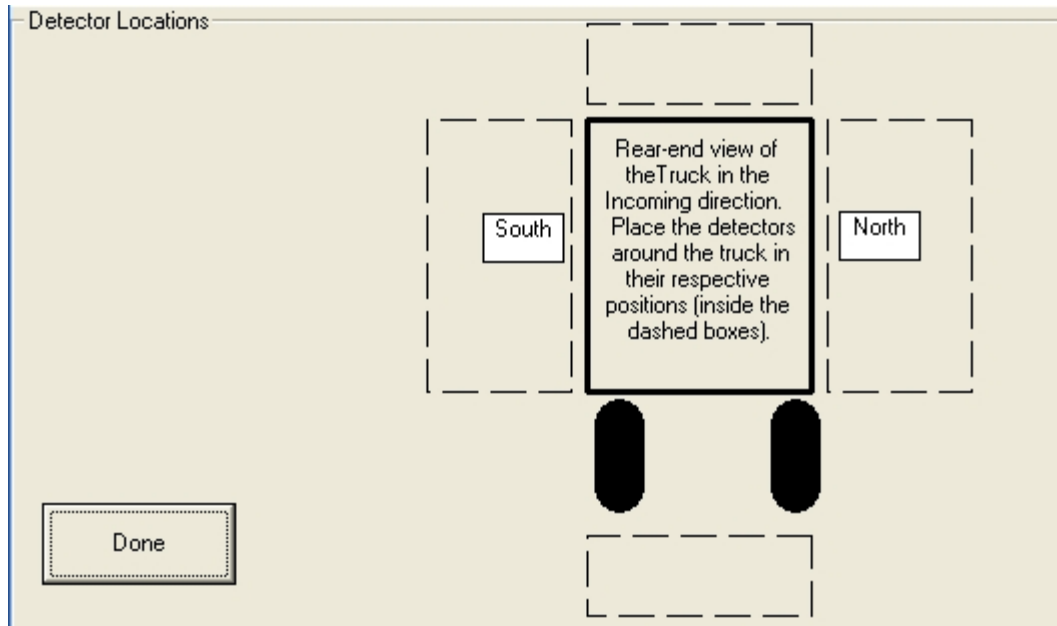


Photo-eyes

Photo-Eye Configuration

Total Number of Photo-Eyes: (0 to 8)

Distance between Photo-Eyes: (0.0 to 30Ft.)

☒ Bi-Directional System
☐ Uni-Directional System

The top section of this menu has three options. The first is the Total Number of pairs of Photo-eyes (remember that photo-eyes come in pairs: one transmitter and one receiver per pair). Most systems have 2: one at each end of the detectors. Up to 8 photo-eye pairs can be accommodated.

The next option is the distance between the photo-eye pairs. This distance is in Feet (if MPH speed is selected in the Admin – Alarms Setup - Speed Alarms Menu) or Meters (if Km/Hr is selected) and is measured along the vehicle path (not across it). The typical distance is 6 - 10 feet.

The final option at the top is the selection of Unidirectional or Bi-directional operation. If you are only checking vehicles in one direction (for instance: coming into the facility only), then select unidirectional. If you plan to check vehicles in both directions (for instance: entering and exiting the facility), then select bi-directional. Note: if you have only one photo-eye pair, do not select Bi-directional. The system cannot distinguish both directions with a single photo-eye pair.

Forward Direction Name:

Reverse Direction Name:

☒ ☐

Truck Present Photo-Eye (begins cycle)

Photo-Eyes ON to Maintain Truck Presence (requires ALL)

Photo-Eyes for Speed Checking

Photo-Eye at Starting end of Detector

Photo-Eye at Far end of Detector

You must now determine your directions for clarity. If you selected a unidirectional system, the right side of the above display will be blank. Facing the XSD-1000 Frame and Detectors from the Monitor Panel location, determine which direction vehicles will pass through the system and define a name for that direction (ie: Incoming, Entrance, etc). For instance, as you face the XSD-1000 Frame and Detectors, if vehicles enter the system from left to right as they enter your facility, you could call this direction 'Entrance', or 'Forward'. Whatever name you choose will be used on-screen and in the Log Files and Printer Logs to determine the direction of a Truck Present cycle.


There are 5 boxes below the photo-eyes that display the functions of the photo-eyes. The first one is highlighted initially. To select other functions, click on the definition boxes and the photo-eyes enabled for that function will be shown.

The number of photo-eyes you selected previously determines how many lights are available below the name you select. Each light represents a photo-eye. A 'black' light means it is not selected; a 'green' light means it is selected. The light with the box around it represents photo-eye number 1. The others are numbered from left to right. As you click on the boxes below the lights, the lights will change to show the ones selected and unselected. To change a photo-eye from selected to unselected or unselected to selected, click on the photo-eye you wish to change. The photo-eye numbers on the screen match the numbers on the Remote I/O Digital Input card. If you wired the left-most photo-eye into Input #1, then number one on the screen represents the left-most photo-eye.

You must determine which photo-eyes perform the following functions:

- Truck Present Photo-Eye: Only one light should be green here and should be an 'end' light (first or last). The direction the vehicle travels for the Forward Direction Name cycle will determine which photo-eye starts the Truck Present cycle. The first photo-eye blocked by the truck will start the Truck Present cycle. Click on any light to toggle it from on to off to on.
- Photo-Eye(s) ON to Maintain Truck Presence: These are the photo-eyes that must be on to maintain the Truck Present cycle. If any of the lights defined here remain blocked, the Truck Present cycle will continue. All the photo-eyes selected here must be off during a Truck Present Cycle to end a Truck Present cycle.
- Photo-Eyes for Speed Checking: Any photo-eye not used to start the Truck Present cycle for this direction should be used for speed checking.
- Photo-Eye at Starting end of Detector: This could be the same photo-eye that starts a Truck Present cycle (if you only have two photo-eyes on your system). There is one photo-eye at each end of the detector. The one the vehicle will block first in this direction should be selected here. This gives the system the knowledge it needs to calculate the Alarm Points properly.
- Photo-Eye at Far End of Detector: This is the photo-eye at the other end of the detector used for Alarm Point calculations.

If you have a bi-directional system, you will need to set the Reverse Direction Name section up like you did the Forward Direction Name section. Keep in mind that the vehicle is now moving in the opposite direction, and the photo-eye settings for the Forward section should be a mirror image of this section.

 Forward Direction Picture (Click HERE to change)	<div></div> <div>Done</div> <p>Note: the Photo-eye with the box around it indicates Photo-eye number 1.</p>
---	---

Now you must select the picture that represents which way the vehicle will be moving in the Forward Direction Name direction. Click below the picture to change the direction. This picture will be displayed in the event of a vehicle alarm, and an approximate location of any source material will be displayed.

Relay Output Options

The screenshot shows a window titled "Relay Output Assignments" with a table for configuring alarm outputs. The table has columns for "Alarm Name", "1", "2", "3", "4", "5", "6", "7", and "Beeper". The "Relay Assigned" header is centered above columns 1 through 7. The "Alarm Name" column lists seven events: Radiation Alarm, Speed Alarm, Detector Failure Alarm, High Background Alarm, System Alarm, I/O Module Failure, and Truck Present Time-Out. Each cell in the table contains a checkbox. A "Done" button is located at the bottom center of the window.

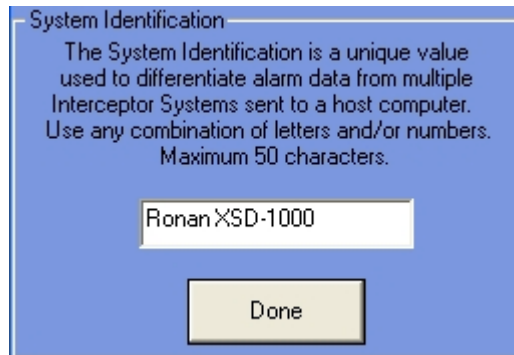
Alarm Name	1	2	3	4	5	6	7	Beeper
Radiation Alarm	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>				<input type="checkbox"/>
Speed Alarm	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				<input type="checkbox"/>
Detector Failure Alarm	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>				<input type="checkbox"/>
High Background Alarm	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				<input type="checkbox"/>
System Alarm	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				<input type="checkbox"/>
I/O Module Failure	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>				<input type="checkbox"/>
Truck Present Time-Out	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				<input type="checkbox"/>

You have 4 relays and an internal beeper available on each XSD-1000 system. This option allows you to select the relay that will trip on the alarm specified. You can select the same relay for all alarms, or split them up. Click on a blank box to check it, or on a check mark to deselect it. Any relay can be set to activate on any, all, or none of the events listed.

Each relay is a Form 'C' type contact arrangement (N.O., N.C., Common).

The beeper (located on the underside of the Monitor Panel) can also be programmed to alarm on any, all, or none of the events.

System ID



This is the title displayed at the top of the main screen. It is also used in the communications function to identify this XSD-1000 system. If you have multiple XSD-1000 systems communicating to a host (or server), the System Identification for each must be unique.

The value here can be anything you decide, up to a maximum of 50 characters.

The Log Files from each XSD-1000 system can be uploaded to a host system over the Ethernet link and 'linked' into a Microsoft® Access file. The unique System ID will help organize this combined file.

Background Alarms

Background Alarms		
Detector Low Count Failure:	<input type="text" value="1"/>	(0 - 10000)
Detector Low Count Consecutive Failures till Alarm:	<input type="text" value="3"/>	(0 - 9)
High Background Alarm Multiplier:	<input type="text" value="3"/>	(1-99)
High Background Consecutive Failures till Alarm:	<input type="text" value="3"/>	(0 - 9)
<div>Done</div>		

The default values for this menu should not be changed without consulting the factory.

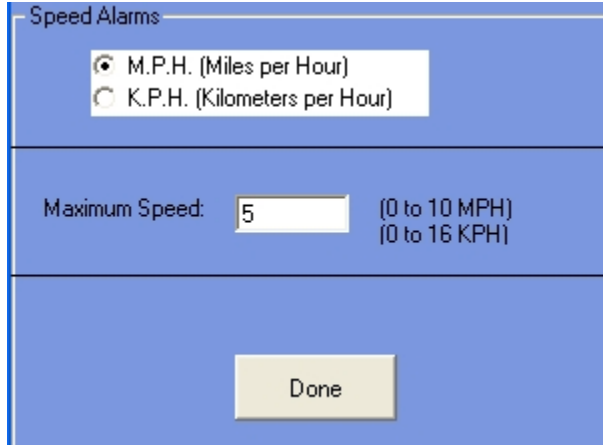
The Detector Low Count Failure is the lowest number of counts you can receive from an active detector. This value is typically 1.

The Consecutive Failures till Alarm ensures that you do not get false alarms in a very low background radiation area.

The High Background Alarm Multiplier should always be 3. If the detector counts suddenly peak above the background average by this amount (3 times background average), then the detector will fault after the Consecutive Number of Faults. This alarm is to ensure that radioactivity introduced to the detectors during Background mode does not affect the sensitivity or calibration of the system.

The Consecutive Failures till Alarm behaves the same as above, except here it applies to a High Background Alarm.

Speed Alarms

A screenshot of a 'Speed Alarms' configuration menu. The menu has a blue background and is divided into three horizontal sections. The top section contains two radio button options: 'M.P.H. (Miles per Hour)' which is selected, and 'K.P.H. (Kilometers per Hour)'. The middle section is labeled 'Maximum Speed:' and contains a text input field with the number '5'. To the right of the input field, there are two lines of text: '(0 to 10 MPH)' and '(0 to 16 KPH)'. The bottom section contains a single 'Done' button.

The top item in this menu is the speed units. Select either MPH or KPH for your use. Notice that the Maximum Speed will be automatically changed based on your selection. After your units selection, type in the correct speed in the second section.

The maximum speed for vehicles is typically 5 MPH (8 KPH). Unless otherwise instructed by Ronan factory personnel, this value should remain at 5 MPH (8 KPH).

Speed detection is performed using photo-eyes. In a single photo-eye pair system, speed checking cannot be performed.

Truck Present Alarms

Truck Present Alarms			
<input checked="" type="checkbox"/> Truck Present Alarms Enabled		Maximum Truck Present Time: <input type="text" value="60"/> (0-999 Sec)	
Truck Present 'ON' Delay: <input type="text" value="0"/> (0-99 Sec)		Truck Present 'OFF' Delay: <input type="text" value="3"/> (0-99 Sec)	
Alarm Number	Sigma Value (0.0 to 9.9)	Detector	Reduction Factor 'F' (Range 0.0 to 9.9)
1	<input type="text" value="4.3"/>	Detector 1A,1B: {}	<input type="text" value="1"/>
2	<input type="text" value="4.3"/>		
3	<input type="text" value="4.3"/>	Detector 2A,2B: {}	<input type="text" value="1"/>
4	<input type="text" value="4.3"/>		
5	<input type="text" value="4.3"/>		
6	<input type="text" value="4.3"/>		
7	<input type="text" value="4.3"/>		
8	<input type="text" value="4.3"/>		
<div>Done</div>			

The first box defines whether alarms are enabled during a Truck Present cycle. This option should always be selected.

The Truck Present 'ON' Delay is for delaying the start of Truck Present cycles and is primarily for applications where trucks may stop on a weight scale after triggering the Truck Present Photo-eye. This value will delay the start of the cycle. Normally, the value here is zero.

The Maximum Truck Present Time should always be 60 seconds. This value minimizes false alarms due to the statistical algorithms used.

The Truck Present 'OFF' Delay value is used to maintain a Truck Present cycle when the photo-eyes may become unblocked between the cab and trailer of a truck. If the gap between a cab and trailer exceeds the distance between your photo-eyes, use this value to compensate such that at least one photo-eye is blocked during the truck cycle.

Truck Present Alarms		
<input checked="" type="checkbox"/> Truck Present Alarms Enabled		Maximum Truck Present Time: <input type="text" value="60"/> (0-999 Sec)
Truck Present 'ON' Delay: <input type="text" value="0"/> (0-99 Sec)		Truck Present 'OFF' Delay: <input type="text" value="3"/> (0-99 Sec)
Alarm Number	Sigma Value (0.0 to 9.9)	Reduction Factor 'F' (Range 0.0 to 9.9)
1	<input type="text" value="4.3"/>	
2	<input type="text" value="4.3"/>	<input type="text" value="1"/>
3	<input type="text" value="4.3"/>	
4	<input type="text" value="4.3"/>	<input type="text" value="1"/>
5	<input type="text" value="4.3"/>	
6	<input type="text" value="4.3"/>	
7	<input type="text" value="4.3"/>	
8	<input type="text" value="4.3"/>	
<div>Detector</div> <div>Detector 1A,1B: {}</div> <div>Detector 2A,2B: {}</div>		
<div>Done</div>		

The bottom section should never be changed except under factory direction. The Sigma Values and Reduction Factors directly control the sensitivity of the XSD-1000 system.

Quality Assessment

The Quality Assessment functions of the XSD-1000 is intended for users requiring periodic assessment of the system's functionality for ISO or insurance purposes. This functionality will allow you to track initial installation of the detectors and their output values, then track them periodically and compare any differences. The system will automatically calculate a valid differential from period to period including the Test Source decay.

Multiple reports are available to check all replacement activities and dates of detectors and Test Sources.

If you plan to use this feature, you should ensure that immediately after installation and before commissioning the system, that your detectors and Test Source are listed in the activity report. This information will be required after the first period to enable the system to compare the results and determine the validity of the detectors.

You also need to set up the interval for this periodic test. After the interval time elapses, a warning box will appear on the Main Screen reminding you that your periodic assessment is due.

Reports – Events by Date

Events by Date									
	Date	Time	Event	S/N	Isotope	DetNbr	Strength-Bkgd	TestCounts	Initials
▶	6/15/2007	8:11:42 AM	Replace Detector	KY-103656-1		1	0	0	CEB
	6/15/2007	8:12:12 AM	Replace Detector	KY-103656-2		2	0	0	CEB
	6/15/2007	8:13:23 AM	Replace Check Source	710-43	Cs-137	0	9	0	CEB
	6/15/2007	8:24:09 AM	Detector Sensitivity Check	KY-103656-2		2	17	137	JHA
	6/15/2007	8:24:09 AM	Detector Sensitivity Check	KY-103656-1		1	17	136	JHA

Done

Print

This report will list all Detector or Test Source replacements (or installments) and all Detector Sensitivity Checks by the date they were performed. The data is identical to the report of Events by Type, except arranged by date.

There are three event types that can be presented:

- Replace Detector
- Replace Check Source
- Detector Sensitivity Check

Reports – Events by Type

Events by Type									
	Date	Time	Event	S/N	Isotope	DetNbr	Strength-Bkgd	TestCounts	Initials
▶	6/15/2007	8:24:09 AM	Detector Sensitivity Check	KY-103656-2		2	17	137	JHA
	6/15/2007	8:24:09 AM	Detector Sensitivity Check	KY-103656-1		1	17	136	JHA
	6/15/2007	8:13:23 AM	Replace Check Source	710-43	Cs-137	0	9	0	CEB
	6/15/2007	8:11:42 AM	Replace Detector	KY-103656-1		1	0	0	CEB
	6/15/2007	8:12:12 AM	Replace Detector	KY-103656-2		2	0	0	CEB

Done

Print

This report will list all Detector or Test Source replacements (or installments) and all Detector Sensitivity Checks by the Event Type. The data is identical to the report of Events by Type, except the event types are grouped together.

There are three event types that can be presented:

- Replace Detector
- Replace Check Source
- Detector Sensitivity Check

Reports – Detector Sensitivity Checks

Sensitivity Report for: Ronan XSD-1000													
06-15-2007 08:25:43													
----- Background -----							----- Test Source -----						
Det# - Det Name / Serial Nbr	First	Prev	Now	Delta%	Allow%	P?	First	Prev	Now	Delta%	Allow%	P?	Initials
1 - North / KY-103656-1	Note1	Note1	17	??%	??%	?	Note1	Note1	136	??%	??%	?	JHA
2 - South / KY-103656-2	Note1	Note1	17	??%	??%	?	Note1	Note1	137	??%	??%	?	JHA

Note 1: There are no other records for this detector as of yet.

Done
Print

This report will list the last Sensitivity Check performed compared to the one previous to it, and give an assessment of pass or fail by comparing the percent difference between these two readings. The 'First' value will also be listed as a reference.

Note that if you replace a detector, it becomes the current with no history when a Detector Sensitivity Check is performed. Immediately after replacing a detector, a Sensitivity Check should be done for that detector to establish a reference for the normal periodic Sensitivity Check to determine its validity.

The report has two halves: the left half is based on background averages (or Norm). This test verifies the low-level sensitivity of the detector. The right half is an assessment with your Test Source, and validates the gain of the detector. It is important to perform a 'Replace Test Source' at system installation so the system can determine the amount of source decay to apply when performing the periodic Sensitivity checks.

The above report shows that only one Detector Sensitivity Check has been performed. Therefore, there is no 'Delta%' nor 'Allow%' nor 'Passed?'.

Sensitivity Report for: Ronan XSD-1000 06-15-2007 12:26:05

Det# - Det Name / Serial Nbr	Background						Test Source						Initials
	First	Prev	Now	Delta%	Allow%	P?	First	Prev	Now	Delta%	Allow%	P?	
1 - North / KY-103656-1	Note1	17	17	000%	010%	Y	Note1	136	138	001%	021%	Y	ZEH
2 - South / KY-103656-2	Note1	17	17	000%	010%	Y	Note1	137	138	001%	021%	Y	ZEH

Note 1: There are no other records for this detector as of yet.

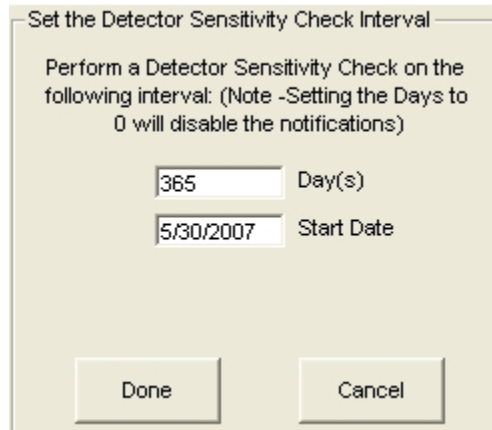
Done Print

Note the above Detector Sensitivity Report has 2 entries for each detector. You can see slight differences between the Now and the Prev values on the Test Source half of the report (Now is the last Detector Sensitivity Check). The Delta% is the percent difference between the Now and Prev readings. The Allow% is the allowance percentage difference between the Now and Prev readings. In the P? (Passed?) column, both detectors passed both the Background and Test Source Checks.

If your checks produce an N value (not passed), call Ronan Service to get the detector in question serviced. The Passed? Column has the following possibilities:

- Y = Yes, this detector passed both the current test, and the longevity test
- N = No, this detector failed the current test (Now compared to Prev)
- ? = Not enough data to evaluate this detector
- R = The detector has failed the longevity test. Contact Ronan Engineering to get this detector Refurbished.

Set Sensitivity Check Interval



The screenshot shows a dialog box titled "Set the Detector Sensitivity Check Interval". Inside the dialog, there is a text instruction: "Perform a Detector Sensitivity Check on the following interval: (Note -Setting the Days to 0 will disable the notifications)". Below this text are two input fields. The first field is labeled "Day(s)" and contains the value "365". The second field is labeled "Start Date" and contains the value "5/30/2007". At the bottom of the dialog, there are two buttons: "Done" and "Cancel".

This menu allows you to establish your periodic interval for the Detector Sensitivity Checks. After the number of Days from the Start Date, the system will prompt you (on the Main Screen) daily as a reminder to perform the Detector Sensitivity Check. When you perform the Detector Sensitivity Check, the Start Date will automatically be updated to that date.

Replace Detector

Replace a Detector

Select the Detector to replace:
Detector Nbr - Name / Serial Nbr

1 - North / KY-103656-1
2 - South / KY-103656-2

Replace

with Serial Number:

Your Initials:

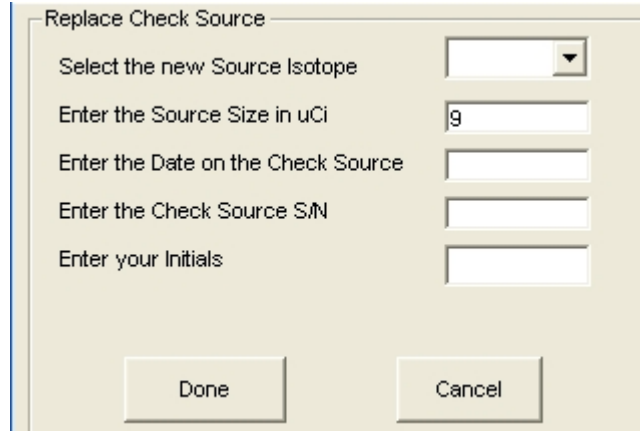
NOTE: Whenever you replace a detector it is recommended that you perform a Sensitivity Check on (at least) that detector to establish a base-line for your normal interval Sensitivity Checks.

Done Cancel

At initial installation, or when a detector is replaced (new or after service), you should perform a Replace Detector function. The detectors available according to the Administrative Options – Configure Detectors setup will determine which detectors are listed. Note that on initial installation, you may not have Serial Numbers listed for the detectors. This is normal.

To log replacing (or installing) a detector, you click on one of the detectors in the left box, and it will be displayed in the box under the 'Replace' label. You must then supply the Serial Number (or S.O. number) listed on the detector. Next supply your initials and click the 'Done' button and this detector will then be added to the Quality Assessment Events, and will be used (instead of the replaced detector) for future Detector Sensitivity Checks.

Replace Test Source



The screenshot shows a dialog box titled "Replace Check Source". It contains five input fields and two buttons. The first field is a dropdown menu labeled "Select the new Source Isotope". The second field is a text box labeled "Enter the Source Size in uCi" with the value "9" entered. The third field is a text box labeled "Enter the Date on the Check Source". The fourth field is a text box labeled "Enter the Check Source S/N". The fifth field is a text box labeled "Enter your Initials". At the bottom are two buttons: "Done" and "Cancel".

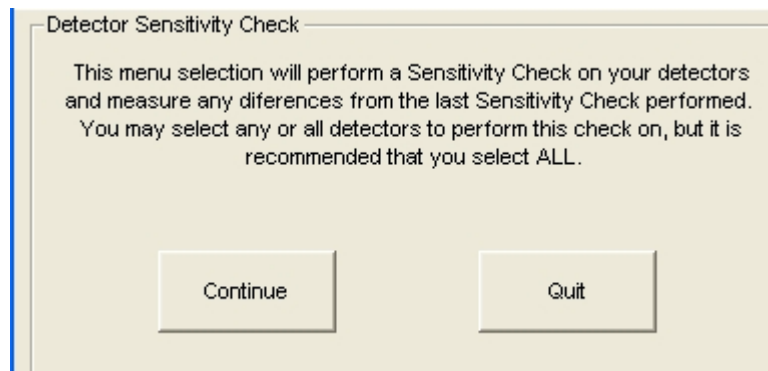
To initially install (or eventually replace) a Test Source, you use this menu. Typically, the information required here is listed on a tag on the Test Source. This information is necessary for the system to determine the amount of source activity decay between Detector Sensitivity Checks to determine a proper Allowance Percent for the check.

- Click on the arrow (on the top box) and select the type (isotope) of Test Source you are installing (or replacing with).
- Type in the Test Source Field Strength in uCi (micro-Curies).
- Enter the date on the Test Source.
- Enter the Serial Number from the label on the Test Source.
- Finally, enter your initials, then click on the 'Done' button

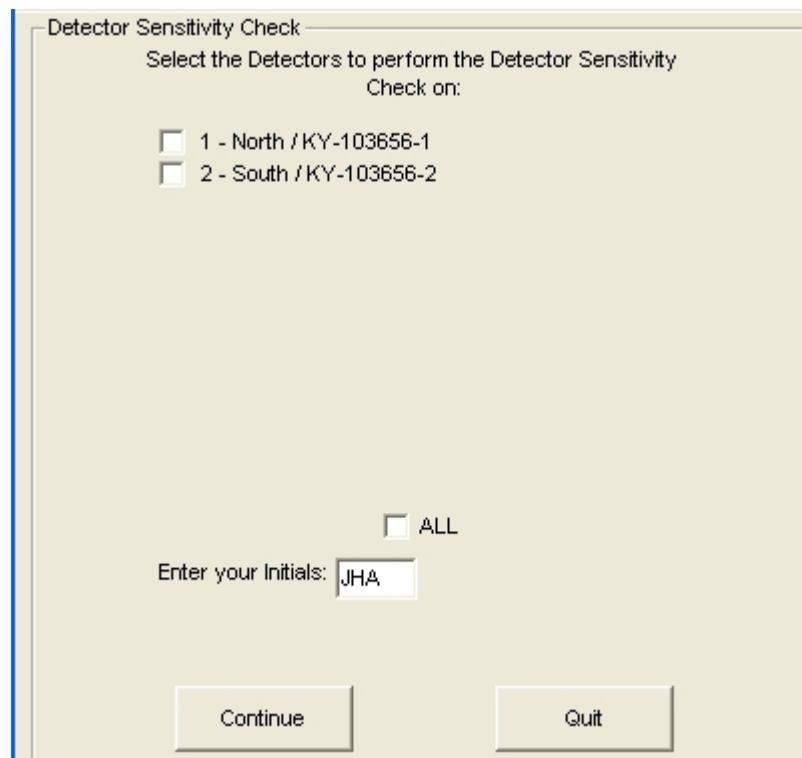
The information you entered will be entered into the Quality Assessment Event log.

Perform Detector Sensitivity Check

The Detector Sensitivity Check is a check on the quality of the measurement and the sensitivity of the detectors in your system. Tracability and performance checks are typically required by ISO and insurance organizations. The Detector Sensitivity Check function will check the detectors attached to your system and maintain a log of the checks performed for tracability.



The first screen is informational only. If you choose to Continue, the next screen will appear.

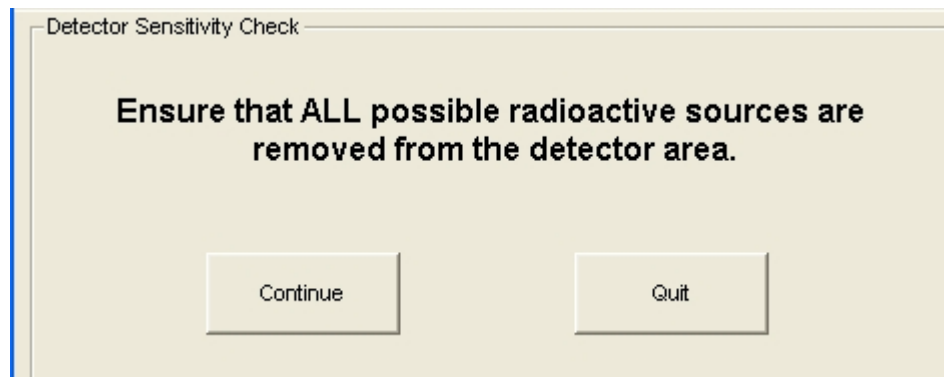


On the second screen, a list of enabled detectors is presented. You may select any or all of the detectors to perform the Sensitivity Check on. If done on the interval specified in the Set Sensitivity Check Interval menu, all detector should be checked. If you have just

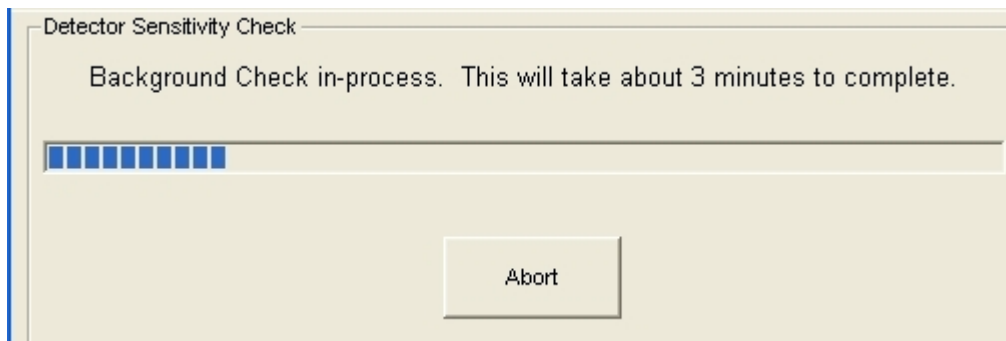
Replaced a Detector, you can select only the one you just replaced. If you click the 'All' box, all detectors will be selected automatically.

You must enter your initials before the system will accept the Continue button. Note: clicking on the 'Quit' or 'Abort' button at any screen during the Detector Sensitivity Check function will quit the function and write nothing to the Quality Assessment Event log file.

After selecting the detector(s) to check, click on the Continue button and the next screen will appear.



The system is preparing to perform a Background Radiation test on the detector(s) you selected. Ensure that the Test Source and any vehicles or trucks are not near the detectors before clicking on the Continue button.



During this time, the system is obtaining a Background Radiation average for each detector you selected previously. Upon completion, the next screen will appear automatically.

Detector Sensitivity Check

Detector Selection	Detector Nbr - Detector Name / Detector Serial Nbr
->	1 - North / KY-103656-1
	2 - South / KY-103656-2

Place the Test Source on the selected detector target then click the Continue Button to start the Sensitivity Test. Each detector test will take approximately 3 minutes.

Current Test Progress

Continue Abort

The system will automatically select the detector to check. Place the Test Source on the target on the selected detector (the one with the arrow pointing to it), and press the Continue button. The check for this detector will run. At the conclusion of that test, the next detector will be selected, and you then move the Test Source to the newly selected detector. This procedure will repeat until all detectors you selected have been checked.

After the last detector has been checked, a message will appear telling you that all tests are complete, and to press the Continue button. Pressing the Continue button will cause the system to write the test results to the Quality Assessment Event log file and display the Detector Sensitivity report on the screen. Today's date will also replace the previous date in the Sensitivity Check Interval.

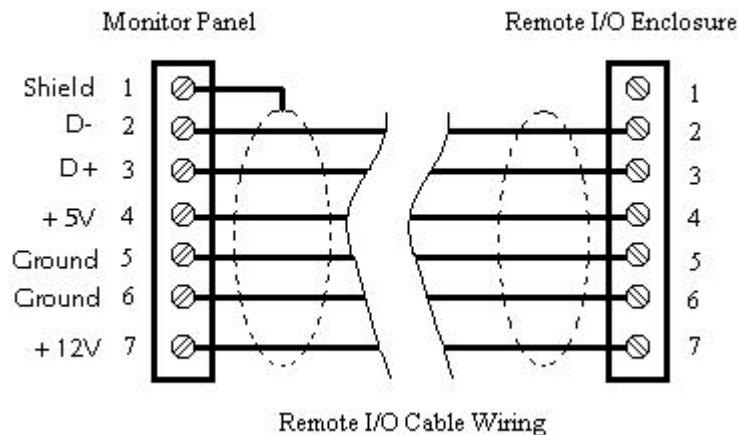
TroubleShooting Guide

This troubleshooting guide will help you troubleshoot problems based on the failure you receive from the system. Refer to the Overview section for system component definitions such as Monitor Panel, Remote I/O Enclosure, etc, as the Troubleshooting Guide will use these definitions to refer to the components of the system

No Remote I/O Modules Found

Normally when starting the XSD-1000 System, the System Status bar reads 'Verifying Connected I/O Modules' for a few seconds, then starts the 'Power Up Stabilization'. If during the initial verification function, the system cannot locate any Remote I/O Modules, a large orange button appears and asks you to check the modules and cabling, then click the orange button to restart.

- Check the voltage on TB-2 terminals 4 & 5 on the bottom of the Monitor Panel. It should read between 4.75 VDC and 5.25 VDC. If not, remove the wire from pins 4 & 5, and recheck the voltage at the terminals. If the voltage is between 4.75 VDC and 5.25 VDC, check the cable for a short or miswiring (see diagram below). Click on the large orange button on the screen, and verify that the green LED on the bottom of the Monitor Panel is flashing while the "Verifying Connected I/O Modules" status is displayed. If not, disconnect the Remote I/O Cable from TB-2 terminals 2 & 3 and re-check the green LED (you will probably have to click on the Orange 'Restart' button on the screen). If the LED is then flashing, there is a short in the Remote I/O Cable, an open wire in the Cable, is miswired, or there is a problem in the Remote I/O Enclosure. If the LED is still not flashing, replace the Communications board in the Monitor Panel.
- The following wiring diagram illustrates the correct wiring between the Monitor Panel and the Remote I/O Enclosure:



Remote I/O Failure

There is one I/O module for each detector in your system, plus one module for photo-eyes 1 – 4, and another for photo-eyes 5 – 8. For instance, if you have 2 detectors and 2 photo-eyes (typical system), you will have 4 Remote I/O Modules (the fourth is the Relay Output for Auto Verification Notification). The Remote I/O Module numbers listed in the Log File are defined in the Remote I/O Module Addressing section.

- Check the Monitor Panel screen and the current Log File to determine if only one Remote I/O Module has failed, or if ALL Remote I/O Modules have failed. If all have failed, go to Step 1 in the ‘No Remote I/O Modules Found’ section.
- Open the Remote I/O Enclosure and notice the red LED’s on each of the Remote I/O Modules. Any that are NOT flashing, but are on, are NOT communicating. Any LED’s that are constantly off have lost power, have totally failed, or have an address conflict. If you have recently added or replaced a Remote I/O Module, refer to the ‘Remote I/O Module Addressing’ section to verify the module’s address.
- Make sure the terminal screws on the Remote I/O Modules are tight and there are no loose wires.
- Remove the power from the Monitor Panel for about 5 seconds, then restore it. All LED’s on Remote I/O Modules should begin flashing within a few seconds.
- If a Module (or Modules) still cannot communicate or power up, replace the Remote I/O Module. Refer to the ‘Remote I/O Module Addressing’ section for proper addressing.

Detector Failure

Detector Failures can come from two areas:

- Actual detector failure
- Failure of Scintillator Input Remote I/O Module power supply

(You can refer to the chart in the 'Remote I/O Module Addressing' for the correct I/O Module address if you are not sure which I/O Module to look for).

- Check the Scintillator Input Remote I/O Module in the Remote I/O Enclosure to ensure its red LED is flashing. If not, refer to the 'Remote I/O Failure' section. Check the voltage at the Remote I/O Modules pins +24V & Com. You should see at least 15VDC at these terminals. If so, proceed to the section 'Troubleshooting the Detector'.
- If there is no voltage at these pins, disconnect the wires to the +24V and Com terminals and recheck the voltage.
- If you read a low voltage (less than 15VDC) or have no voltage, replace the Scintillator Input Module.
- If the voltage is greater than 15VDC, proceed to the 'Troubleshooting the Detector' section.

Photo-Eye Failure

Check the 12VDC (TB-2 terminals 6 & 7) on the bottom of the Monitor Panel. If there is no voltage at these pins, remove the Remote I/O Cable from TB-2 terminals 6 & 7, and recheck the voltage at the terminals. If there is now 12VDC at the terminals, then the Remote I/O Cable is miswired or broken and needs replaced. If there is voltage on the terminals, check the wires at the terminal block on the Communications board inside the Monitor Panel. If they are intact, replace the 12VDC power supply.

To use the system with a failed Photo-eye (assuming you have more than two Photo-eyes on your system), do the following:

If you have more than 2 photo-eyes, and a failure occurred on a photo-eye at the beginning or end of the detector, replace it with one of the others such that the photo-eyes at both ends of the detector are functional. Go to the Administrative Options – Configure – PhotoEyes, click on each of the photo-eye configuration boxes, and click off the photo-eye you took out. This, in effect, disables that photo-eye until you can get the failed one repaired or replaced.

Note that it will help if you first go to Administrative Options – File – Save Current Settings to Disk File and save your settings first. Then when the failed photo-eye is repaired/replaced, you can go to Administrative Options – File – Restore Settings from Disk File and retrieve you last setup before the photo-eye configuration was changed.

If you only have 2 photo-eyes, you will need to switch the system to Uni-Directional in the Administrative Options – Configure – PhotoEyes menu. If the failed photo-eye is the Truck Present Start photo-eye for the direction you need, you can physically swap the photo-eyes on the frame. Unfortunately, with only one photo-eye available, the system's sensitivity is affected and you may get an increase in false alarms. It is imperative that you get the photo-eye repaired/replaced as soon as possible.

As above, the failed photo-eye can be turned off using the Administrative Options – Configure – PhotoEyes menu. Click on each of the photo-eye configuration boxes and click off the failed photo-eye, until it is repaired/replaced.

Relay Failure

This failure will probably become apparent during a System Verify (Manual or Automatic). If a failure occurs with an Alarm Relay, go to the Administrative Options – Configure – Configure Relay Output Assignments, and re-assign the failed relay to another working relay. The Alarm Relays are located in the Monitor Panel and will require repair/replacement of the printed circuit board inside the unit.

If the relay failure is a Verification Notification relay, Speed Notification relay, or a Gate Control relay, these are located on the frame in the Remote I/O Enclosure. See the section on Remote I/O Failure for help here.

Troubleshooting the Detector

NOTE: Make sure the wiring from the detector to the Scintillator Input Remote I/O Module is correct. If you have just replaced (or added) a Scintillator Input Remote I/O Module when the Detector Failure occurred, refer to the Remote I/O Module Addressing section to ensure you have properly addressed the Remote I/O Module.

- Remove the cable from the detector. This is a military style twist-off connector located at the top of the detector.
- Make sure the Remote I/O Modules are powered up; the red LED on the Scintillator Remote I/O Modules needs to be On or Flashing.
- Check the voltage at pins A & J of the twist-off connector. If you have greater than 14VDC at these pins, the detector needs to be repaired or replaced. Otherwise, replace or repair the detector cable.

Adding/Replacing a Remote I/O Module

When replacing a Remote I/O Module, there are two important things to check:

- Replace with the same module type (Scintillator Input, 3-30VDC Input, etc.)
- Make sure the address on the new board is correct.

You do not have to remove the field wiring to replace a Remote I/O Module, unless the module's connector is faulty. Pull the connector up, press the plastic release tab on the I/O Module, remove the module and replace with a new one, and push on the connector.

When upgrading (adding additional features, detectors, etc.) follow the installation instructions for proper addressing and wiring.

NOTE: If two Remote I/O Modules have the same address, either one or both will not communicate properly! See the section on 'Remote I/O Module Addressing'.

Remote I/O Module Addressing













In the following illustrations, the slider on each switch position 1 – 7, should match the black portion of each switch. For instance:










in this illustration, switch position 1 is On (up), positions 2 through 7 are Off (down).

This chart illustrates the proper addressing for each Remote I/O Module:

Module Address	Module Type	Description	Switch Positions
1	3-30VDC Input	Photo-eyes 1 - 4	
2	3-30VDC Input	Photo-eyes 5 - 8	
5	Relay Output	Auto Verification Annunciator	
7	Scintillator Input	Detector 1A	
8	Scintillator Input	Detector 2A	
9	Scintillator Input	Detector 3A	
10	Scintillator Input	Detector 4A	
11	Scintillator Input	Detector 5A	

12	Scintillator Input	Detector 6A	
13	Scintillator Input	Detector 7A	
14	Scintillator Input	Detector 8A	
15	Scintillator Input	Detector 9A	
16	Scintillator Input	Detector 10A	
17	Scintillator Input	Detector 11A	
18	Scintillator Input	Detector 12A	
19	Scintillator Input	Detector 1B (Dual Detector ONLY)	
20	Scintillator Input	Detector 2B (Dual Detector ONLY)	
21	Scintillator Input	Detector 3B (Dual Detector ONLY)	
22	Scintillator Input	Detector 4B (Dual Detector ONLY)	
23	Scintillator Input	Detector 5B (Dual Detector ONLY)	

24	Scintillator Input	Detector 6B (Dual Detector ONLY)	
25	Scintillator Input	Detector 7B (Dual Detector ONLY)	
26	Scintillator Input	Detector 8B (Dual Detector ONLY)	
27	Scintillator Input	Detector 9B (Dual Detector ONLY)	
28	Scintillator Input	Detector 10B (Dual Detector ONLY)	
29	Scintillator Input	Detector 11B (Dual Detector ONLY)	
30	Scintillator Input	Detector 12B (Dual Detector ONLY)	

Printer

You have the option to select which events will be printed to the printer. These options are found in the User Setup - Events Logging menu. The same events available for the Log File are available for the Printer. Any event checked, if it occurs, will be printed. You may select different events for the Printer and Log File.

The optional printer supplied by Ronan is a thermal 4" wide printer with graphics capability. Its primary purpose is to log alarm events on hard copy. Truck Present Alarm events will be printed on an individual 'ticket' of paper, while other system and background alarms will be printed when a truck arrives or when the system is shut down.

The cable interface at the monitor panel is a 25-pin male D-sub-style connector.

Events

The following events can be selected for printing or logging in the User Setup menus:

- Startup/Shutdown Events: XSD-1000 program startup/shutdown
- Background Alarms: Alarms occurring during Background Mode. These include High Background Alarms, Detector Failure Alarms.
- Truck Present Alarms: Alarms occurring during Truck Present Mode. Including Radiation Alarms, Vehicle Speed Alarms. The Truck ID will also be printed with these events.
- System Alarms: Program failure, Remote I/O Module failure, Communications failure.
- Truck Enter/Exit Events: Vehicles triggering the Truck Present photo-eye(s), and exiting the system. The Truck ID will also be printed with these events.
- System Verification Events: Summary when the System Verification is performed either manually or automatically.

Passwords

The XSD-1000 system requires a password to access the Administrative menus, and to shut down the software. There are three passwords for each function. The default Administrative access password is 'admin'. Once accessed, the Administrative Passwords should be changed for security reasons.

The default Exit password (to shut down the XSD-1000 software) is 'exit'. This password should also be changed during the Administrative session.

Alarms

Radiation Alarm – These alarms are only detected during a Truck Present cycle. If a radioactive source has been detected in a vehicle during a Truck Present cycle or the vehicle has blocked the photo-eyes for longer than the Maximum Truck Present Time (defined in Administrative Options – Alarms Setup – Truck Present Alarms), this alarm will be activated.

Speed Alarm – This alarm is only detected during a Truck Present cycle. The Photo-Eyes for Speed Checking (defined in Administrative Options – Configuration – PhotoEyes) will detect the vehicle's speed and report any speed violations. A speed violation requires that the vehicle be re-scanned through the system. Numerous speed violations could mean that a photo-eye has failed and the system thinks it is blocked, causing spurious speed violations. Periodically run the System Verification to check for proper photo-eye operation.

Truck Present Time-Out Alarm – This alarm is only detected during a Truck Present cycle and triggers a Radiation Alarm. (See Radiation Alarm above). If you receive a Truck Present Time-Out Alarm and the vehicle had already exited the system, run the System Verification to check the photo-eye operation. A failed photo-eye can look like a blocked photo-eye to the system.

Detector Fault Alarm – This alarm is triggered by the counts (value displayed in the green boxes on the Main Screen for each detector) received by a detector being below the Detector Low Count Failure value defined in the Administrative Options – Alarms Setup – Background Alarms menu. The box under this setting is the consecutive number of times this condition must be met before actually issuing the alarm. This value should always be 3. The Low Count Failure value is normally set to 1.

High Background Alarm – This alarm can occur only during Background Mode (when no photo-eyes are blocked). If a large radioactive source is exposed to the detectors, the instantaneous counts are compared against the background average (displayed during Background Mode in the green boxes on the Main Screen). If the instantaneous counts exceed the background average by a factor defined in the High Background Alarm Multiplier (Administrative Options – Alarms Setup – Background Alarm menu), and it occurs on consecutive samples (as defined by the High Background Consecutive Failures till Alarm menu), this alarm will be triggered. If this alarm occurs, the background averaging will cease until the condition is remedied.

I/O Failure Alarm – These alarms can occur anytime a Remote I/O Module fails to communicate properly.

Appendix

Operating System Configuration

It may be necessary to reconfigure your Windows XP operating system from time to time. These reasons can be adding printers, configuring your LAN access, setting up shared directories, etc. The system will allow this, but will discard any changes the next time it boots. The reconfiguration mentioned here is to the operating system stored on Drive C. Changes you make in the menus of the XSD-1000 are stored on Drive D, which is NOT write-protected.

Also note that there is no typical 'Shut Down' function on the Windows menu. This feature is not required normally since the hard disk is write-protected. For normal shutdown, you can simply unplug the unit.

There are two methods for disabling the write-protection on Drive C: temporary and permanent. It is advised to NEVER use the permanent write-protect disable function unless you are the owner and operator of the system, or you have qualified personnel operating the system. This system can have access to your LAN/WAN, internet, and numerous other sites. The system also depends on minimal network traffic to maintain its communications speed to the Remote I/O modules and maintain its sensitivity.

The two methods are described here. To temporarily disable the write-protect feature of Drive C, select the Start button, then the Run function. In the Open: box, type 'ProtectionOff.bat', then click on the OK button. This will disable the write-protection function until you reboot the system. After reboot, the write-protection function will automatically be enabled. To reboot the system after making any changes, you should again select the Start button, then the Run function. In the Open: box, type 'Restart.bat' and the OK button. This will ensure that any settings you have made are saved before actually shutting down.

The second method is similar to the first. Select the Start button, then the Run function. In the Open: box, type 'PProtectionOff.bat', then click on the OK button. This permanently disables the write-protection function, even after rebooting. If at some point later you decide to re-enable the write-protect function, do the following: Select the Start button, then the Run function. In the Open: box, type 'ProtectionOn.bat', then click the OK button. The system must be rebooted to enable the write protect function. This need not be immediately, but keep in mind that you are not protected until you reboot. This is done by selecting the Start button, then the Run function. In the Open: box, type 'Restart.bat' and click the OK button.

XSD-1000 Specifications

Frame Components

Electrical	Supply	+ 5 VDC @ 7.5A max +12 VDC @ 4.5A max Optional 120 VAC @ 6A max /220 VAC @3A max
	Signal	RS-485 Communications
	Connections	6 Position Terminal Block for cable from Monitor Panel (See chart for maximum cable lengths) All scintillator/photo-eye connections local to frame.
Environmental	Operating Temp	-20C to +60C normal -40C to +60C with Heaters
	Storage Temp	-40C to +60C
	Humidity	0 – 100%
	Classifications	NEMA 4
Mechanical	Frame Material	Steel – Painted
	Frame Weight	
	Detector Mat'l	Steel – Painted
	Detector Weight	
	Options	Detectors – 1 to 12 (Single or Dual) Photo-eyes – 1 to 8

Monitor Panel Components

Electrical	Supply	85 – 265 VAC @ 2A max, 50/60Hz
	Signal	RS-485 Communications to/from Frame, Ethernet, USB
	Connections	AC Power, 6 Position Terminal block for Power/Communications to Frame, 4 Alarm Relays (Form 'A'), Beeper, Keyboard, Mouse, Printer, Ethernet, USB.
Environment	Operating Temp	0C to +50C
	Storage Temp	-20C to +60C
	Humidity	0% to 95% non-condensing
	Classification	None
Mechanical	Material	Steel – Painted enclosure Glass – Touch Screen Aluminum – Screen Bezel, Terminal Cover
	Size	Enclosure – 300mm x 300mm x 120mm LCD Panel – 8.4" Color w/Touch-screen
	Weight	20 lbs., 9.07 kgs
Computer	Type	Fan-less Single Board VIA 733 MHZ with Low Power C3 Processor
	Operating Sys.	Windows XP® Embedded
	Hard Disk	40G hard disk for file storage

Options	System Options	
Remote Camera	Capturing Vehicle Images when Alarms Occur	
RFID Reader	Capturing Rail Car identification when Alarms	
	Occur	
Ticket Printer	Thermal ticket printer for alarm notifications	
SNM Detection	Special Nuclear Materials detection includes	
	Gamma and Neutron detection	
Isotope	Permits the identification of isotopes detected and	
Identification	reduces nuisance alarms	

Max Cable Lengths (feet) for XSD-1000 Monitor Panel to Remote I/O Panel

Nbr of Remote I/O Cards ¹	Supply Voltage from Monitor Panel (VDC)	22 ga - Max Length	20 ga - Max Length	18 ga - Max Length	16 ga - Max Length	14 ga - Max Length
3	12	426.1	673.4	1065.2	1378.5	2169.8
4	12	319.6	505.1	798.9	1033.9	1627.4
5	12	255.6	404.0	639.1	827.1	1301.9
6	12	213.0	336.7	532.6	689.2	1084.9
7	12	182.6	288.6	456.5	590.8	929.9
8	12	159.8	252.5	399.4	516.9	813.7
9	12	142.0	224.5	355.1	459.5	723.3
10	12	127.8	202.0	319.6	413.5	651.0
11	12	116.2	183.7	290.5	376.0	591.8
3-11 ⁶	5 + 12	N/A	25	25	25	25

Notes:

1. Minimum is 3 cards: 1 Digital Input for Photo-eyes, 2 Scintillator Input cards.
2. All *new* installations will require a 4-wire cable with overall shield and a 12VDC to 5VDC Power supply⁵ in the Remote I/O Panel.
3. Cable lengths are calculated using wire resistances for 19/?? stranding.
4. 18 AWG and 16 AWG are the standard wire gages for XSD-1000 systems.
5. For retrofits of Interceptor 500, if cable length is < 25 ft., use 6 wire cable without power supply card.

**- New Installation User Software Setup -
XDS-1000 Monitoring System
07 June 2007**

These steps, at a minimum must be performed to use the XSD-1000 System:

Administrative Options – File – Log File Creation

Set the interval for Log File Creation. ('Daily' will create a new Log File every day, etc.)

Administrative Options – Configure – Detectors

Select the number of detectors and their availability here. This menu determines the total number of detectors for your system, and their basic configuration (Single/Dual).

User Setup – Detector Names Status

Type the names of each detector to identify them (North, East, Top-Left, etc.)

Administrative Options – Configure – Detector Locations

Move the detector boxes around the truck at their appropriate locations. Remember that Detector 1 is tied to Remote I/O Module Address 7, Detector 2 is tied to Address 8, etc.

Administrative Options – Configure - System ID

Type in a unique ID for this system. If you are using multiple systems linked together over your LAN system, each system MUST have a unique ID (Lower Gate, North Entrance, etc).

Perform the following if you plan to use the Quality Assessment Package:

Administrative Options – Quality Assessment – Replace Components – Set Sensitivity Check Interval

Normally this is 365 days, but can be whatever you set as your standard (a value of 0 disables the warning).

Administrative Options – Quality Assessment – Replace Components – Replace Detectors

You will need to 'replace' (first time is install) the detectors to put them into the database.

Administrative Options – Quality Assessment – Replace Components – Replace Test Source

This also must be done to determine the Sensitivity Check Allowances.

Administrative Options – Quality Assessment – Replace Components – Perform Detector Sensitivity Check

This must be done to establish a reference base of values for future Sensitivity Checks.

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Windows® XP Embedded Runtime

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The software on this device includes software licensed from Microsoft Corporation or its affiliate.

The terms also apply to any Microsoft

- Updates,
- Supplements,
- Internet-based services, and
- Support services

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As described below, using some features also operates as your consent to the transmission of certain standard computer information for Internet-based services.

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 - Directly support the manufacturer's specific use for the device, or
 - Provide system utilities, resource management, or anti-virus or similar protection.

Software that provides consumer or business tasks or processes may not be run on the device. This includes email, word processing, spreadsheet, database, scheduling and personal finance software. The device may use terminal services protocols to access such software running on a server.

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- You may use terminal services protocols to connect the device to another device running business task or processes software such as email, word processing, scheduling or spreadsheets.
- You may allow up to ten other devices to access the software to use
 - File Services,
 - Print Services,
 - Internet Information Services, and

- Internet Connection Sharing and Telephony Services.

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- Reverse engineer, decompile or disassemble the software;
- Make more copies of the software than specified in this agreement;
- Publish the software for others to copy;
- Rent, lease or lend the software; or
- Use the software for commercial software hosting services.

Except as expressly provided in this agreement, rights to access the software on this device do not give you any right to implement Microsoft patents or other Microsoft intellectual property in software or devices that access this device.

You may use remote access technologies in the software such as Remote Desktop to access the software remotely from another device. You are responsible for obtaining any licenses required for use of these protocols to access other software.

- **Remote Boot Feature.** If the *Ronan Engineering Company* enabled the device Remote Boot feature of the software, you may
 - use the Remote Boot Installation Service (RBIS) tool only to install one copy of the software on your server and to deploy the software on licensed devices as part of the Remote Boot process; and
 - use the Remote Boot Installation Service only for deployment of the software to devices as part of the Remote Boot process; and
 - download the software to licensed devices and use it on them.

For more information, please refer to the device documentation or contact *Ronan Engineering Company*.

- **Internet-Based Services.** Microsoft provides Internet-based services with the software. Microsoft may change or cancel them at any time.
 - Consent for Internet-Based Services.** The software features described below connect to Microsoft or service provider computer systems over the Internet. In some cases, you will not receive a separate notice when they connect. You may switch off these features or not use them. For more information about these features, visit

<http://www.microsoft.com/windowsxp/downloads/updates/sp2/docs/privacy.mspix>.

By using these features, you consent to the transmission of this information. Microsoft does not use the information to identify or contact you.

b. Computer Information. The following features use Internet protocols, which send to the appropriate systems computer information, such as your Internet protocol address, the type of operating system, browser and name and version of the software you are using, and the language code of the device where you installed the software. Microsoft uses this information to make the Internet-based services available to you.

- **Web Content Features.** Features in the software can retrieve related content from Microsoft and provide it to you. To provide the content, these features send to Microsoft the type of operating system, name and version of the software you are using, type of browser and language code of the device where the software was installed. Examples of these features are clip art, templates, online training, online assistance and Appshelp. These features only operate when you activate them. You may choose to switch them off or not use them.
- **Digital Certificates.** The software uses digital certificates. These digital certificates confirm the identity of Internet users sending X.509 standard encrypted information. The software retrieves certificates and updates certificate revocation lists. These security features operate only when you use the Internet.
- **Auto Root Update.** The Auto Root Update feature updates the list of trusted certificate authorities. You can switch off the Auto Root Update feature.
- **Windows Media Player.** When you use Windows Media Player, it checks with Microsoft for
 - Compatible online music services in your region;
 - New versions of the player; and
 - Codecs if your device does not have the correct ones for playing content. You can switch off this feature. For more information, go to:
<http://microsoft.com/windows/windowsmedia/mp10/privacy.aspx>.
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