TREK

REMOTE SERVICES

USER GUIDE

November 2012

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1 What You Need To Know Before You Read This Document

Before reading this document you should be familiar with the material in the TReK Getting Started User Guide (TREK-USER-001). If you have not read this document, you may have difficulty with some of the terminology and concepts presented in this document.

We assume you are an experienced Windows user. Information about how to use a mouse or how to use Windows is not addressed in this user guide. Please see your Windows documentation for help with Windows.

2 Technical Support

If you are having trouble installing the TReK software or using any of the TReK software applications, please try the following suggestions:

Read the appropriate material in the manual and/or on-line help.

Ensure that you are correctly following all instructions.

Checkout the TReK Web site at http://trek.msfc.nasa.gov/ for Frequently Asked Questions.

If you are still unable to resolve your difficulty, please contact us for technical assistance:

TReK Help Desk E-Mail, Phone & Fax:

E-Mail:	trek.help@nasa.gov
Telephone:	256-544-3521 (8:00 a.m. - 4:30 p.m. Central Time)
Fax:	256-544-9353

TReK Help Desk hours are 8:00 a.m. – 4:30 p.m. Central Time Monday through Friday. If you call the TReK Help Desk and you get a recording please leave a message and someone will return your call. E-mail is the preferred contact method for help. The e-mail message is automatically forwarded to the TReK developers and helps cut the response time.

3 Introduction

The TReK Remote Services application is used to configure TReK to accept remote connections from external TReK systems. Using this application you can configure security settings, create user accounts, and track remote connections. One of the terms that will be used frequently in this document is the term “sentinel”. In a conceptual sense a sentinel is both a guard and a gateway. You create a sentinel to allow remote TReK

users to connect and use your TReK services. As a guard the sentinel evaluates each incoming connection and only accepts the connection if it meets the current security configuration criteria. As a gateway, the sentinel provides the passageway for incoming connections and requests for services. In a technical sense a sentinel is basically a network socket (TCP listener socket). It is possible to create multiple sentinels and you can define which network card to use when you create a sentinel. Each sentinel can support multiple remote connections. Each time a remote user connects to a sentinel, the sentinel uses the current security configuration to determine whether to accept the connection. If the connection meets the security criteria the connection is accepted. If not it is rejected. There are three security configurations each offering various levels of security: Allow All Connections, Check Source IP Address Only, and Login Required. Detailed information about each security configuration is described later in this document.

4 Remote Services Main Window

The Remote Services main window consists of two main areas as shown in Figure 1. The top part of the main window contains the list of sentinels identified by your TReK system. When you start the Remote Services application the list will be empty. This is because you have not yet added any sentinels to the list. The bottom part of the window is a message area that is used to display important status and error information messages about the remote service activities in progress.

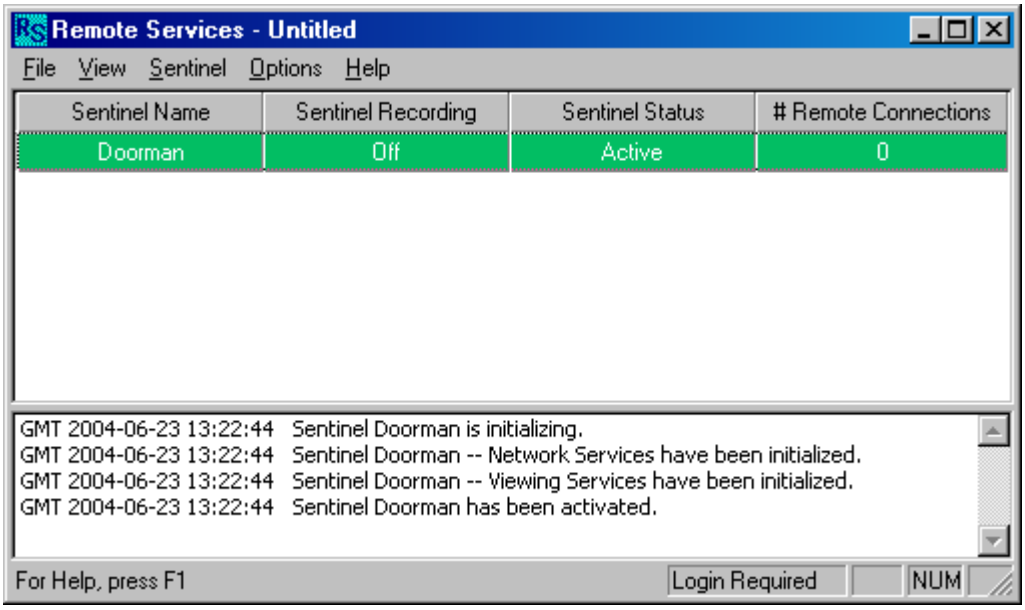

Figure 1 Remote Services Main Window

There are four pieces of information that are displayed for each sentinel in the sentinel list. They are Sentinel Name, Sentinel Recording, Sentinel Status, and # Remote Connections. The Sentinel Name is a user-defined name given to the sentinel when it is

created. The Sentinel Recording column identifies whether the information flowing across the connection is being recorded. The Sentinel Status column identifies the status of the sentinel. The # Remote Connections column identifies how many remote connections are being supported by the sentinel.

If you are running the Remote Services application or viewing this document from within Microsoft Word then you have probably noticed that the sentinel row has a color associated with it. The color provides information about the sentinel. For example, when using the default colors, if the sentinel row is black, this indicates that the sentinel has not been activated. If the sentinel row is purple, this indicates that the sentinel is initializing. If the sentinel row is green, this indicates that the sentinel is ready to accept connections. The colors are helpful in providing immediate information about the general configuration and status of each sentinel in the list.

5 Remote Services Menus

The Remote Services application contains five main menus: File, View, Sentinel, Options, and Help. Each of these menus is described in more detail below.

5.1 File Menu

The File menu is used to create, open, and save remote services configurations and to exit the Remote Services application. A Remote Services configuration is comprised of the sentinels in the sentinel list along with all the information associated with each sentinel. This includes the color preferences you set in the Set Color Preferences dialog. When you save a configuration, the Remote Services application will default to the <base_path>\configuration_files\remote_services directory.

If the operating system is installed in the default directory on the C drive then:

<base_path> = C:\Documents and Settings\<username>\Application Data\TReK

You can save your configuration files anywhere you like, but this default directory provides an easy way for you to keep up with your files.

Each of the items on the File menu is described below.

New

New provides a way to start a new configuration. When you start a new configuration any sentinels in the list are deleted and all activities associated with those sentinels are stopped. If there are unsaved sentinels in the sentinel list when New is selected, you will be given the option of saving the configuration before all the sentinels are deleted from the sentinel list. The New menu item will be insensitive when there are sentinels in the sentinel list which are initializing. As soon as the sentinel(s) finish initializing the menu item will be available.

Open
Open provides a way to open a previously saved configuration. The Open menu item will be insensitive when there are sentinels in the sentinel list which are initializing. As soon as the sentinel(s) finish initializing the menu item will be available.

Save
Save provides a way to save the current configuration. The Save menu item will be insensitive when there are sentinels in the sentinel list which are initializing. As soon as the sentinel(s) finish initializing the menu item will be available.

Save As
Save As provides a way to save the current configuration with another name. The Save As menu item will be insensitive when there are sentinels in the sentinel list which are initializing. As soon as the sentinel(s) finish initializing the menu item will be available.

Exit
Exit provides a way to exit the Remote Services application. The Exit menu item will be insensitive when there are sentinels in the sentinel list which are initializing. As soon as the sentinel(s) finish initializing the menu item will be available.

5.2 View Menu

The View menu is used to change attributes associated with the Remote Services main window. There are three items on the View menu. Each is described below:

Status Bar
The Status Bar is located at the very bottom of the Remote Services main window. The status bar is used to display messages and useful information to you without interrupting your work. The status bar has "panes," which include "indicators" and a "message line." The indicators provide the status of items such as SCROLL LOCK. The message line on the status bar can display information about program status or about a toolbar button or menu item that you are pointing to with the mouse. The status bar will always display the current security configuration (e.g. Login Required). If you select the Status Bar item on the View menu, this will toggle the Status Bar on and off.

Set Color Preferences
The Set Color Preferences option brings up the Set Color Preferences dialog. This dialog can be used to turn off, turn on, or change the colors used in the Remote Services main window.

Clear Message Area
As mentioned in section 4**,** the message area is located at the bottom of the Remote Services main window. This is where important status and error messages will be displayed while you are working with the application. If you select the Clear Message Area item on the View menu, this will clear all the messages in the Message Area. Once they have been cleared, you cannot get them back.

5.3 Sentinel Menu

The Sentinel menu is the most frequently used menu in the Remote Services application. It is used to add sentinels to the sentinel list in the main window, and to control all the activities associated with each sentinel. Each of the items on the Sentinel menu are described below.

Add Sentinel
Used to add a sentinel. When you select Add Sentinel, a dialog box will be presented so that you can fill in the information your TReK system needs in order to know how to identify and create the sentinel.

Activate Sentinel
Used to tell Remote Services to activate the sentinel and prepare to evaluate incoming connections from remote TReK systems. The Activate Sentinel option is only available when you have a sentinel selected that is not activated (i.e., Sentinel Status is Inactive.)

Start Recording
Used to tell your TReK system to start recording the data flowing across the connections supported by a particular sentinel. (Recording can be set up when you initially add a sentinel to the list, but if you don't specify recording at that time it can be added later using this menu option). The Start Recording option is only available when you have a sentinel selected with a Recording Status of Off or Stopped.

Pause Recording
Used to tell your TReK system to pause recording for a particular sentinel. Please note that this will only pause recording. The Pause Recording option is only available when you have a sentinel selected with a Recording Status of Recording.

Resume Recording
Used to tell your TReK system to resume recording for a particular sentinel. The Resume Recording option is only available when you have a sentinel selected with a Recording Status of Paused.

Stop Recording
Used to tell your TReK system to stop recording a particular sentinel. The Stop Recording option is only available when you have a sentinel selected with a Recording Status of Recording or Paused.

View Realtime Messages
Used to tell your TReK system to display the realtime messages associated with the connections supported by a particular sentinel.

Deactivate Sentinel
Used to tell your TReK system to shutdown the services associated with a particular sentinel. When you select a sentinel in the sentinel list, and then select the Deactivate Sentinel option, the sentinel will be deactivated and your TReK system will stop services associated with that particular sentinel. Any other activities associated with that sentinel such as recording or viewing will also stop because your TReK system will no longer be running services associated with that sentinel. Any remote connections supported by that sentinel will be dropped. The Deactivate Sentinel option is only available when you have an active sentinel selected. If you want to delete the sentinel from the list, use the Delete Sentinel option.

Delete Sentinel
Used to tell your TReK system to shutdown and delete the selected sentinel. When you select a sentinel in the sentinel list, and then select the Delete Sentinel option, the sentinel will be removed from the list and your TReK system will stop the services associated with that sentinel. Any remote connections supported by that sentinel will be dropped. The Delete Sentinel option is only available when you have a sentinel selected.

Show Sentinel Properties
Used to see a complete list of properties about a particular sentinel. This includes information such as the Sentinel Name, Recording Properties, etc. The sentinel properties are defined when you add the sentinel to the sentinel list using the Add Sentinel dialog.

5.4 Options Menu

The Options menu is used to access information about general remote services attributes and specific remote services status information. Each of the items on the Options menu is described below.

Set Security Configuration
Used to set the security configuration and define TReK user accounts.

Set Remote Services Options
Used to set Remote Services application options such as the default directory to be used for Remote Services configuration files.

Show Remote Services Statistics
Used to view specific remote services network statistics information. This includes information such as the number of packets received, the number of packets sent, if any packets were dropped, the number of connections, etc.

Recorded Data Viewer
Provides access to the Recorded Data Viewer. The Recorded Data Viewer is used to view information stored in a TReK recording file.

5.5 Help Menu

The Help menu is used to access on-line help for the Remote Services application. Each of the items on the Help menu is described below.

Help Topics
Used to access the typical Windows Contents and Index on-line help window.

About Remote Services
Used to view the About Remote Services dialog.

5.6 Sentinel List Pop-Up Menu

The Sentinel List pop-up menu can be accessed by clicking the right mouse button in the sentinel list area of the main window. If you right click in the sentinel list area of the window, but you do not click on a sentinel in the list, many of the menu items will be insensitive. This is because many of the menu items are only applicable when a sentinel is selected. If you right click on a sentinel in the sentinel list all the menu items which are applicable to that particular sentinel at that moment in time will be sensitive. The Sentinel List Pop-Up menu is identical to the Sentinel menu on the menu bar.

5.7 Windows Edit Pop-Up Menu

The standard Windows Edit Pop-Up Menu can be accessed whenever your cursor is located inside an edit field inside the Remote Services application. This menu contains the standard edit commands such as Cut, Copy, and Paste.

6 Remote Services Dialog Boxes

This section describes all the dialog boxes in the Remote Services application. For an example of how some of these dialogs are used while working with the Remote Services application please see the TReK Command Management Tutorial (TREK-USER-036).

6.1 Set Color Preferences Dialog

The Set Color Preferences dialog is shown in Figure 2 below. It is used to control the color feature associated with the Remote Services main window sentinel list. The color of a sentinel in the sentinel list indicates the sentinel's status. The color feature can be turned off. If it is off, the sentinels in the sentinel list will always be black. If the color feature is on, the sentinels in the sentinel list will turn a specific color based on the sentinel status and the colors assigned in the Set Color Preferences dialog.

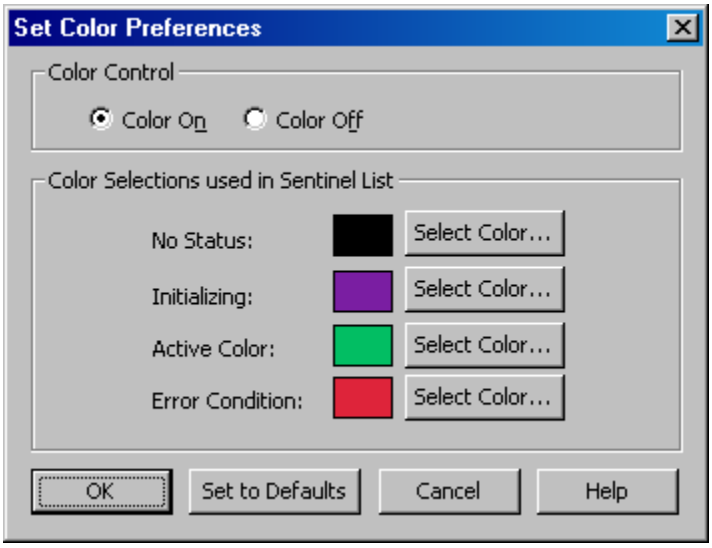

Figure 2 Set Color Preferences Dialog

Each field and control on the Set Color Preferences dialog is described below.

Color On
Turns the color feature on.

Color Off
Turns the color feature off.

No Status Color
The color assigned when the status of the sentinel is "Inactive". "Inactive" indicates that there is no information available about the sentinel. This will be the case when the sentinel has been added to the sentinel list but it has not been activated. In this situation, your TReK system has not been told to do anything about the sentinel and therefore has no status information about the sentinel. (Default Color: Black)

Initializing Color
The color assigned when the status of the sentinel is "Initializing". This status will occur when the sentinel is in the process of activating. (Default Color: Purple)

Active Color
The color assigned when the status of the sentinel is "Active" or ready to accept connections. This status will occur when the sentinel has been activated. (Default Color: Green)

Error Condition Color

The color assigned to a sentinel when an unknown error occurs. (Default Color: Red)

Buttons

Select Color
The Select Color button is used to access the standard Windows Color dialog in order to change the assigned color.

Set to Defaults
The Set to Defaults button will reset all the fields and controls in the Set Color Preferences dialog box to the original values that were in place when the TReK software was installed.

6.2 Add Sentinel (General Tab) Dialog

The Add Sentinel dialog is used to add a sentinel to the sentinel list in the main window. Remember you create a sentinel to accept connections from remote TReK systems. Sentinels are uniquely identified by the Sentinel Name. As can be seen in Figure 3 there are two tabs in the Add Sentinel dialog. The General tab is divided into two sections: General Information and Communication Information. The General Information section contains general information such as the sentinel name. The Communication Information section tells your TReK system what IP address and port number to use when creating the sentinel (network socket). The Browse button next to the Local IP Address field can be used to see a list of all the available IP addresses on your machine. This can be helpful if you have more than one network card installed.

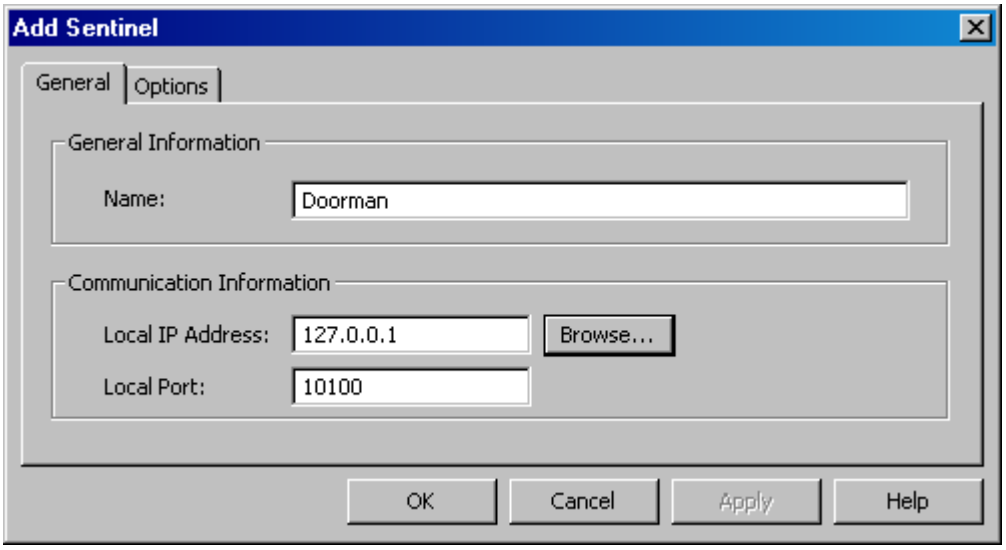

Figure 3 Add Sentinel (General Tab) Dialog

Each field on the General Tab of the Add Sentinel dialog is described below.

Name (Required Field)
The name field is used to tell your TReK system the name of your sentinel.

Local IP Address (Required Field)
The Local IP address field is used to tell your TReK system what IP address (or network card) to use when creating the sentinel. The IP Address field will automatically default to your local unicast IP address. If you want to see a list of all the IP addresses for your machine, just push the Browse button next to the IP address field. Your TReK system retrieves your local unicast IP address from the Windows registry. If you are not familiar with the registry, don't worry about it. You don't need to be familiar with the registry to use your TReK system.

If your machine does not have network connectivity (such as no ethernet card or modem or the system is not connected to a network), set the IP address to `127.0.0.1`. This is called a loopback address and can be used while you are working in standalone mode. This would really only be useful when you are learning to use the Remote Services application and/or the Command Management capability. Since the purpose of the Remote Services application is to accept connections from remote systems, it isn't very useful if you're not connected to a network.

Local Port (Required Field)
The Local Port is used to tell your TReK system which port to use when creating the sentinel.

Note: When you are ready to work with your remote users, you will need to give them the IP Address and Port number of your sentinel. This is information they will enter into their TReK system when trying to establish a network connection with your TReK system. While TReK provides a default port number for sentinels (10100), you may want to consider selecting a different port number. By doing this you can minimize the number of people who know what port number you are using thereby making your system more secure.

6.3 Add Sentinel (Options Tab) Dialog

The Options Tab, shown in Figure 4, provides a way to configure optional sentinel services. The Options tab is divided into two sections: Sentinel Message Recording and Sentinel Message Viewing. The Sentinel Message Recording section is used to identify whether the messages sent to/from remote users should be recorded and if so where the recorded messages should be stored. The Sentinel Message Viewing section is used to configure properties associated with viewing the messages sent to/from remote users. This is how you identify how many messages should be displayed in the View Realtime Sentinel Messages dialog. If you turn viewing off, you will still be able to bring up the View Realtime Sentinel Messages dialog, but no messages will be displayed in the dialog.

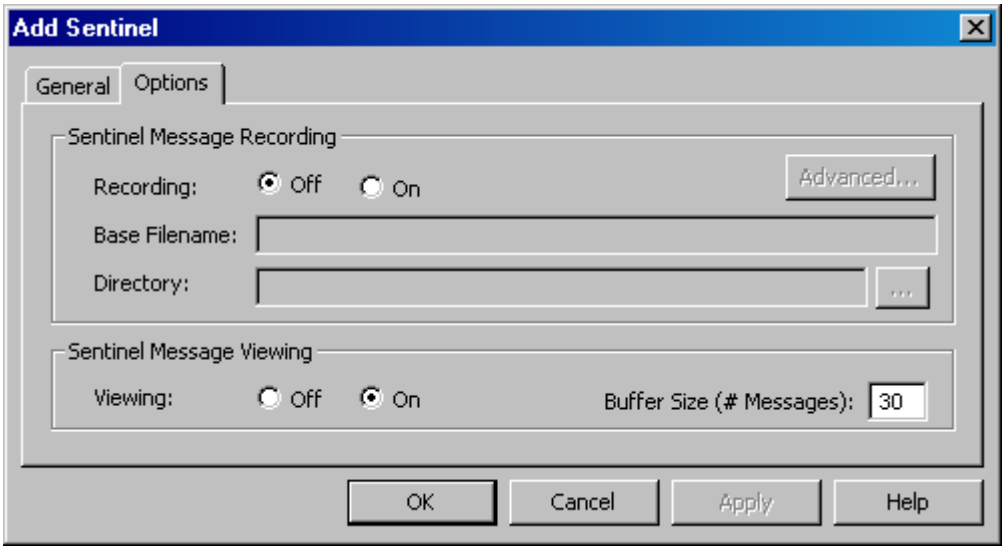

Figure 4 Add Sentinel (Options Tab) Dialog

Each field on the Options Tab of the Add Sentinel dialog is described below.

Recording (Required Field)
The Recording option is used to tell your TReK system whether the data flowing across the connections supported by the sentinel should be recorded.

Base Filename (Required Field if Recording is On)
When your TReK system records the data flowing across the connections supported by the sentinel, the raw data is stored in one or more files in a local directory. A base filename (provided by you) is used as the base name of the file and the rest of the file name is generated by your TReK system. The complete filename indicates the time the file was created and closed. It's a good idea to select a meaningful name that will be easy to remember and is closely associated with the data that you are recording.

Directory (Required Field if Recording is On)
The Directory information is used to tell your TReK system which directory should be used when storing your data recording files. When you want to view the recorded data, you will be asked to provide this Directory information so your TReK system can find the files. This field requires a complete directory path. An example of this is `c:\MyRecordingFiles\`. If you don't like to type or you need help defining the complete path, you can push the … (dot dot dot) button located to the right of the Directory field. This will bring up a Windows Browse for Folder dialog which you can use to identify the local directory path where you want to store your recorded data files. The Browse for Folder dialog is not described in this document since it is a typical Windows dialog box. If you need help with this dialog, please refer to your Windows on-line help.

Viewing (Required Field)

The Viewing option is used to tell your TReK system whether the realtime messages associated with the sentinel's connections should be available for viewing. Viewing does use CPU and memory resources. Therefore, remember that if you start to run low on resources it is possible to turn viewing off.

Buffer Size (# Messages) (Required if Viewing is On)
The Buffer Size tells your TReK system how many realtime messages to store in memory at a time. The buffer will wrap and older messages will be overwritten. This is a safeguard against using up too much memory.

6.4 Browse for IP Address Dialog

The Browse For IP Address dialog is shown in Figure 5. This dialog is used to search a TReK system for all IP addresses or network cards associated with the system.

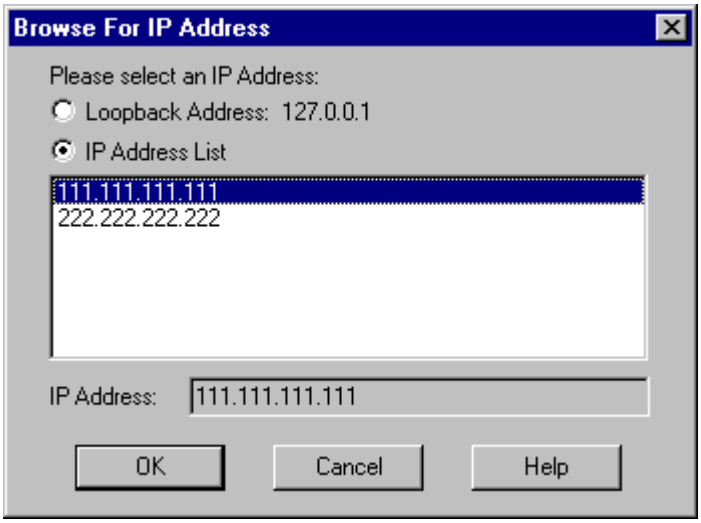

Figure 5 Browse For IP Address Dialog

Each field in the Browse For IP Address dialog is described below.

Please select an IP Address: (Required Field)
You have two options when choosing an IP address. If your TReK system does not have network connectivity (such as no ethernet card or modem or the system is not connected to a network), you need to use the standard loopback address (127.0.0.1). This option is provided by choosing the "*Loopback Address: 127.0.0.1*" radio button. Users with one or more network cards will need to choose which network card or IP Address they would like to use. Choosing the "*IP Address List*" radio button provides this option. The user must then select an IP address from the list.

IP Address

The IP Address field is filled in when you select the Loopback IP address or an IP Address in the list. The IP Address will be copied to the dialog box that contained the button you used to bring up the Browse For IP Address dialog.

6.5 Sentinel Properties Dialog

The Sentinel Properties dialog is used to view and modify sentinel properties. The sentinel properties are defined when you add the sentinel to the sentinel list using the Add Sentinel dialog. The Show Sentinel Properties dialog is identical to the Add Sentinel dialog. If the sentinel is active, some of the fields will be insensitive because they cannot be modified.

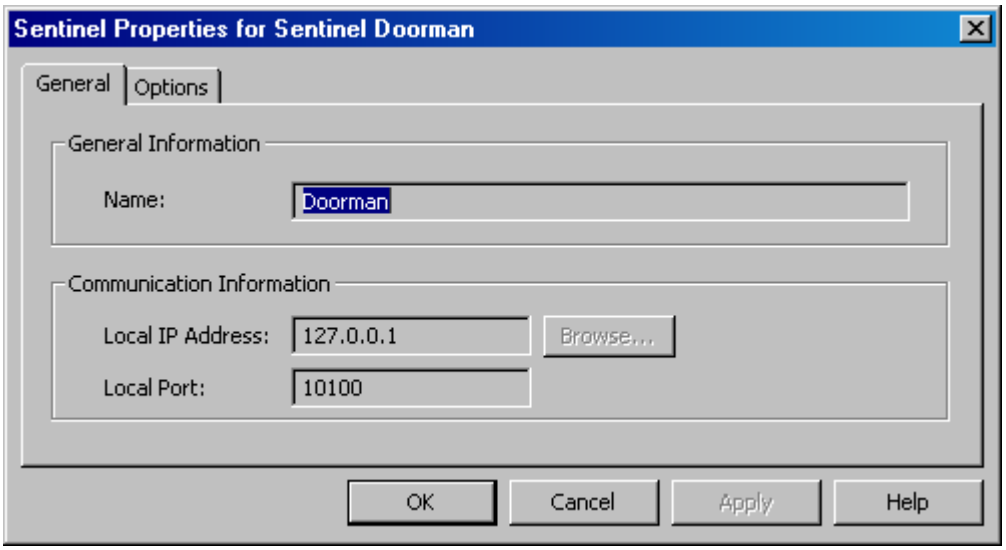

Figure 6 Sentinel Properties Dialog

6.6 Enter Recording Information Dialog

The Enter Recording Information dialog is shown in Figure 7. This dialog will appear when you select Start Recording from the Sentinel Menu or Sentinel List pop-up menu. You use this dialog to tell your TReK system where you want to store your recording files and what you want to use for the Base Filename.

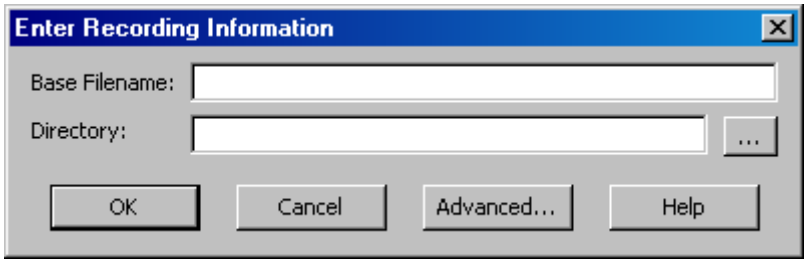

Figure 7 Enter Recording Information Dialog

Each field in the Enter Recording Information dialog is described below.

Base Filename (Required Field)
When your TReK system records data, the raw data is stored in one or more files in a local directory. A base filename (provided by you) is used as the base name of the file and the rest of the file name is generated by your TReK system. The complete filename indicates the time the file was created and closed. It's a good idea to select a meaningful name that will be easy to remember and is closely associated with the data that you are recording.

Directory (Required Field)
The Directory information is used to tell your TReK system which directory should be used when storing your recording files. This field requires a complete directory path. An example of this is `C:\MyRecordingFiles\`. If you don't like to type or you need help defining the complete path, you can push the … (dot dot dot) button located to the right of the Directory field. This will bring up a Windows Browse for Folder dialog which you can use to identify the local directory path where you want to store your recorded data files.

The Browse for Folder dialog is not described in this document since it is a typical Windows dialog box. If you need help with this dialog, please refer to your Windows on-line help.

Dialog Buttons
There is one non-standard button on the Enter Recording Information dialog box. It is described below.

Advanced
The Advanced button displays the Advanced Recording Properties dialog. This dialog is described in section 6.7.

6.7 Advanced Recording Dialog

The Advanced Recording dialog is shown in Figure 8. This dialog will appear when you select the Advanced button located next to a Sentinel Recording option. This could be in the Add Sentinel dialog or the Enter Recording Information dialog. You use this dialog to tell your TReK system what recording properties to use for a particular recording activity.

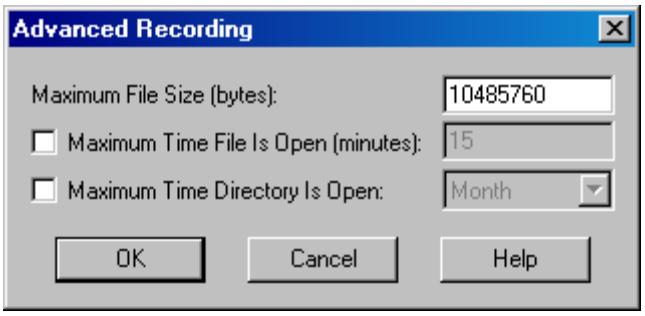

Figure 8 Advanced Recording Dialog

Each field in the Advanced Recording dialog is described below.

Maximum File Size (bytes) (Required Field)
The Maximum File Size information is used to determine when to close a recording file. This property is always used.

Maximum Time File Is Open (minutes)
The Maximum Time File Is Open Checkbox is used to indicate whether the file should be closed based on a maximum time. This is an optional property. If you check the checkbox then this property will be used. If you check the box, then you must also fill in the text field with the amount of time in minutes that should be used as the maximum time. The Maximum Time File Is Open property is used in addition to the Maximum File Size property. If the maximum size is reached before the maximum time, then the file will be closed based on the size. However, if the maximum time is reached before the maximum size is reached, the file will be closed based on the maximum time.

Maximum Time Directory Is Open
The Maximum Time Directory Is Open Checkbox is used to indicate whether recording files should be placed in sub-directories within the parent base directory. The directories will be open/closed based on Day, Week, Month, or Year. This is an optional property. If you check the checkbox then this property will be used.

6.8 View Realtime Sentinel Messages (Sentinel Name) Dialog

The View Realtime Sentinel Messages dialog is shown in Figure 9. This dialog displays the realtime sentinel messages that were sent back and forth between the sentinel and a remote TReK system. The messages are formatted to show the TReK Receipt Time (TRT) associated with the message, the hexadecimal representation of the message, and other sentinel/message specific information.

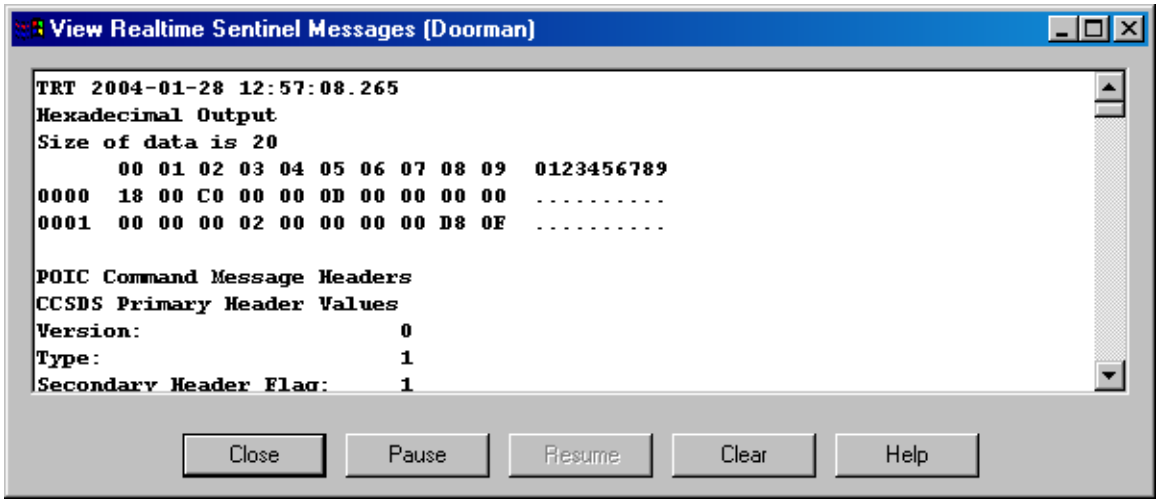

Figure 9 View Realtime Sentinel Messages Dialog

Buttons
There are several non-standard buttons on the View Realtime Sentinel Messages dialog box. Each is described below.

Pause
The Pause button will pause the display of any incoming messages. Since the realtime messages are stored in a buffer it is possible for the buffer to wrap while the display is paused. Therefore, when you push the Resume button you may see some of the messages that arrived while the display was paused or some may be missing because the buffer wrapped.

Resume
The Resume button will resume display of any incoming messages.

Clear
The Clear button will clear the display and the underlying buffer where the realtime messages are stored. Therefore, if you push the Clear button, all the realtime messages that TReK currently has stored in the buffer and the window will be deleted. However, any new messages that arrive after you push the clear button will be stored in the buffer and displayed in the realtime message viewer window. (Note: If you are recording incoming messages they will always be stored to disk. So even if you push the clear button in a realtime viewer window this does not affect data that is being recorded to disk. You can use the Recorded Data Viewer to view messages that have been recorded in a file.)

Note: Passwords are not displayed in the View Realtime Sentinel Messages dialog.

6.9 Set Security Configuration Dialog

The Set Security Information dialog is shown in Figure 10. This dialog provides a way to set the security configuration that will be used for all incoming connection requests. TReK supports three levels of security. The lowest (most minimal) level of security is "Allow All Connections". This configuration automatically accepts all incoming connections. No source IP address checks are performed and no login is required. Please note that services such as command destination services are configured separately and may not be available even if the connection is allowed. The second level of security is "Check Source IP Address Only". This configuration will only check the source IP address for the remote party requesting to connect. If the IP address is in the list of approved addresses, then the connection will be accepted. If not, the connection will be rejected. The third level of security (maximum level) is Login Required. This configuration requires the remote party to enter a username and password. The user account can be configured to check the source IP address or to allow the user to connect from any IP address. This is the safest security configuration.

For more information about how the security configuration affects the command management capability please reference the TReK Command Management Tutorial (TREK-USER-036).

Note: TReK only provides encryption on the data zone of messages associated with the sentinel. Security services such as VPN must be implemented by the user or supporting control center.

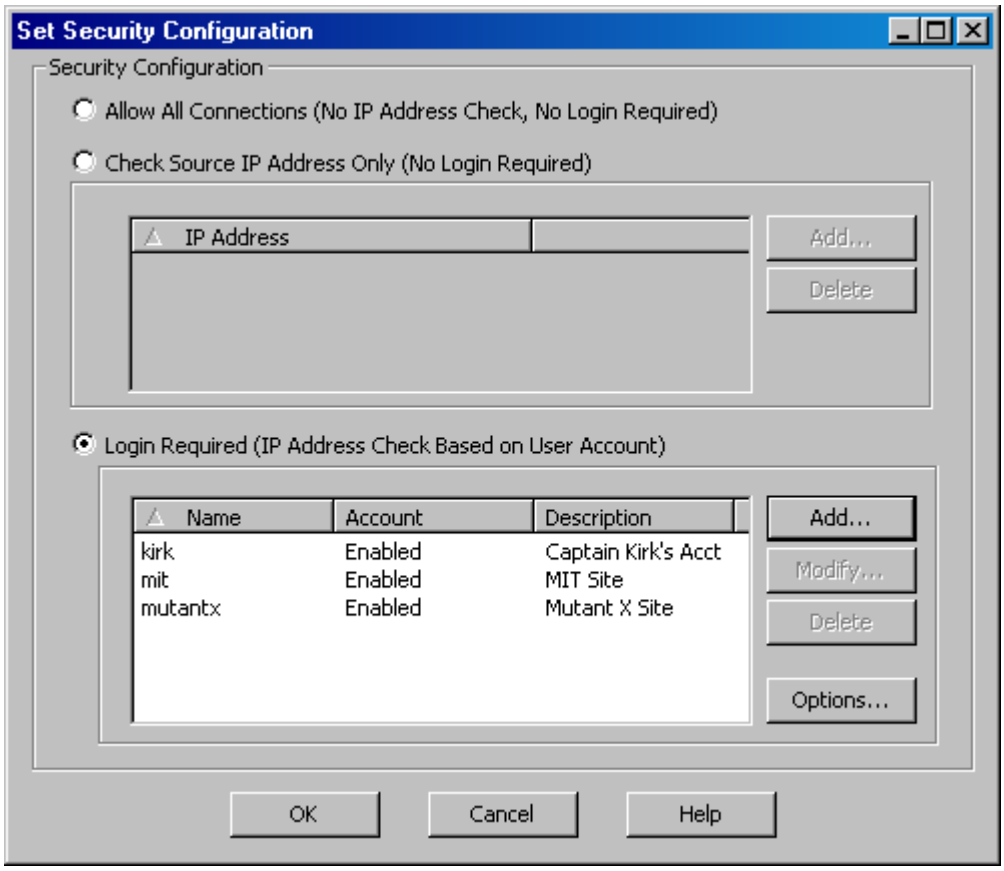

Figure 10 Set Security Configuration Dialog

Each field in the Set Security Configuration dialog is described below.

Security Configuration (Radio Buttons)
There are three security configurations: Allow All Connections, Check Source IP Address, and Login Required.

IP Address List
This is the global IP Address list that is used when the security configuration is set to "Check Source IP Address". This list is only used with the "Check Source IP Address" configuration. The Add button is used to add IP Addresses to the list and the Delete button is used to Delete addresses from the list.

Buttons
The Add button provides a way to add an IP address to the list. The Add IP Address dialog is described in Section 6.10. The Delete button provides a way to delete an IP address from the list.

Login Required User Account List

The List under the Login Required radio button shows a list of all TReK user accounts. This list displays the username, account enable/disable status, and a short description for each account.

Buttons
The Add button can be used to add a user account. The Add User Account dialog is described in section 6.11. The Modify button can be used to Modify a user account. The Delete button can be used to delete a user account. The Options button can be used to set account password rules. The Options (Login Required Configuration) dialog is described in Section 6.12. Please remember that these user accounts have no relation to the computer's user accounts (created using the operating system). TReK user accounts are completely separate and independent.

6.10 Add IP Address Dialog

The Add IP Address dialog is shown in Figure 11. This dialog is used to add an IP address to the Check Source IP Address Only IP address list in the Set Security Configuration dialog or for IP address checks in the Add User Account dialog.

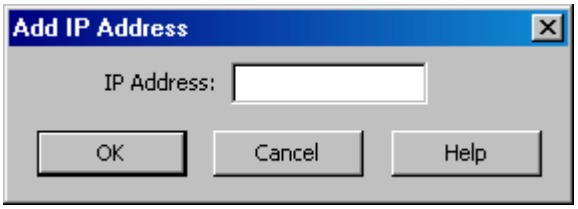

Figure 11 Add IP Address Dialog

Each field in the Add IP Address dialog is described below.

IP Address (Required)
The IP Address to add to the list.

6.11 Add User Account Dialog

The Add User Account dialog is shown in Figure 12. This dialog is used to add a user account to the list of user accounts in the Set Security Configuration dialog. The Username and Password information is case sensitive. So when a remote user logs in, they need to enter the username and password information exactly as you define it in this dialog.

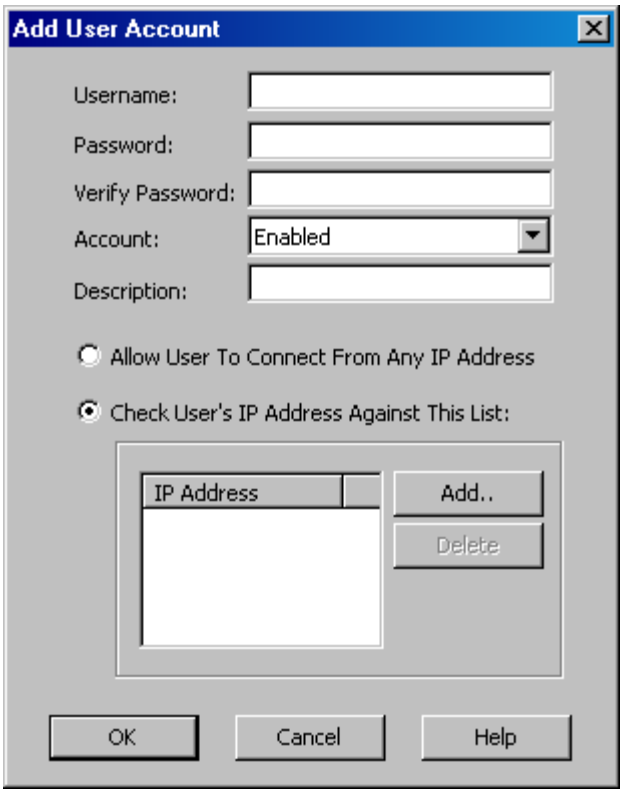

Figure 12 Add User Account

Each field in the Add User Account dialog is described below.

Username (Required)
The username for the account.

Password (Required)
The password for the account.

Verify Password (Required)
The data in this field must match the data in the Password field.

Account (Required)
Each user account can be set to Enabled or Disabled. If the account is Disabled, and a remote user attempts to connect using this account's username, the connection will be rejected.

Description
A brief description of the account. This description will be displayed in the Set Security Configuration dialog's user account list.

Allow User To Connect From Any IP Address
If this option is selected, a user logging in using this account can connect from any IP address and no source IP address check will be performed.

Check User's IP Address Against This List
If this option is selected, a source IP address check will be performed when a user logs in using this account. The source IP address will be checked against the list of IP addresses listed under this radio button.

Buttons
The Add button provides a way to add an IP address to the list. The Delete button provides a way to delete an IP address from the list.

IP Address List (Required if Check User's IP Address Against This List is checked)
This list contains the list of source IP addresses that are approved for this user. If the "Check User's IP Address Against This List" is selected and the user attempts to connect, the user's source IP address will be compared to the addresses on this list. If the source IP address is on this list the connection will be accepted. Otherwise the connection will be rejected. The Add button can be used to add IP addresses to the list. The Delete button can be used to delete IP addresses from the list.

6.12 Options (Login Required Configuration) Dialog

The Options (Login Required Configuration) dialog is shown in Figure 13. This dialog provides a way to enforce password rules for each user account. By default, none of these rules are enforced. To enforce a rule, select the checkbox next to the rule.

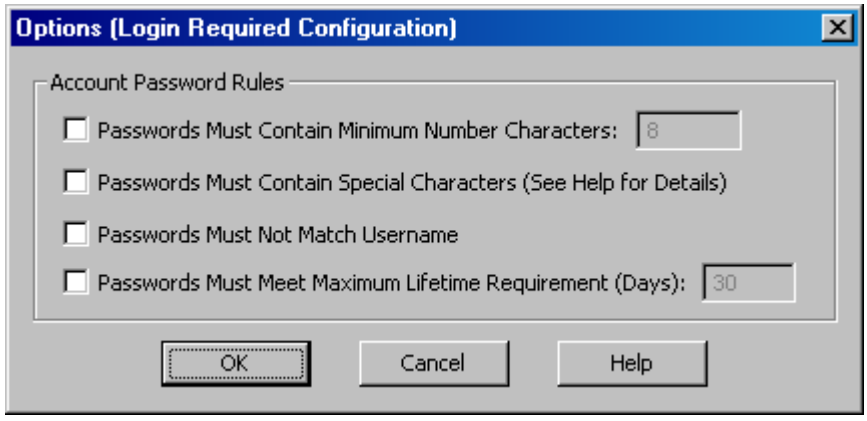

Figure 13 Options (Login Required Configuration) Dialog

Each field in the Options (Login Required Configuration) dialog is described below.

Password Must Contain Minimum Number Characters:
If this rule is selected, then all passwords entered must contain at least the number of characters specified in the field. This will not cause current passwords failing to meet the rule to be reset.

Password Must Contain Special Characters
If this rule is selected, then the password must contain characters from at least three of the following four categories: lower case letters, upper case letters, numbers, and special characters (for example, the dollar sign '$'). This will not cause current passwords failing to meet the rule to be reset.

Password Must Not Match Username
If this rule is selected, then the password must be different than the username. This will not cause current passwords failing to meet the rule to be reset.

Password Must Meet Maximum Lifetime Requirement (Days)
If this rule is selected, then the password must be changed after the specified number of days. An expired password can be changed during login. The age of the password is maintained even if this field is not selected. Therefore, when selected, the password age begins from the last time the password was set.

6.13 Set Remote Services Options Dialog

The Set Remote Services Options dialog is shown in Figure 14. This dialog provides a way to set application defaults. For example, you can set the default directory for remote services configuration files.

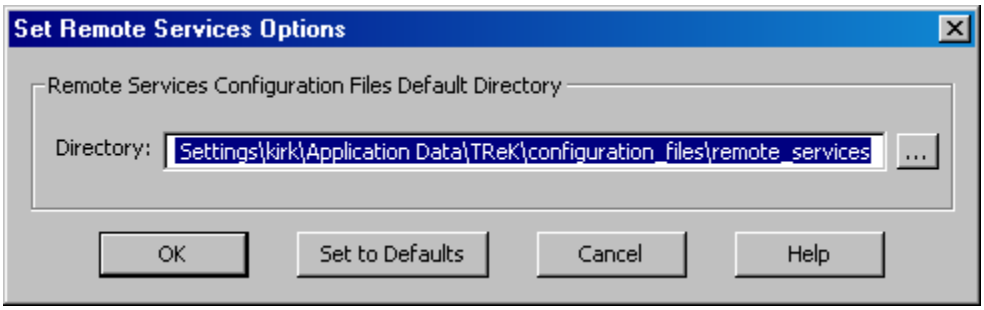

Figure 14 Set Remote Services Options Dialog

Each field in the Set Remote Services Options dialog is described below.

Remote Services Configuration Files Default Directory
This property provides a way to set a user-specified default directory for configuration files. You can leave this field blank. If you leave it blank, TReK will use the following directory:

<base_path>\configuration_files\remote_services

The <base_path> on a Windows 2000 computer is shown below.

<base_path> = C:\Documents and Settings\<username>\Application Data\TReK

Buttons
There is one non-standard button on the Set Remote Services Options dialog. It is described below.

Set to Defaults
The Set to Defaults button will reset all properties in the dialog box to the original values that were in place when the TReK software was installed.

6.14 Remote Services Statistics

The Remote Services Statistics dialog is shown in Figure 15. This dialog provides statistics information about the remote services work currently in progress. For example, you can use this dialog to display information about the number of packets received, the number of packets sent, etc.

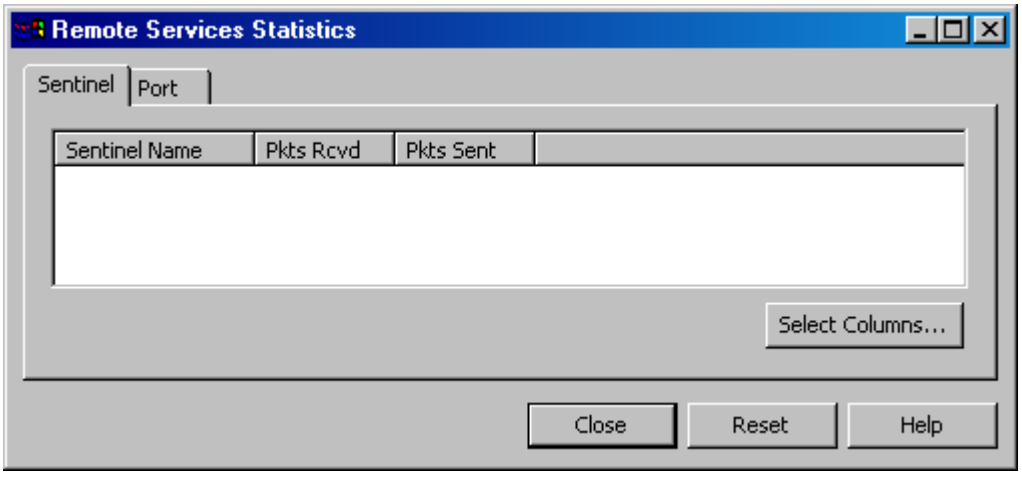

Figure 15 Remote Services Statistics (Sentinel Tab) Dialog

The Remote Services Statistics dialog is a tabbed dialog with two tabs: Sentinel and Port. The Sentinel tab shows statistics for each of the sentinels that are currently in the main window sentinel list. Please note that until a remote user has connected to a sentinel, the Sentinel tab will not show any statistics information. The Port tab shows statistics for each of the ports that are currently in use. Information displayed for a port shows a summary of all activity on the port. If there are packets (command messages, command

responses, etc) arriving at the port other than the packets you expect (or are configured for) this will still be reflected in the port statistics information. The Sentinel tab is shown in Figure 15. There are nine columns of information that can be displayed in the Sentinel tab and ten columns of information that can be displayed in the Port tab. The Port tab is shown in Figure 16.

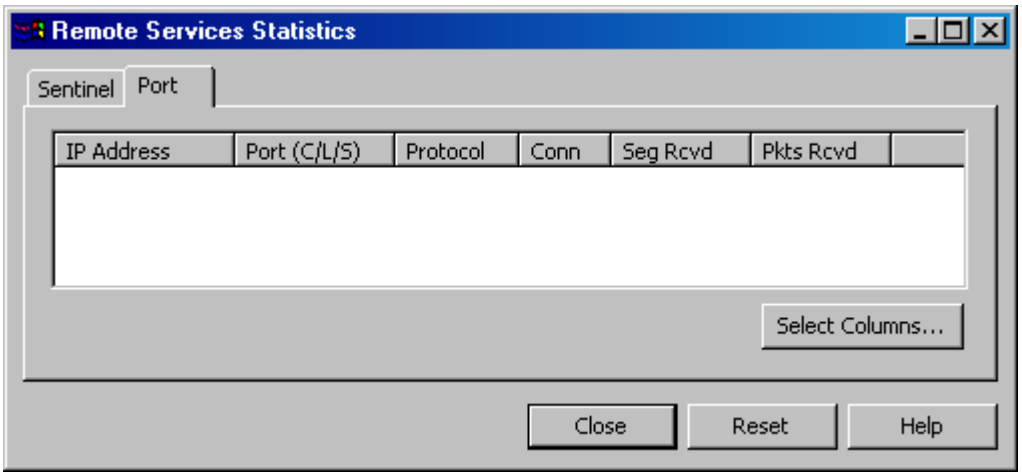

Figure 16 Remote Services Statistics (Port Tab) Dialog

Buttons

Select Columns

There is a Select Columns button on each tab. The Select Columns button is used to identify which columns should be displayed. The Select Columns button on the Sentinel tab will display the Select Sentinel Statistics Columns dialog described in Section 6.15. The Select Columns button on the Port tab will display the Select Port Statistics Columns dialog described in Section 6.16.

Reset

The Reset button resets all statistics information to zero. Statistics collection will resume from that point with the count starting at zero. For example, suppose you have received 700 packets (the value 700 will be in the Packets Received column). If you push the Reset button, the Packets Received value will be reset to 0 and the 700 in the Packets Received column will be replaced with 0.

6.15 Select Sentinel Statistics Columns Dialog

The Select Sentinel Statistics Columns dialog is shown in Figure 17. This dialog is used to configure the columns in the Sentinel tab of the Remote Services Statistics dialog.

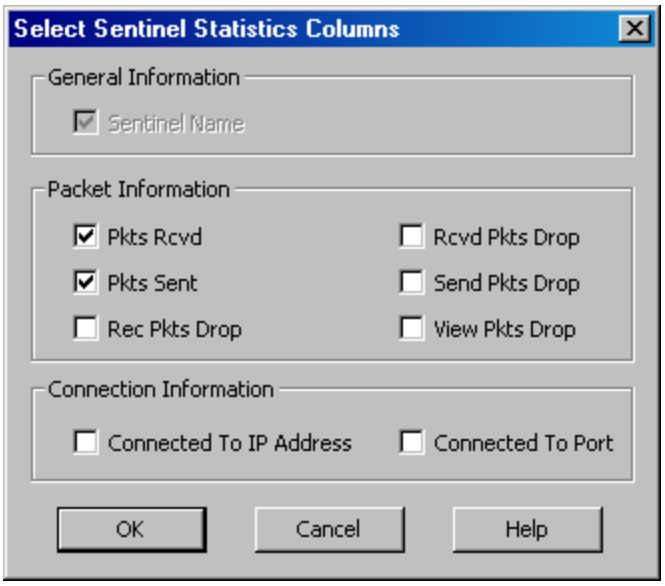

Figure 17 Select Sentinel Statistics Columns Dialog

Each field in the Select Sentinel Statistics Columns dialog is described below.

Sentinel Name
Sentinel Name. The Sentinel Name column cannot be hidden.

Pkts Rcvd
The number of packets received from the remote user system. If you check the Pkts Rcvd button, the Pkts Rcvd column will be displayed.

Rcvd Pkts Drop
Rcvd Pkts Drop stands for Received Packets Dropped. It is the number of packets that arrived from the remote user system that TReK dropped. If you check the Rcvd Pkts Drop button, the Rcvd Pkts Drop column will be displayed.

Pkts Sent
The number of packets sent to the remote user system. If you check the Pkts Sent button, the Pkts Sent column will be displayed.

Send Pkts Drop
Send Pkts Drop stands for Send Packets Dropped. It is the number of packets that TReK attempted to send but dropped. If you check the Send Pkts Drop button, the Send Pkts Drop column will be displayed.

Rec Pkts Drop

Rec Pkts Drop stands for Record Packets Dropped. It is the number of record packets that TReK dropped and therefore did not successfully store in the recording file. If you check the Rec Pkts Drop button, the Rec Pkts Drop column will be displayed.

View Pkts Drop
View Pkts Drop stands for View Packets Dropped. It is the number of packets that arrived from the remote user system that TReK dropped and therefore failed to display in the view realtime messages dialog. If you check the View Pkts Drop button, the View Pkts Drop column will be displayed.

Connected To IP Address
Identifies the IP Address that the sentinel is connected to. If you check the Connected To IP Address button, the Connected To IP Address column will be displayed.

Connected To Port
Identifies the port that the sentinel is connected to. If you check the Connected To Port button, the Connected To Port column will be displayed.

6.16 Select Port Statistics Columns Dialog

The Select Port Statistics Columns dialog is shown in Figure 18. This dialog is used to configure the columns in the Port tab of the Remote Services Statistics dialog.

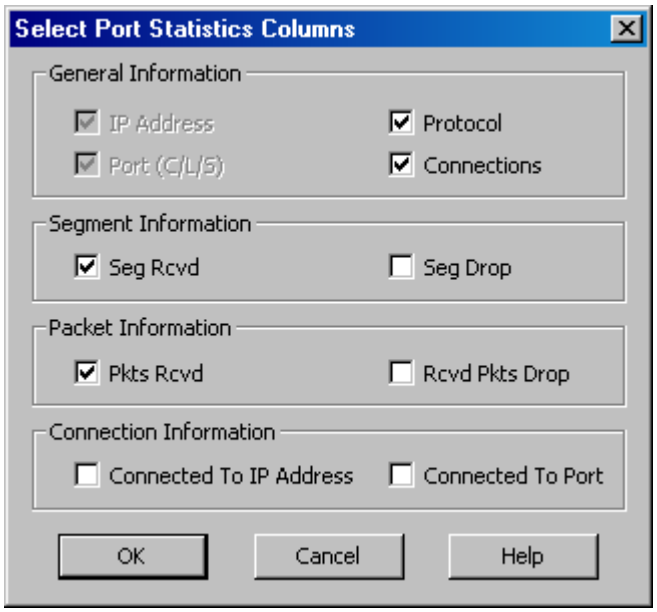

Figure 18 Select Port Statistics Columns Dialog

Each field in the Select Port Statistics Columns dialog is described below.

IP Address
The IP Address column cannot be hidden.

Port (C/L/S)
The Port column cannot be hidden. The port column shows a set of ports that are being used by TReK sockets to receive and send packets. A sentinel may have a Client, Listener, or Server (C/L/S) Socket/Port combination associated with it. In some cases it is possible to have more than one socket/port associated with a sentinel. For example, if TReK is configured to listen for TCP connection requests on a particular port (which you identified when you added the sentinel) and a connection was established, the port column on the port tab will show two entries corresponding to the sentinel that you added. One of the entries will be for the Listener Socket; the other entry will be for the Server Socket that was created by the Listener Socket when the connection was established. The Listener's socket/port information is identified by a port entry in the Port column that only contains the Listeners Socket's port number (e.g., /6100/). The Listener Socket's port information identifies the number of connections or Server Sockets associated with the port. The Server Socket's port information is identified by a port entry that contains two values: the Listener Socket's port number and the newly created Server Socket's port number (e.g., /6100/1024). The Server Socket's port information is important because it is the port that is actually receiving and sending the TCP packets.

Protocol
The Protocol (e.g. TCP). If you check the Protocol button, the Protocol column will be displayed. All sentinel connections are TCP.

Connections
The number of connections that have been established by the port's socket. If you check the Connections button, the Conn column will be displayed.

Seg Rcvd
Seg Rcvd stands for Segments Received. It is the number of TCP packet segments that arrived from the remote user system. TCP may break apart or combine packets to form segments prior to transmitting data. This column is only applicable for TCP. If you check the Seg Rcvd button, the Seg Rcvd column will be displayed.

Seg Drop
Seg Drop stands for Segments Dropped. It is the number of TCP packet segments that arrived from the remote user system and were dropped. TCP may break apart or combine packets to form segments prior to transmitting data. This column is only applicable for TCP. If you check the Seg Drop button, the Seg Drop column will be displayed.

Pkts Rcvd

Pkts Rcvd stands for Packets Received. It is the number of packets that arrived from the remote user system. If you check the Pkts Rcvd button, the Pkts Rcvd column will be displayed.

Rcvd Pkts Drop
Rcvd Pkts Drop stands for Received Packets Dropped. It is the number of packets that arrived from the remote user system and were dropped. If you check the Rcvd Pkts Drop button, the Rcvd Pkts Drop column will be displayed.

Connected To IP Address
Identifies the IP Address that the sentinel is connected to. If you check the Connected To IP Address button, the Connected To IP Address column will be displayed.

Connected To Port
Identifies the port that the sentinel is connected to. If you check the Connected To Port button, the Connected To Port column will be displayed.

6.17 Recorded Data Viewer Dialog

The Recorded Data Viewer is used to view data that is stored in a TReK recording file. The Recorded Data Viewer can be used to view any type of TReK recording file: ERIS messages, commanding messages, telemetry data, or sentinel messages. The Recorded Data Viewer works in a Pulse mode. The Recorded Data Viewer dialog is shown in Figure 19. First you use the Configure dialog to identify the recording files you would like to view. Then you can start the viewing session by pushing the Start button. The Recorded Data Viewer will display the amount of data (messages/packets) based on the Pulse Rate that you identified in the Configure dialog. Each time you would like to view the next set of data you push the Pulse button. You can stop at any time by pushing the Stop button. You can clear the display by pushing the Clear button. Note the black box next to the Status field in Figure 19. This box changes color based on the activity in progress. For instance, it will be black when the Recorded Data Viewer has not been configured. It will alternate between green and red once the Start button has been pushed. It will turn green when data is available, and it will turn red when all the data has been played back and there is no more data available.

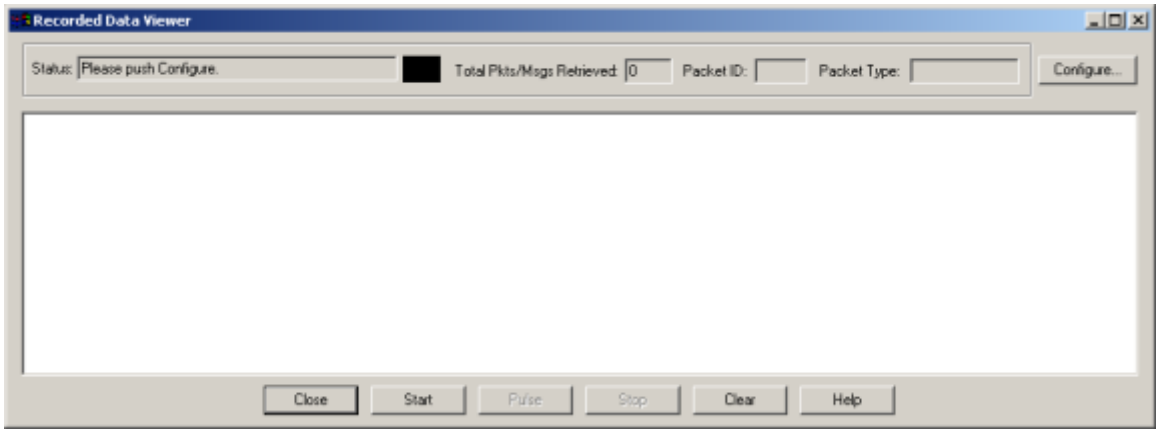

Figure 19 Recorded Data Viewer Dialog

Each field in the Recorded Data Viewer dialog is described below.

Status
This Status field displays a text message to indicate the status of the Recorded Data Viewer.

Total Pkts/Msgs Received
The Total Pkts/Msgs Received field displays the number of packets or messages that have been retrieved from the recording files. This number will increment each time you push the Pulse button so you know the total number of packets or messages that have been viewed thus far.

Packet ID
This is an identifier that is associated with the recorded data. For telemetry data this is the packet ID or APID. This is N/A for ERIS, command, and sentinel data.

Packet Type
This is the packet type associated with the recorded data: ERIS, PDSS Payload, Suitcase Simulator, EHS Command, TReK (sentinel messages are tagged with a packet type of TReK), etc.

Buttons
There are several non-standard buttons on the Recorded Data Viewer dialog. Each is described below.

Configure
The Configure button displays the Configure dialog which provides a way to identify the recording files you wish to view. This dialog also provides a way to configure the pulse rate. This dialog is discussed in Section 6.18.

Start/Replay
The Start button is used to start a viewing session. Once the recorded data viewing has started, you use the Pulse button to request more data. If you push the Stop button or the recorded data viewing session completes (you hit the end of the recorded data files), then the Start button will be re-labeled Replay. At this point Replay will start the recorded data viewing session at the beginning (at the Start Time).

Pulse
The Pulse button will display the next set of data retrieved from the recording files.

Stop
The Stop button will stop the recorded data viewing session. At this time you can replay the data or you can reconfigure the Recorded Data Viewer to view a different set of recording files.

Clear
The Clear button will clear all the text in the Recorded Data Viewer window.

6.18 Configure (Recorded Data Viewer) Dialog

The Configure dialog is shown in Figure 20. You can only view one type of data at a time. For example, you cannot identify recording files that contain ERIS messages and recording files that contain telemetry data. If you identify more than one set of recording files, they must contain the same type of data. Please note that the TReK Receipt Time/Spacecraft Time buttons are only used when working with recording files that contain telemetry data. These buttons are ignored if the recorded data is ERIS data, commanding data, or sentinel data. When viewing telemetry data all the data must be from the same packet ID (APID). For example, you cannot view both Packet ID 7 and Packet ID 2 data at the same time. If you are familiar with the Add A Playback Packet dialog then the Recorded Data Viewer may look somewhat familiar. This is because the information you enter to work with the Recorded Data Viewer is similar to the information you would enter to set up a local TReK playback. When you use the Recorded Data Viewer TReK is basically performing a playback. However instead of the data being played back through your TReK system, it is only being made available for viewing in the Recorded Data Viewer dialog.

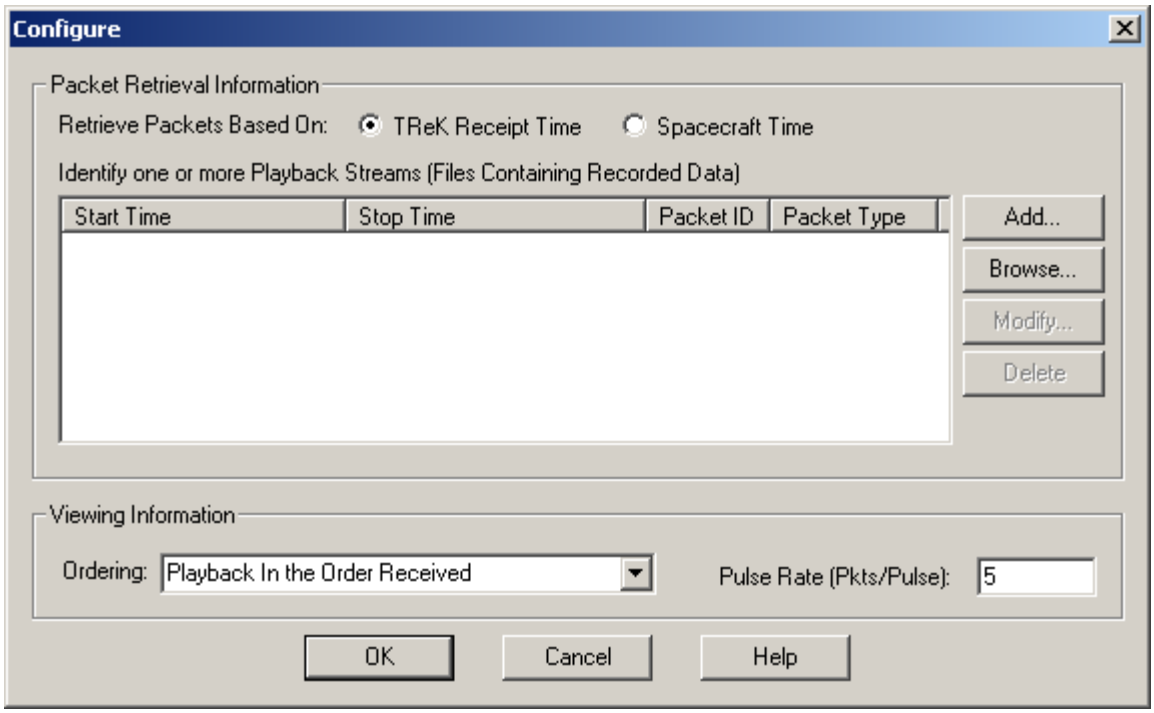

Figure 20 Configure (Recorded Data Viewer) Dialog

Each field in the Configure (Recorded Data Viewer) dialog is described below.

Retrieve Packets Based On (Required Field for Telemetry Data)
This option tells your TReK system whether to use TReK Receipt Time or Spacecraft Time when telemetry packets are retrieved from the data recording files for viewing. Spacecraft Time refers to the Embedded Time that is located in the CCSDS secondary header for PDSS Payload packets and Suitcase Simulator packets. Spacecraft Time can only be used when viewing telemetry data.

Playback Stream List (Required Field)
This playback stream list displays each set of recording files that you have identified. For each set of recording files, the entry will show the Start Time, Stop Time, Packet ID, and Packet Type associated with those recording files.

Ordering (Required Field)
Ordering identifies the ordering that TReK should use when displaying the data that has been retrieved from the recording files. For example, you can select to display the data in the order it was received, display the data after it has been reordered based on time, or display the data after it has been reordered based on time and all duplicates have been removed. Duplicates can occur if you have identified multiple sets of recorded data that overlap in time. This can occur if you are working with recording files that contain both realtime data and dump data. There may be some timeframe in which the same packets were recorded in both sets of recording files. In this situation you may want to identify

both sets of recording files in order to merge them together into one contiguous time frame, but you want to remove any duplicates that were the result of the time overlap.

Note: When working with ERIS data files, command data files, or sentinel data files please select 'Playback In The Order Received'. Since these types of data do not contain a sequence count or an embedded time, these packets cannot be re-ordered.

Pulse Rate (Pkts/Pulse) (Required Field)
The number of packets or messages to display each time the Pulse button is pushed.

Buttons
There are several non-standard buttons on the Configure Recorded Data Viewer dialog. Each is described below.

Add
The Add button displays the Add dialog described in 6.19. It is used to add information about a set of TReK recording files.

Browse
The Browse button displays the Windows Open dialog which can be used to select one or more TReK recording files.

Modify
The Modify button is only available when an item in the list is selected. Modify provides a way to edit an item in the list. If you push the Modify button a dialog identical to the Add dialog described above (except for the title) will be displayed.

Delete
The Delete button is only available when an item in the list is selected. Delete provides a way to delete an item from the list.

6.19 Add (Configure Recorded Data Viewer) Dialog

The Add dialog is shown in Figure 21. This dialog provides a way to identify one set of recording files.

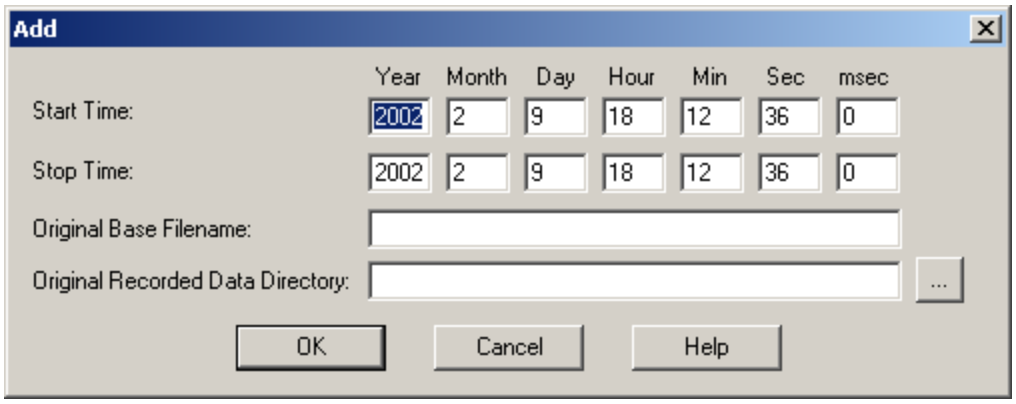

Figure 21 Add (Configure Recorded Data Viewer) Dialog

Each field in the Add (Configure Recorded Data Viewer) dialog is described below.

Start Time (Required Field)
The Start Time information tells your TReK system where to start the recorded data viewing. You can choose to start the viewing at any location within the time span associated with the recorded data. The start time does not have to be an exact match with the start time on any of the files. It can be any time before or after the start time on the first file. Please remember that the Start Time is a TReK receipt time for ERIS data, command data, and sentinel data.

Stop Time (Required Field)
The Stop Time information tells your TReK system where to stop the playback. You can choose to stop the recorded data viewing at any location within the time span associated with the recorded data. The stop time does not have to be an exact match with the stop time on any of the files. It can be any time after the start time on the first file. Please remember that the Stop Time is a TReK receipt time for ERIS data, command data, and sentinel data.

Original Base Filename (Required Field)
The Original Base Filename field is used to tell your TReK system the Base Filename you used when you originally recorded the data. Be sure to enter exactly what you entered when you originally recorded the data. For example, if you used the name "eris" for the Base Filename when you recorded the data, then you should enter "eris" in the Original Base Filename field. (Note: File extensions are not required but they are allowed.)

Original Recorded Data Directory (Required Field)
The Original Recorded Data Directory field is used to tell your TReK system where the original data recording files are stored. This field requires a complete directory path. An example of this is `C:\MyRecordingFiles\`. If you don't like to type or you need help defining the complete path, you can push the … (dot dot dot) button located to the right of the Original Recorded Data Directory field. This will bring up a Windows Browse for Folder dialog which you can use to identify the local directory path where your recorded

data files are stored. The Browse for Folder dialog is not described in this document since it is a typical Windows dialog box. If you need help with this dialog, please refer to your Windows on-line help.

6.20 Deactivate Sentinel Warning Message Dialog

The Deactivate Sentinel Warning message dialog will appear if you attempt to deactivate a sentinel from the sentinel list in the main window. If you are sure you want to proceed answer Yes. If you do not want to proceed answer No and no action will be taken.

Figure 22 Deactivate Sentinel Warning Message Dialog

6.21 Delete Sentinel Warning Message Dialog

The Delete Sentinel Warning message dialog will appear if you attempt to delete a sentinel from the sentinel list in the main window. If you are sure you want to proceed answer Yes. If you do not want to proceed answer No and no action will be taken.

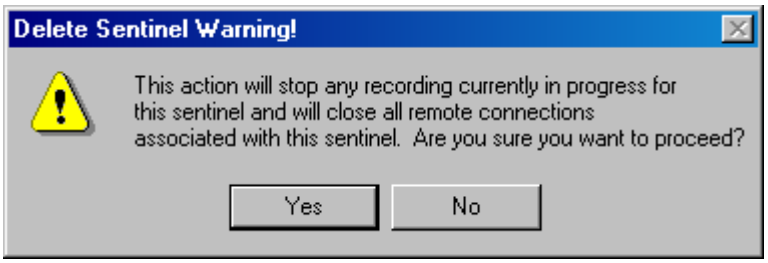

Figure 23 Delete Sentinel Warning Message Dialog

6.22 Invalid Configuration Information Dialog

The Invalid Configuration Information dialog is shown in Figure 24. This dialog appears only if you attempt to open a configuration file that contains invalid configuration information. This usually happens when you move a configuration file from one machine to another. For example, when you save a configuration file, the sentinels and all the

information associated with the sentinels (including the IP address information) are stored in the configuration file. If you move the configuration file, then some of this information will no longer be valid.

The Invalid Configuration Information dialog contains two lists. The list at the top of the dialog contains a list of the sentinels that are stored in the configuration file. If the sentinel contains any invalid information it will be red. When you select a sentinel in the sentinel list, the list located below the sentinel list will display all the invalid items associated with that particular sentinel.

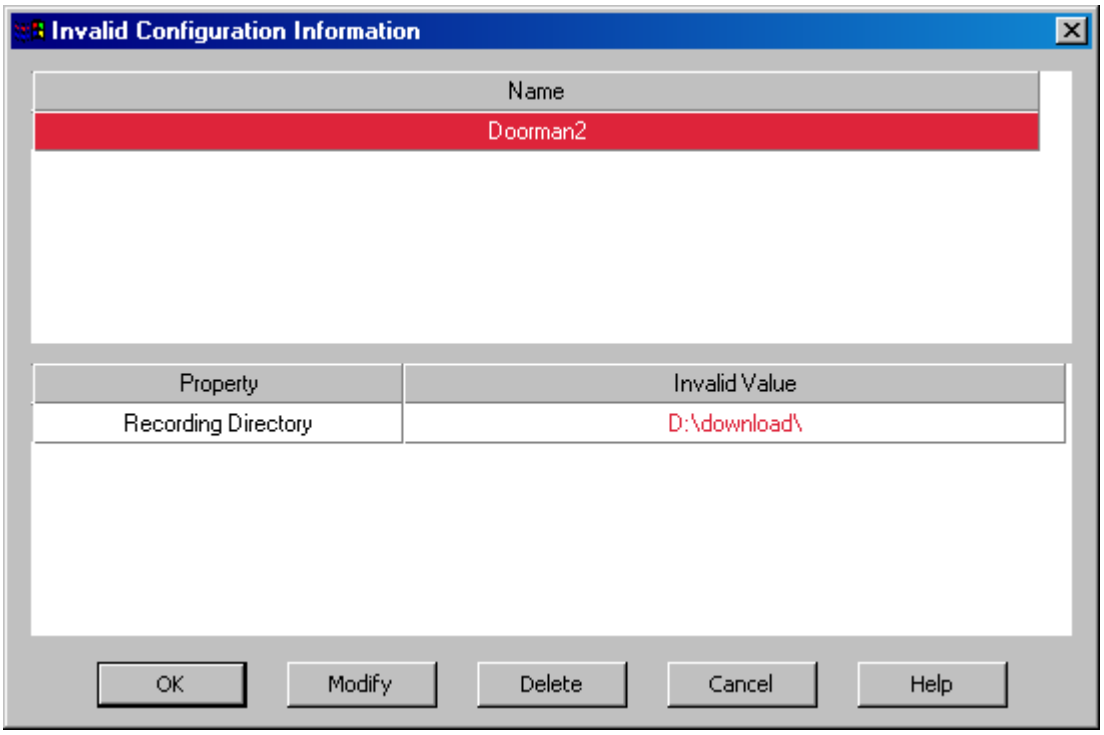

Figure 24 Invalid Configuration Information Dialog

Buttons

Modify
When you select a sentinel in the sentinel list and push the Modify button, the Sentinel Properties dialog will be displayed. The Sentinel Properties dialog can be used to change the properties that are invalid.

Delete
Selecting the Delete button will delete the sentinel from the configuration. The configuration file will not be changed unless you perform a save after the configuration file has been successfully opened.

Cancel
Selecting the Cancel button will abort the entire process and leave the configuration file unchanged.

6.23 Close Configuration Warning Message Dialog

The Close Configuration Warning message dialog will appear if you attempt to perform a New or Open and there are sentinels in the sentinel list. If you are sure you want to proceed answer Yes. If you do not want to proceed answer No and no action will be taken.

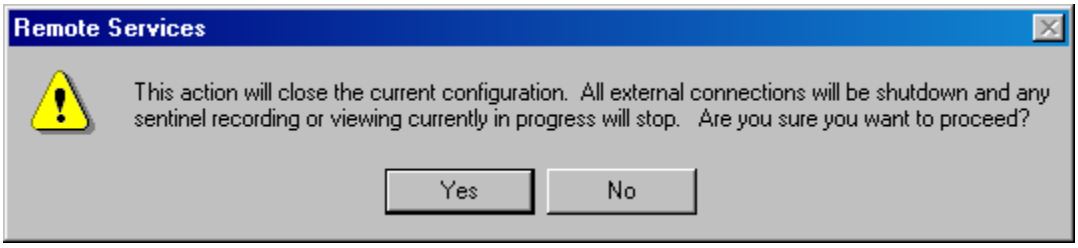

Figure 25 Close Configuration Warning Message Dialog

6.24 Save Changes Message Dialog

The Save Changes message dialog will be displayed when you close the current configuration by selecting New, Open, or Exit. The Save Changes message dialog provides a way to save the current configuration before closing it.

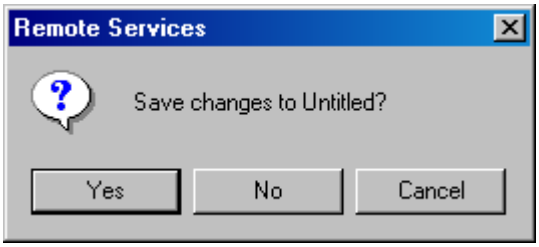

Figure 26 Save Changes Message Dialog

6.25 Exit Confirmation Message Dialog

The Exit Confirmation message dialog is displayed to help you avoid exiting the Remote Services application by accident. It will be displayed only if you exit the application with the current configuration unchanged. If the configuration has changed, you will be prompted with the Save Changes dialog instead of the Exit Confirmation dialog. If you are prompted with the Exit Confirmation dialog and you are sure you want to exit, answer

Yes. If you do not want to exit the application, answer No and the application will not proceed with the exit.

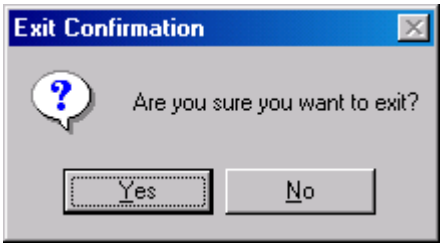

Figure 27 Exit Confirmation Message Dialog

7 Special Topics

There are no special topics at this time.

Appendix A Glossary

Note: This Glossary is global to all TReK documentation. All entries listed may not be referenced within this document.

Application Programming Interface (API)	A set of functions used by an application program to provide access to a system's capabilities.
Application Process Identifier (APID)	An 11-bit field in the CCSDS primary packet header that identifies the source-destination pair for ISS packets. The type bit in the primary header tells you whether the APID is a payload or system source-destination.
Calibration	The transformation of a parameter to a desired physical unit or text state code.
Communications Outage Recorder	System that captures and stores payload science, health and status, and ancillary data during TDRSS zone of exclusion.
Consultative Committee for Space Data Systems (CCSDS) format	Data formatted in accordance with recommendations or standards of the CCSDS.
Consultative Committee for Space Data Systems (CCSDS) packet	A source packet comprised of a 6-octet CCSDS defined primary header followed by an optional secondary header and source data, which together may not exceed 65535 octets.
Conversion	Transformation of downlinked spacecraft data types to ground system platform data types.
Custom Data Packet	A packet containing a subset of parameters that can be selected by the user at the time of request.
Cyclic Display Update Mode	A continuous update of parameters for a particular display.
Decommutation (Decom)	Extraction of a parameter from telemetry.
Discrete Values	Telemetry values that have states (e.g., on or off).

Dump	During periods when communications with the spacecraft are unavailable, data is recorded onboard and played back during the next period when communications resume. This data, as it is being recorded onboard, is encoded with an onboard embedded time and is referred to as dump data.
Enhanced HOSC System (EHS)	Upgraded support capabilities of the HOSC systems to provide multi-functional support for multiple projects. It incorporates all systems required to perform data acquisition and distribution, telemetry processing, command services, database services, mission support services, and system monitor and control services.
Exception Monitoring	A background process capable of continuously monitoring selected parameters for Limit or Expected State violations. Violation notification is provided through a text message.
Expected State Sensing	Process of detecting a text state code generator in an off-nominal state.
EXPRESS	An EXPRESS Rack is a standardized payload rack system that transports, stores and supports experiments aboard the International Space Station. EXPRESS stands for EXpedite the PRocessing of Experiments to the Space Station.
File transfer protocol (ftp)	Protocol to deliver file-structured information from one host to another.
Flight ancillary data	A set of selected core system data and payload health and status data collected by the USOS Payload MDM, used by experimenters to interpret payload experiment results.

Grayed out	Refers to a menu item that has been made insensitive, which is visually shown by making the menu text gray rather than black. Items that are grayed out are not currently available.
Greenwich Mean Time (GMT)	The solar time for the meridian passing through Greenwich, England. It is used as a basis for calculating time throughout most of the world.
Ground ancillary data	A set of selected core system data and payload health and status data collected by the POIC, which is used by experimenters to interpret payload experiment results. Ground Ancillary Data can also contain computed parameters (pseudos).
Ground receipt time	Time of packet origination. The time from the IRIG-B time signal received.
Ground Support Equipment (GSE)	GSE refers to equipment that is brought in by the user (i.e. equipment that is not provided by the POIC).
Ground Support Equipment Packet	A CCSDS Packet that contains data extracted from any of the data processed by the Supporting Facility and the format of the packet is defined in the Supporting Facility's telemetry database.
Huntsville Operations Support Center (HOSC)	A facility located at the Marshall Space Flight Center (MSFC) that provides scientists and engineers the tools necessary for monitoring, commanding, and controlling various elements of space vehicle, payload, and science experiments. Support consists of real-time operations planning and analysis, inter- and intra-center ground operations coordination, facility and data system resource planning and scheduling, data systems monitor and control operations, and data flow coordination.

IMAQ ASCII	A packet type that was added to TReK to support a very specific application related to NASA's Return to Flight activities. It is not applicable to ISS. It is used to interface with an infrared camera that communicates via ASCII data.
Limit Sensing	Process of detecting caution and warning conditions for a parameter with a numerical value.
Line Outage Recorder Playback	A capability provided by White Sands Complex (WSC) to play back tapes generated at WSC during ground system communication outages.
Measurement Stimulus Identifier (MSID)	Equivalent to a parameter.
Monitoring	A parameter value is checked for sensing violations. A message is generated if the value is out of limits or out of an expected state.
Parameter	TReK uses the generic term parameter to mean any piece of data within a packet. Sometimes called a measurement or MSID in POIC terminology.
Payload Data Library (PDL)	An application that provides the interface for the user to specify which capabilities and requirements are needed to command and control his payload.
Payload Data Services Systems (PDSS)	The data distribution system for ISS. Able to route data based upon user to any of a number of destinations.
Payload Health and Status Data	Information originating at a payload that reveals the payload's operational condition, resource usage, and its safety/anomaly conditions that could result in damage to the payload, its environment or the crew.
Payload Operations Integration Center (POIC)	Manages the execution of on-orbit ISS payloads and payload support systems in coordination/unison with distributed International Partner Payload Control Centers, Telescience Support Centers (TSC's) and payload-unique remote facilities.

Payload Rack Checkout Unit (PRCU)	The Payload Rack Checkout Unit is used to verify payload to International Space Station interfaces for U.S. Payloads.
Playback	Data retrieved from some recording medium and transmitted to one or more users.
Pseudo Telemetry (pseudo data)	Values that are created from calculations instead of directly transported telemetry data. This pseudo data can be created from computations or scripts and can be displayed on the local PC.
Remotely Generated Command	A command sent by a remote user whose content is in a raw bit pattern format. The commands differ from predefined or modifiable commands in that the content is not stored in the POIC Project Command Database (PCDB).
Science data	Sensor or computational data generated by payloads for the purpose of conducting scientific experiments.
Subset	A collection of parameters from the total parameter set that is bounded as an integer number of octets but does not constitute the packet itself. A mini-packet.
Super sampled	A parameter is super sampled if it occurs more than once in a packet.
Swap Type	A flag in the Parameter Table of the TReK database that indicates if the specified datatype is byte swapped (B), word swapped (W), byte and word swapped (X), byte reversal (R), word reversal (V) or has no swapping (N).
Switching	A parameter's value can be used to switch between different calibration and sensing sets. There are two types of switching on TReK: range and state code.

Transmission Control Protocol (TCP)	TCP is a connection-oriented protocol that guarantees delivery of data.
Transmission Control Protocol (TCP) Client	A TCP Client initiates the TCP connection to connect to the other party.
Transmission Control Protocol (TCP) Server	A TCP Server waits for (and accepts connections from) the other party.
Telemetry	Transmission of data collected form a source in space to a ground support facility. Telemetry is downlink only.
Telescience Support Center (TSC)	A TSC is a NASA funded facility that provides the capability to plan and operate on-orbit facility class payloads and experiments, other payloads and experiments, and instruments.
User Application	Any end-user developed software program that uses the TReK Application Programming Interface software. Used synonymously with User Product.
User Data Summary Message (UDSM)	Packet type sent by PDSS that contains information on the number of packets sent during a given time frame for a PDSS Payload packet. For details on UDSM packets, see the POIC to Generic User IDD (SSP-50305).
Uplink format	The bit pattern of the command or file uplinked.
User Datagram Protocol (UDP)	UDP is a connection-less oriented protocol that does not guarantee delivery of data. In the TCP/IP protocol suite, the UDP provides the primary mechanism that application programs use to send datagrams to other application programs. In addition to the data sent, each UDP message contains both a destination port number and a fully qualified source and destination addresses making it possible for the UDP software on the destination to deliver the message to the correct recipient process and for the recipient process to send a reply.

User Product	Any end-user developed software program that uses the TReK Application Programming Interface software. Used synonymously with User Application.
Web	Term used to indicate access via HTTP protocol; also referred to as the World Wide Web (WWW).

Appendix B Acronyms

Note: This acronym list is global to all TReK documentation. Some acronyms listed may not be referenced within this document.

AOS	Acquisition of Signal
API	Application Programming Interface
APID	Application Process Identifier
ASCII	American Standard Code for Information Interchange
CAR	Command Acceptance Response
CAR1	First Command Acceptance Response
CAR2	Second Command Acceptance Response
CCSDS	Consultative Committee for Space Data Systems
CDB	Command Database
CDP	Custom Data Packet
COR	Communication Outage Recorder
COTS	Commercial-off-the-shelf
CRR	Command Reaction Response
DSM	Data Storage Manager
EHS	Enhanced Huntsville Operations Support Center (HOSC)
ERIS	EHS Remote Interface System
ERR	EHS Receipt Response
EXPRESS	Expediting the Process of Experiments to the Space Station
ES	Expected State
FAQ	Frequently Asked Question
FDP	Functionally Distributed Processor
FSV	Flight System Verifier
FSV1	First Flight System Verifier
FSV2	Second Flight System Verifier
FPD	Flight Projects Directorate
FTP	File Transfer Protocol
GMT	Greenwich Mean Time
GRT	Ground Receipt Time
GSE	Ground Support Equipment
HOSC	Huntsville Operations Support Center
ICD	Interface Control Document
IMAQ ASCII	Image Acquisition ASCII
IP	Internet Protocol
ISS	International Space Station
LDP	Logical Data Path
LES	Limit/Expected State
LOR	Line Outage Recorder
LOS	Loss of Signal
MCC-H	Mission Control Center – Houston
MOP	Mission, Operational Support Mode, and Project
MSFC	Marshall Space Flight Center
MSID	Measurement Stimulus Identifier

NASA	National Aeronautics and Space Administration
OCDB	Operational Command Database
OS	Operating System
PC	Personal Computer, also Polynomial Coefficient
PCDB	POIC Project Command Database
PDL	Payload Data Library
PDSS	Payload Data Services System
PGUIDD	POIC to Generic User Interface Definition Document
POIC	Payload Operations Integration Center
PP	Point Pair
PRCU	Payload Rack Checkout Unit
PSIV	Payload Software Integration and Verification
RPSM	Retrieval Processing Summary Message
SC	State Code
SCS	Suitcase Simulator
SSP	Space Station Program
SSCC	Space Station Control Center
SSPF	Space Station Processing Facility
TCP	Transmission Control Protocol
TReK	Telescience Resource Kit
TRR	TReK Receipt Response
TSC	Telescience Support Center
UDP	User Datagram Protocol
UDSM	User Data Summary Message
URL	Uniform Resource Locator
USOS	United States On-Orbit Segment
VCDU	Virtual Channel Data Unit
VCR	Video Cassette Recorder
VPN	Virtual Private Network