Spirent Datum PC
User's Manual

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Document Version: 4.4

Contents

1 Introduction

Spirent Datum™ is a complete solution for the evaluation of wireless data device performance. The Datum application runs on either a mobile agent or a laptop for the flexibility and convenience of a wide range of testers and device types.

Mobile data consumers perceive quality in terms of data throughput and connectivity. Rigorous data testing must take into account a wide array of data applications, devices, suppliers and use models.

Datum enhances data test accuracy and controls costs by providing a single technical solution capable of meeting a full scope of testing requirements. The **Datum PC** software interface allows engineers to select the test applications, configure the test process and customize monitoring and reporting options. **Datum Mobile**, the handset-resident test application significantly extends the pool of potential testers. Management control of the entire process is enabled with a **Project Server** providing central availability of test configurations, methodology and results.

This document describes the use of the Datum PC software application for data performance analysis.

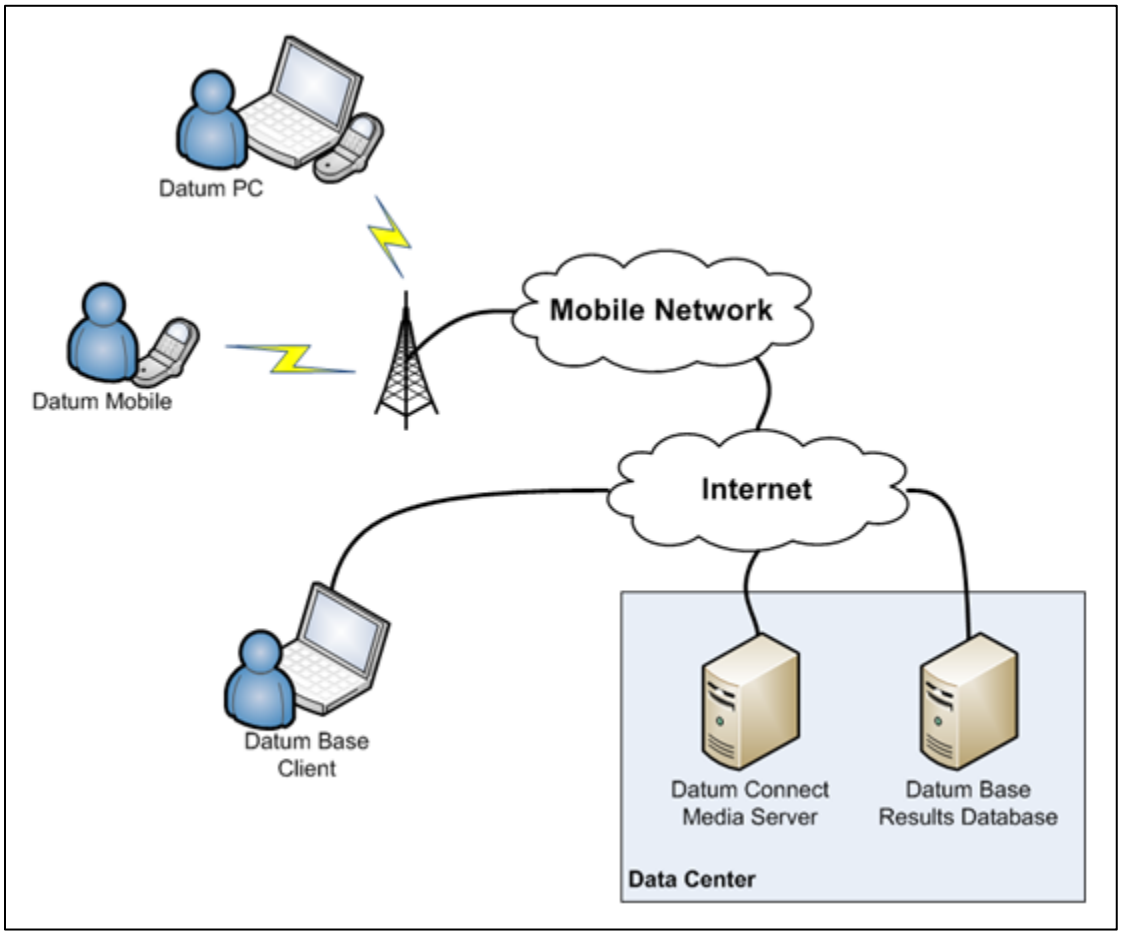


Figure 1-1 – Spirent Datum Solution

2 Datum PC Installation

2.1 System Component Verification

A laptop computer, a test mobile and a tethering cable (not supplied) are required to run Datum PC. Any computer used with Datum PC must meet the Datum PC minimum computing requirements:

	Optimal Performance	Minimal Performance
Processor	Intel Core 2 Duo	Intel P4
RAM	2 GB	1 GB
Free Disk Space	10 GB	1 GB
Operating System	Windows XP, Vista or 7	Windows XP
Software	N/A	• Microsoft .NET Framework 3.5 SP1 (See Section 2.1.1) • User Account Control setting disabled on Windows Vista and 7 machines (See Section 2.1.2) • Microsoft Excel 2007 or higher (for the Report Generator); alternatively, download Microsoft Excel Viewer to view the .XLSX output reports • User must be logged in as a Windows Administrator. Datum PC will not run under a non-admin login.

2.1.1 Microsoft .NET Framework 3.5 SP1

The Datum PC software application requires Microsoft .NET Framework 3.5 SP1. Spirent recommends performing a manual check for this component. To verify the current version of Microsoft .NET:

- From the **Windows Start Menu** select **Settings → Control Panel → Add or Remove Programs** (**Programs and Features** in Microsoft Vista)
- Verify that Microsoft .NET Framework 3.5 SP1 is installed

If Microsoft .NET Framework 3.5 SP1 is required:

- Browse to the Microsoft .NET Framework download site: http://www.microsoft.com/downloads/details.aspx?FamilyID=ab99342f-5d1a-413d-8319-81da479ab0d7&DisplayLang=en
- Follow the instructions to install

2.1.2 Disabling User Account Control (Windows Vista)

Spirent Datum requires that the **User Account Control (UAC)** setting be disabled on Windows Vista machines. To disable **UAC** in Vista:

- From the **Windows Start** menu select **Settings → Control Panel**.
- Under **User Accounts and Family Safety** select **Add or remove user accounts**.

Figure 2-1 - User Accounts and Family Safety Area

- Click on any user account (i.e. the Guest account).
- In the list of user account options, select **Go to the main User Accounts page**.

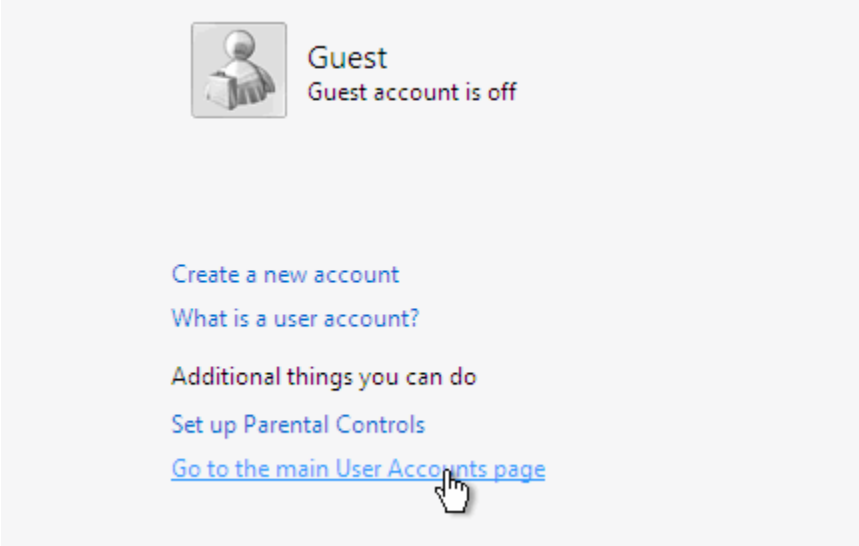


Figure 2-2 - User Account Options

- Under **Make changes to your user account**, select **Change security settings**.

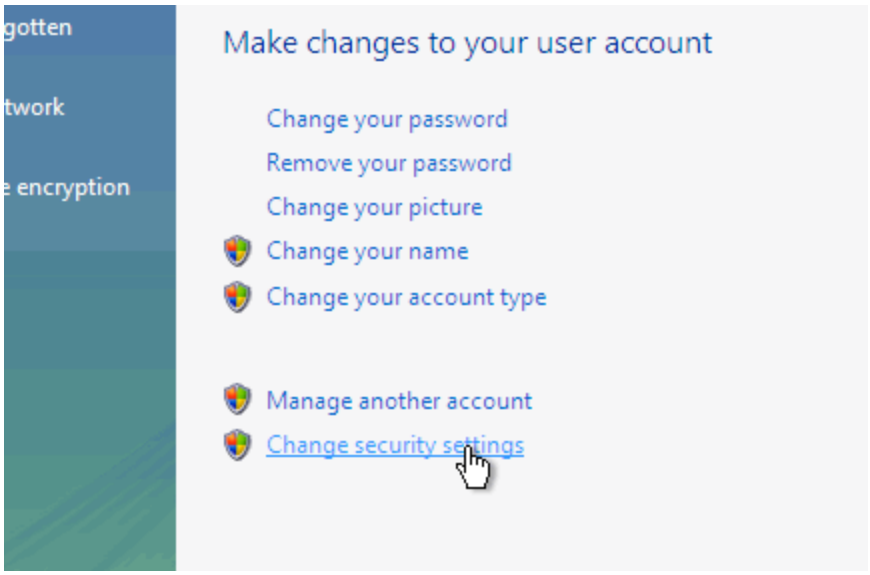


Figure 2-3 - Make changes to your user account

- Deselect **Use User Account Control (UAC) to help protect your computer**.

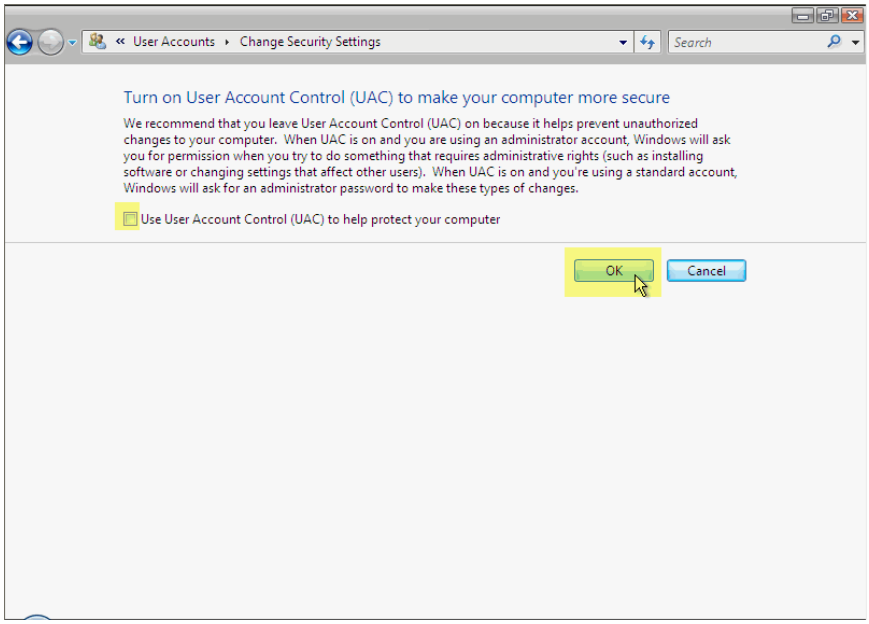


Figure 2-4 - User Account Control Screen

- Click **OK** to confirm your selection.
- When prompted, restart your computer to apply the changes.

The **User Account Control (UAC)** settings on Windows Vista must be disabled in order for Datum to run. An error message will appear if **UAC** is enabled on a machine running Datum.

2.2 Software Installation

The Datum PC installation file may be obtained from your Spirent representative. Once you have the Datum installation package:

- Unzip the package (if applicable) and click on **Setup**.
- Follow the instructions to complete the software installation.

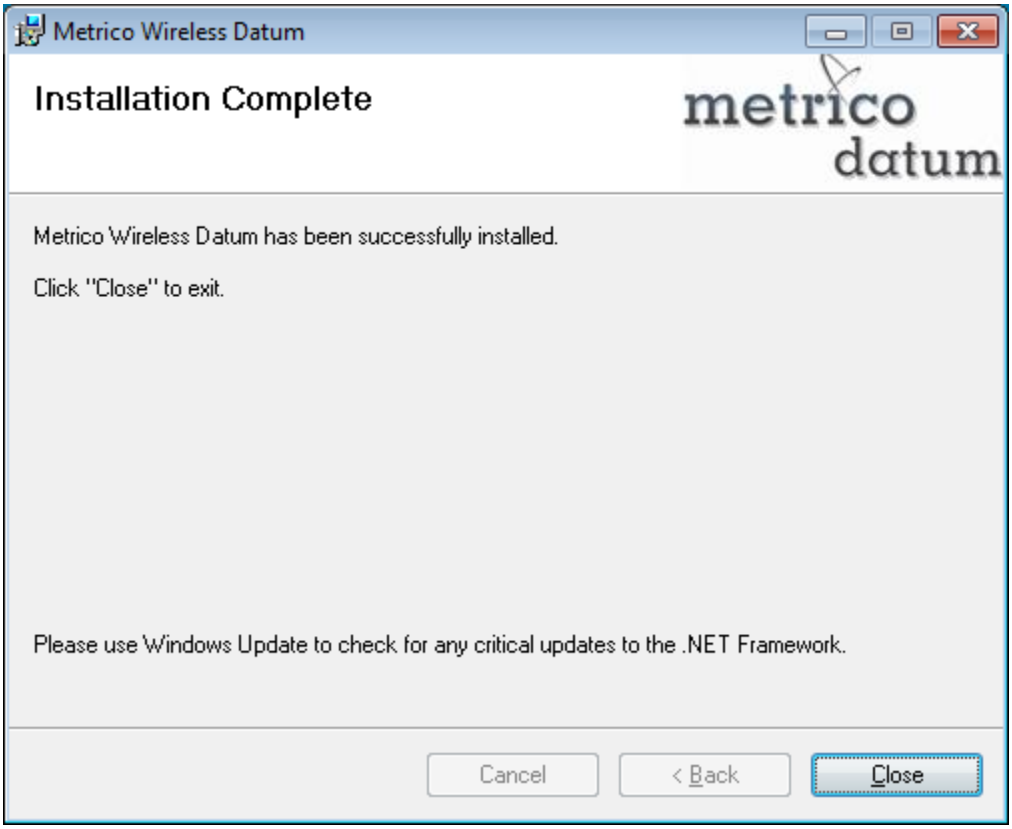


Figure 2-5 - Datum PC Installation Complete Indication

3 Datum PC Workspace Orientation

The main window of Spirent Datum PC as seen during a test session is shown in the figure below.

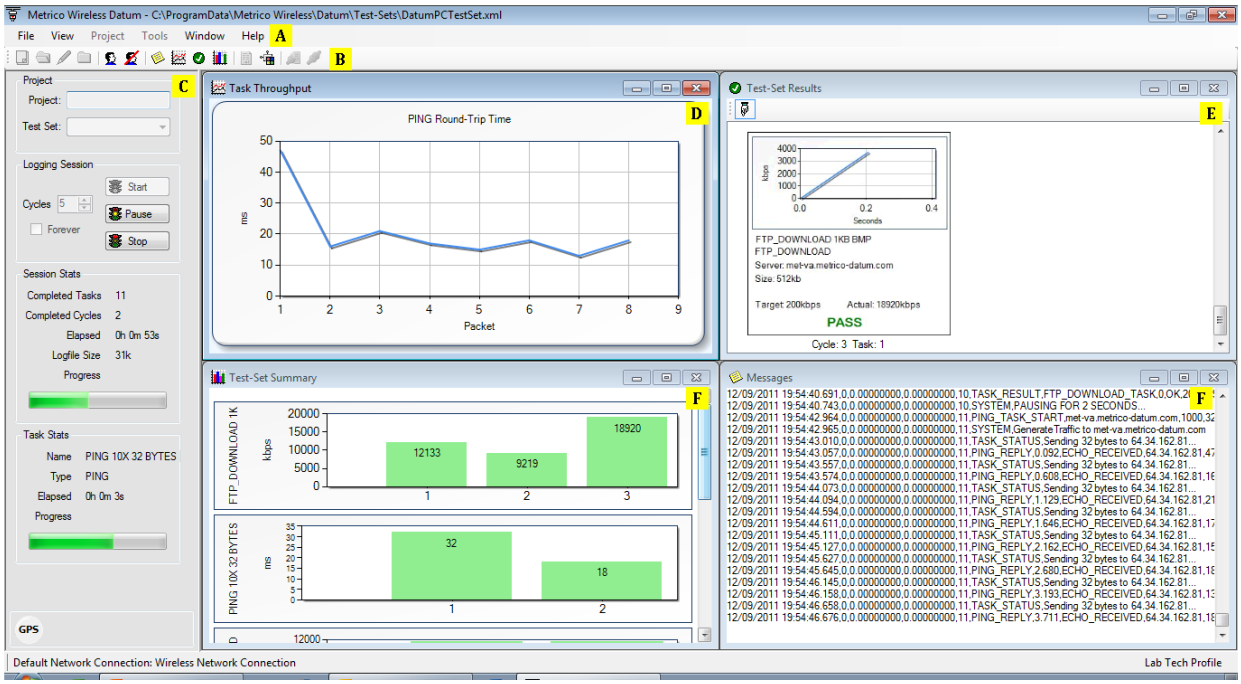


Figure 3-1 - Datum Workspace

Key areas of interest in the Datum window include:

A. Menu Bar

B. Toolbar

C. Control Panel
- Controls and statistics for the current test

D. Task Throughput Window
- Display of the instantaneous throughput during each task

E. Test-Set Results Window
- Display of the setting and output information for each task

F. Test-Set Summary Window
- Display of the key performance metric for each task

G. Messages Window
- Display of all task related messages

4 Application Workflow

This section provides an overview of the Datum PC workflow.

These steps are required when testing data performance with Datum:

- Open the program
- Specify the configuration options for the test
- Define the list of tasks to be performed in the current test by selecting an existing Test-Set or by creating a new Test-Set
- Start the test
- Analyze the results

When running Datum PC in conjunction with a Datum Project Server, it is also necessary to:

- Connect to a Project
- Upload test data to the Project

See Chapter 10 for instructions on interfacing with a Datum Project Server.

The Datum testing process is illustrated in **Figure 4-1**. The following sections of this document describe the detailed procedures used in working with Datum.

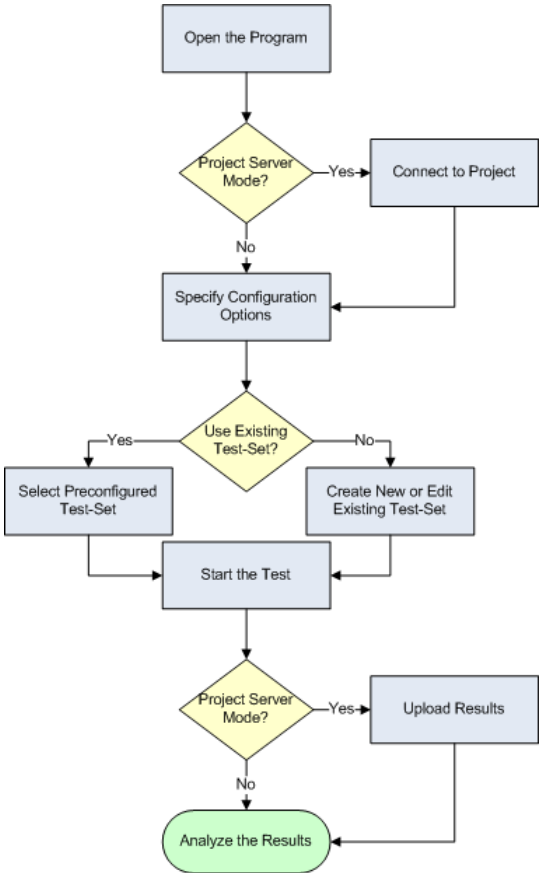


Figure 4-1 - Datum PC Application Workflow

5 Starting Datum PC

To begin data performance testing, double-click the **Datum** icon on the **Windows Desktop**, or from the **Windows Start Menu** select **All Programs → Metrico Wireless → Datum**.

The first time Datum is opened, an internet connection is required for time synchronization and product activation.

In order to connect to a Datum project server, the time difference between the PC and the project server must be less than five minutes. Upon startup, Datum will check the time difference and prompt the user if a change needs to be made to the local PC.

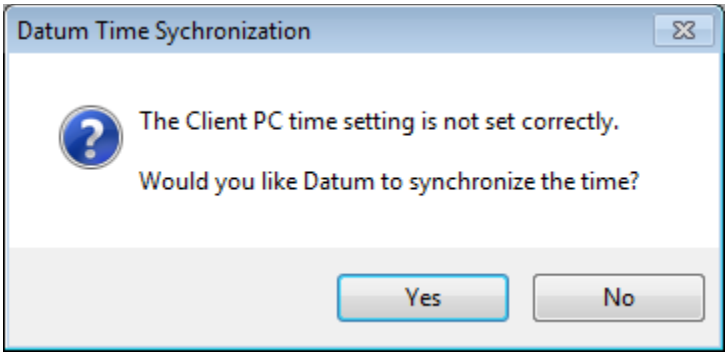


Figure 5-1 - Datum Time Synchronization Dialog

A notification will appear when the time synchronization operation is complete.

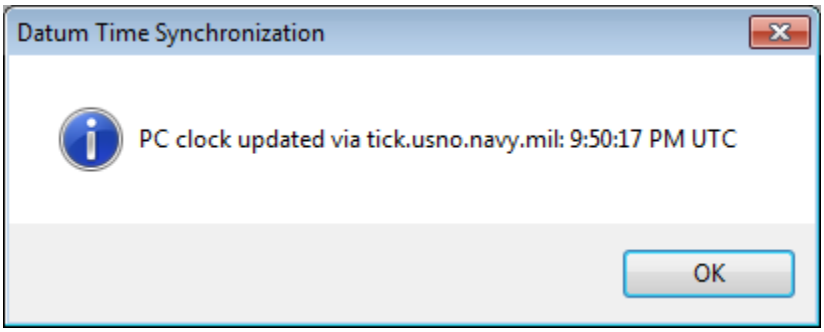


Figure 5-2 - PC Clock Update Notification

When opening Datum for the first time, the **Datum Information** dialog will appear. Fill in the fields as appropriate. The **Customer Activation Code**, **Company** and **Email** fields are required. Obtain your **Customer Activation Code** from you Spirent representative. All other fields are optional. Click **Register** to invoke the online registration process.

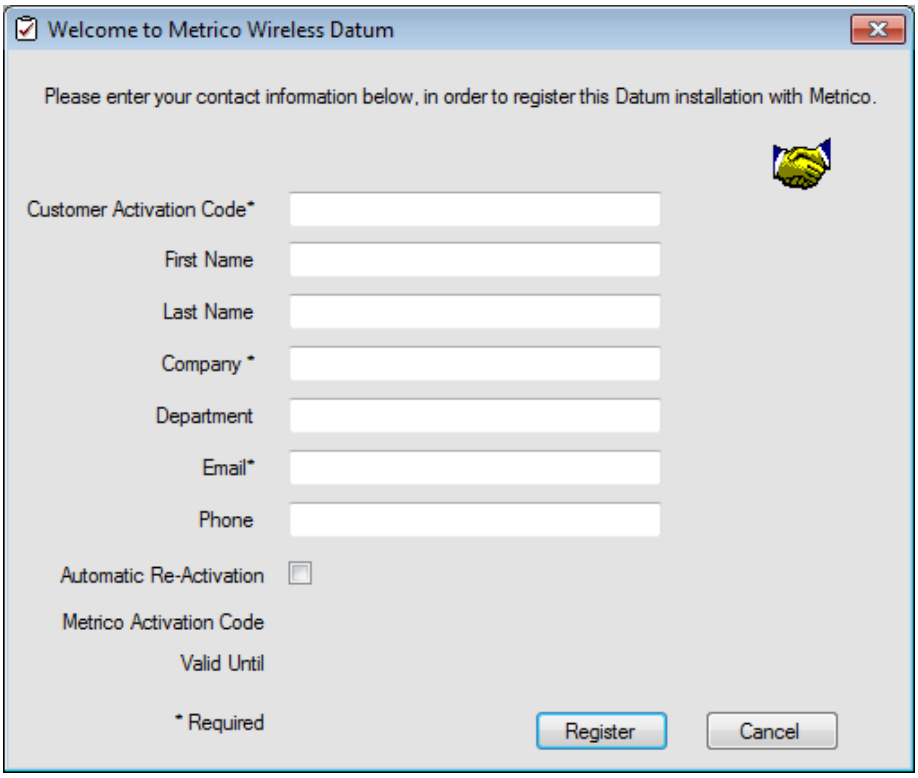


Figure 5-3 - Datum Information Dialog

When online registration is complete, the **Datum Activation Complete** notification will appear.

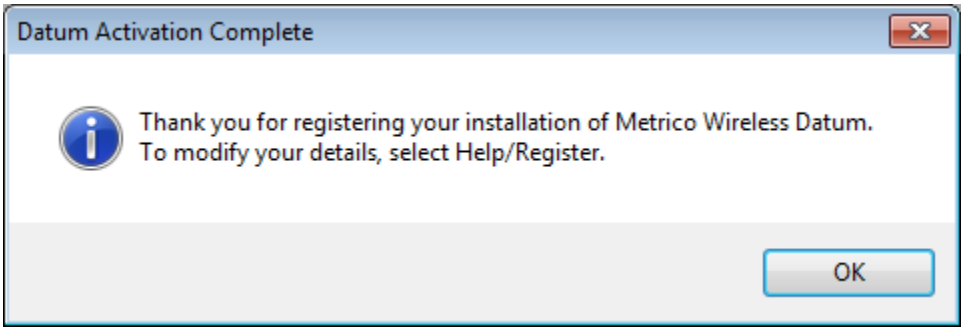


Figure 5-4 - Datum Activation Complete Notification

After the **Datum Activation Complete** dialog is dismissed, the **Connect To** dialog will appear, allowing you to select from any active network connection for testing.

- Select **Use as Default Network connection** to bypass the **Connect To** dialog upon startup. The test connection may be changed at any time from the **Connect To** screen of the **Tools → Settings** dialog.
- Selecting the **Auto-Connect** option will allow Datum to automatically reconnect the wireless interface after a drop, eliminating the need to manually reconnect the device.
- The **Reconnect Timeout** parameter specifies how long Datum will attempt to re-establish the connection.

Make your selection and click **OK**.

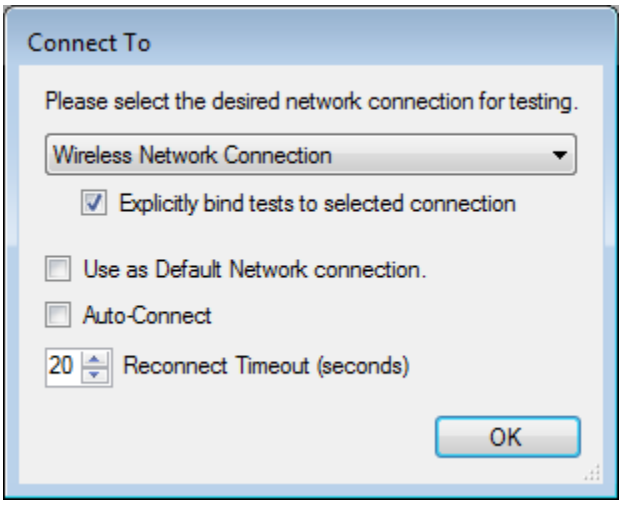


Figure 5-5 - Connect To Dialog

The **Log File Location** dialog will appear allowing you to choose the folder in which to store Datum's log files. Browse to find and make your selection and click **OK**. When the **Log File Location** dialog is dismissed, the main Datum workspace will appear.

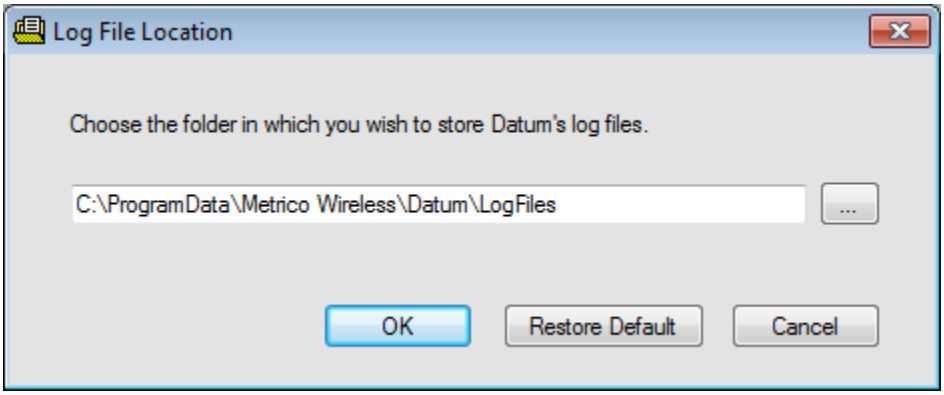


Figure 5-6 - Log File Location Dialog

6 Configuring Datum PC

Datum must be configured with the user preferences for the current test session. Configuring the program consists of:

- Choosing a Profile
- Selecting a Test-Set
- Customizing Test Settings:
  - Logging Options
  - Logged Messages
  - Test Servers
  - TCP/IP Settings
  - GPS
  - Network Connection

Each configuration option is described in detail in the following sections.

6.1 Choosing a Profile

A **Profile** contains the data display options for the current logging session. To load a Profile:

- Select **File → Profiles → Open** or click the **Load User Profile** button on the Toolbar.
- Select the desired pre-configured Profile:
  - **ProfileFieldTech.xml** is a simplified display with position information for use during data collection.
  - **ProfileLabTech.xml** is a detailed diagnostic display.

The pre-configured Profiles are illustrated below in **Figure 6-1** and **Figure 6-2**.

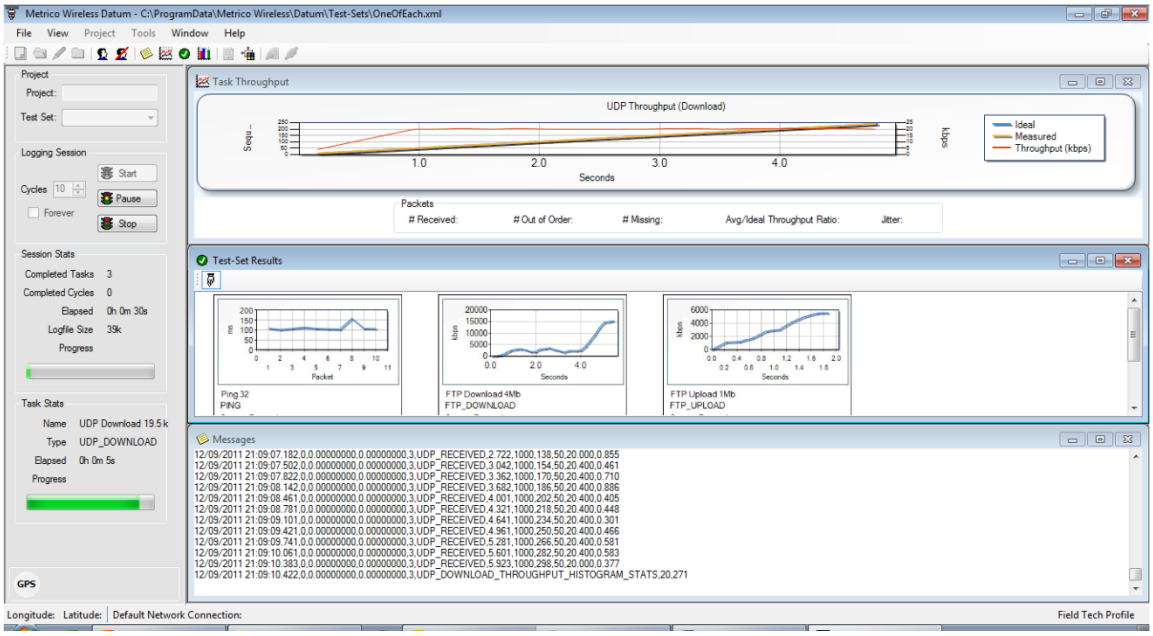


Figure 6-1 - Field Tech Profile

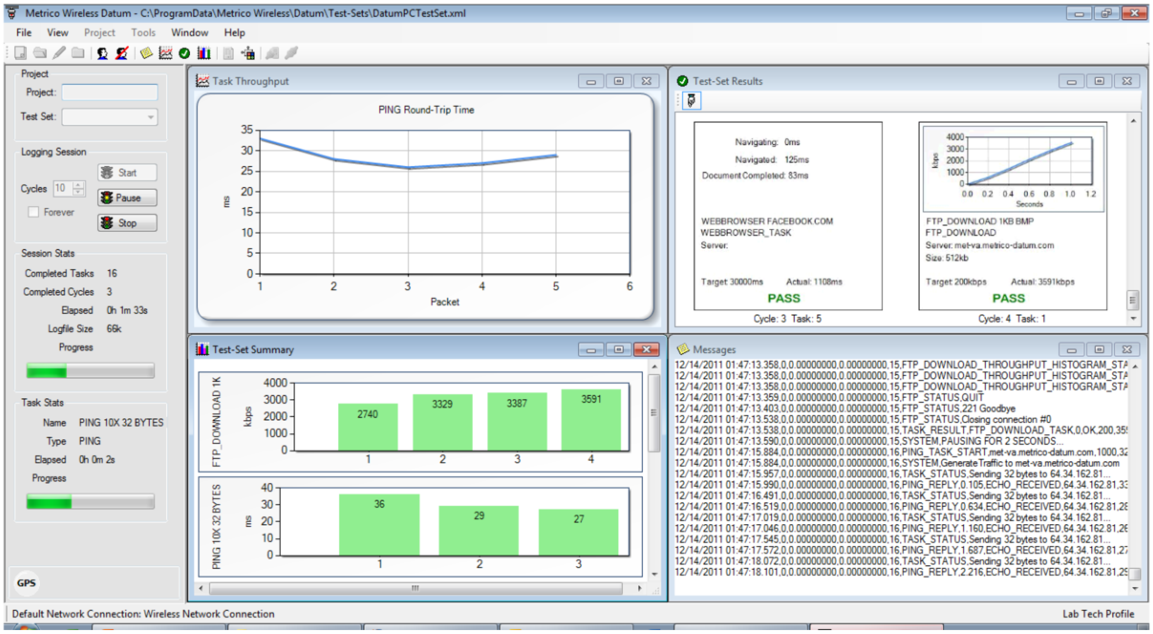


Figure 6-2 - Lab Tech Profile

As an alternative to selecting a pre-configured Profile to define the display options, individual data windows may be opened at any time from the **View** menu or from the toolbar icons. The available data windows are:

- **Messages** – This window displays all task-related messages.

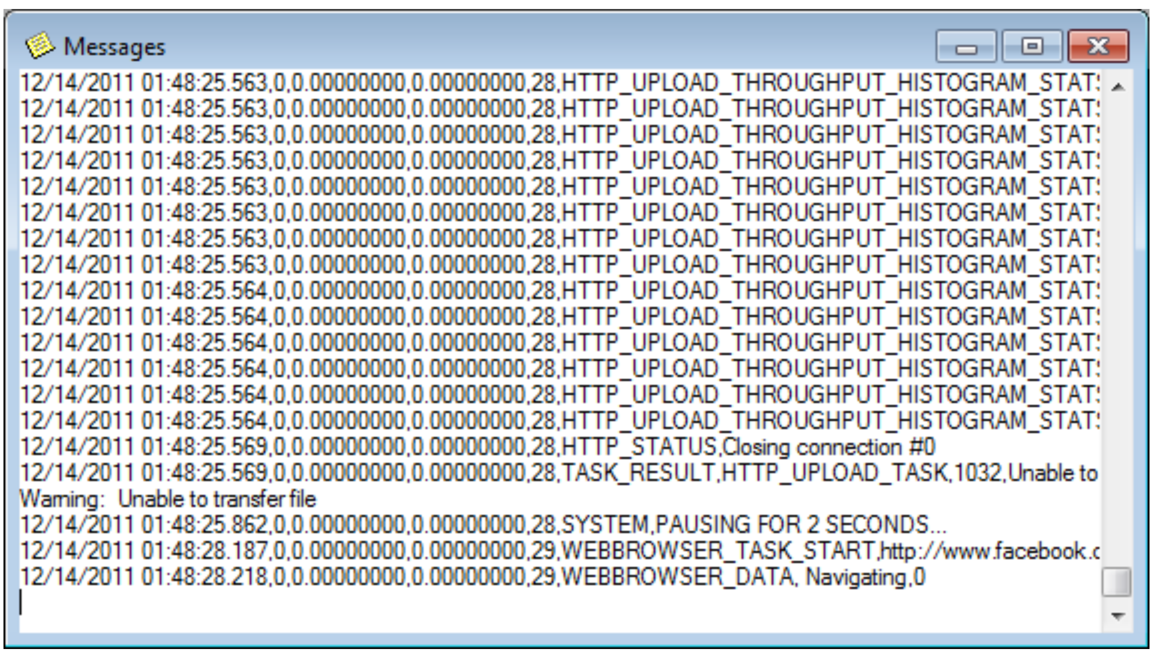


Figure 6-3 - Messages Window

- **Task Throughput** – This window displays the instantaneous throughput during each task.

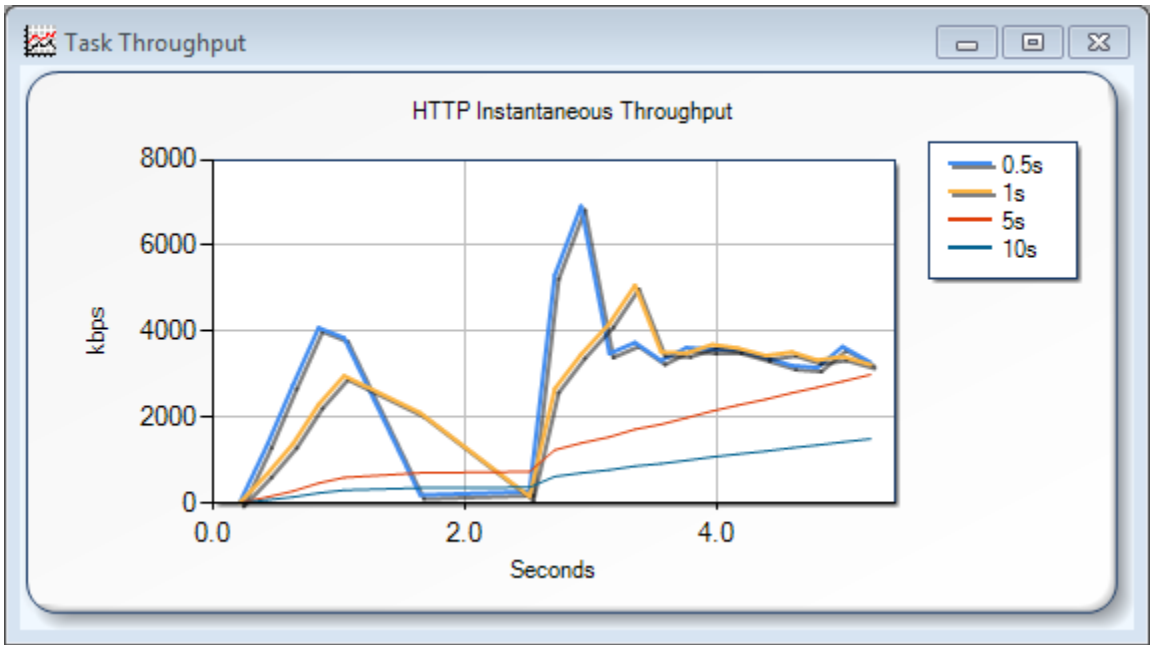


Figure 6-4 - Task Throughput Window

- **Test-Set Results** – This window provides setting and output information for each task.

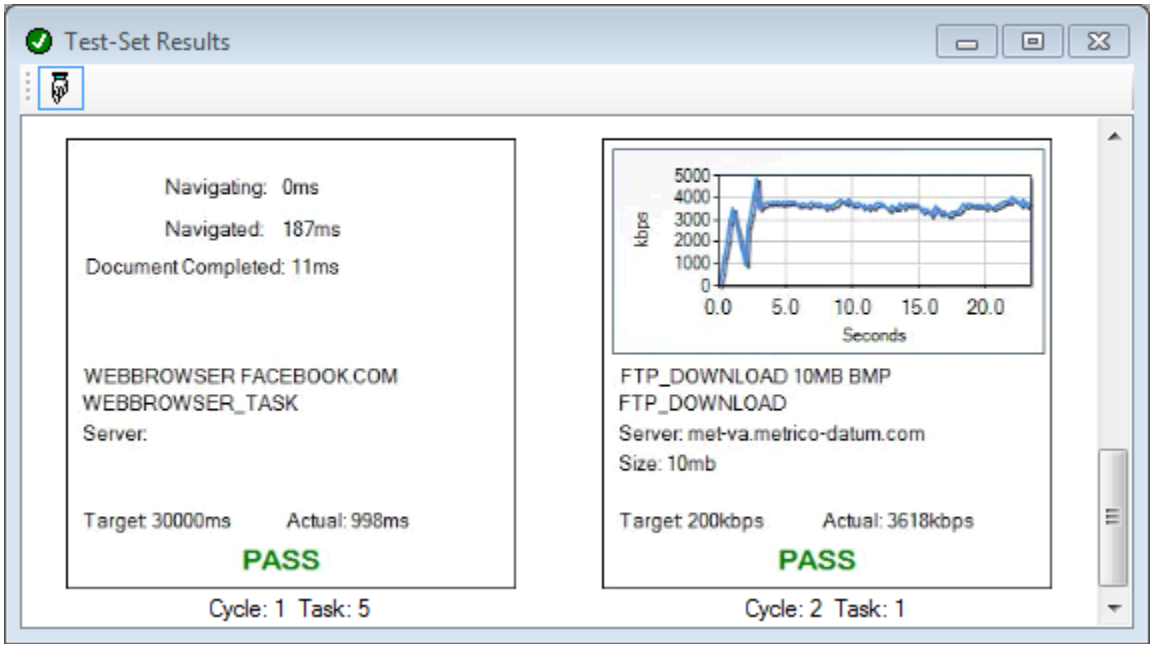


Figure 6-5 - Test-Set Results

- **Test-Set Summary** – This window displays the key performance metric for each task in the Test-Set.

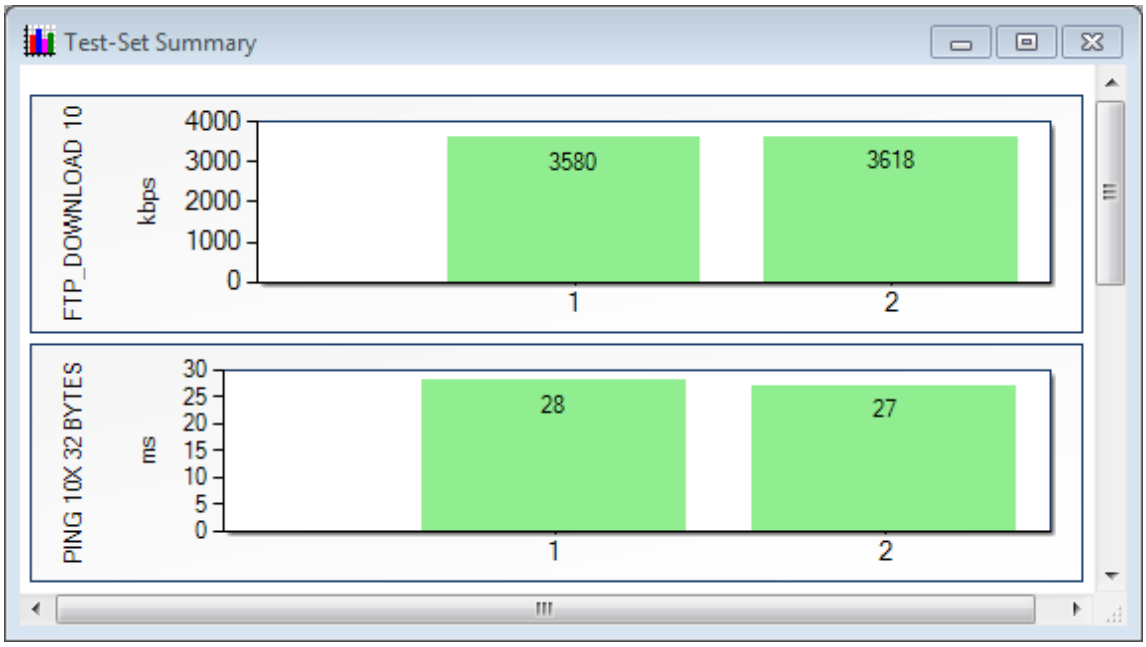


Figure 6-6 - Test-Set Summary Window

The windows can be arranged using the **Cascade**, **Tile Vertical** and **Tile Horizontal** options in the **Window** menu.

6.2 Selecting a Test-Set

The **Test-Set** provides a list of tasks to be performed in the current logging session. In this context, a **task** refers to an instance of a data application. The available tasks are:

- Adaptive UDP (Download and Upload)
- FTP (Download, Upload and Simultaneous Download/Upload)
- HTTP (Download and Upload)
- Ping
- UDP (Download and Upload)
- Wait
- Web Browser

A pre-configured Test-Set may be selected from the local machine or from the Project Server. See Chapter 10 for information about loading a Test-Set from a Project Server.

To select a local pre-configured Test-Set:

- Select **File → Test-Sets → Open** or click on the **Load Test-Set** button on the Toolbar. For example purposes, you may choose the **OneOfEach.xml** sample Test-Set that is shipped with Datum. This Test-Set includes each of the task types.

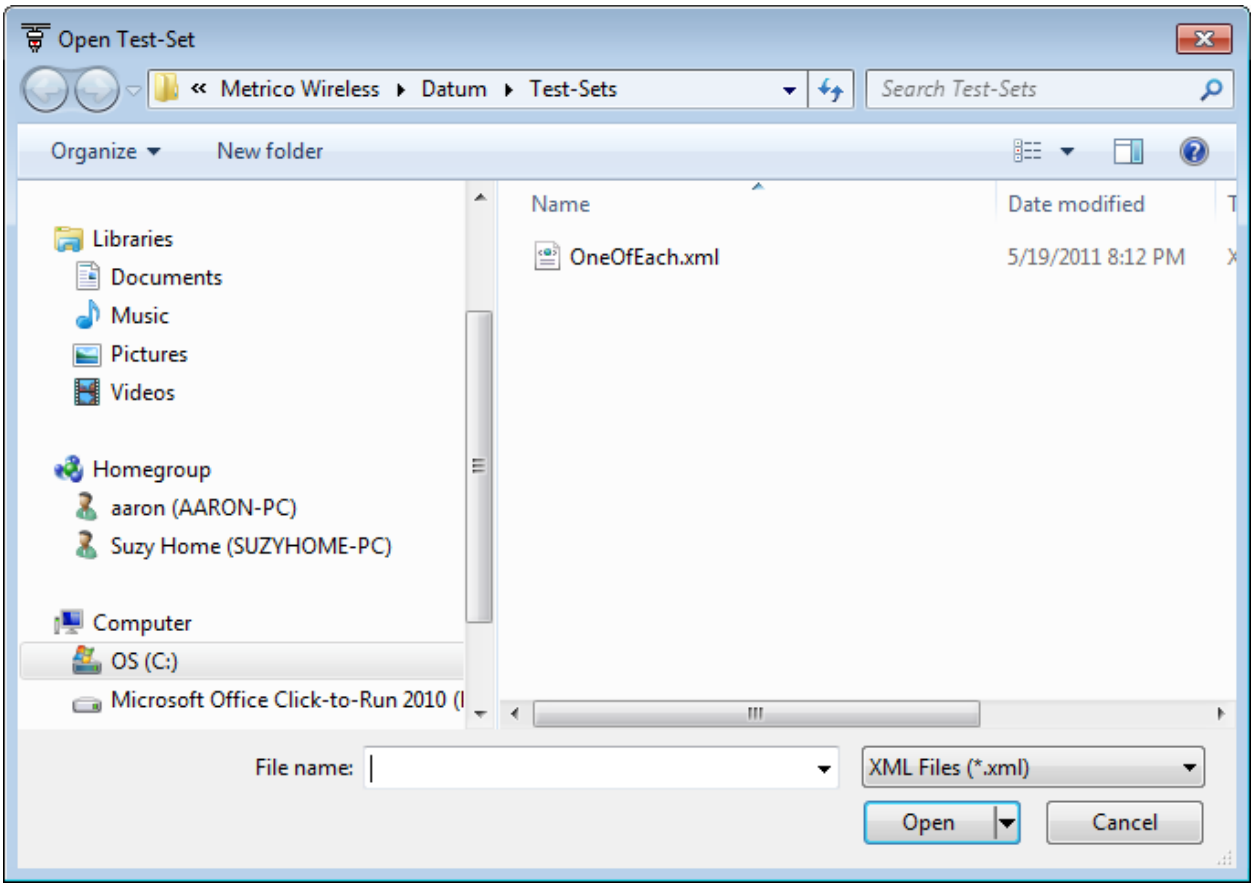


Figure 6-7 - Test-Set Selection Dialog

Datum provides the flexibility to create your own Test-Sets from scratch and to edit existing Test-Sets. See Chapter 7 of this document for instructions on customizing Test-Sets.

6.3 Customizing Test Settings

Configurable settings allow Datum PC users to conform tests to individual requirements. Test settings are controlled from the **Tools → Settings** dialog.

6.3.1 Customizing Logging Options

Datum creates a log file for each test session containing all details about the test setup and task messages. The log files are maintained in an open-format, comma-delimited file for direct access to the information. By default, the log files are stored in **C:\Program Data\ Metrico Wireless\Datum\LogFiles**.

Logging settings are configurable from the **Logging** tab of the **Tools → Settings** dialog.

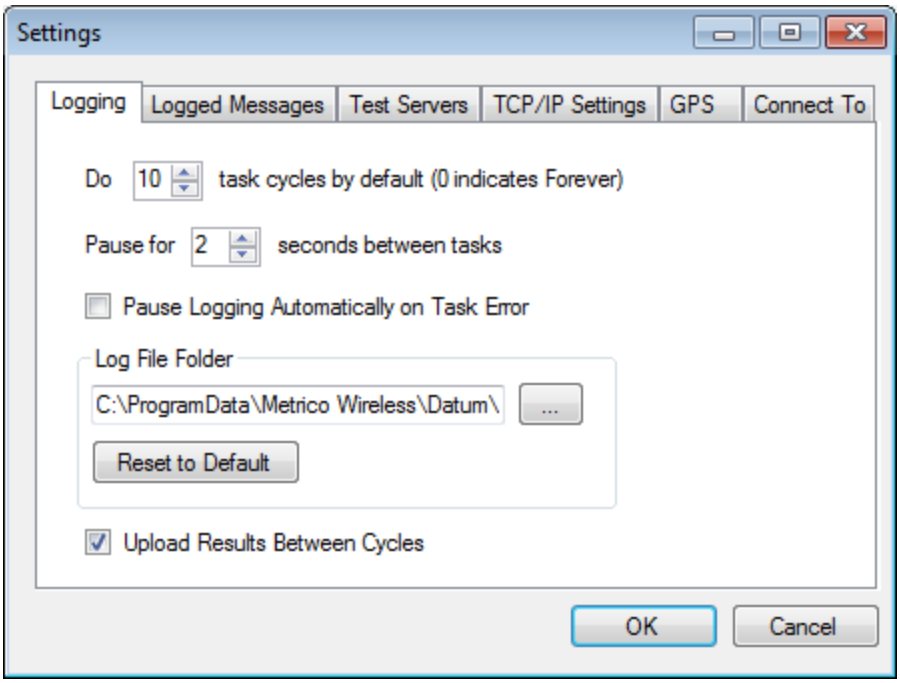


Figure 6-8 - Logging Tab of Settings Dialog

Task control options available on the **Logging** tab include:

- **Do X task cycles by default** – A cycle is one iteration of all tasks in a Test-Set. Enter **0** in this field to indicate that the Test-Set should repeat forever. The default value set here may be overridden for any test in the Logging Session area of the Control Panel.
    - **Note**: In most cases the number of cycles will be taken as the number of **Repeats** specified in the Test-Set Editor. In the event that no **Repeats** are defined (as may be the case for older Test-Sets), this value will be used as the default number of cycles.
- **Pause for Y seconds between tasks** – This option provides for down time between the completion of one task in a Test-Set and the start of the next task.

Datum can be configured to automatically pause when a logging error occurs (i.e. disconnected cable, disrupted internet connection, etc.) This feature is disabled by default. To toggle this feature:

- On the **Logging** tab of the **Settings** dialog, select **Pause Logging Automatically on Task Error**.

To change the log file storage location:

- Specify the new log file storage location in the **Log File Folder** area.

By default, Datum will upload test results at the end of each cycle. Uncheck **Upload Results Between Cycles** to upload all results upon test completion.

6.3.2 Customizing Throughput Statistics

Datum aggregates throughput results by providing a distribution of instantaneous throughput values. While Datum captures instantaneous throughput every time data is sent or received, the user indicates whether or not these messages are written to the log file. Excluding these messages significantly decreases output file size. The settings on the **Logged Messages** tab of the **Settings** dialog control how throughput data is presented.

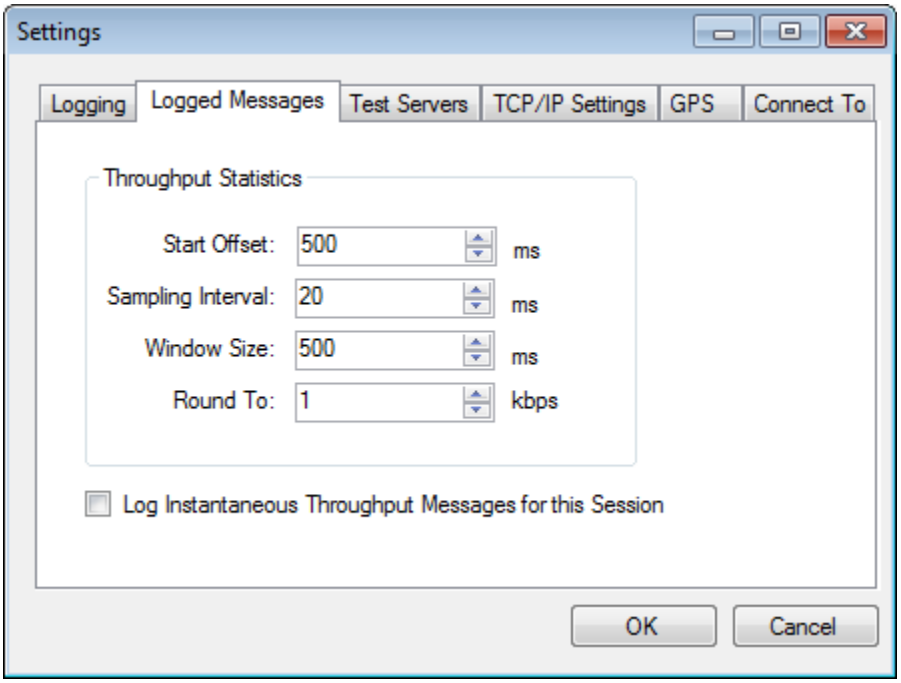


Figure 6-9 - Logged Messages Tab of Settings Dialog

- **Start Offset** – The time after the start of the task when Datum begins sampling throughput values. **Start Offset** should be at least as large as **Window Size** to ensure that all throughput measurements are calculated over a full window of time.
- **Sampling Interval** – Describes how often the throughput will be sampled over the duration of the test. The lower the value, the more data points will be generated.
- **Window Size** – The time period before each sampling point that the throughput is calculated over. The larger the **Window Size**, the smoother the data. The smallest allowable **Window Size** is 100 ms.
- **Round To** – Each sample is rounded using this parameter. This value controls the number and size of histogram bins in the aggregated output data. The smallest allowable **Round To** value is 1.
- **Log Instantaneous Throughput Messages for this Session** – This choice affects the size of the output log file. Choosing to log these messages will result in a larger file size. For this reason, this option will default to unchecked every time Datum is started. Aggregate histogram data will be logged regardless of this setting. Selecting this option will also enable messages that indicate the status of the WAIT task. This option is typically reserved for debugging purposes.

6.3.3 Selecting Test Servers

Datum test servers are hosted by Spirent to guarantee access and test consistency. Multiple test servers may be available. Spirent internal testing has shown that throughput can be sensitive to client distance from the test server. It is therefore desirable to prioritize the test servers in order of closest to farthest from your location. Three different **Sort Type** options are available for prioritization.

- **Manual** – Use the **Move Up** and **Move Down** buttons to manually prioritize the test servers in order from most desirable to least desirable. For example, if the available servers are situated in different geographic locations, sort the servers in order by distance from your location (closest to farthest).

- **Latency** – With this option, Datum runs a ping test to each server, using the results to sort the servers in order of lowest to highest mean Round Trip Time. Configure the number of pings to attempt and the timeout threshold before clicking **Apply** to run the test.

- **Location** – Use this option to sort available servers in order from closest to farthest from the location entered in the **Latitude** and **Longitude** coordinate fields. In the **Client Location** area:
  - Select **Current** to populate **Latitude** and **Longitude** based on the coordinates of the attached GPS. See Section 6.3.5 for GPS configuration information.
  - Select **Fixed** to manually enter the client location or use the **Find Coords** button to find the coordinates based on the street address.

The **Update List** button refreshes the server list from the Directory Server in the event that any options have been inadvertently removed here.

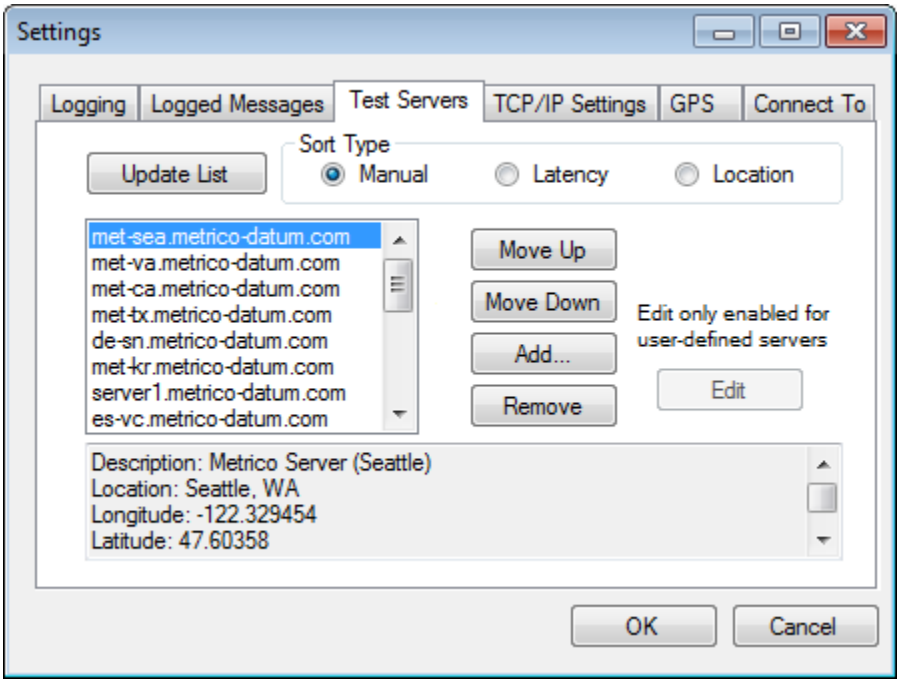


Figure 6-10 - Test Servers Tab of Settings Dialog - Manual Sort Type

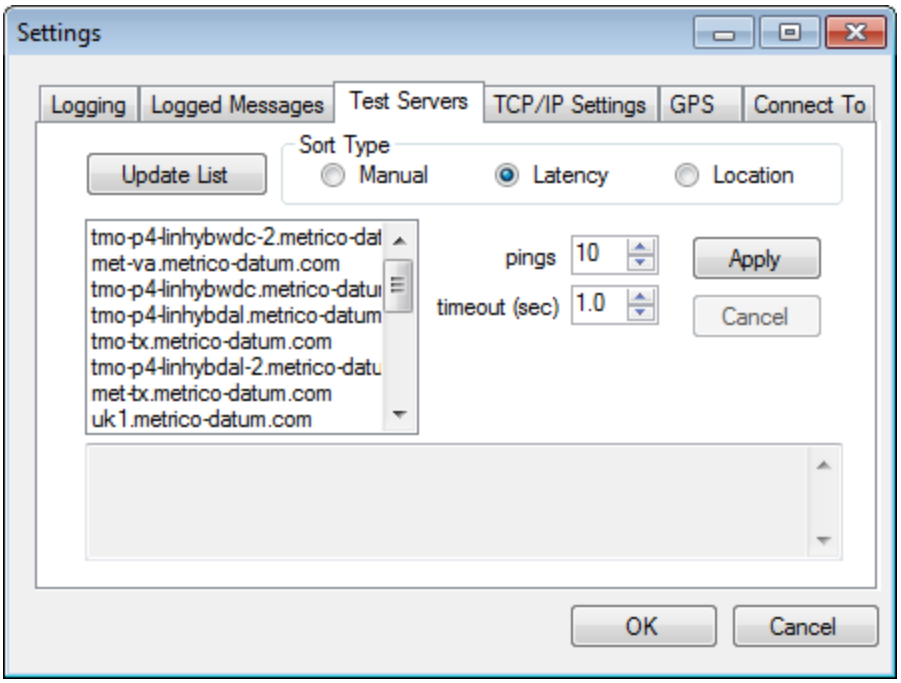


Figure 6-11 - Test Servers Tab of Settings Dialog - Latency Sort Type

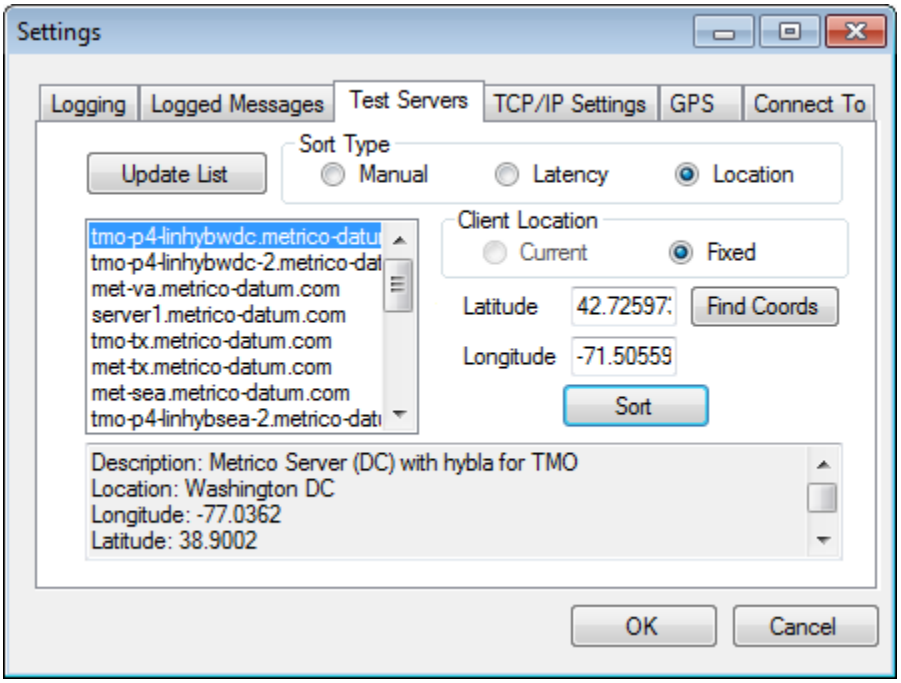


Figure 6-12 - Test Servers Tab of Settings Dialog - Location Sort Type

6.3.4 Configuring TCP/IP Settings

TCP Socket Settings control the size of the buffers that are used by the application and the TCP/IP stack when sending and receiving data. Spirent internal testing has revealed that throughput on wireless networks can be sensitive to these values.

- **Receive Socket Buffer** - The size of the buffer allocated for receiving TCP data before it is processed by the application.
- **Send Socket Buffer** – The size of the buffer allocated for TCP data before it is sent over the network.
- **Application Transfer Buffer** – The size of the buffer used to store data to the application before it is read from or written to disk.

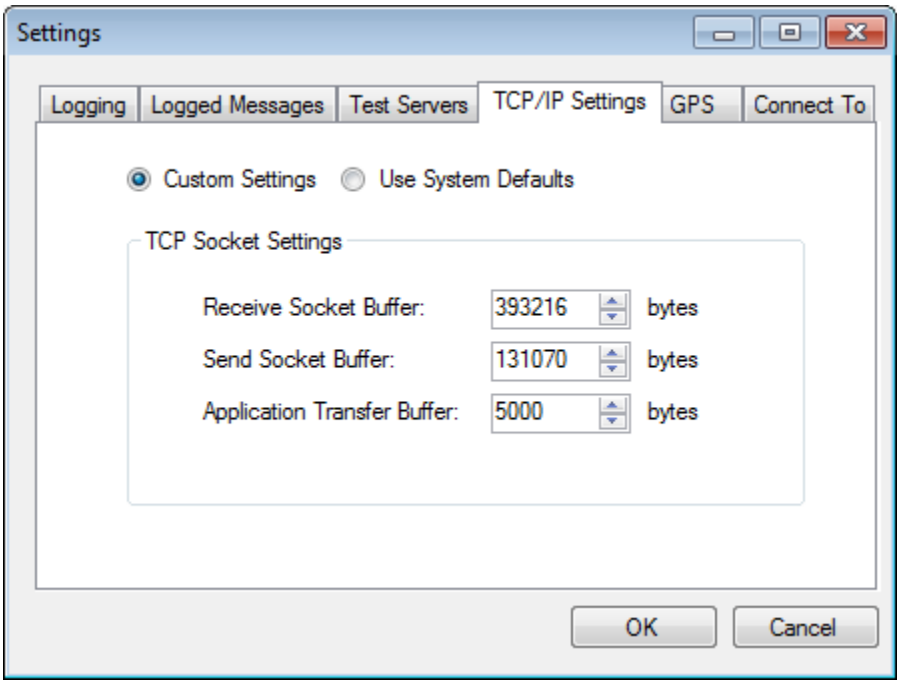


Figure 6-13 - TCP/IP Settings Tab of Settings Dialog

6.3.5 Configuring GPS

Datum can record GPS location information during testing. Location information may be used to display data testing results graphically in MapInfo™ and similar mapping applications. To capture GPS information with Datum:

- Connect your GPS device and enable the device to acquire a signal.
- Select the **GPS** tab of the **Tools** → **Settings** dialog.
- Choose the GPS data source corresponding to your device. Select **Garmin** or the COM port corresponding to a DeLorme device.
- Select the **Enable Alarm** option to sound an audible alarm when the GPS fix is lost.
- Use the **Reset** button to identify a new device attached during a Datum PC session.

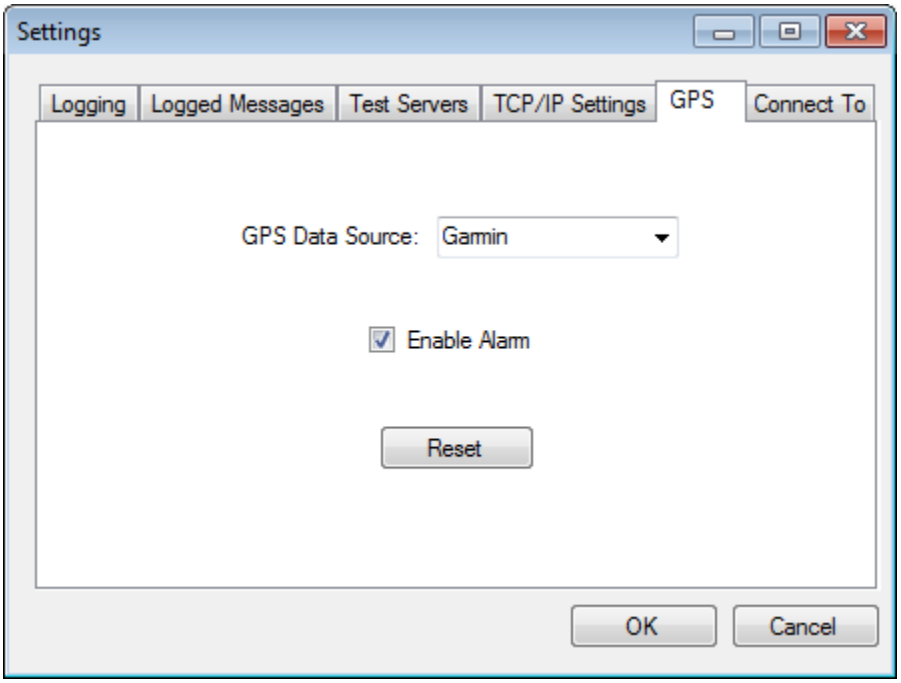


Figure 6-14 - GPS Tab of Settings Dialog

The color of the GPS indicator provides the GPS state:

Gray	No GPS attached
Red	GPS attached, no fix
Yellow	GPS attached, 2D fix
Green	GPS attached, 3D fix

To view the GPS position during data collection, load the **Field Tech Profile** as described in Section 6.1. The GPS position will be visible in the lower left-hand corner. In any view, the GPS position may be seen in the **Messages** display window.

6.3.6 Choosing the Network Connection

Any active network connection on the test PC may be used as the test connection. The network connection option dialog is presented when the software starts. The selection may be modified at any time from the **Connect To** screen of the **Tools → Settings** dialog.

- The **Explicitly bind tests to selected connection** option is selected by default. This is the recommended settings for most users. Deselecting this option prevents tests from failing due to a conflict with certain antivirus software packages. If you suspect this issue, contact Spirent Support for further assistance.
- Select **Use as Default Network connection** to bypass the **Connect To** dialog upon startup. The test connection may be changed at any time from the **Connect To** screen of the **Tools → Settings** dialog.
- Selecting the **Auto-Connect** option will allow Datum to automatically reconnect the wireless interface after a drop, eliminating the need to manually reconnect the device.
- The **Reconnect Timeout** parameter specifies how long Datum will attempt to re-establish the connection.

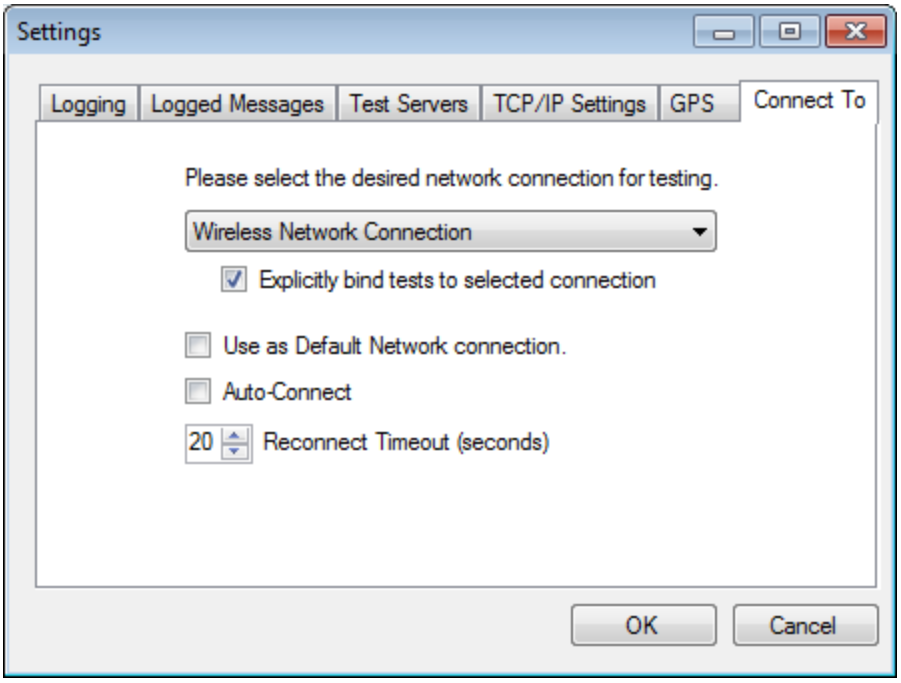


Figure 6-15 - Connect To Tab of Settings Dialog

7 Customizing Test-Sets

Datum enhances data test accuracy by providing a single technical solution capable of meeting a full set of testing requirements. To this end, the Datum PC interface allows users to customize lists of tasks for testing data performance using the **Test-Set Editor**. This section describes how to customize a Test-Set to meet specific data testing requirements.

7.1 Accessing the Test-Set Editor

Test-Sets are created, edited and saved from the **Test-Set Editor**. There are two different ways to access the **Test-Set Editor**:

- To build a new Test-Set from scratch, select **File** → **Test-Sets** → **New** or click the **New Test-Set** button on the Toolbar.
- To edit an existing Test-Set, select **File** → **Test-Sets** → **Edit** or click the **Edit Test-Set** button on the Toolbar. We recommend editing a pre-configured Test-Set as a way to familiarize yourself with the available options when first learning the software.

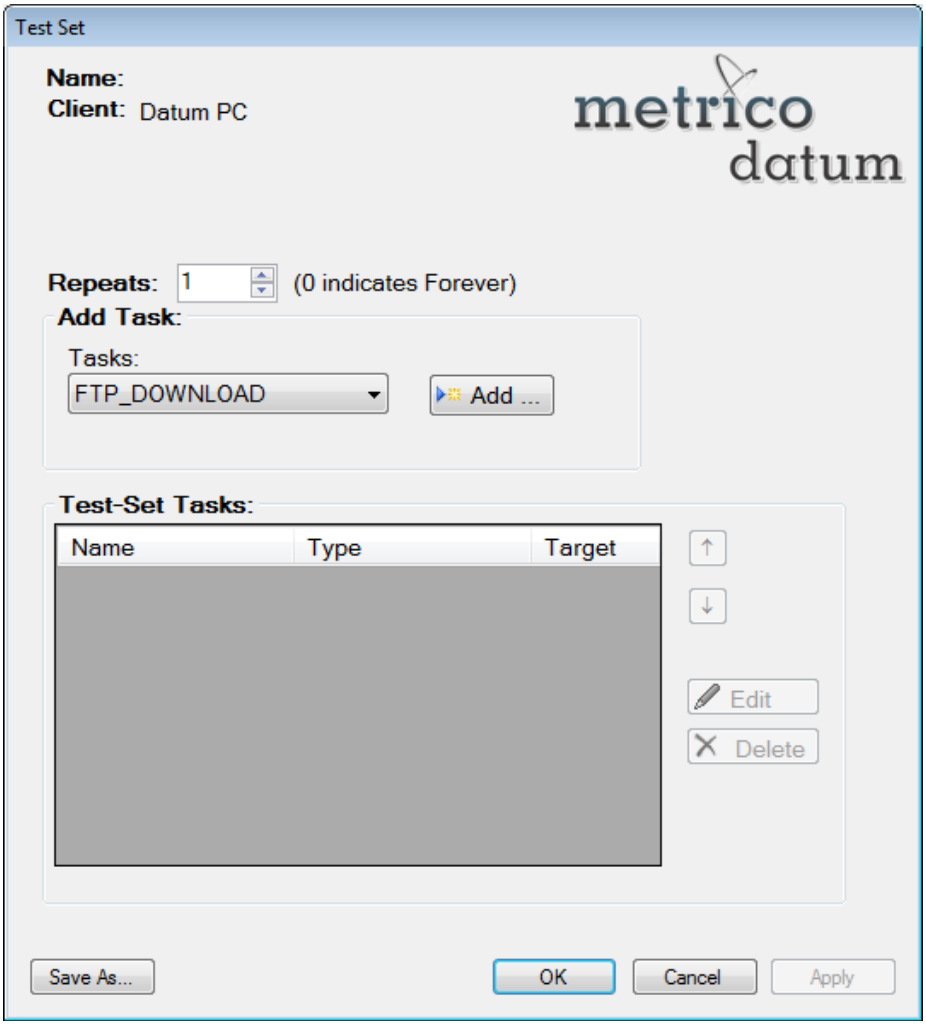


Figure 7-1 - Test-Set Editor

7.2 Modifying the Test Structure

When the **Test-Set Editor** appears, use the available settings to configure the structure of the Test-Set:

- Add a new task to the Test-Set by selecting any task type and clicking the **Add** button. The **Task Details** dialog (discussed in the following section) will open.
- Edit an existing task by selecting the task and clicking the **Edit** button to invoke the **Task Details** dialog. Alternatively, double-click on an existing task in the Test-Set, or right-click on the task and select **Edit**.
- Tasks may be removed from the Test-Set by selecting an existing task and clicking the **Delete** button. Alternatively, right-click on a task and select **Delete** to remove it from the Test-Set. Hold the **Shift** or **Ctrl** key to select multiple tasks to delete at once.
- Tasks may be reordered using the **up** and **down** arrow buttons. Alternatively, right-click on a task and select **Move Up** or **Move Down**, or simply drag and drop the task to the desired position.

7.3 Modifying Task Details

The **Task Details** dialog allows you to configure the properties of each individual task. The dialog is invoked upon the addition of a new task or the selection of an existing task for editing.

When the **Task Details** dialog appears:

- **Name** the task. We recommend keeping the default descriptive name that reflects the settings of the current task. Examples of descriptive names include **FTP Download 512 KB BMP** or **UDP Upload 10.2 KBPS**.
- The remaining settings in the Task Details dialog are unique to the selected task type. **Appendix D** describes the settings for each task type.
- After entering all desired settings, click **OK** to accept changes and exit the dialog, or click **Cancel** to exit the dialog without accepting changes.

7.4 Specifying the Number of Repeats

Use the **Repeats Window** to specify the default number of times to execute the task list. This default number of repeats may be overridden by specifying the number of cycles when starting the test.

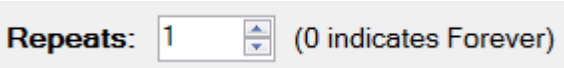


Figure 7-2 - Repeats Window

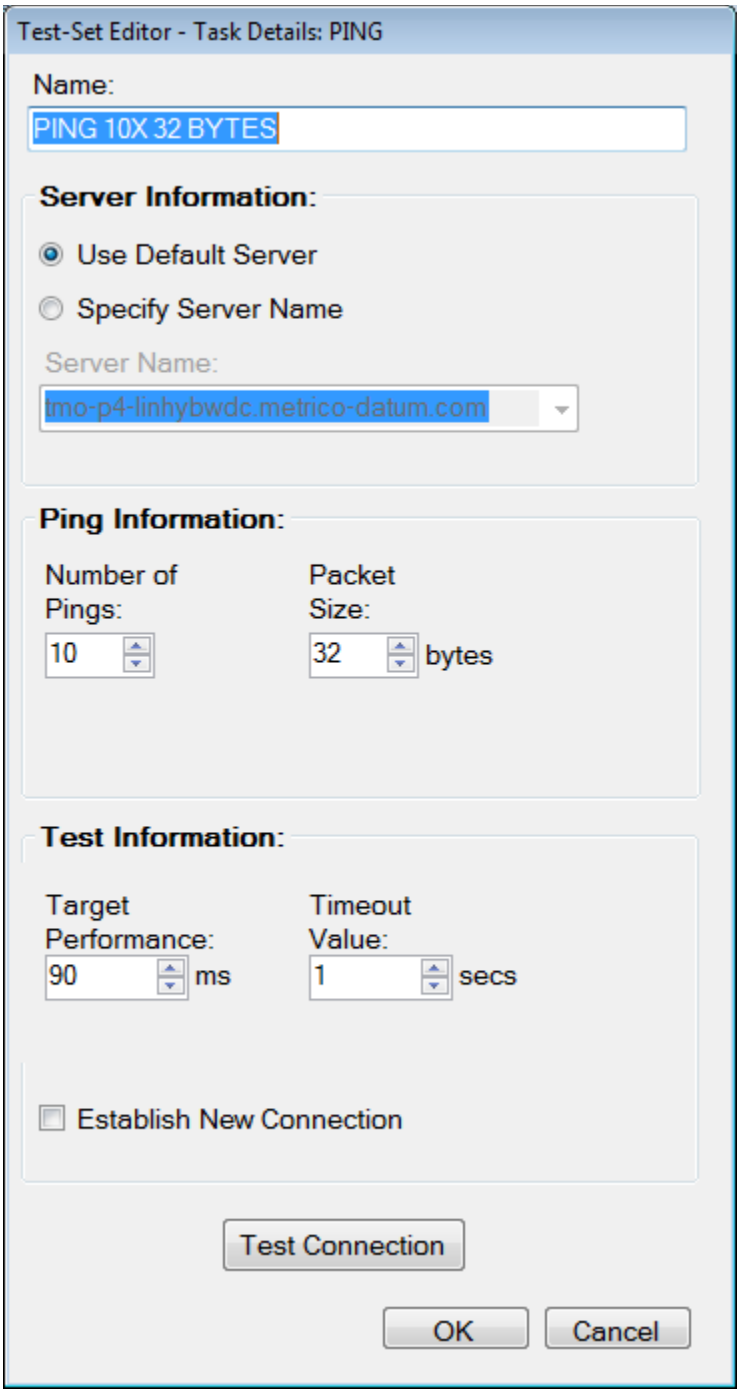


Figure 7-3 - Task Details Dialog (PING Task)

7.5 Finalizing the Test-Set

Once all tasks have been configured, save the Test-Set by clicking **OK** or **Save As** in the main **Test-Set Editor** window.

8 Running a Test

8.1 Starting a Test

Once the Profile is selected, the Test-Set is specified and the settings are configured, the test is ready to begin. To start the test:

- Specify the number of cycles of the Test-Set to execute in the **Logging Session** area of the **Control Panel**. A cycle is one iteration of all tasks in the Test-Set. Check the **Forever** box to continue until the test is manually stopped by the user.
- Select **File** → **Start** or click the **Start** 

button on the Control Panel.
- The **Test Details** dialog will appear. Fill in any information you wish to maintain about the test setup. Any field in this dialog may be left blank.
- Click **OK** to start the test. Click **Cancel** to exit the **Test Details** dialog without running the test.

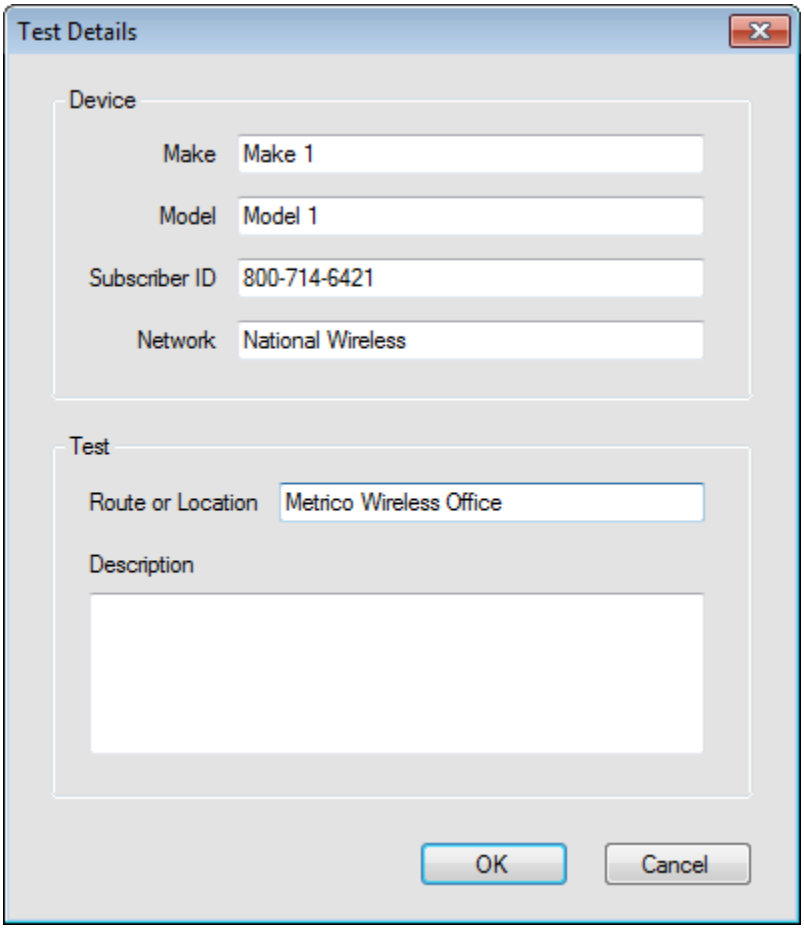


Figure 8-1 - Test Details Dialog

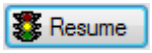
8.2 Pausing a Test

Datum allows the user to manually pause the current logging session and to resume logging when desired. To pause a logging session:

- Select **File** → **Pause** or click the **Pause** 

button on the Control Panel.

To resume logging:

- Select **File** → **Resume** or click the **Resume** 

button on the Control Panel.
- Enter a description of the pause reason and click **OK**, or click **Skip** if no description is desired. The Pause Description is written to the session log file.

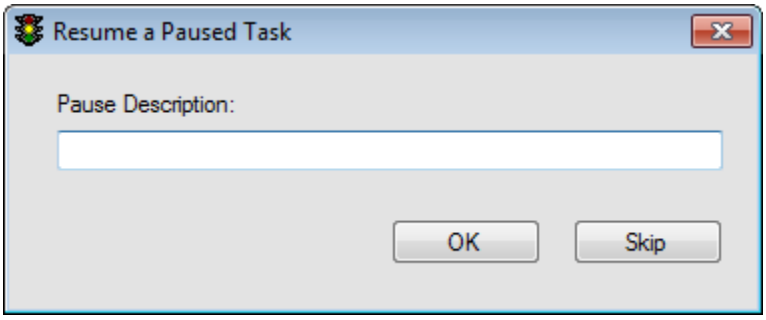


Figure 8-2 - Resume a Paused Task Dialog

8.3 Stopping a Test

The logging session will automatically stop when all cycles of the Test-Set are complete. After the session is finished, the Progress indicator in the Session Stats area of the Control Panel will show COMPLETE.

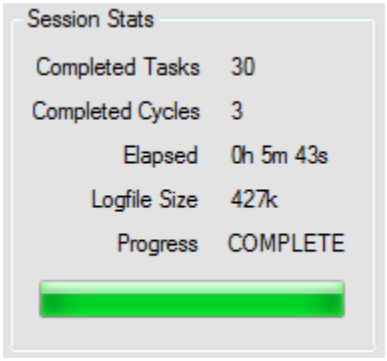
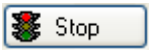


Figure 8-3 - Session Completion Indication

A test may also be stopped manually. To manually stop a test:

- Select **File** → **Stop** or click the **Stop** 

button on the Control Panel.
- The **Stop Logging** dialog will appear.
  - Click **Yes** to interrupt the current task and terminate the test immediately.
  - Click **No** to stop the test after completing the current task.
  - Click **Cancel** to resume the test.

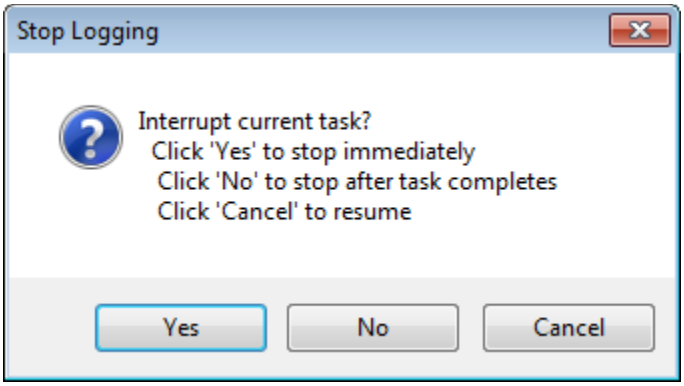


Figure 8-4 - Stop Logging Dialog

9 Analyzing the Results

9.1 Examining the Data Views

All data collected during the test will be present in the Messages, Test-Set Results and Test-Set Summary windows in the main Datum PC window. Scroll through any of these windows to analyze the data captured during the test.

9.2 Generating a Report

Select **Tools → Create Report** or click on the **Create Report**  button on the Toolbar to produce a pre-configured report summarizing Test-Set results.

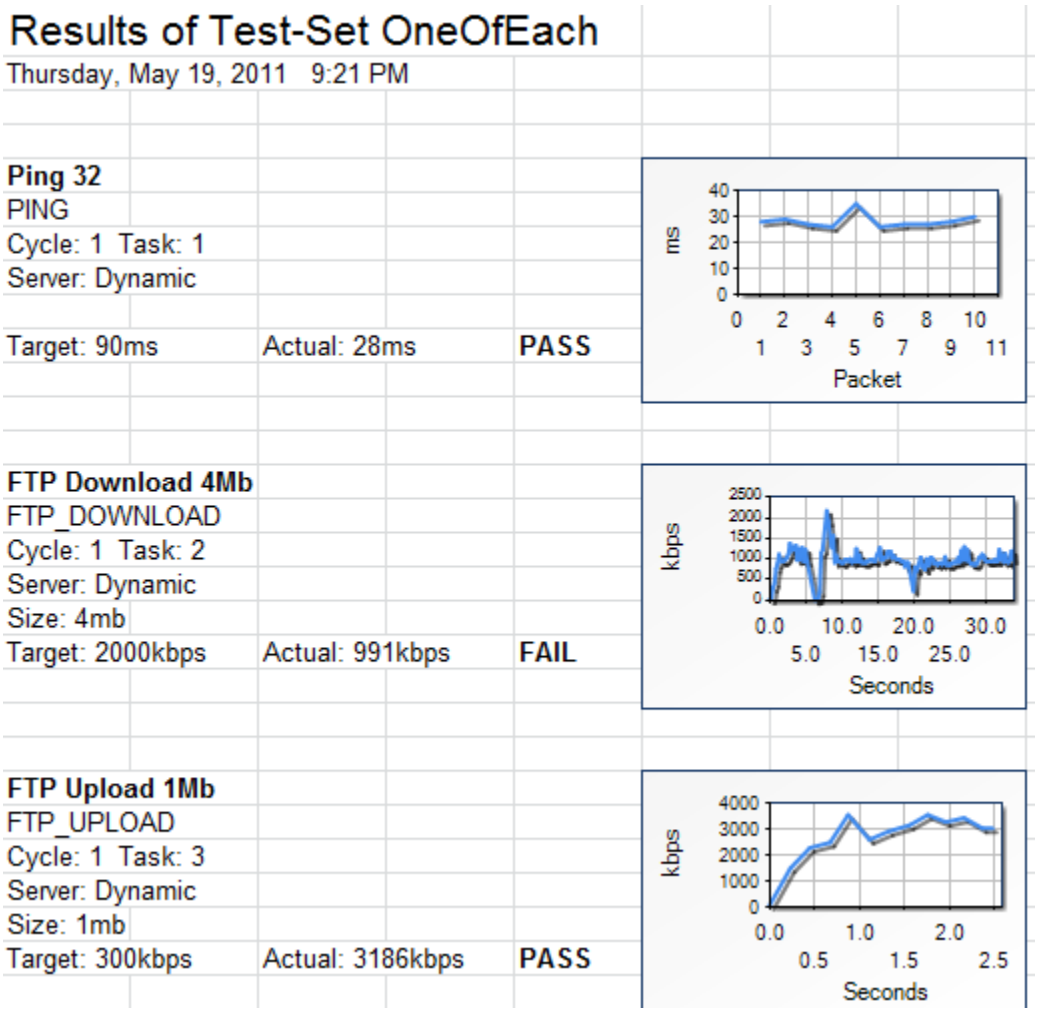


Figure 9-1 - Summary Report

9.3 Viewing the Logs

The log file containing the messaging for each test is stored in the location specified in the **Logging** tab of the **Tools → Settings** dialog as described in Section 6.3.1. Each log file is identified by the Test-Set name and the date and time at which the test was started. Note that Datum will trim any file path / name combination that exceeds the Windows limit of 260 characters.

The log files are maintained in an open-format, comma-delimited file for direct access to the information. All task messages and information entered on the **Test Details** screen are maintained in the log files.

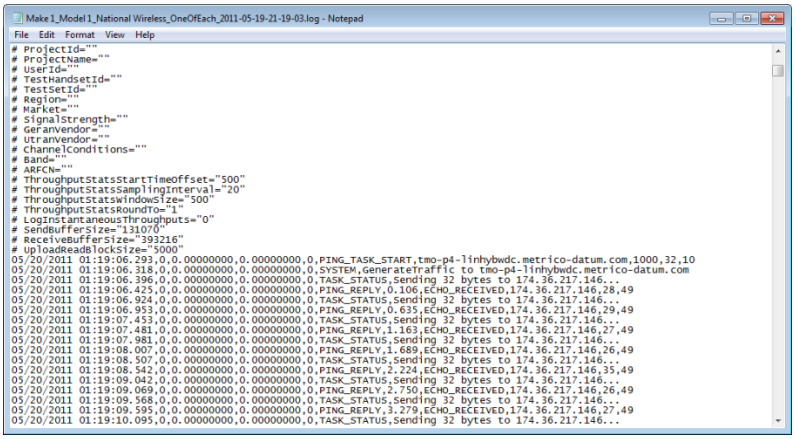


Figure 9-2 - Datum Test Log

9.4 Performing Other Post-Processing Applications

Datum Post-Processing Plug-In applications can be provided by Spirent to assist with client-specific analysis requirements. Examples of post-processing applications that may be provided include:

- Displaying a customized output report
- Uploading the log file to a specific website
- Invoking a mapping application to display the data geographically

To access any Post-Processing Plug-In available in your installation:

- Select **Tools → Plug-Ins** or click the **Manage-Plug Ins** button on the Toolbar.
- The name of the last log file collected appears in the **Log File** field. Click the **Browse** button to select a different file to work with.
- Click **Run ...** to run the Post-Processing Plug-In of interest.
- Check the **Show these options when logging ends** box to have the dialog appear at the end of each test session.
- Click **Done** when finished.

Contact a Spirent representative for further information on customized post-processing applications.

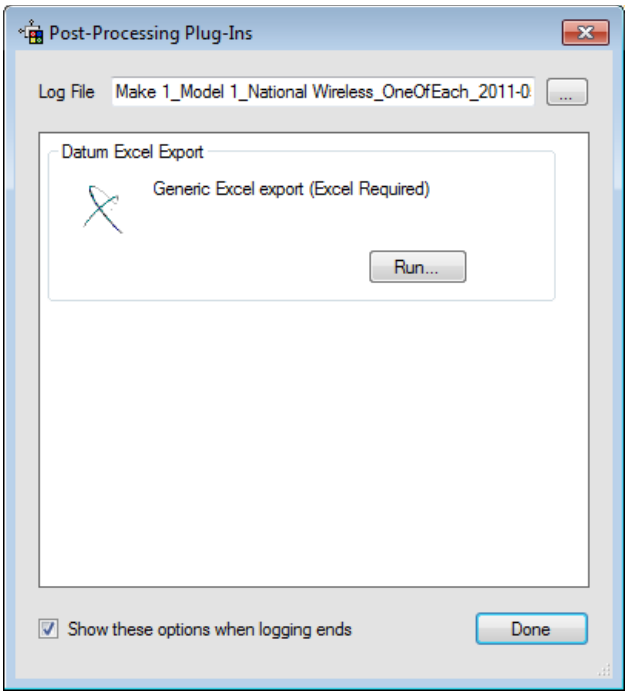


Figure 9-3 - Post-Processing Plug-Ins Dialog

9.5 Interpreting the Data

The outcome of each task is summarized in terms of a single Key Performance Indicator (KPI). A user-defined target threshold set in the **Task Details** dialog of the **Test-Set Editor** (see Section 7.3) is used to determine whether the task has been performed satisfactorily. The table below provides the PASS/FAIL criteria for each task type:

Task Type	Task KPI	Units
Adaptive UDP Download	Average Throughput	Kilobits per Second
Adaptive UDP Upload	Average Throughput	Kilobits per Second
FTP Download	Average Throughput	Kilobits per Second
FTP Simultaneous Download/Upload	Average Throughput (provided for both DL and UL)	Kilobits per Second
FTP Upload	Average Throughput	Kilobits per Second
HTTP Download	Average Throughput	Kilobits per Second
HTTP Upload	Average Throughput	Kilobits per Second
Ping	Average Ping Time	Milliseconds
UDP Download	Average Throughput	Kilobits per Second
UDP Upload	Average Throughput	Kilobits per Second
Web Browser	Page Download Time (the time between initial navigation to the page and display of the complete page in the browser	Milliseconds

The PASS/FAIL status for each completed task, along with the target and actual KPI values, is displayed in the **Test-Set Results** window.

10 Interfacing with the Project Server

The Datum Project Server is an optional web-based interface for sharing Datum test information and compiling test results. The Project Server allows for the comparison of device performance based on key data application metrics, as well as detailed analysis of individual metrics. Using the Project Server, results may be filtered to target a specific dataset for analysis.

This section describes the steps required for interfacing with the Project Server during a Datum PC session. Interfacing with the Project Server consists of:

- Connecting to a Project
- Loading a Test-Set from the Project
- Uploading Test Results to the Project

10.1 Connecting to a Project

In order to load a Test-Set that is part of a Project or to upload test results to the project, it is necessary to establish communication between Datum PC and the Project. To connect to a project:

- Select **Project → Connect to a Project** to display the **Project Settings** dialog.

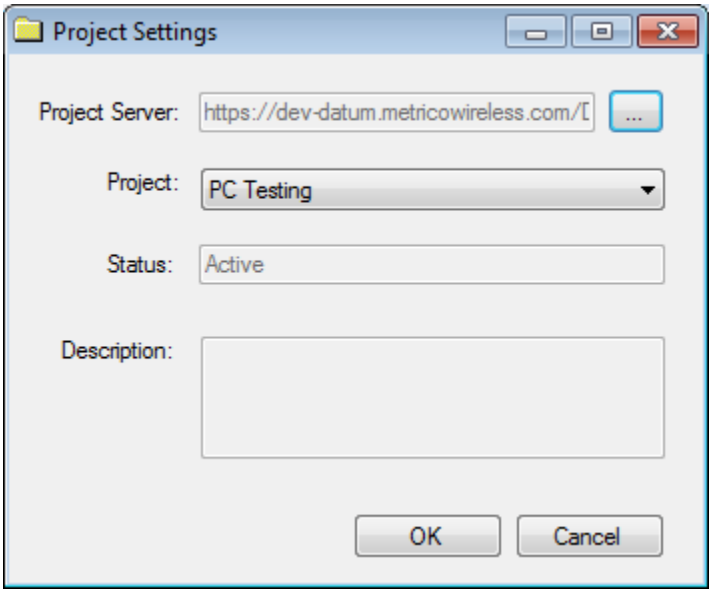


Figure 10-1 - Project Settings Dialog

- Select the **Project Server** ... button to display the **Project Server Settings** dialog.
- If the **Project Server URL** is not populated automatically, it may be entered manually.

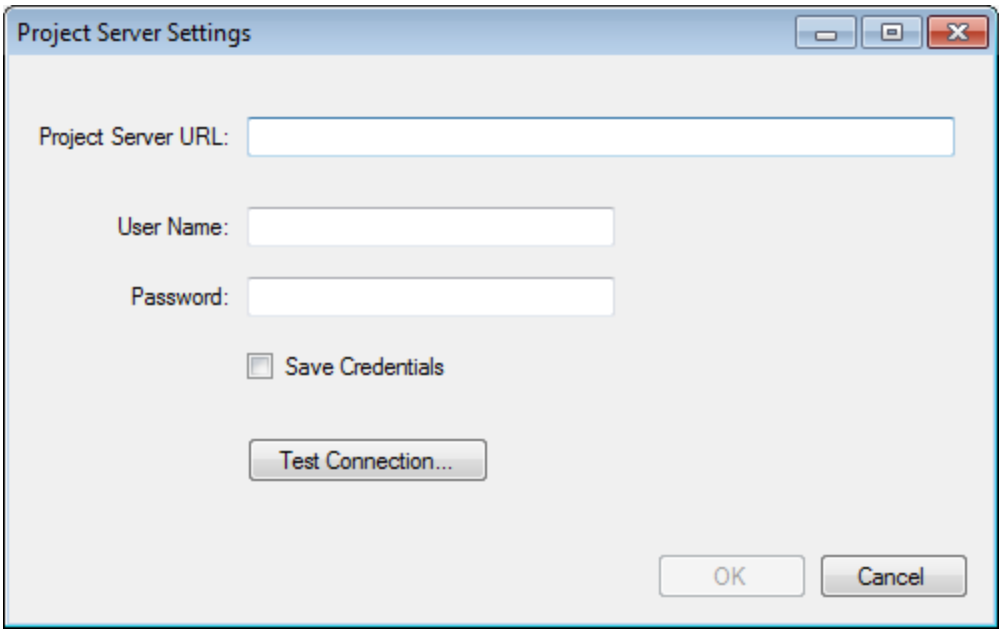


Figure 10-2 - Project Server Settings Dialog

- Enter your **User Name** and **Password**.
- Click the **Test Connection** button. The **Connection Succeeded** message indicates that communication has been established with the **Project Server**.
- Click **OK** to close the message.
- Click **OK** again to return to the **Project Settings** dialog.
- Select the desired **Project** from the drop-down menu.
- Click **OK** to clear the **Project Settings** dialog.

10.2 Loading a Test-Set from a Project

Pre-configured Test-Sets may be available on the Project Server. To use a Test-Set from a Project Server, Datum PC must be connected to the Project as described in Section 10.1.

Once Datum PC has been connected to the Project, select the desired Test-Set from the **Test Set** drop down in the **Project** area of the **Control Panel**. Note that any available Test-Set may be downloaded for use. If the Test-Set contains tasks that are not supported by Datum PC, those tasks will be skipped at run time.

After selecting the Test-Set, start the test as described in Chapter 8.

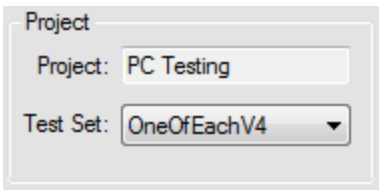


Figure 10-3 - Project Area of the Control Panel

10.3 Uploading Test Data to a Project

Datum PC test results must be uploaded to the Project Server in order to be analyzed alongside other test results. To upload test data to the Project Server:

- When connected to a Project Server, the **Upload Project Logfiles** dialog appears at the completion of a test.
- Log files that have not yet been uploaded to the Project Server are listed on the **Pending Uploads** tab of the dialog.
- Select each file to be uploaded and click **Upload Files** to begin the upload.
- When uploading is complete, a summary of uploaded files will be displayed. Click **Close** to clear the dialog.

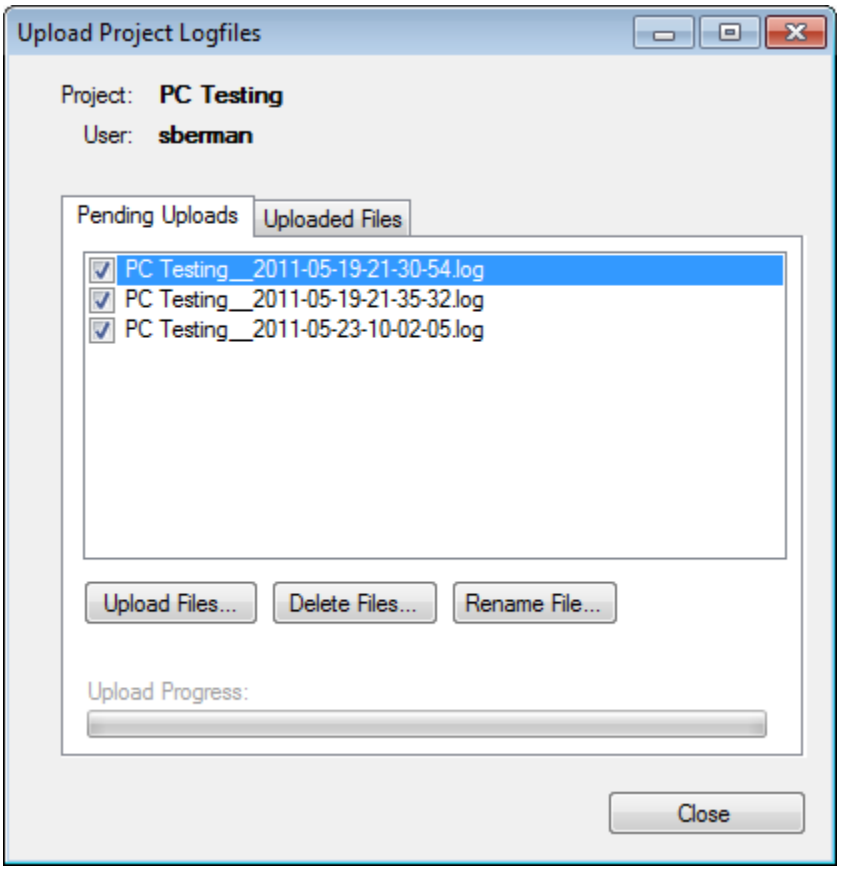


Figure 10-4 - Upload Project Logfiles Dialog

Appendix A – Glossary

Term	Definition
Adaptive UDP (User Datagram Protocol)	The Adaptive UDP test finds and reports the best possible UDP throughput under current network conditions. UDP (User Datagram Protocol) is a connectionless, host-to-host protocol typically used for real-time applications.
Cycle	One iteration of all tasks in a Datum Test-Set.
FTP (File Transfer Protocol)	A client server application protocol that provides reliability in the transfer of data between network nodes; FTP sacrifices some speed in favor of reliability.
FTP Simultaneous Download / Upload	This test determines whether the device is capable of performing an FTP download and an FTP upload at the same time. This test provides the average throughput of both the download task and the upload task in kilobits per second. Datum Mobile clients also provide the elapsed time for this task.
HTTP (Hypertext Transfer Protocol)	A communications protocol used to transfer data over the internet.
Ping	A utility program that tests internet access to a device by sending a series of messages and measuring the replies.
Profile	The Datum mechanism that defines the data display options for the current logging session. Profiles are stored in XML files.
Project Server	An optional web-based interface for sharing Datum test information and compiling test results.
Task	An instance of a data application (i.e. Ping, FTP Download, UDP Upload, etc.)
Test-Set	The Datum mechanism that provides the list of tasks to be performed in the current logging session. Test-Sets are stored in XML files.
UDP (User Datagram Protocol)	A connectionless, host-to-host protocol typically used for real-time applications; UDP sacrifices reliability in favor of speed.

Appendix B – Menu Reference

File Menu

Use the **File Menu** to perform basic file operations.

Menu Command	Description
Test-Sets	Open or manipulate a Test-Set. See more information on Test-Set options below.
Profiles	Open or close a Profile. See more information on Profile options below.
Start	Begin a test.
Pause	Temporarily discontinue logging.
Resume	Restart logging after a pause.
Stop	Terminate a logging session before the end of the Test-Set.
Exit	Terminate the program.

Test-Sets Menu

A Test-Set provides a list of tasks to be performed in the current logging session. Test-Sets are stored in XML files.

Menu Command	Description
New	Create a new Test-Set from scratch. See Chapter 7 for instructions on using the **Test-Set Editor** to create a new Test-Set.
Open	Load an existing Test-Set into the workspace.
View	View the details of an existing Test-Set. This option invokes the **Test-Set Editor** to display the information for each task.
Edit	Modify the details of an existing Test-Set. See Chapter 7 for instructions on using the **Test-Set Editor** to customize a Test-Set.
Close	Clears all information pertaining to the current Test-Set from the data views. Information will be cleared from the Session Stats and Task Stats areas of the Control Panel and from all data windows.

Profiles Menu

A Profile defines the data display options for the current logging session. Profiles are stored in XML files.

Menu Command	Description
Open	Load a Profile into the workspace.
Close	Closes all data windows associated with the current Profile.

View Menu

Use the **View Menu** to control which information is displayed on the screen.

Menu Command	Description
Messages	Open the window that displays all task-related messages.
Throughput	Open the window that displays the instantaneous throughput during each task.
Results	Open the window that provides setting and output information for each task.
Summary	Open the window that displays the key performance metric for each task in the Test-Set.

Project Menu

Use the **Project Menu** to interface with a Datum Project Server. A Project Server is an optional web-based interface for sharing Datum test information and compiling test results.

Menu Command	Description
Connect to a Project	Establish communication between Datum PC and a Project Server.
Disconnect from a Project	Terminate communication between Datum PC and a Project Server. This option is visible only when connected to a project.
Upload Log Files	Upload Datum test results collected locally to a Project Server. This option is visible only when connected to a project.
Refresh Current Project	Refresh communication between Datum PC and the Project Server. This option is visible only when connected to a project.

Tools Menu

Use the **Tools Menu** to invoke utilities for post-processing collected data and configuring test settings.

Menu Command	Description
Create Report	Generate a pre-configured report summarizing results for the current Test-Set.
Plug-Ins	Run any Post-Processing Plug-In applications provided by Spirent to assist with custom analysis requirements. See Section 9.4 for more information on Post-Processing Plug-Ins.
Settings	Customize test settings for logging data, capturing throughput statistics, selecting test servers, configuring GPS and choosing a network connection. See Section 6.3 for a detailed explanation of each option.
Check TCP Settings	Verify the Windows Registry settings that may affect data throughput performance. Compare the actual values of each parameter to the Windows default value.

Window Menu

Use the **Window Menu** to arrange and access the available data windows.

Menu Command	Description
Cascade	Cascade open windows.
Tile Vertical	Tile open windows vertically.
Tile Horizontal	Tile open windows horizontally.
Window Names (Messages, Task Throughput, Test-Set Results, Test-Set Summary)	The names of all open windows will be listed at the bottom of the **Window Menu**. Select the name of any listed window to activate that window.

Help Menu

Use the **Help Menu** to learn how to get the most out of **Spirent Datum**.

Menu Command	Description
Contents	Opens the Online Help file for **Spirent Datum**.
User's Guide	Opens the Datum PC User's Guide in PDF format.
Quick Start	Opens a one-page summary of steps for first-time users of the software.
Visual Guide	Opens a one-page visual summary of key program features.
Registration	Use this option to update registration information with Spirent.
Check for Updates	Determine whether a more recent version of Spirent Datum PC is available.
About Datum	Displays the **Spirent Datum** splash screen containing version and copyright information.

Appendix C – Toolbar Reference

The Datum PC Toolbar provides shortcuts to the most commonly used functions.

Figure C-1 - Datum PC Toolbar

Toolbar Icon	Tooltip	Description
	New Test-Set	Create a new Test-Set from scratch. See Chapter 7 for instructions on using the **Test-Set Editor** to create a new Test-Set.
	Load Test-Set	Load an existing Test-Set into the workspace.
	Edit Test-Set	Modify the details of an existing Test-Set. See Chapter 7 for instructions on using the **Test-Set Editor** to customize a Test-Set.
	Unload Test-Set	Clears all information pertaining to the current Test-Set from the data views. Information will be cleared from the Session Stats and Task Stats areas of the Control Panel and from all data windows.
	Load User Profile	Load a Profile into the workspace.
	Unload User Profile	Closes all data windows associated with the current Profile.
	View Task Messages	Open the window that displays all task-related messages.
	View Task Throughput	Open the window that displays the instantaneous throughput during each task.
	View Test-Set Results	Open the window that provides setting and output information for each task.
	View Test-Set Summary	Open the window that displays the key performance metric for each task in the Test-Set.
	Create Report	Generate a pre-configured report summarizing results for the current Test-Set.
	Manage Plug-Ins	Run any Post-Processing Plug-In applications provided by Spirent to assist with custom analysis requirements. See Section 9.4 for more information on Post-Processing Plug-Ins.
	Test Server Settings	Display the **Test Servers** tab of the **Settings** dialog to prioritize among available test servers.
	Network Interface Settings	Display the **Connect To** tab of the **Settings** dialog to specify the properties of the active network connection.

Appendix D – Task Specific Configuration Details

The **Task Details** dialog of the **Test-Set Editor** (see Chapter 7) allows you to configure the properties of each individual task. The dialog is invoked upon the addition of a new task or the selection of an existing task for editing.

Most settings in the **Task Details** dialog are unique to the selected task type. The settings for each task type are described in the sections of this Appendix:

A_UDP_DOWNLOAD and A_UDP_UPLOAD (Adaptive UDP)

The same configuration settings are available for the A_UDP_DOWNLOAD and A_UDP_UPLOAD tasks.

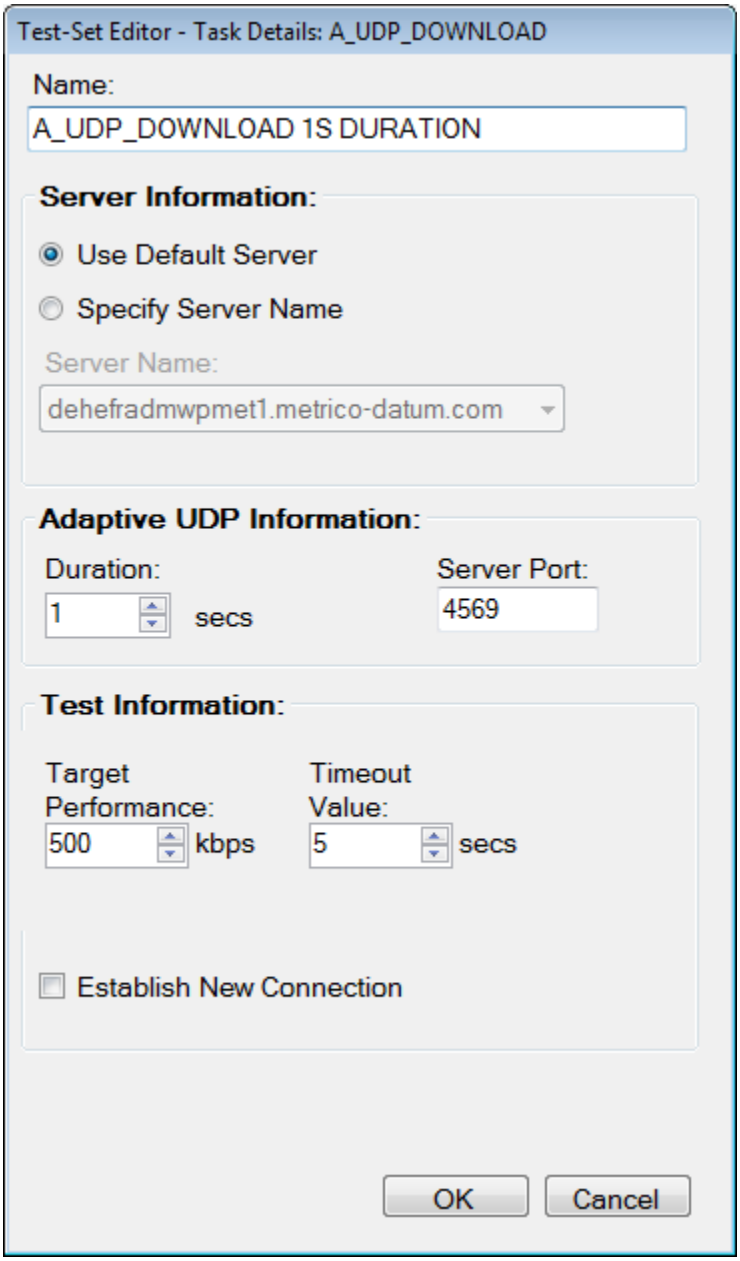


Figure D-1 - Task Details Dialog - A_UDP_DOWNLOAD and A_UDP_UPLOAD

Server Information	• **Server Name** – Name of the server to send data to or receive data from. Only Spirent configured servers may be used for this test. A "Default Server" option is available for Datum PC, allowing the program to select from the available servers.
Adaptive UDP Information	• **Duration** – The length of time in seconds that the test should run. • **Server Port** – The port that the media server monitors for this test. Do not change this value unless directed by Spirent.
Test Information	• **Target Performance** – The desired average throughput in kilobits per second. An Adaptive UDP task will be scored as PASSING if the average task throughput exceeds this target threshold. • **Timeout Value** – The length of time the Adaptive UDP task will attempt to run before failing due to exceeding expected task duration. • **Establish New Connection**– Checking this box will establish a new server connection for this task. Use this option to measure the performance of establishing connections and to analyze tasks initiated from a disconnected state.

FTP_DOWNLOAD and FTP_UPLOAD

The same configuration settings are available for the FTP_DOWNLOAD and FTP_UPLOAD tasks.

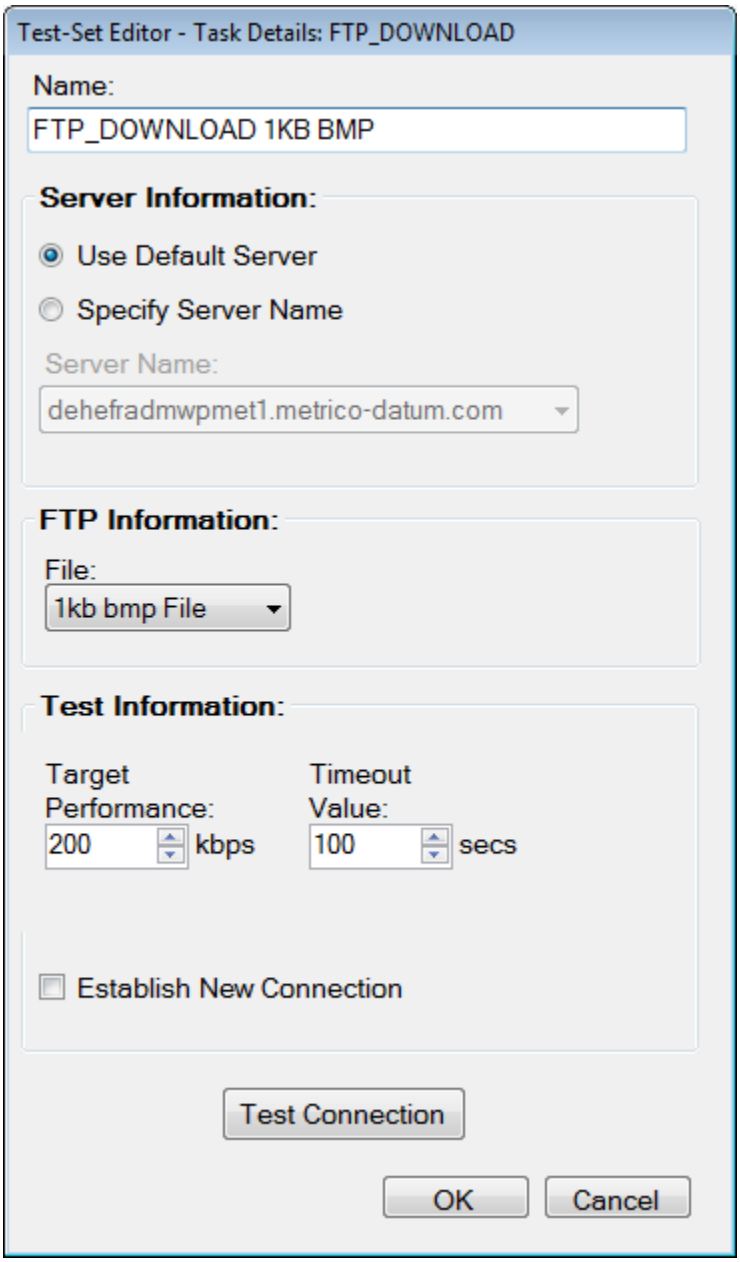


Figure D-2 - Task Details Dialog - FTP_DOWNLOAD and FTP_UPLOAD

Server Information	• **Server Name** – Name of the server to send data to or receive data from. Only Spirent configured servers may be used for this test. A "Default Server" option is available for Datum PC, allowing the program to select from the available servers.
FTP Information	• **File** – Used to specify the download or upload file based on file size and file type. Various file sizes are available for bitmap, text and zip file types.
Test Information	• **Target Performance** – The desired average throughput in kilobits per second. An FTP task will be scored as PASSING if the average task throughput exceeds this target threshold. • **Timeout Value** – The length of time the FTP task will attempt to run before failing due to exceeding expected task duration. • **Establish New Connection** – Checking this box will establish a new server connection for this task. Use this option to measure the performance of establishing connections and to analyze tasks initiated from a disconnected state.
Test Connection	• Click **Test Connection** → **Start** to confirm that the FTP_DOWNLOAD or FTP_UPLOAD task functions properly.

FTP_SIM_DU (Simultaneous FTP Download/Upload)

This test determines whether the device is capable of performing an FTP download task and an FTP upload task at the same time. This test provides the average throughput of both the download task and the upload task in kilobits per second. Datum Mobile clients also provide the elapsed time for this task.

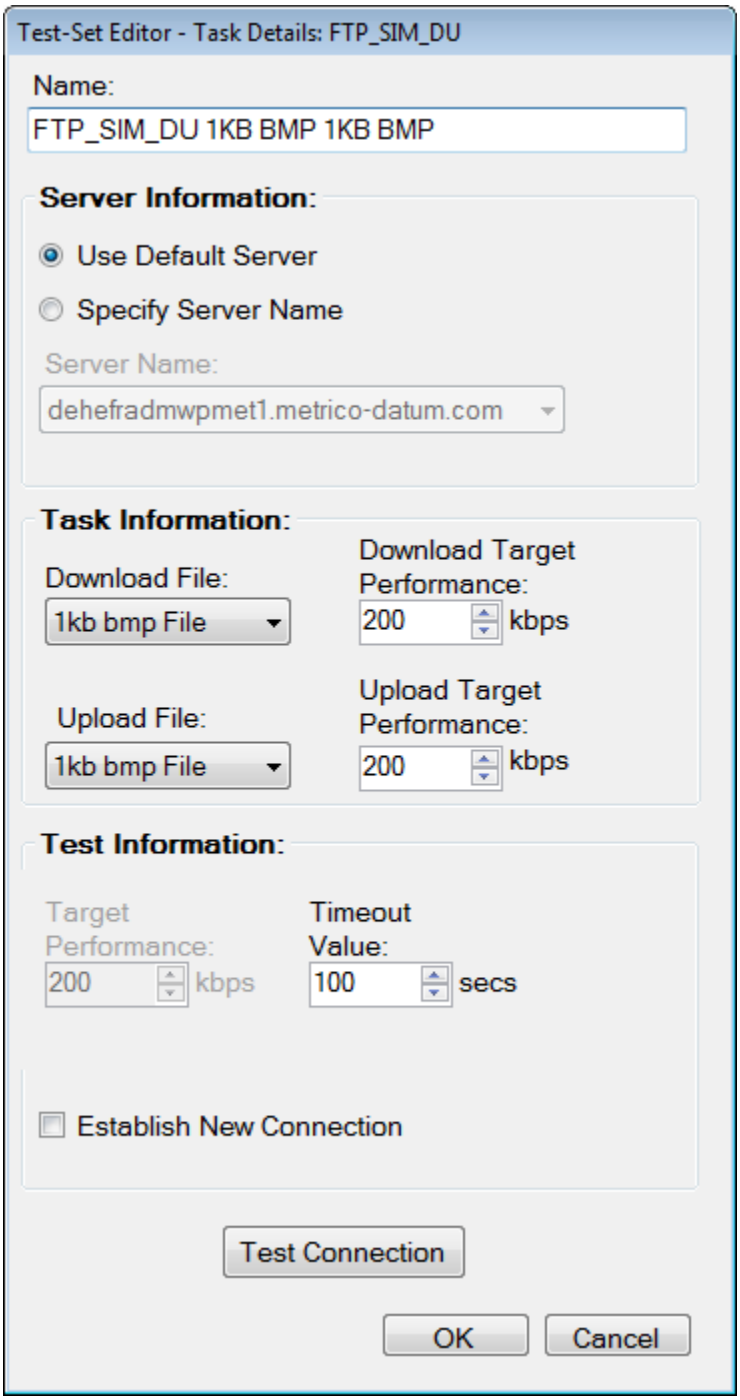


Figure D-3 - Task Details Dialog – FTP_SIM_DU

Server Information	• **Server Name** – Name of the server to send data to and receive data from. Only Spirent configured servers may be used for this test. A "Default Server" option is available for Datum PC, allowing the program to select from the available servers.
Task Information	• **Download / Upload File** – Used to specify the download and upload files based on file size and file type. Various file sizes are available for bitmap, text and zip file types. • **Download / Upload Target Performance** – The desired average throughput for each task type in kilobits per second. An FTP_SIM_DU task will be scored as PASSING in Datum PC if both the download and upload task throughputs exceed the respective target thresholds.
Test Information	• **Timeout Value** – The length of time the FTP_SIM_DU task will attempt to run before failing due to exceeding expected task duration. • **Establish New Connection** – Checking this box will establish a new server connection for this task. Use this option to measure the performance of establishing connections and to analyze tasks initiated from a disconnected state.
Test Connection	• Click **Test Connection → Start** to confirm that the FTP_DOWNLOAD and FTP_UPLOAD tasks function properly.

HTTP_DOWNLOAD

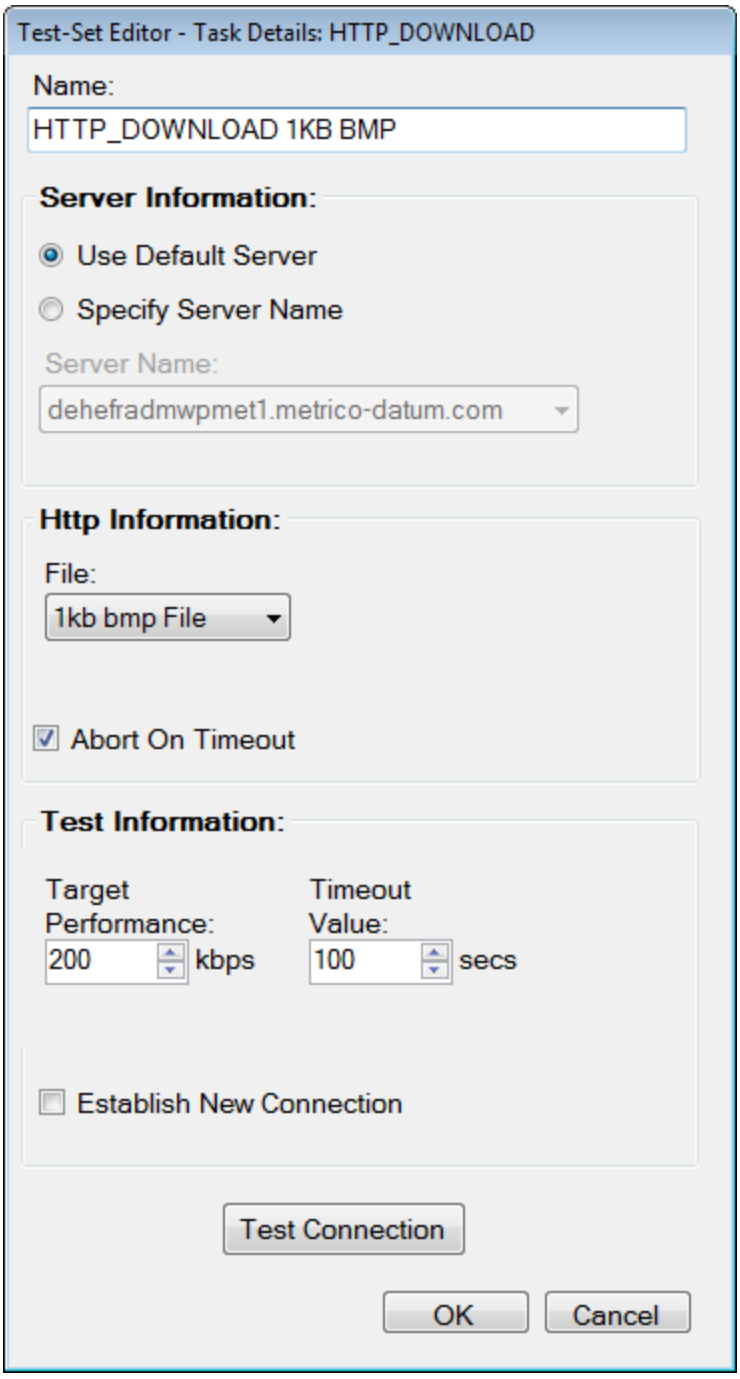


Figure D-4 - Task Details Dialog – HTTP_DOWNLOAD

Server Information	• **Server Name** – Name of the server to receive data from. Only Spirent configured servers may be used for this test. A "Default Server" option is available for Datum PC, allowing the program to select from the available servers.
HTTP Information	• **File** – Used to specify the download file based on file size and file type. Various file sizes are available for bitmap, text and zip file types. • **Abort On Timeout** – This option supports "fixed duration HTTP tests" in which performance of the same test file is compared across different networks. Deselect this option to conclude the test when the specified timeout duration has occurred without marking the test as incomplete. The larger test files required to accurately gauge performance on faster networks might exceed the timeout threshold on slower networks. Choosing not to abort on timeout will allow HTTP performance measurement for larger files on slower networks.
Test Information	• **Target Performance** – The desired average throughput in kilobits per second. An HTTP task will be scored as PASSING if the average task throughput exceeds this target threshold. • **Timeout Value** – The length of time the HTTP task will attempt to run before failing due to exceeding expected task duration. • **Establish New Connection** – Checking this box will establish a new server connection for this task. Use this option to measure the performance of establishing connections and to analyze tasks initiated from a disconnected state.
Test Connection	• Click **Test Connection** → **Start** to confirm that the HTTP_DOWNLOAD task functions properly.

HTTP_UPLOAD

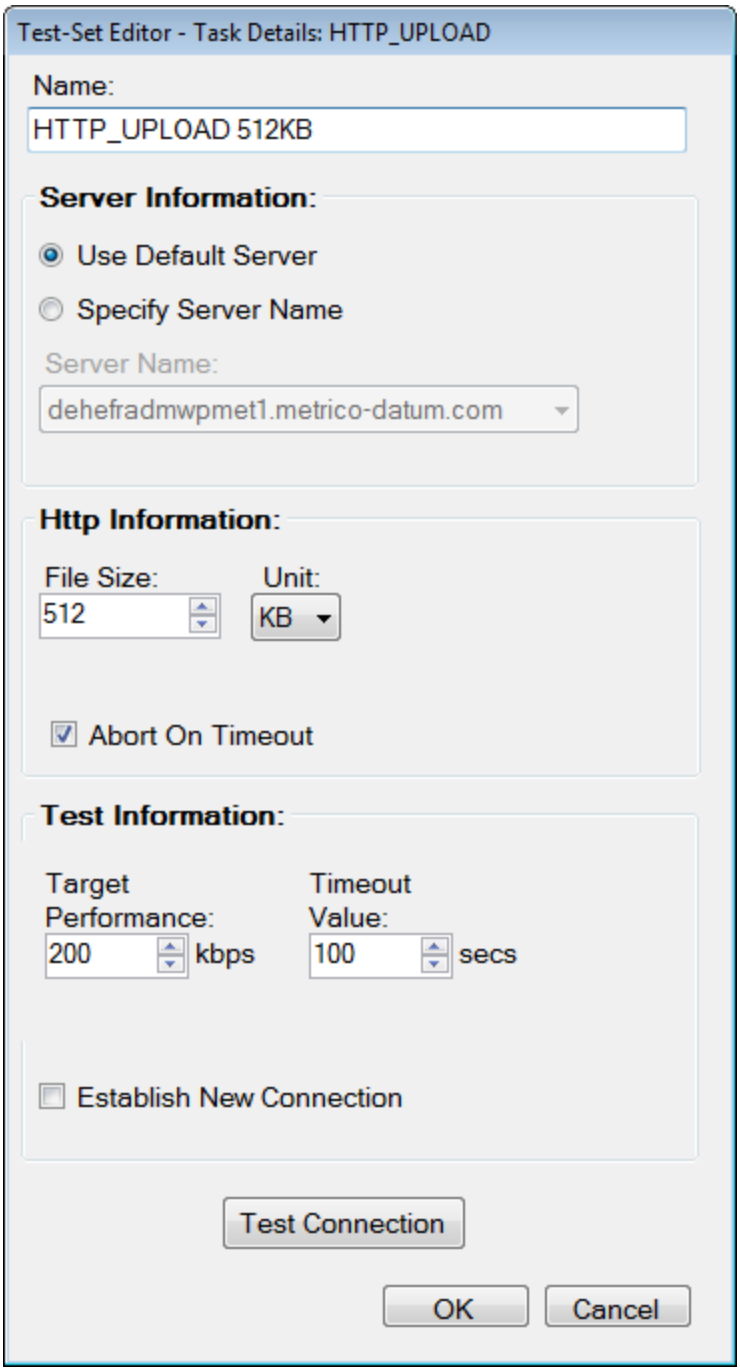


Figure D-5 - Task Details Dialog – HTTP_UPLOAD

Server Information	• **Server Name** – Name of the server to send data to. Only Spirent configured servers may be used for this test. A "Default Server" option is available for Datum PC, allowing the program to select from the available servers.
HTTP Information	• **File Size**– Used to specify the amount of data to transmit in terms of numbers of bytes (kb or Mb as specified in the **Unit** field). • **Abort On Timeout** – This option supports "fixed duration HTTP tests" in which performance of the same test file is compared across different networks. Deselect this option to conclude the test when the specified timeout duration has occurred without marking the test as incomplete. The larger test files required to accurately gauge performance on faster networks might exceed the timeout threshold on slower networks. Choosing not to abort on timeout will allow HTTP performance measurement for larger files on slower networks.
Test Information	• **Target Performance** – The desired average throughput in kilobits per second. An HTTP task will be scored as PASSING if the average task throughput exceeds this target threshold. • **Timeout Value** – The length of time the HTTP task will attempt to run before failing due to exceeding expected task duration. • **Establish New Connection** – Checking this box will establish a new server connection for this task. Use this option to measure the performance of establishing connections and to analyze tasks initiated from a disconnected state.
Test Connection	• Click **Test Connection** → **Start** to confirm that the HTTP_UPLOAD task functions properly.

PING

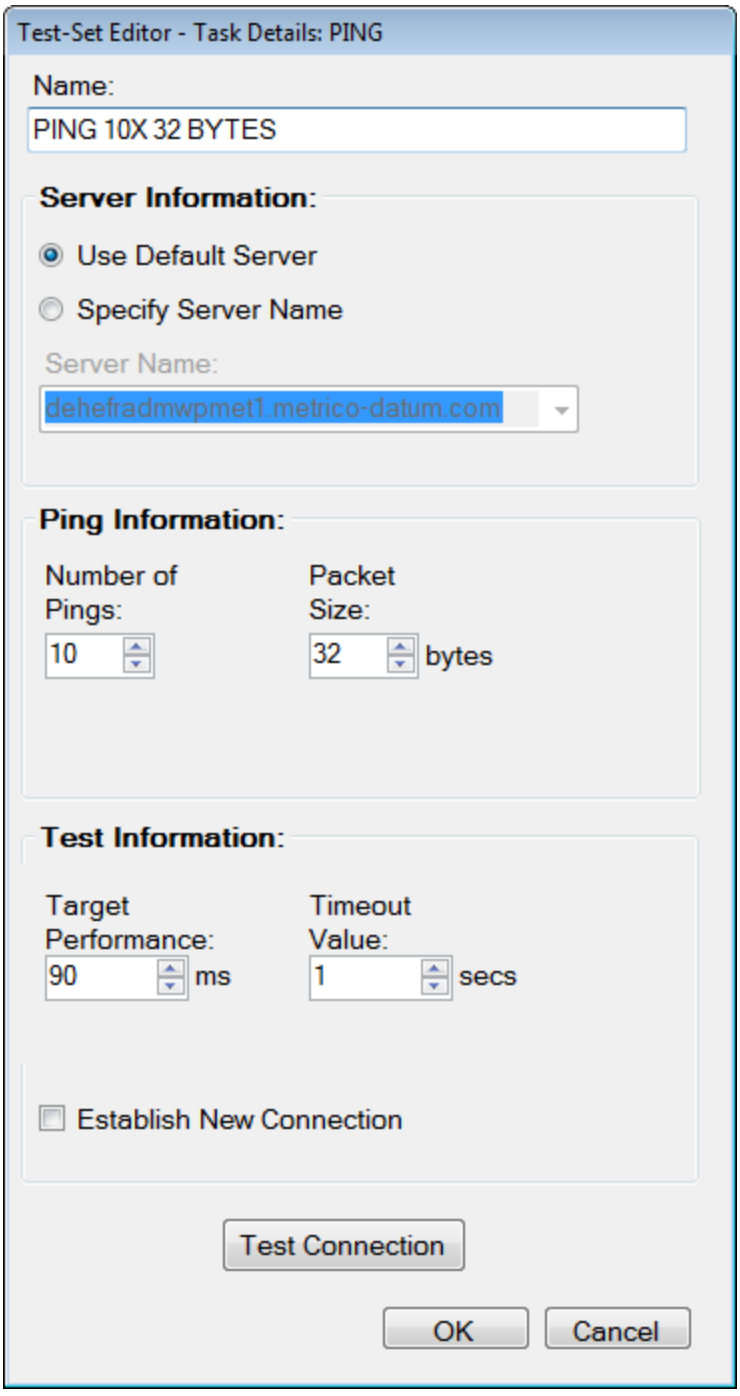


Figure D-6 - Task Details Dialog - PING

Server Information	• **Server Name** – The name of the server to ping. Any valid web or IP address may be used. A "Default Server" option is available for Datum PC, allowing the program to select from the available Spirent servers.
Ping Information	• **Number of Pings** – The number of times to ping the server in the current task. • **Packet Size** – The amount of data (in bytes) with which to ping the server.
Test Information	• **Target Performance** – The desired average ping time in milliseconds. A PING task will be scored as PASSING if the average time for all pings is less than this target threshold. • **Timeout Value** – The length of time the PING task will to attempt to run before failing due to exceeding expected task duration. • **Establish New Connection** – Checking this box will establish a new server connection for this task. Use this option to measure the performance of establishing connections and to analyze tasks initiated from a disconnected state.
Test Connection	• Click **Test Connection → Start** to confirm communication with the PING task server.

UDP_DOWNLOAD and UDP_UPLOAD

The same configuration settings are available for the UDP_DOWNLOAD and UDP_UPLOAD tasks.

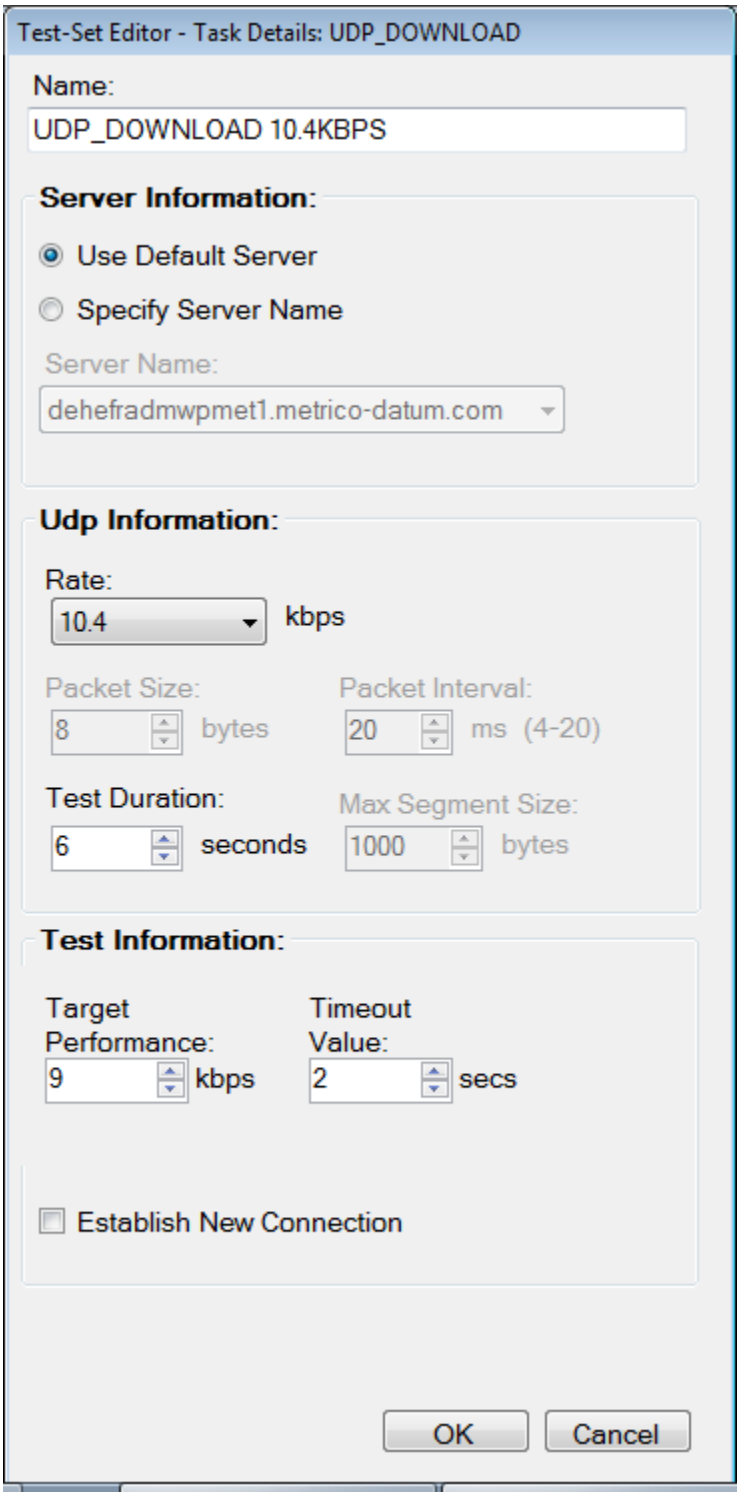


Figure D-7 - Task Details Dialog - UDP_DOWNLOAD and UDP_UPLOAD

Server Information	• **Server Name** – Name of the server to send data to or receive data from. Only Spirent configured servers may be used for this test. A "Default Server" option is available for Datum PC, allowing the program to select from the available servers.
UDP Information	• **Rate** – The rate at which UDP packets will be transmitted. The **Packet Size** and **Packet Interval** fields will automatically populate based on the selected rate. If the **Custom** rate option is selected, the **Packet Size** and **Packet Interval** fields will be available for modification. • **Test Duration** - The absolute duration of the UDP task. Because the **Packet Interval** is set by the **Rate**, the **Test Duration** determines the total number of packets transmitted during the test. • In the event that a UDP packet is too large to be sent as a single entity, it will be transmitted in smaller segments as specified by the **Max Segment Size**.
Test Information	• **Target Performance** – The desired average throughput in kilobits per second. A UDP task will be scored as PASSING if the average task throughput exceeds this target threshold. The default value is 90% of the selected **Rate**. • **Timeout Value** – The length of time the UDP task will attempt to run before failing due to exceeding expected task duration. • **Establish New Connection** – Checking this box will establish a new server connection for this task. Use this option to measure the performance of establishing connections and to analyze tasks initiated from a disconnected state.

WAIT

The WAIT task allows the user to insert a buffer period of inactivity between tasks.

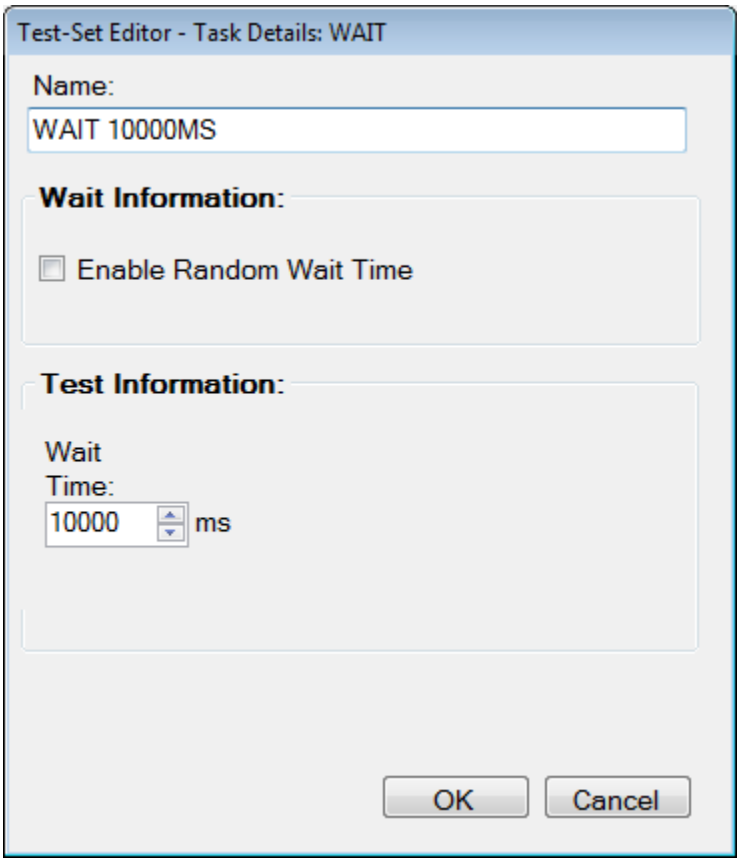


Figure D-8 - Task Details Dialog - WAIT

Wait Information	• **Enable Random Wait Time** – Selecting this box will cause the system to randomly select the WAIT time as any number of milliseconds up to the maximum value set in the **Wait Time** field. With this box checked, the system will generate a new random time for each run of the test.
Test Information	• **Wait Time** – The desired time to wait before the next task (in milliseconds). When **Enable Random Wait Time** is enabled, this value gives the maximum value that may be selected.

To view the messages indicating the status of the WAIT task during testing select the **Log Instantaneous Throughput Messages** check box on the **Tools → Settings → Logged Messages** screen. Note that choosing to log these messages will result in a larger output file size.

WEBBROWSER_TASK

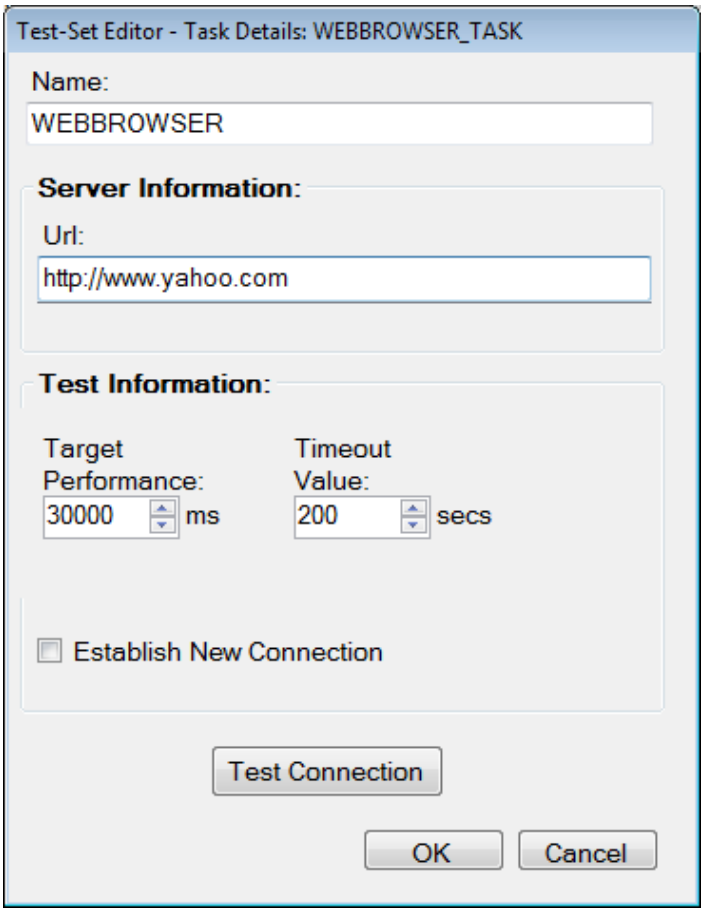


Figure D-9 - Task Details Dialog - WEBBROWSER_TASK

Server Information	• **URL** – Any valid web address may be used to conduct this task.
Test Information	• **Target Performance** – The desired download time in milliseconds. A WEBBROWSER_TASK will be scored as PASSING if the time between initial navigation to the page and display of the complete page in the browser is less than this target threshold. • **Timeout Value** – The length of time the WEBBROWSER_TASK will attempt to run before failing due to exceeding expected task duration. • **Establish New Connection** – Checking this box will establish a new server connection for this task. Use this option to measure the performance of establishing connections and to analyze tasks initiated from a disconnected state.
Test Connection	• Click **Test Connection** → **Start** to confirm communication with the test URL.