



Spatial Collect

Data Logging Software



Quick Reference Guide



Spatial Collect Quick Reference Guide

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This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

Introduction

This Quick Reference Guide provides instructions for installing and using the Spatial Collect data logging software for the IP-S2 system.

System Requirements

Your computer must meet the minimum requirements listed in Table 1-1 to run the Spatial Collect software.

Table 1-1. System Requirements

Component	Minimum Requirements
Processor	Dual-Core 2.5 GHz or higher
RAM	4 GB
Hard Disk	75GB
Graphics	NVIDIA GeForce 9800 GT with 512 MB dedicated VRAM (ATI and graphics cards with shared VRAM are not supported).
Operating System	• Microsoft Windows XP Professional 64-bit SP2 • Microsoft Windows 7, 64-bit

Installing Spatial Collect

1. Double-click the Spatial Collect executable file from the computer's hard drive, and click **Run**.

The **Installer Language** window appears (Figure 1-1).



Figure 1-1. Installer Language Window

2. Select your language preference, and click **OK**.
The **Spatial Factory Collect Setup Wizard** appears (Figure 1-2).



Figure 1-2. Spatial Factory Collect Setup Wizard

3. Click **Next**.

The **Choose Install Location** window appears (Figure 1-3).

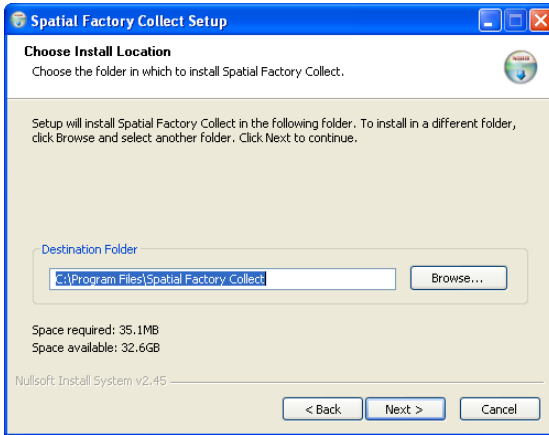


Figure 1-3. Choose Install Location Window

4. If the destination folder in which you want to install the Spatial Collect program is correct, click **Next**. If not, click **Browse**, locate a different folder in which to save the program, and then click **Next**.

The **Choose Start Menu Folder** window appears (Figure 1-4).

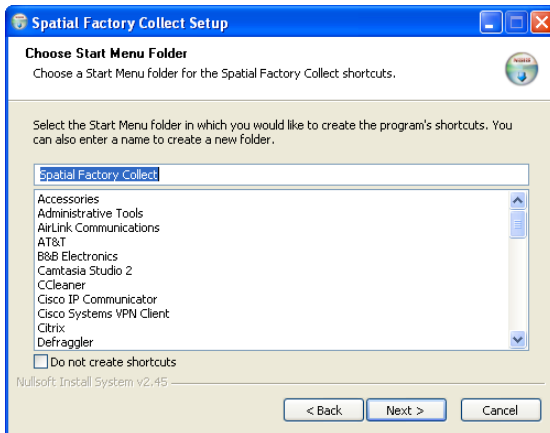


Figure 1-4. Choose Start Menu Folder Window

5. Select a Start menu folder in which to create a Spatial Collect shortcut, and click **Next**.

The **Choose Components** window appears (Figure 1-5).

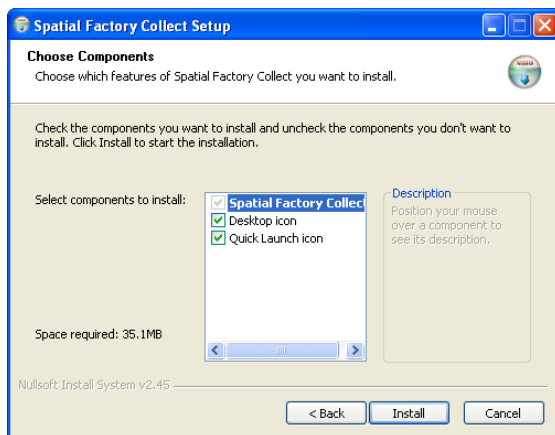


Figure 1-5. Choose Components Window

6. Click **Install** to keep the components that are selected by default (recommended).

The **Installing** window appears, displaying a progress bar.

7. Once the installation is complete, click **Finish** on the setup wizard.

(Optional) Loading a Background Map

To load a background map into Spatial Collect, the Spatial Factory program must be installed on the computer to cache the necessary maps. If Spatial Factory is not installed on your computer, see “Installing Spatial Factory” on page 1-5. If you do not want a background map, skip to “Logging Data” on page 2-1.

Installing Spatial Factory

1. Double-click the Spatial Factory executable file from the computer's hard drive, and click **Run**.
The **Installer Language** window appears (Figure 1-1).

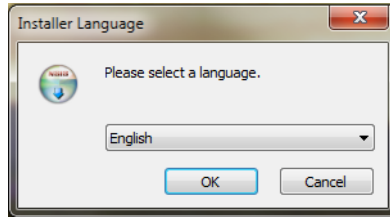


Figure 1-6. Installer Language Window

2. Select your language preference, and click **OK**.
The **Spatial Factory Setup Wizard** appears (Figure 1-2).



Figure 1-7. Spatial Factory Setup Wizard

3. Click **Next**.

The **Choose Install Location** window appears (Figure 1-3).

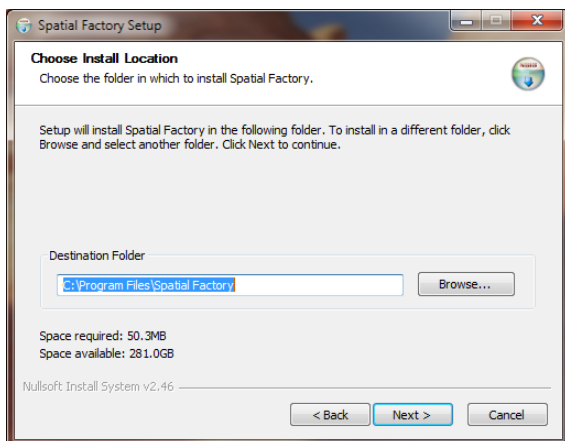


Figure 1-8. Choose Install Location Window

4. If the destination folder in which to install the Spatial Factory program is correct, click **Next**. If not, click **Browse**, locate a different folder in which to save the program, and then click **Next**.

The **Choose Start Menu Folder** window appears (Figure 1-4).

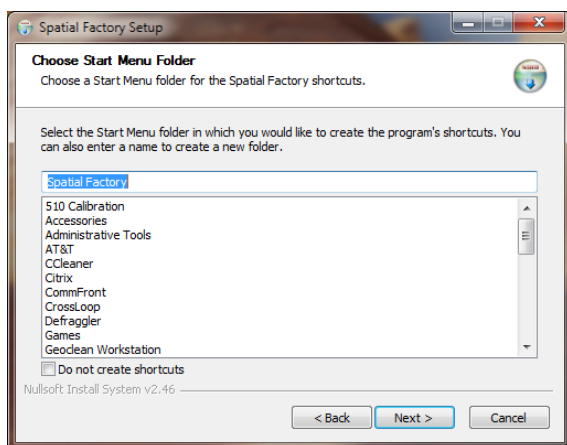


Figure 1-9. Choose Start Menu Folder Window

5. Select a Start menu folder in which to create a Spatial Factory shortcut, and click **Next**.

The **Choose Components** window appears (Figure 1-5).

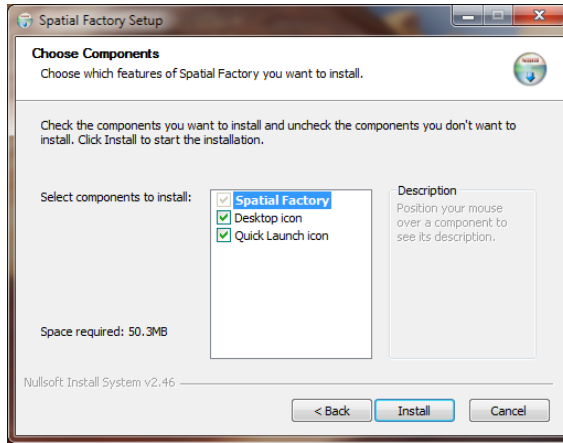


Figure 1-10. Choose Components Window

6. Click **Install** to keep the components that are selected by default (recommended).

The **Installing** window appears, displaying a progress bar (Figure 1-11).

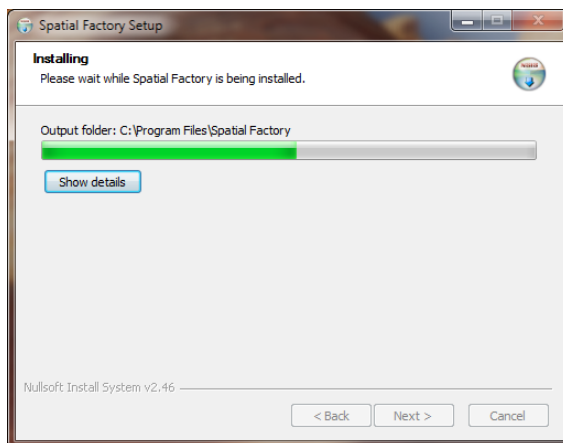


Figure 1-11. Installing Window

Once the installation is complete, the **Completing the Spatial Factory Setup Wizard** window appears (Figure 1-12).

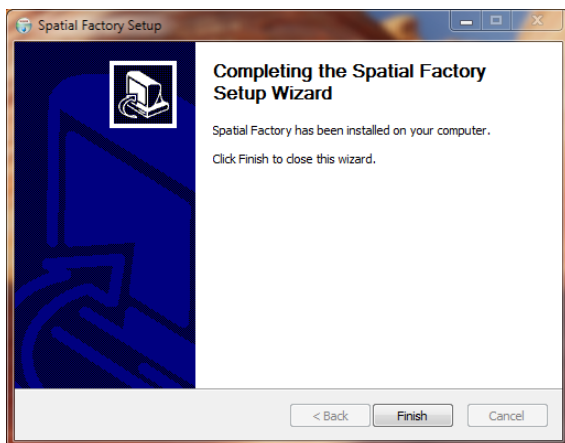


Figure 1-12. Completing the Spatial Factory Setup Wizard Window

7. Click **Finish**.

Caching Background Maps

1. Open Spatial Factory.
The main page appears (Figure 1-13).

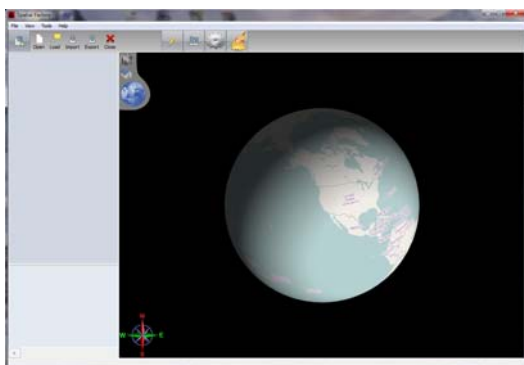


Figure 1-13. Spatial Factory Main Page (Map View)

2. Click **File ► Preferences**

The **Preferences** window appears with the **Applications** tab open (Figure 1-14).

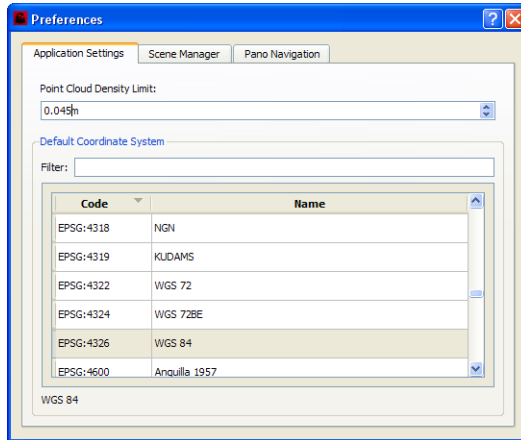


Figure 1-14. Preferences Window

3. Click the **Scene Manager** tab, and note the **Map Cache Directory** path. (You will have to enter this path later in Spatial Collect.) The default is similar to C:/Documents and Settings/User/Local Settings/Temp.

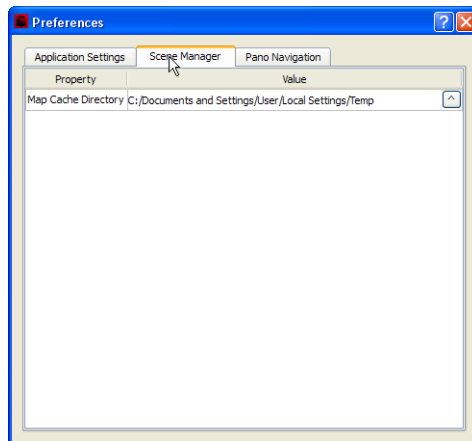


Figure 1-15. Preferences Window – Scene Manager

4. Once the location is noted, close the **Preferences** window.

5. While the computer is connecting to the Internet, zoom into and around the location on the globe where you will be collecting IP-S2 data.

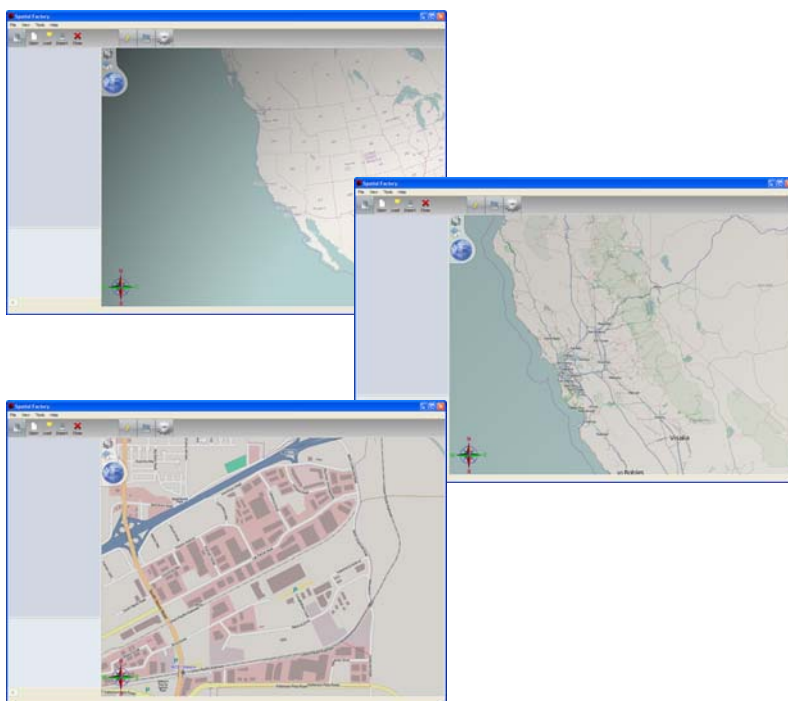


Figure 1-16. Zooming In on the Map

The map tiles that are loaded as you zoom in further are placed into the **Map Cache Directory**.

6. Once you have cached all of the necessary maps for the area you are working in, close Spatial Factory.
7. Open Spatial Collect, and click **File ► Preferences**.

- Click the **Scene Manager** tab, and type the same **Map Cache Directory** that was used for Spatial Factory into the **Value** field.

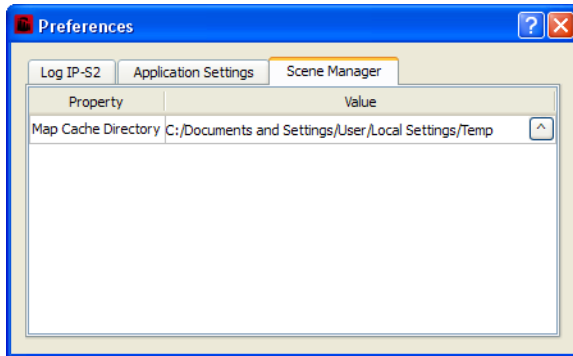


Figure 1-17. Preferences Window – Scene Manager



This guide assumes the Spatial Factory and Spatial Collect programs are installed on the same computer. If they are not, perform the following:

- Copy the entire Temp folder in the **Map Cache Directory** where the map tiles are stored onto the computer running Spatial Collect.
 - On the computer running Spatial Collect, enter the path of the Temp folder into the **Value** field on the **Scene Manager** tab to load the background map.
-
- Once the **Map Cache Directory** has been entered, close the **Preferences** window.

Notes:

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

Logging Data

This chapter describes in four steps how to log data using Spatial Collect. The user is advised to perform these steps in sequence to ensure the accuracy of the collected data and proper system operation.

Step 1: Getting Started

1. Open Spatial Collect on the computer.
The main page appears with a warning message.

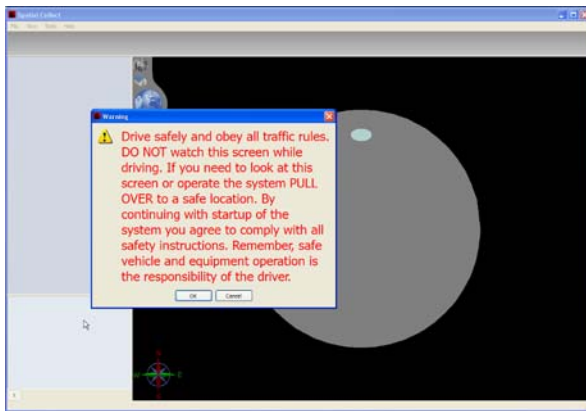


Figure 2-1. Main Page – Driver Warning

2. Read the driver safety message, and click **OK**.
The **Job Setup** window appears.

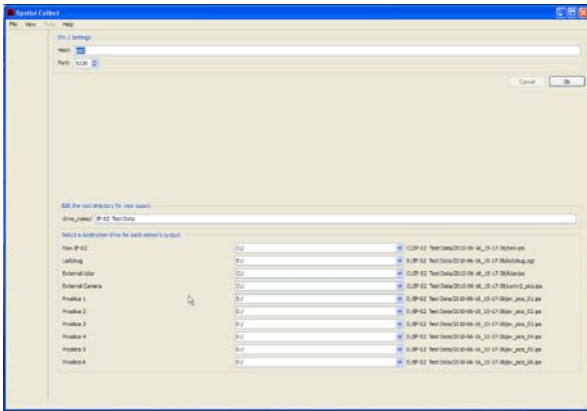


Figure 2-2. Job Setup Window



Do not change the host name or TCP/IP port in the **IP-S2 Settings** box; otherwise, no Ethernet connection can be made to the IP-S2 system to begin data logging.

3. In the **drive_name** field, type a name for the root directory where IP-S2 datasets will be stored.
4. Select the destination drive for each of the sensor outputs in the IP-S2 system. You can place data from the sensors onto multiple hard drives.
5. Confirm the IP-S2 system is powered up and all of the system components have been successfully initialized. To do this:
 1. Open a Web browser while connected to the IP-S2 via Ethernet.

2. Type either **http://ips2** or **http://192.168.2.166** in the address bar. The IP-S2 Web Manager appears with the **Dashboard** tab open.

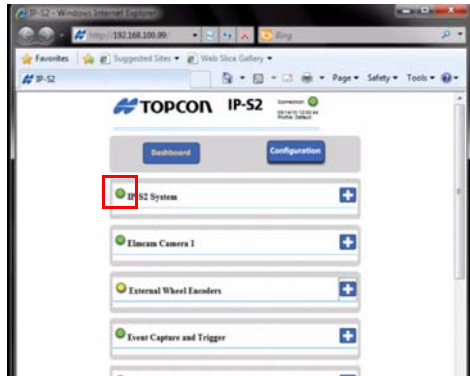


Figure 2-3. IP-S2 Web Manager – Dashboard Tab

3. On the IP-S2 Web Manager, wait for the status circle next to each component (Figure 2-3) to turn green, which means the sensor is operating properly. A yellow circle means the sensor is still activating, and a red circle means there is an error with the sensor.



If a status circle is red, check the sensor cable connections, close the Web Manager, and then reopen the Web Manager.

4. Click **OK** to begin the static alignment process for the inertial measurement unit (IMU) and IP-S2 data logging.

Step 2: Performing the Static Alignment

(Continued from Step 1)

The static alignment must be performed in adequate GNSS conditions, i.e. away from tall buildings and trees, with 6+ GPS satellites being tracked.

1. During static alignment, do not move until the process reaches **100%** and the notice on the main window changes from **Static Alignment** to **Logging** (Figure 2-5 on page 2-5).



It is critical that the vehicle is not moved during the static alignment process. Anyone inside of the vehicle must remain still. Anyone outside of the vehicle should not lean on the vehicle, open doors or the trunk, etc.

2. When the static alignment begins, confirm that all of the component icons on the left side of the window are green, which means the components are operating properly. A yellow icon means a notice has been logged for that particular component, and a red icon means there is an error with the component. To remedy a red icon:
 1. Check the cable connected to the specific component.
 2. If the System, GPS, Encoder, IMU, etc. icon is red, power-cycle the IP-S2 by pressing the OFF button (or turning off the power system) and then the ON button (or turning on the power system).
 3. Restart Spatial Collect.

During static alignment, the connection percentage displays.

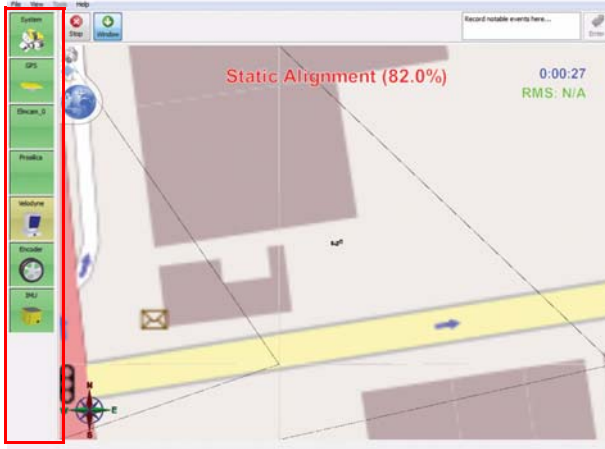


Figure 2-4. Static Alignment in Progress

When **Logging** appears on the page (Figure 2-5), the static alignment process is complete (Figure 2-5).

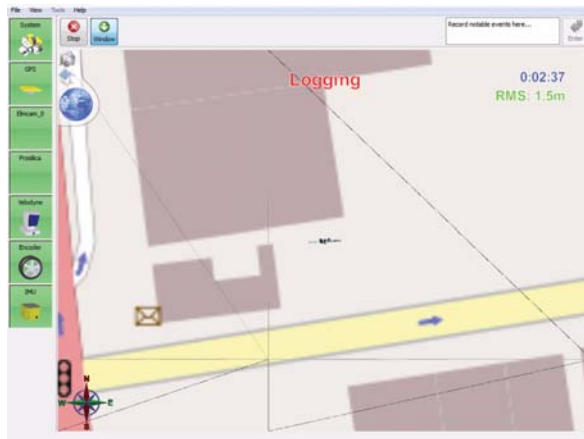


Figure 2-5. Static Alignment is Complete

4. Begin driving the vehicle and collecting data.
5. Be aware of the system height clearance.
6. Perform a kinematic alignment during the data run.

Step 3: Kinematic Alignment

(Continued from Step 2)

During data logging, it is recommended to perform a kinematic alignment for the inertial measurement unit (IMU) to produce the best post-processing results.

To do the kinematic alignment, perform the following during the IP-S2 data run:

1. There must be at least three minutes of adequate GNSS conditions (6+ tracked satellites) while moving at speeds in excess of 15 mph (25 km/h).
2. During this time, the vehicle should have made at least one left turn and one right turn.

Step 4: Shutting Down Spatial Collect

(Continued from Step 3)

1. Park the vehicle, and click **Stop** at the top of the Spatial Collect page.



Figure 2-6. Spatial Collect — Stop Button

A warning message appears, asking if you want to stop logging.

2. Click **Yes**.

- Click **Window** to exit the full screen mode.



Figure 2-7. Spatial Collect — Window Button

- Wait five minutes until the static alignment is complete. Do not move for five minutes. Anyone inside of the vehicle must remain still. Anyone outside of the vehicle should not lean on the vehicle, open doors or the trunk, etc.



It is critical that the vehicle is not moved during this process.

During static alignment, the disconnection time displays. When finished, the **Job Setup** window appears.

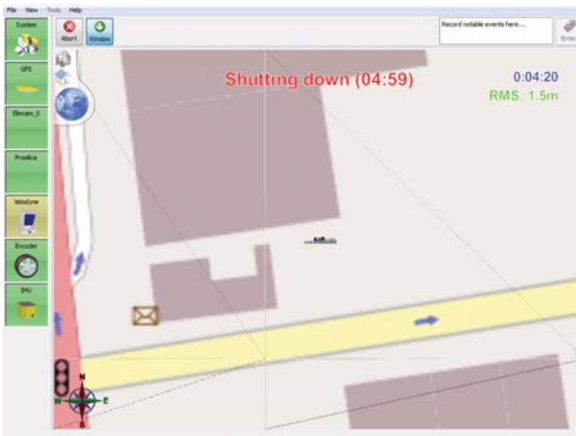


Figure 2-8. Spatial Collect — Shutting Down

- Click **File ► Exit** to close Spatial Collect.
- You can turn off the vehicle and IP-S2 system or begin another IP-S2 logging run.

Notes:

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

Spatial Collect Features

This chapter describes how to view collected data during a data run and how to view component information.

View Icons

In the project area of Spatial Collect there are three viewing icons: Map View (globe icon), 3-D View (house icon), and Panoramic View (camera icon). Two of these icons allow the user to view collected data during a run.

This section describes the Map View and 3-D View and what type of information each icon offers that can be accessed during a data run.

The Map View

The Map View displays the following:

- The 2-D trajectory that the vehicle has taken over the course of the data run.
- The images, represented by blue spheres, that were collected during the data run.
- A section of the Lidar data that was collected in real-time. (By default, Spatial Collect shows 75m of the collected Lidar data, but the following distance is user-defined under **File ▶ Preferences**.)

All of this information is displayed on a cached background map of the area in which the IP-S2 data is being collected.



The background map is an optional feature to import. For information about how to import a background map into Spatial Collect, see “(Optional) Loading a Background Map” on page 1-4.

To display the Map View, click **View ► Map View** or click the **Globe** icon in the project area.

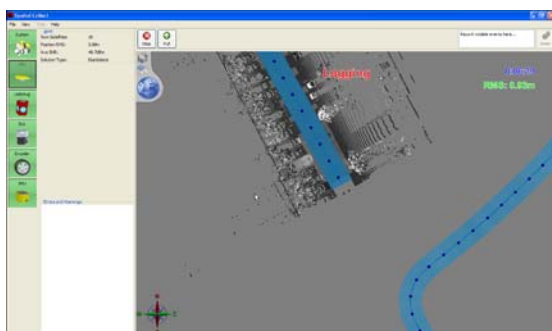


Figure 3-1. Map View

3-D View

The 3-D view displays the following:

- The 3-D trajectory that the vehicle has taken over the course of the data run.
- The images, represented by blue spheres, that were collected during the data run (although you cannot view the images during data logging).
- A section of the data in 3-D that was collected in real-time. (By default Spatial Collect shows 75m of the collected Lidar data, but the following distance is user-defined under **File ► Preferences**.)

To display the 3-D View, click **View ► 3-D View** or click the **House** icon in the project area.

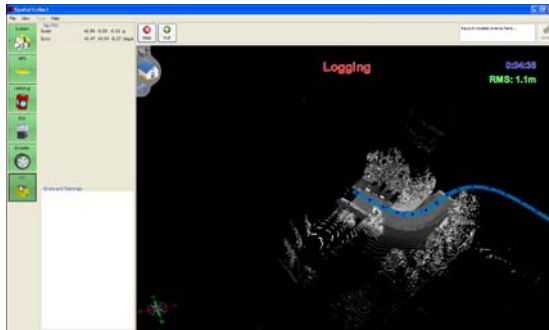


Figure 3-2. 3-D View

Component Information

This section lists the component icons on the left side of the Spatial Collect window and describes the type of information each icon offers that can be accessed during a data run.

Status Information Icon

The system information displays the following:

- The position of the RMS (The RMS value is also displayed on the Map View during logging.) The RMS value is a measure of the current precision that is being obtained by the IP-S2 system.
- The data rate for the Lidar in Mb/s. This value is a measure of how much Lidar data is being collected per second.
- The percentage of hard drive space that has been used on any hard drive connected to the logging computer

To display the status information, click the **System** icon (Figure 3-3).

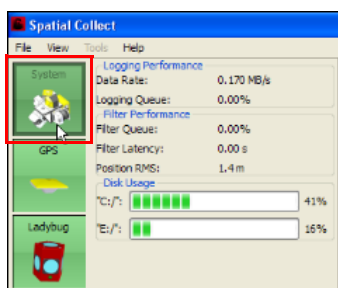


Figure 3-3. Status Information

GNSS Information Icon

The GNSS (Global Navigation Satellite Systems) information displays the following:

- The current number of GPS + GLONASS (Global Navigation Satellite System maintained and operated by the Russian Federation Ministry of Defense) being tracked by the GNSS antenna.
- The average SNR (Signal-to-Noise Ratio) value, which is the average signal strength of the tracked satellites.
- The current solution type of the GNSS receiver and the Position RMS of the GNSS receiver.

To display the GNSS Information, click the **GPS** icon (Figure 3-4).



Figure 3-4. GNSS Information

Ladybug Camera Icon

The Ladybug (camera) information displays the following:

- The current frame rate for the images collected by the camera.
- The total amount of frames collected.
- The drop frame count (the amount of images that were not collected during the data run).
- The current data rate of logging the collected images to the hard drive selected on the **Job Setup** window.

To display the Ladybug camera information, click the **Ladybug** icon (Figure 3-5).

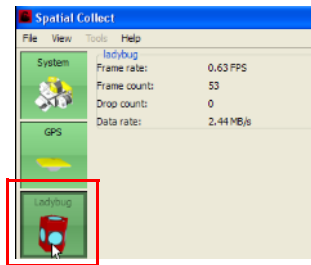


Figure 3-5. Ladybug Camera Information

Wheel Encoders Icon

The wheel encoder information displays the current velocity of the vehicle in m/s (Figure 3-6).

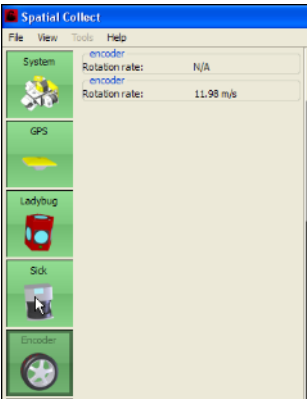


Figure 3-6. Wheel Encoder Information



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