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TRAXPro Version

TRAX Stealth Stud User's Manual

Solar Powered Traffic Counting Stud

Release 1.4T - March 2016

LIMITED WARRANTY

JAMAR Technologies, Inc. warrants the TRAX Stealth Stud and TRAX Stealth Stud Radio Module for a period of one (1) year limited warranty against defects in material and workmanship.

JAMAR Technologies, Inc. warrants each new instrument to be free from defective material and workmanship and agrees to remedy any such defect. At its option, it may furnish a new part in exchange for any part which, under normal installation, use and service discloses such defect. The instrument must be returned to the JAMAR factory or authorized service agent intact, for examination, with all transportation charges prepaid.

This warranty does not extend to any products which have been subject to misuse, neglect, accident, improper installation or use in disregard of instructions furnished by JAMAR. This warranty does not extend to products which have been repaired or altered outside the JAMAR factory or authorized service agent.

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We are pleased that you have chosen the TRAX Stealth Stud for your data collection needs. We have strived to develop a unit that is easy to use and has the options that our customers require. The Stealth Stud has undergone extensive testing to verify the accuracy of its operations, and each unit is tested before it leaves our facility. However, just like other complex electronic devices, problems can occur. We always suggest that users verify the continuing accuracy of any device they use. Should you detect any problems with any of our products, please notify JAMAR Technologies immediately.

For the latest support information on the TRAX Stealth Stud, please visit our web site at:

www.jamartech.com/traxstealthstudsupport.html

Support is also available by e-mail at:

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Support is also available by phone at:

1-215-361-2244
Monday — Friday, 8:00 AM to 5:00 PM Eastern time

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Chapter 1

Installation

Important

Before You Begin

• DO NOT attempt installation if the road surface is wet or damp, or if the temperature is below 25 F.
• The Stud should always be placed in the center of the lane so vehicles will pass directly overhead.
• The stud should be installed flush with the road.
• For best accuracy, the stud should be installed where there will be free flowing traffic (above 5 mph) with a gap of at least 3 feet between cars. Accuracy will be decreased if the stud is installed at a location with frequent queueing and start\stop traffic where the gap between vehicles is less than 3 feet. This will typically result in undercounting.
• We strongly recommend that radio communications with a stud be tested and established BEFORE the stud is permanently installed. This will make troubleshooting potential problems considerably easier.

TRAX Stealth Stud Installation

A 5-inch core bit is recommend for use in drilling the hole for the stud. It can be helpful to mark the bit at the depth you want to drill so you can see how far to go while drilling. Once the hole is drilled, remove all debris from the hole and flatten to the correct depth. Remove any water from the hole and dry thoroughly so epoxy will bond properly.

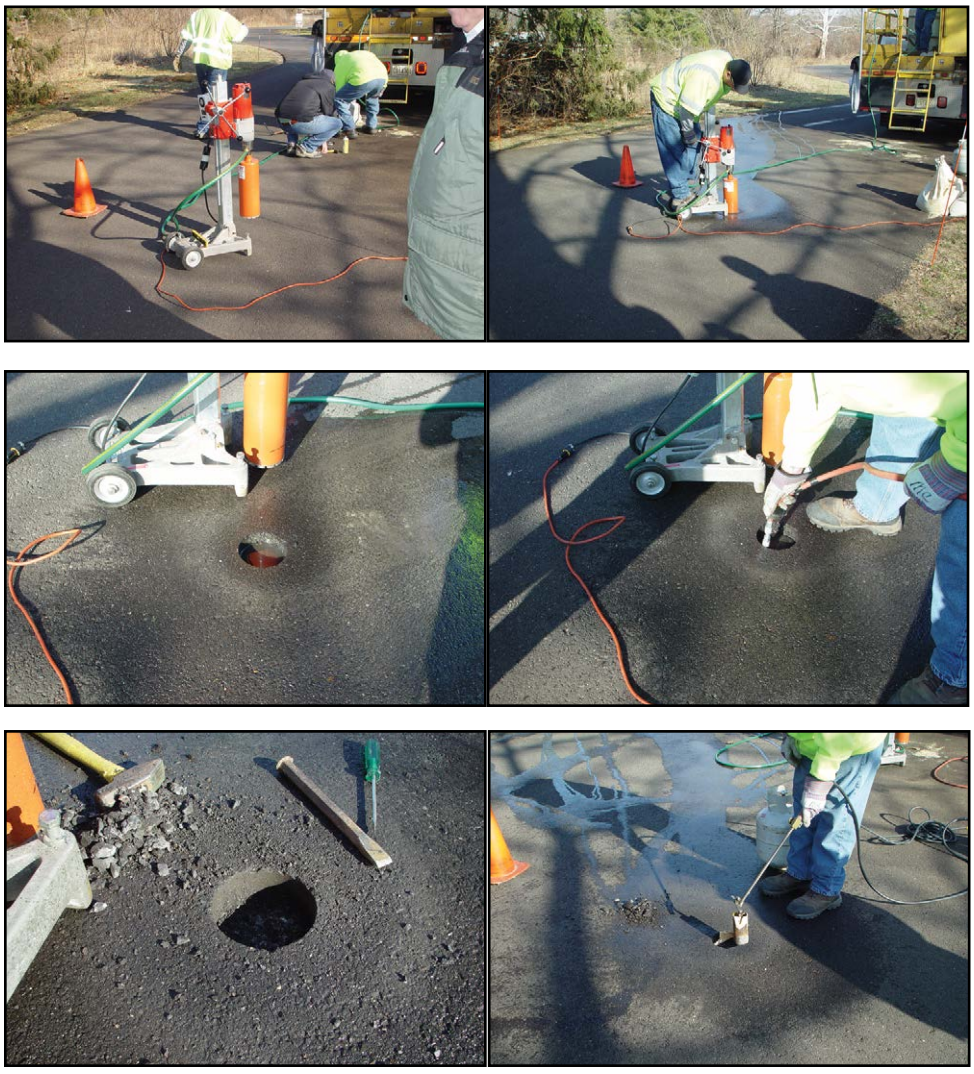


Figure 1-1: Preparing a Hole

Using the installation clips, place the stud in the hole to test for the correct size. If it fits properly, remove the stud and add epoxy to the hole. (Refer to the next page for Applicator Gun instructions.) Place the stud back in the hole and top off the epoxy. Tape can be used both on the stud and the road surface to protect from stray epoxy. Once the epoxy is hardened (10-20 minutes), cut away the installation clips and remove any tape. The stud is now ready to be configured with the TRAXPro software.

Figure 1-2: Installing the Stud

Using the Epoxy Applicator Gun

The Epoxy Applicator gun can be used for fast, clean and efficient installation of a TRAX Stealth Stud. To use the gun, first retract the spindles by holding down the silver latch while pulling back on the spindle knob. (Some force may be required.) Next, push the epoxy cartridge into the gun.

Unscrew the black collar cap from the end of the epoxy cartridge and set it aside (do not discard). While holding the cartridge upright, remove the white cap from the end of the cartridge, being careful not to spill the exposed epoxy. Next, press the mixing tube onto the end of the cartridge.

Slide the black collar cap down over the mixing tube and screw on. This will hold the mixing tube in place. The Epoxy Applicator gun is now ready for use. Refer to the opposite page for instructions on using the gun to install the Stealth Stud in the field.

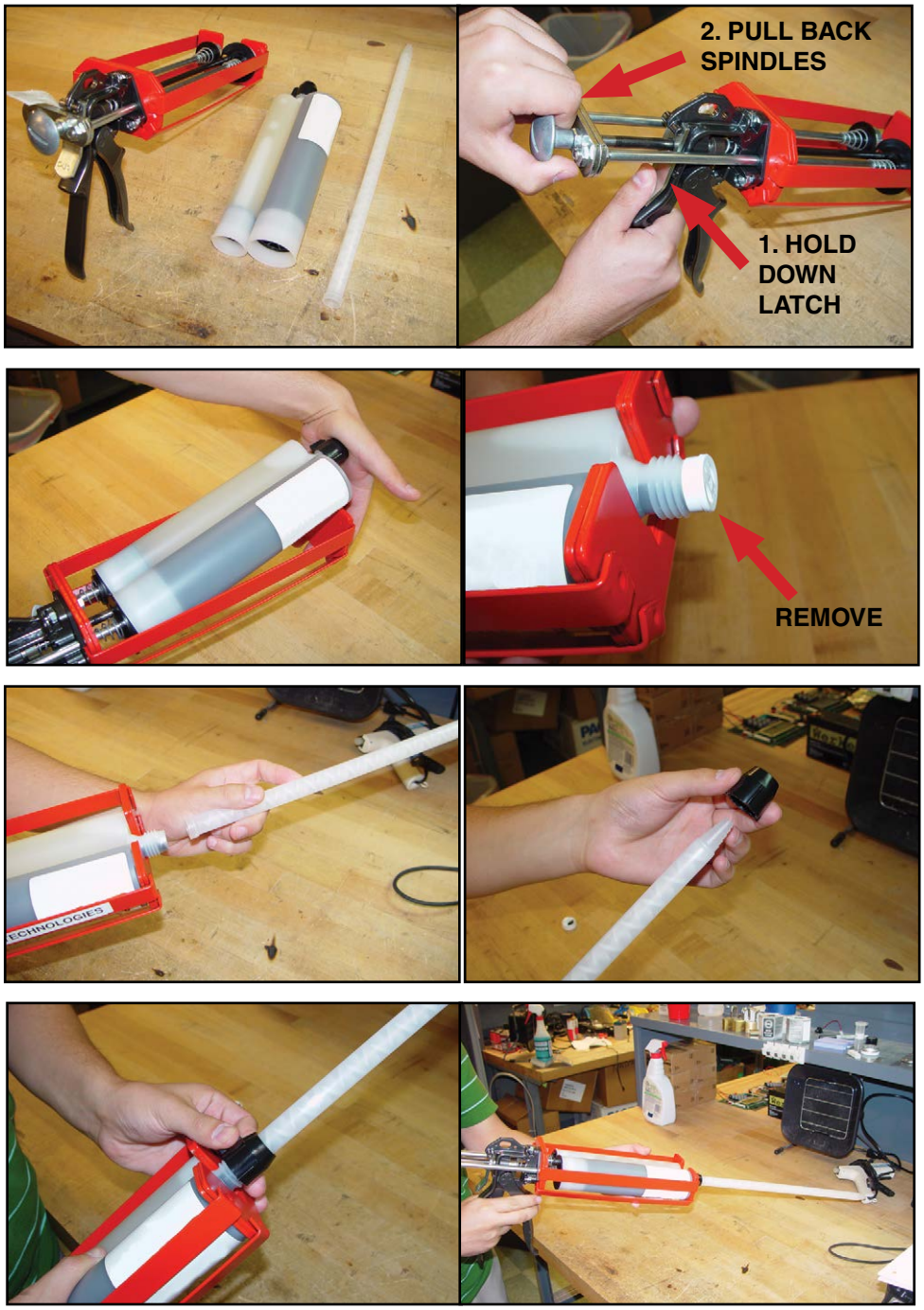


Figure 1-3: Using the Epoxy Gun

Chapter 2

Communicating with the TRAX Stealth Stud

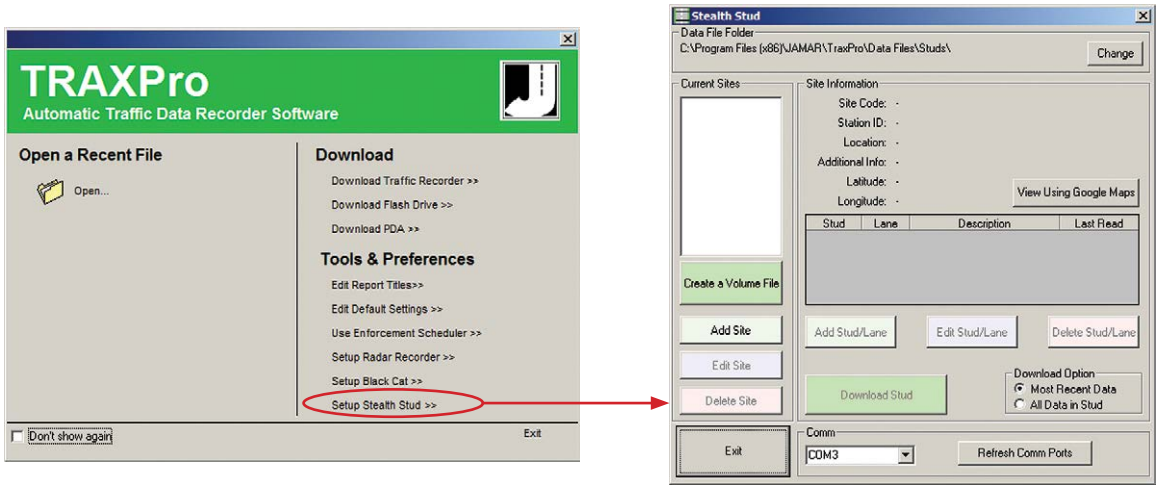
Communicating with the TRAX Stealth Stud

All communication with the TRAX Stealth Stud is done via the USB Radio Module that came with your stud. The first time you plug the Radio Module into your computer's USB port the USB drivers for it should install automatically. This process can take a minute or two to complete.

Once the Radio Module is installed on your computer, start TRAXPro and from the Quick Start screen select *Setup Stealth Stud*.

Figure 2-1: USB Radio Module

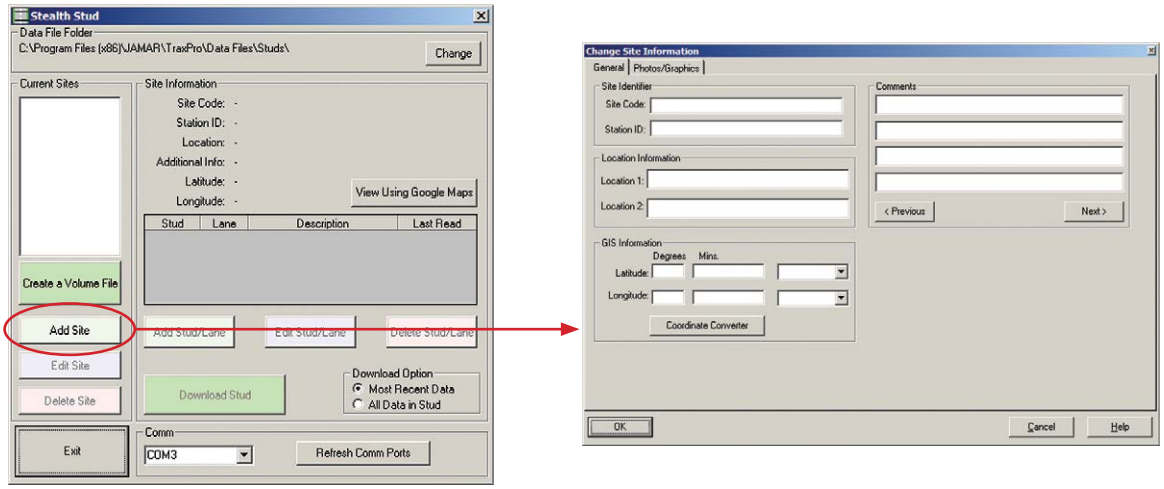
Figure 2-2: Accessing Stud Setup Screen



Creating a Site

Stud data is organized by sites (a site can be the location of a single stud or could have multiple studs installed), so the first time you enter the Stud Setup screen you'll need to add a site by clicking the *Add Site* button. This will open the *Change Site Information* screen.

Figure 2-3: Creating Stud Site



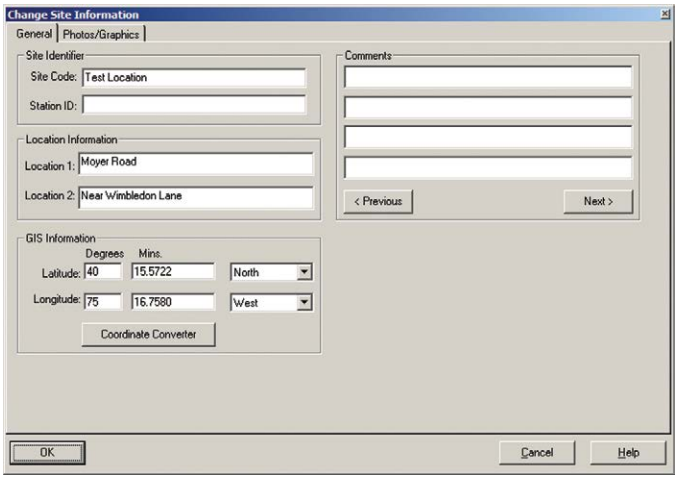


Figure 2-4: Site Details

Sites are organized by the 'Site Code', which must be unique for each Site. This can be numbers or letters - whatever helps you to identify the site.

For this tutorial, enter *Test Location* in the box labelled 'Site Code' a the top left of the screen.

Additional (optional) identifiying information for the site can be entered in the Station ID, Location 1 and Location 2 fields.

We aren't using a Station ID for this tutorial, so leave that field blank. However, we do want to add location information, so enter *Moyer Road* for Location 1 and *Near Wimbledon Lane* for Location 2. This is the street location information for a test site near the JAMAR building.

The GIS Information fields can be used to enter GPS coordinates for the location, if they are available. For our location, enter the Latitude as 40 degrees, 15.5722 minutes North, and the Longitude as 75 degrees, 16.7580 minutes West. We'll soon see how having the GPS info as part of the Site Information will be useful. The Comments field can used to enter any additional information for you Site. We'll leave these blank for now.

Next, click on the tab labelled Photo/Graphics. This screen can be used to add photos and/or graphics of the site location. These can be photos you took while in the field, or they can be images gathered online, which is what we'll do now.

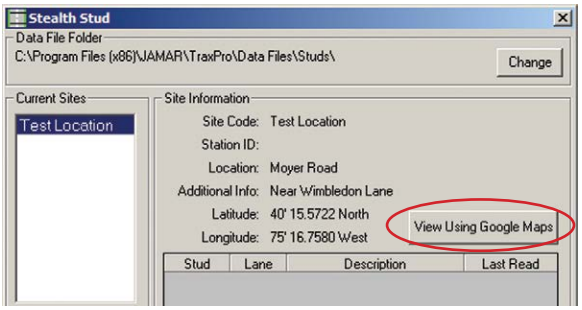


Figure 2-5: Google Maps Option

Click the OK button, and you'll be returned to the main Stealth Stud screen. Notice that the Site Information you entered is now reflected on this screen, including the GPS info. Also notice that next to the GPS info is a button labelled *View Using Google Maps*. If you click this button, a map of the location will be brought up in your Internet browser using Google Maps. For some areas, you can also see a Street View of the location.

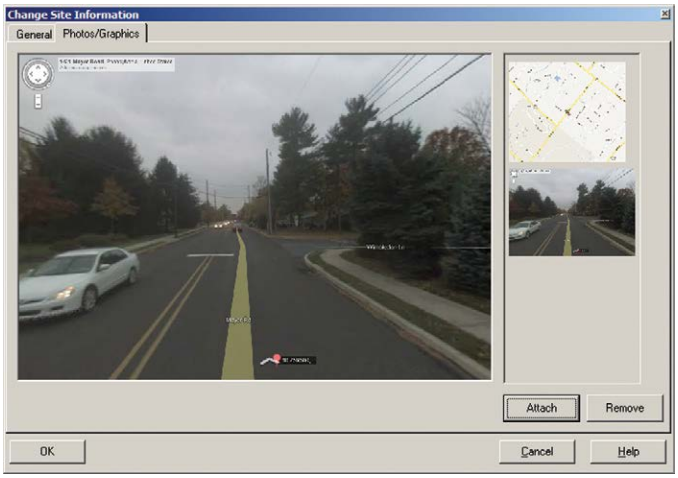


Figure 2-6: Adding Photos

If you have the ability to capture and save screen images, these graphics can be saved to your computer. Once saved, click the *Edit Site* button to return to the Change Site Information screen, then click on the Photos/Graphics tab. Click the *Attach* button to save the images as part of the Site information. Click OK when done.

Adding a Stud to a Site

Now that the Site has been created, the next thing we want to do is add a stud to the site. To do this, click the *Add Stud/Lane* button and the 'Add/Edit/Update Stud' screen will appear.

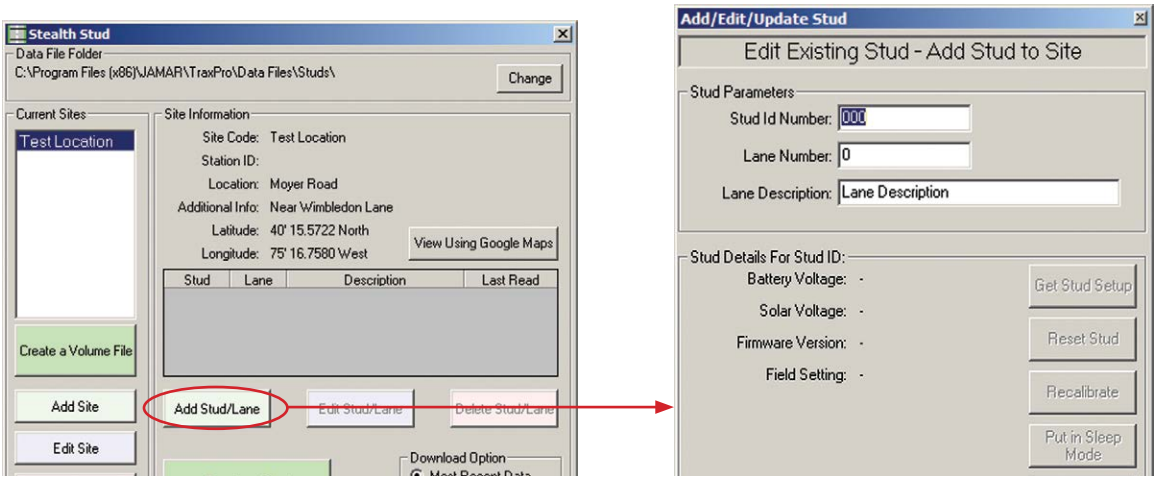


Figure 2-7: Adding a Stud

Important

The most important item on this screen is the first one. **The Stud ID Number must be entered as the serial number found printed on the label that is clearly visible when looking at the front of the stud.** This serial number is also printed on the box the stud came in, and on the black bag the stud was wrapped in.

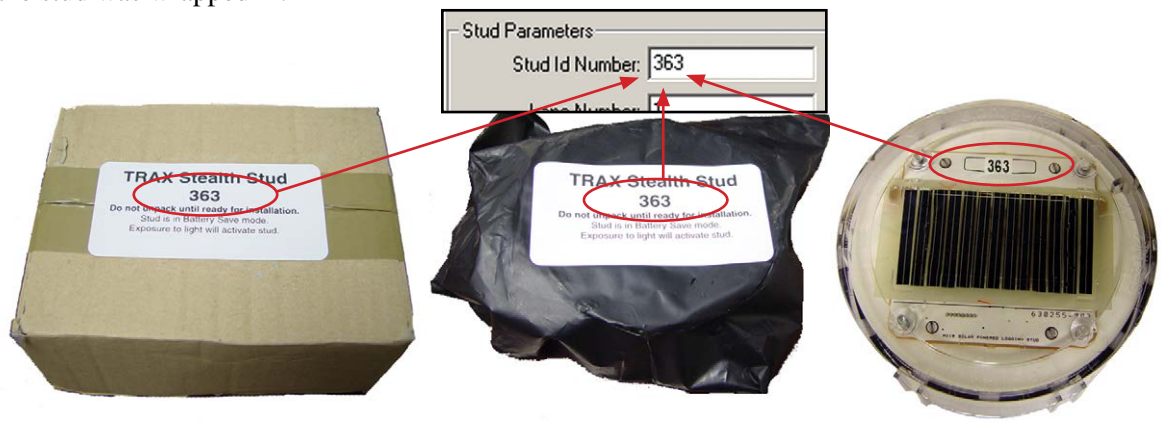


Figure 2-8: Stud Serial Number

The values for Lane Number and Lane Description can be anything that will help you identify which stud you are trying to communicate with. For this stud, enter *1* for the Lane Number and *Northbound* for the Lane Description.

Once you enter a Stud ID Number and Lane Number, the *Add Stud and Exit* button becomes active. Click it to add the stud to the site.

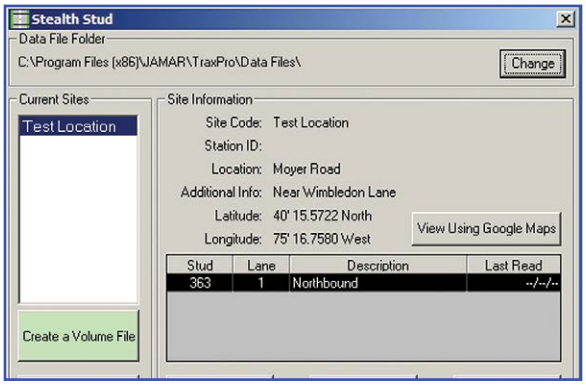


Figure 2-9: Stud Added to Site

You'll now see the stud you just added listed in the middle of the screen. The list includes the Stud ID (serial) number, the lane you assigned, the description you provided and the date when the stud was last downloaded, or read.

Additional studs can be added to the site in the same manner. Note that a site can have just one stud associated with it, or many, depending on how you want to organize your data.

Checking Communications

Once you have assigned a stud for a site, it's a good idea to test your communication with the stud.

Important

IMPORTANT - We highly recommend that you test your communication with a stud BEFORE you install it in the ground. Most installations of the stud are of a permanent nature, so you will want to discover and troubleshoot any communication problems before the stud is permanently installed.

Note that to comunicate with a stud, the stud must be in 'Active' mode. When you first receive a stud it is in 'Sleep' mode and packed in a black bag that prevents light exposure. As soon as the stud is exposed to light it begins to 'wake up'. The wake up process can take 5 to 10 minutes, during which it will not respond to the radio module. Once the stud has woken up and is in active mode, communications can begin.

To test your communication with a stud, select the stud from your list and click the *Edit Stud/Lane* button. This will return you to the Add/Edit/Update Stud screen. Click the *Get Stud Setup* button and TRAXPro will then try to use the Radio Module to communicate with the stud and retrieve its diagnostic info.

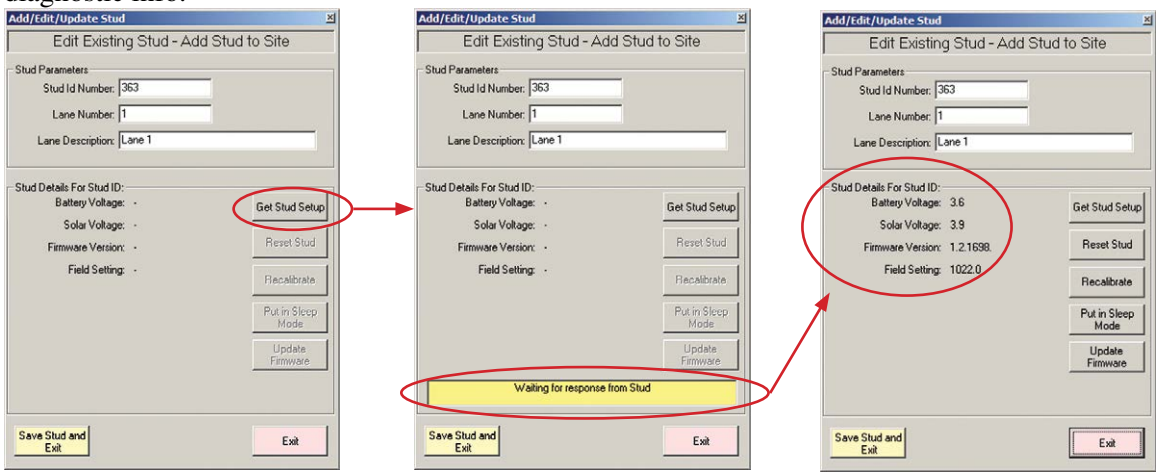


Figure 2-10: Get Stud Setup

Once you have confirmed that you can communicate with the stud, it is ready to be installed in the field.

Sleep Mode

If there will be an extended period of time (more than a few days) before you install an active stud in the field, we recommend that you put the stud back into 'Sleep Mode' to preserve the battery.

To do this, click the *Put in Sleep Mode* button. You'll then see a message asking you to confirm that you want to put the stud into sleep mode. Click *OK* to continue and put the stud into sleep mode.

Once the stud is in sleep mode, you'll see a confirmation message, telling you to put the stud back into its light-blocking bag within 15 minutes or it will wake back up. The stud will remain in sleep mode as long as it is not exposed to light.

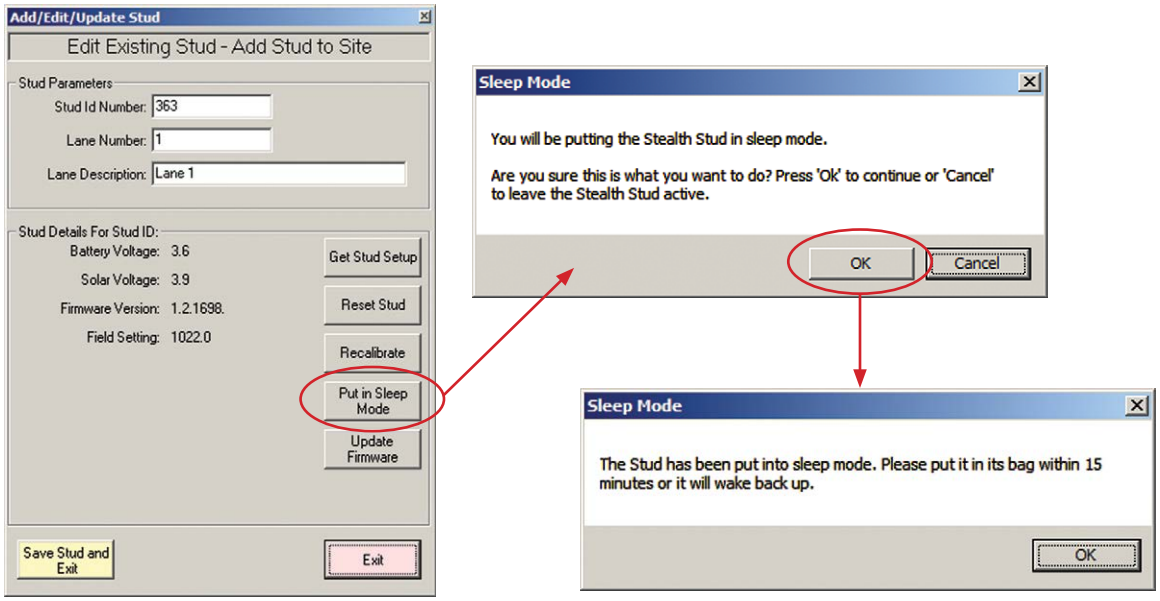


Figure 2-11: Stud Sleep Mode

Resetting and Calibrating a Stud

Once a stud has been installed in the road, it is important that it be calibrated to ensure that the vehicle detection is optimised for the location.

To do this, first reset the stud to clear out all data currently in memory. You do this by clicking the *Reset Stud* button. You'll then see a message asking you to confirm that this is what you want to do. **The Reset Stud command will delete all data currently in the stud, so be sure this is what you want.** If so, click OK to reset the stud.

The stud will then reset, which will take approximately 60 seconds. During this time, a small led light will be on and visible on the stud itself.

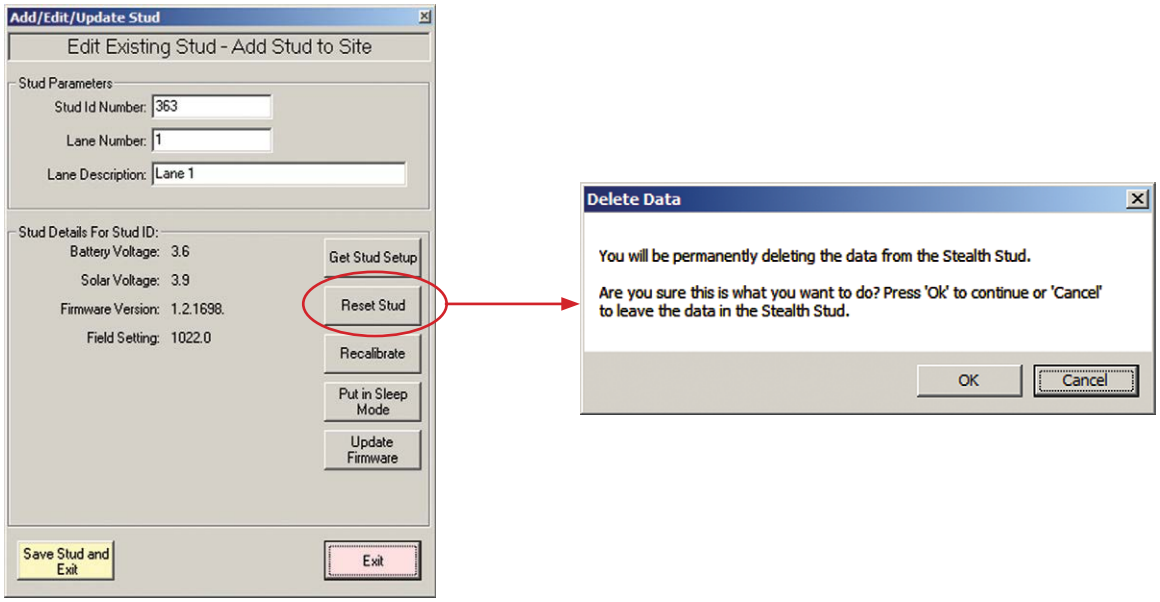


Figure 2-12: Reset Stud

Once the reset is complete, you will want the stud to be correctly calibrated to its new physical environment. It is important that this is done when no vehicles are present as during the calibration the stud is learning the background magnetic field.

To start this process, click the Recalibrate button. The calibration will take a few seconds and then a new Field Setting will be displayed. Once this process is complete the stud is ready to collect data.

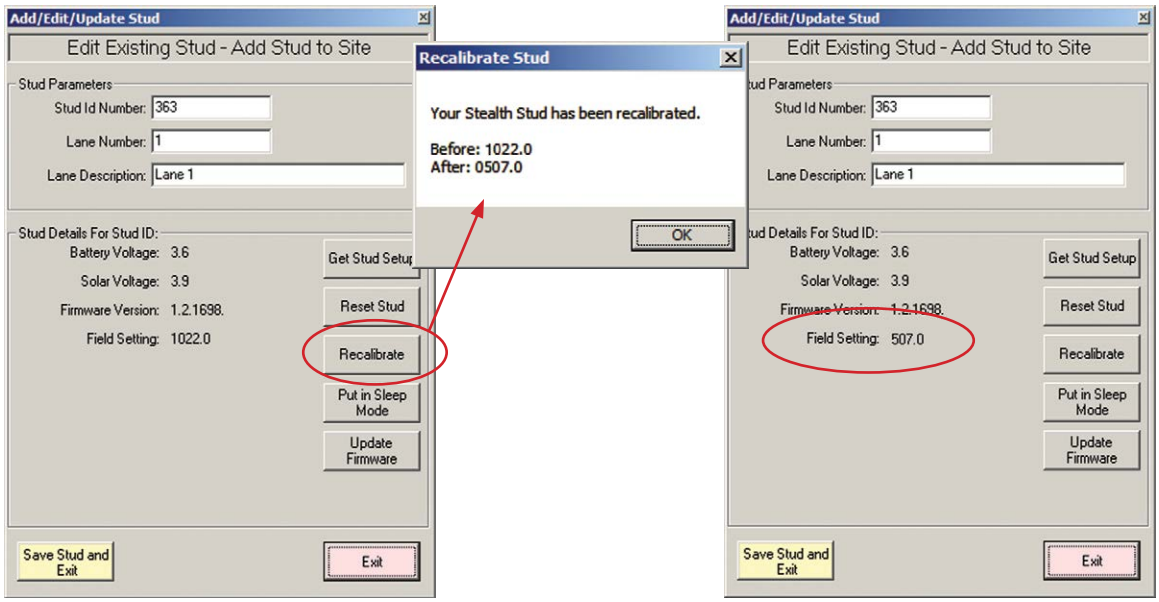
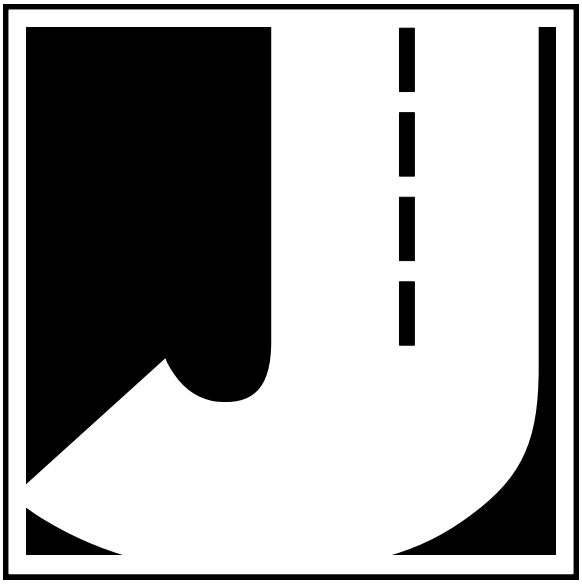


Figure 2-13: Recalibrate Stud



Chapter 3

Downloading Data & Producing Reports

Downloading Data

Once your studs have collected some data, you can download this data for analysis and reporting. You will need to be located within approximately 50 feet of a stud to be able to reliably dowload data from it.

First, select the stud you want to download from the list of studs at a site. Note that you have two options when downloading data from a stud - either to download all the data in the stud's memory, or just the most recent data, which is any data that has not been previously downloaded. (The list of studs shows when each stud was last read, or downloaded.)

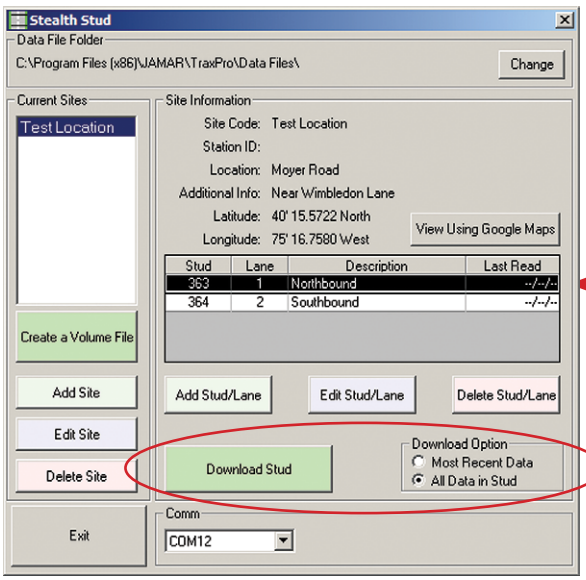


Figure 3-1: Download Stud

Once you have selected the option you want, click the *Download Stud* button and the radio module will attempt to connect to the stud and begin downloading data.

Select Stud you want to download data from

Select to download 'all data' or just 'recent data', then click Download Stud.

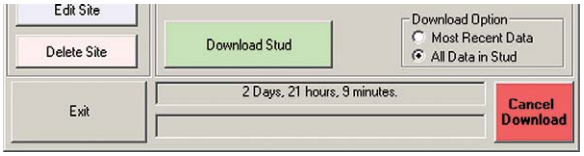


Figure 3-2: Download in Progress

As the download is happening, the screen shows you how much data has been transferred from the stud to the computer.

Once the download is complete, a new window will pop up, showing a preview of the data that has been retrieved from the stud.

There are several options on this screen, available through the buttons along the bottom:

Return to Download – this selection will ake you back to the main Stud screen. Note that the data you just downloaded is now stored in the site's database.

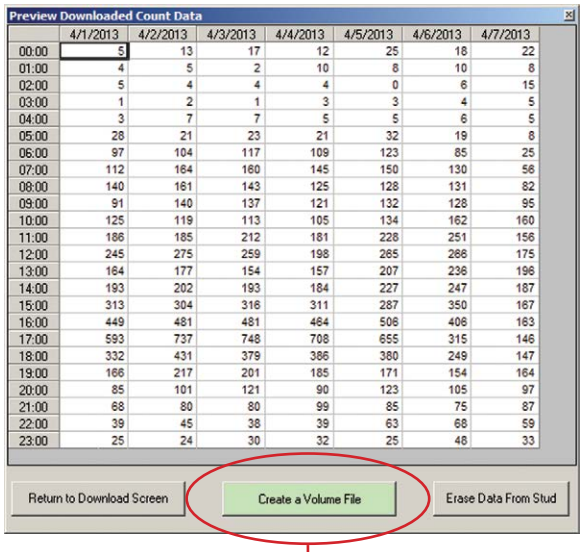


Figure 3-3: Downloaded Data Preview

Erase Data From Stud – this selection will delete all data fom the stud. Note that the data you have just downlaoded is stored in the site's database in TRAXPro.

Create a Volume File – will allow you to create a TRAXPro volume data file from any or all data currently available in the site's database.

Once you click *Create a Volume File*, a screen will appear showing the data that is available in the database for the site. You are given the options of selecting the interval length for the file, the start and end dates for the data, and which lanes to use. Once these are set, click the *Create TRAXPro Count* button and the data file will appear on the screen.

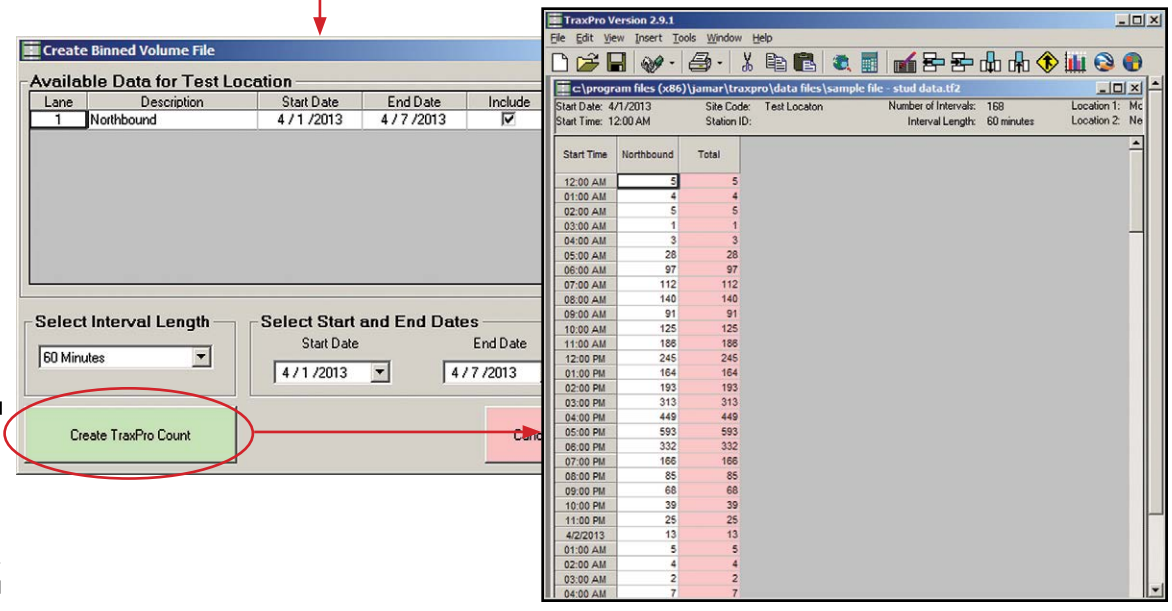


Figure 3-4: Create TRAXPro Count

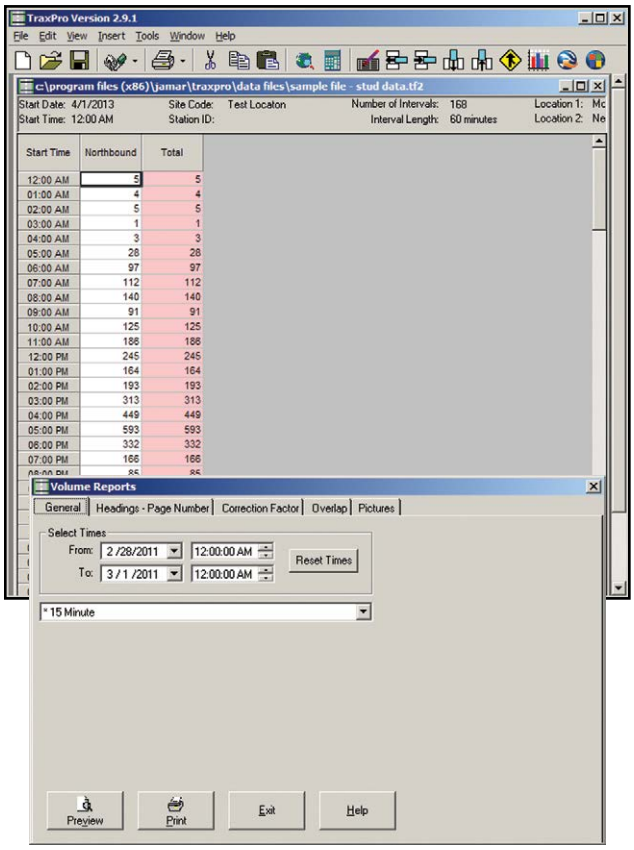


Figure 3-5: Volume Reports Setup

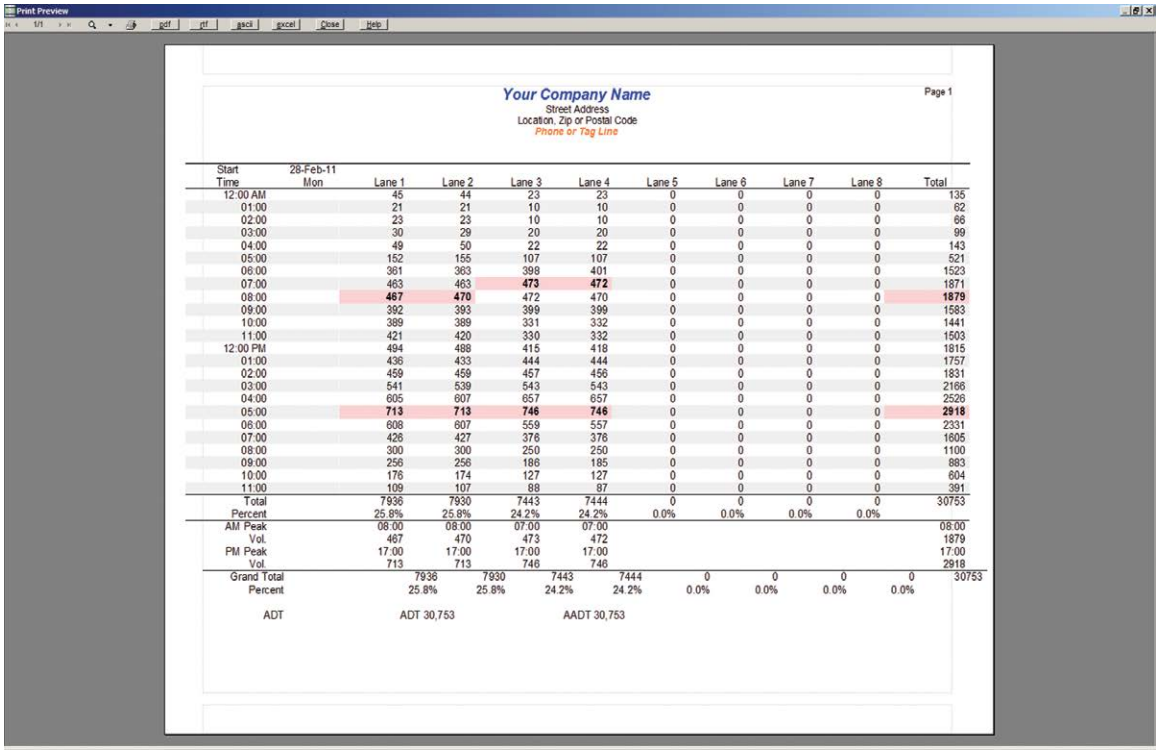


Figure 3-6: Create TRAXPro Count

Producing Reports

Once you have a data file open in TRAXPro, there are many things you can do with the file, such as deleting unused data columns, adding additional information, etc. For full details on the various options, refer to the TRAXPro manual. For now, we just want to produce a report, so click the Printer icon.

The Volume Reports screen allows you to select the type of report you'd like, as well as a number of other options.

Once you've set things the way you want, click the Preview button to see your report. You can then send the report to the printer or save it as a PDF.

Creating a Data File from Previously Downloaded Data

While you can create a TRAXPro volume file as part of the stud download process (as we just covered), you can also create a TRAXPro volume file from previously downloaded data at any point.

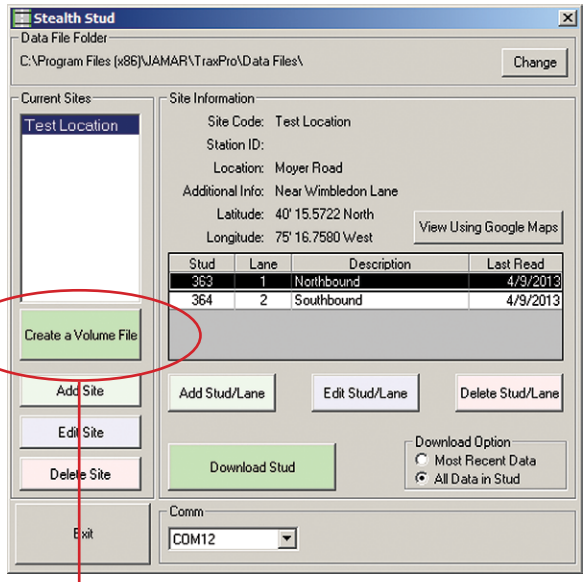


Figure 3-7: Create Volume File

You do this by clicking the button *Create a Volume File* on the main stud screen.

Once you click *Create a Volume File*, a screen will appear showing the data that is available in the database for the site. You are given the options of selecting the interval length for the file, the start and end dates for the data, and which lanes to use. Once these are set, click the *Create TRAXPro Count* button and the data file will appear on the screen.

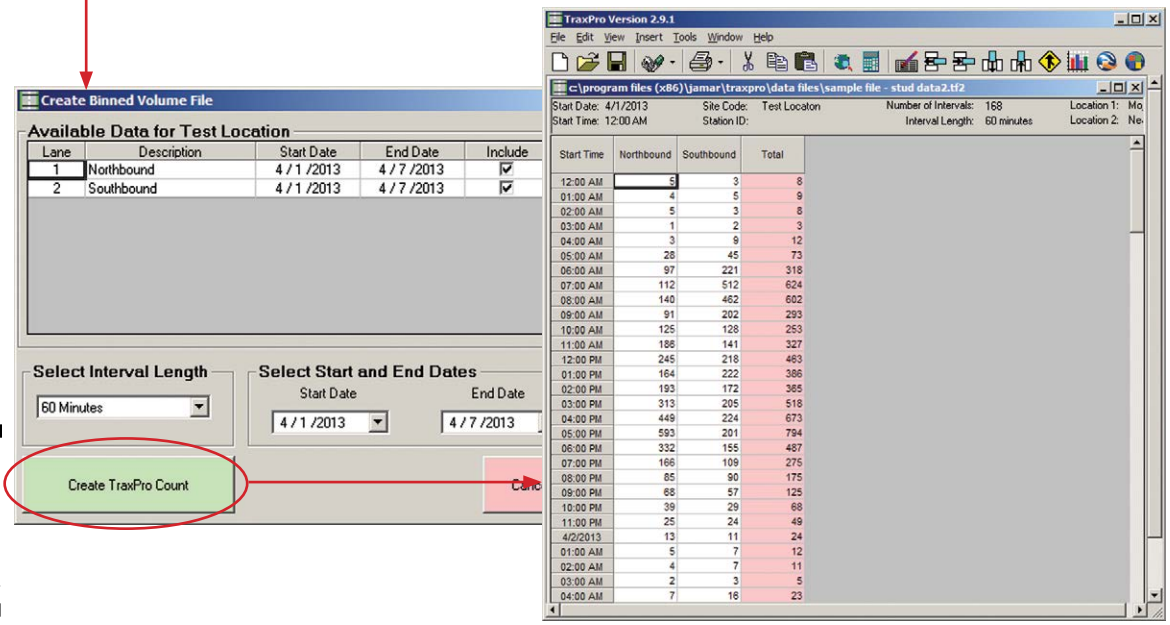
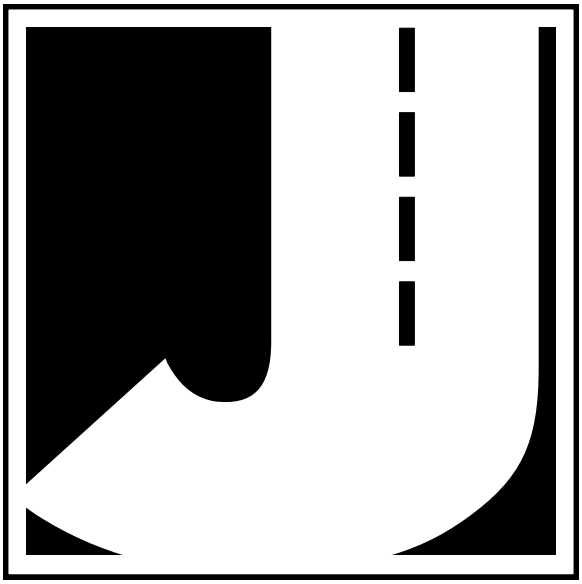


Figure 3-8: Create TRAXPro Count



Appendix

Frequently Asked Questions

Q: Do environmental conditions, like rain or snow, have any effect on data accuracy?
A: No, the Stealth Stud's accuracy of data collection is not affected by weather conditions. However, if snow is deep and covers the unit for prolonged periods of time (greater than 4 weeks) then the stud will stop counting until it gets enough light to charge and return to counting. We have previously had experience of units going for longer than 6 weeks without sunlight and still operating fully.

Q: How does the Stealth Stud record data?
A: Volume data is recorded to memory in binned one minute intervals.

Q: How much data will the stud store?
A: The stud will store up to one year of data before the memory is filled. However, we recommend downloading your data and clearing the memory of the stud on a more frequent basis.

Q: What happens if the stud is not exposed to sunlight for an extended period of time?
A: With a full charge, the stud will usually continue to count for 4 to 6 weeks without exposure to light. Once the battery is drained, the stud will need 3-4 days of exposure to light to recharge and start counting again.

A full charged battery will read 4.0v or higher. If the voltage drops to 2.9v, radio communications are disabled until the voltage returns to 3.6 volts.

Q: I have multiple radio modules for communicating with the studs. Are there any issues I should be aware of?
A: Yes. While the studs will communicate with any working radio module, after you have used one module to communicate with a stud there is a 5 minute timeout period before the stud will talk to a different radio module.

Q: Communicating with the stud and retrieving data sometimes gets interrupted. What might the problem be?
A: This kind of problem usually means the signal between the stud and the radio module is not strong. The following list should be checked:

1. Is the radio module’s antenna screwed on fully?
2. Is the radio module’s antenna being aimed at the stud?
3. Are there other wifi signals (like a smartphone hot spot) that could be interfering with the signal? If so, try disabling these for the data transfer.

Specifications

Size: 4.4" x 2.0"
Weight: Approx. 1.5 pounds
Housing: Polycarbonate and polyester compound
Detector Technology: Magnetometer
Detection Capability: All major types of motorized vehicles, including motorcycles, cars, vans, and trucks
Detection Zone: For optimal accuracy, some part of the metal chassis must pass directly above sensor
Count Accuracy: 5 to 30mph 97%, 30 to 70mph 98%+
Data Storage: Up to one year on 16Mb internal memory
Battery: 3.6V 1900mAh Nickel Metal Hydride (NiMH) pack
Battery Operation: Continuous operation for at least 4 weeks from full charge without any solar input
Battery Charge Time: 2 hours from flat to operating charge (@100 klux - sunny day) 50 hours from flat to full charge (@100 klux - sunny day)
Power Consumption: 1mA during normal operation 35mA during download
Solar Panel Capacity: 305mW
Data Retrieval: Download data files from stud using wireless USB Radio Module connected to computer running TRAXPro software.
Download Speed: Retrieving one week's data takes approximately 20 seconds; retrieving one month's data will take approximately one minute.
Radio Frequency: 2.4GHz band using Zigbee communications between stud and USB radio module
Radio Range: Up to 35 ft. between stud and radio module
Data Collection: Traffic Volume in 1 minute intervals
Temperature Range: -4F (-20C) to 140F (60C)