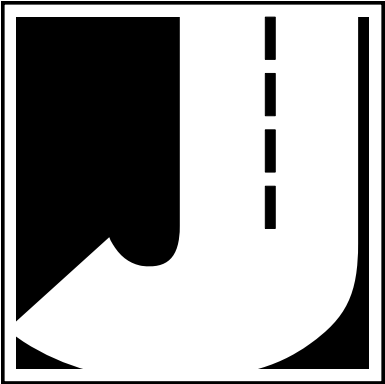


# Traffic Engineering Radar

## User's Manual



**JAMAR Technologies, Inc.**



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## LIMITED WARRANTY

JAMAR Technologies, Inc. warrants the Traffic Engineering Radar against defects in material and workmanship for a period of one (1) year limited warranty on parts and one (1) year limited warranty on labor from the date of purchase.

JAMAR Technologies, Inc. warrants each new instrument manufactured by the company 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 of any instrument of its manufacture which, under normal installation, use and service discloses such defect. The instrument must be returned to our 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, vandalism or incorrect wiring not our own. This warranty does not extend to damage caused by improper installation in disregard of the instructions furnished by us. This warranty does not extend to products which have been repaired or altered outside our factory or authorized service agent. There is a 90 day warranty on the rechargeable battery of the Traffic Engineering Radar.

In no event shall JAMAR Technologies, Inc. be liable for any damages arising from the use of this product including damages arising from the loss of information.

This warranty is in lieu of all other warranties expressed or implied and no representative or person is authorized to assume for us any other liability in connection with the sale or use of our products.

JAMAR Technologies, Inc. reserves the right to make improvements on the product and/or specifications at any time without notice.

Questions concerning this warranty or any JAMAR Technologies, Inc. product should be directed by mail or telephone to:

JAMAR Technologies, Inc.  
1500 Industry Road, Suite C  
Hatfield, PA 19440  
215-361-2244

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If you have any questions about the Traffic Engineering Radar that you cannot find answers for in this manual, there are several ways to get additional information.

On the Hardware Support section of our web site at:

**[www.jamartech.com](http://www.jamartech.com)**

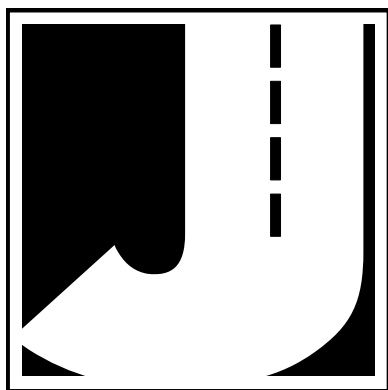
Contact us by e-mail at:

**[sales@jamartech.com](mailto:sales@jamartech.com)**

Contact us by phone at:

**215-361-2244**

**Monday - Friday 8:00 AM to 5:00 PM Eastern time**





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## **Quick Setup Guide for the Traffic Engineering Radar**

- 1.** Install the STARnext software for use with the Traffic Engineering Radar, following the instructions that came with the software.
- 2.** Check the battery voltage of the battery to be used for your study. If the charge is sufficient (13.4 or higher), connect the battery to the Traffic Engineering Radar.
- 3.** Install the Radar in the field, following the directions in Chapter 1.

For the best results, the Traffic Engineering Radar should be installed:

- Six to ten feet back from the road.
- At least six feet above the ground.
- At a 45 degree angle to the flow of traffic.
- Where the far side lane is no greater than 50 feet away.
- Where traffic is free flowing.

The unit should not be installed:

- At an intersection.
- Near where vehicles are likely to park.
- In a position that causes the radar head to be at an extreme angle.
- Near where pedestrians are likely to be crossing.
- Where the Radar's "view" is obstructed.

- 4.** Use the STARnext software to setup the Traffic Engineering Radar as described in Chapter 2. Use the LiveView feature of the software to check that data is being recorded properly.
- 5.** Leave the Traffic Engineering Radar to record data for the time period you would like. A fully charged battery will record data for 7 days or more.
- 6.** Download the data using the STARnext software.
- 7.** Use the STARnext software to view your data and produce reports.

## Chapter 1

# Introduction

## **What is the Traffic Engineering Radar?**

The Traffic Engineering Radar is an automatic vehicle data collector distributed by JAMAR Technologies, Inc. It is designed for ease of use, but contains many options and features to provide comprehensive traffic data. This device is a non-invasive data collector that uses radar to gather highly accurate vehicle data, which means there is no need to install anything in the road.

With the Traffic Engineering Radar, you can gather data that includes vehicle speed, length, gap and volume. At any convenient time, you can transfer the data from the Traffic Engineering Radar to your computer for processing.

The Traffic Engineering Radar contains 4 MB of memory, allowing you to record up to 500,000 vehicles.

## **How is the Traffic Engineering Radar Powered?**

The Traffic Engineering Radar is powered by a 12 Volt rechargeable battery. The standard battery used with the device is a 12V 12A lithium battery. In general, a fully charged battery (13.4 volts or higher) will record data for 8 days before needing to be recharged. The battery voltage can be seen when the unit is connected to the STARnext Software.

Note that when the Traffic Engineering Radar is first shipped to you the battery is disconnected and will need to be connected before first use. We recommend that you check the voltage level of the battery when it is first connected. A fully charged battery should register at 13.4 or higher. If your battery is lower than this, we recommend that you charge it before the first use.

Also note that the Traffic Engineering Radar will be in running mode whenever the battery is connected. We recommend that you disconnect the battery whenever the Traffic Engineering Radar is not in the field collecting data.

*Keeping your battery properly charged is very important.* The rechargeable battery will begin to decay and become less effective if it is allowed to fall

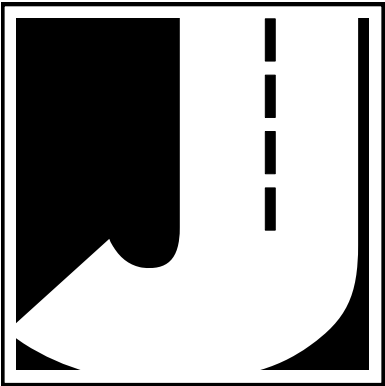
below 11.0 volts. To avoid having to replace your battery prematurely, keep it consistently charged. A well-maintained battery will last for years without having to be replaced. Refer to Chapter 5 *Battery Care* for more information on battery maintenance.

## **Before You Begin**

Before you attempt to collect important data with the Traffic Engineering Radar we strongly recommend that you familiarize yourself with both the operation of the Traffic Engineering Radar, and the software that is used with it, by reading all the documentation that came with the equipment.

Whenever possible, we recommend that you perform a test study if you are new to the Traffic Engineering Radar. This will help you become comfortable with the operation of the equipment and how the data is both collected and analyzed. This should make things easier for you when you have to do your first real study.

Few things are more frustrating than trying to figure out new equipment, or resolve problems, when working on a tight deadline or with critical data. The more familiar you are with the equipment before having to use it for important studies, the better off you will be.



## **Chapter 2**

# **Site Installation**

## Installation

Before going to the site to install the Traffic Engineering Radar, check that you have the following items from the installation kit:



**Pole mounting bracket**



**Three locks  
with keys**



**Chain**

**Clamp Kit**



You will also need a standard flat-head screwdriver or 5/16 inch nut driver (not included with kit) to tighten the mounting clamp.

Check that your laptop is fully charged, has the latest version of the STARnext software installed, and that the date and time on the laptop are correct. You will synchronize the Traffic Engineering Radar's time and date to that of the laptop during setup.

## Selecting a Site

When choosing a location to install the Traffic Engineering Radar, keep in mind that it will need to be mounted to a pole (typically a utility pole) or tree, so the site will need to have one of these available for use.

For the best results, the Traffic Engineering Radar should be installed:

- At a 45 degree angle to the flow of traffic.
- Six to ten feet back from the road.
- At least six feet above the ground.
- Where the far side lane is no greater than 50 feet away.
- Where traffic is free flowing.

The unit should not be installed:

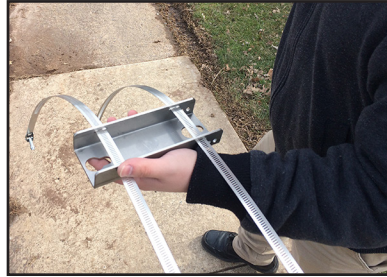
- At an intersection.
- Near where vehicles are likely to park.
- In a position that causes the radar head to be at an extreme angle.
- Near where pedestrians are likely to be crossing.
- Where the Radar's "view" is obstructed.



## Mounting the Traffic Engineering Radar

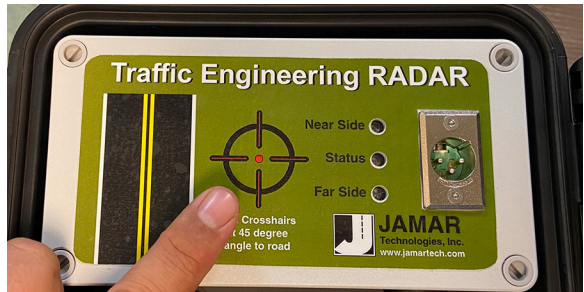
Once a site has been selected, the Traffic Engineering Radar can be easily mounted using the installation kit.

**Step #1** - Thread the SnapLock clamp bands through the openings on the pole bracket.



**Step #2** - For the most accurate results, the bracket should be installed so the Traffic Engineering Radar is facing traffic on a 45 degree angle.

**IMPORTANT:** The area of the Traffic Engineering Radar that you are aiming toward the road on a 45 degree angle is the crosshairs on the front of the Radar head, as shown in the picture here.



Once you have determined the 45 degree angle for the bracket, wrap the bands around the pole and place the bracket.



**Step #3** - Snap down the screws on the clamp bands and tighten the clamp with a flat-head screwdriver or 5/16 inch nut driver.



**Step #4** - Insert the pegs on the back of the Traffic Engineering Radar's mounting bracket into the large holes of the pole mounting bracket and slide the Traffic Engineering Radar down to secure it in place. Note that it is the front of the Traffic Engineering Radar that you are aiming toward the road at a 45 degree angle.



**NOTE: Do not place metallic style stickers on the front of the Radar case as this may affect the accuracy of the Radar data recordings.**

**Step #5** - Lock the unit into the mounting bracket using the hole at the bottom of the bracket. Once the Traffic Engineering Radar has been setup using the STARnext software (refer to the next chapter), close and lock the lid. If you wish to add further security to the installation, the chain that was provided with the recorder can be used. We recommend wrapping the chain around the pole above the unit, then feeding the chain down through the open in the bracket and locking it into place using the lower lock hole of the radar's case.





**Step #6** - Depending on how high you mount the Traffic Engineering Radar, you may need to tilt the unit so it is facing down into the traffic lane. This is done by adjusting the bracket on the back of the Traffic Engineering. Loosen the top bolt on the bracket (there is one on each side) using the provided hex head allen wrench. Once loosened, the unit can be tilted down. The allen wrench can then be used to retighten the bracket.



## **Chapter 3**

# **Programming the Radar Head**

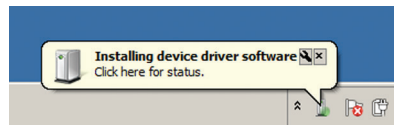
## Connecting to the Traffic Engineering Radar – Hard Wire

Once you have the Traffic Engineering Radar installed, it needs to be programmed to record the data you want. To do this, open the case of the Traffic Engineering Radar and connect your laptop to the serial port of the Traffic Engineering Radar Head unit.

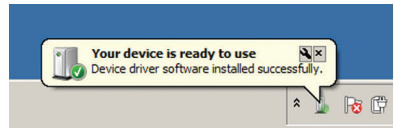


**NOTE:** The cable that connects the Traffic Engineering Radar to your laptop uses a USB serial adapter. This adapter requires that a USB driver be installed for it to work correctly. If you received your laptop directly from JAMAR, the driver has already been installed, so you do not need to worry about this.

If you are using your own computer, when you plug in the USB adapter for the first time you should see a pop-up message along your Windows taskbar like the one shown to the right.

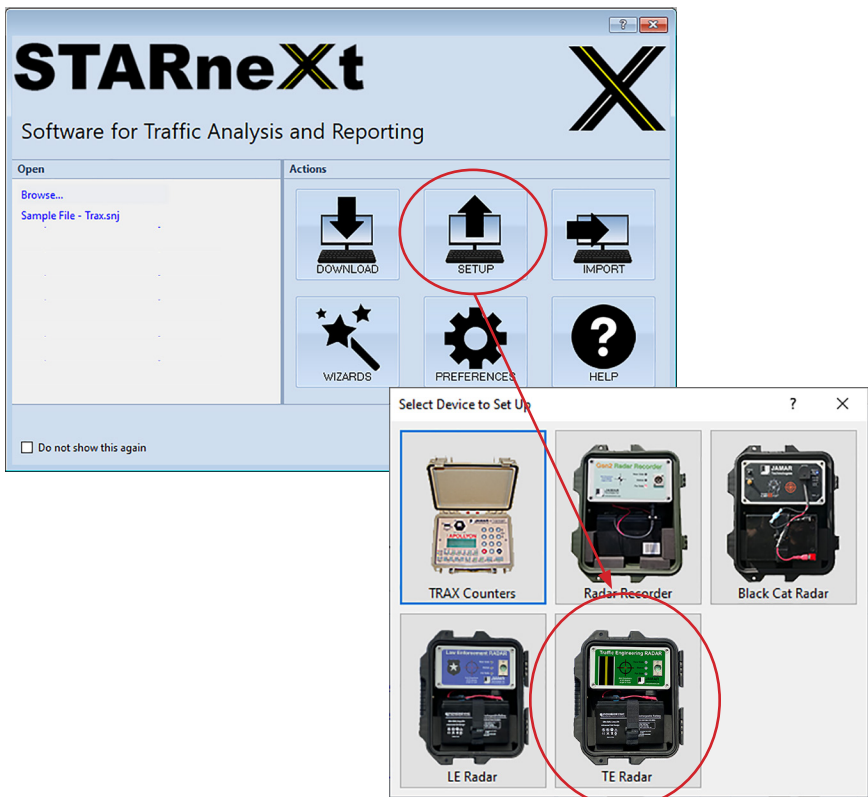


Windows will take a minute or two to find the proper driver and install it. This process is done when you see the message shown to the right.

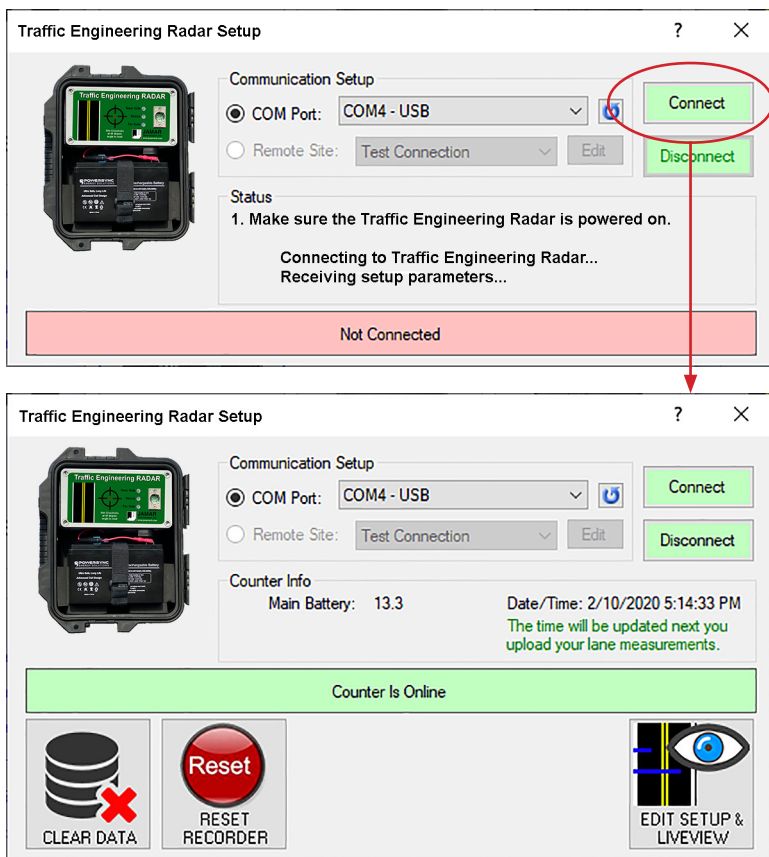


If the driver does not install automatically, refer to the appendix for instructions on manually installing the driver.

Start the STARnext software on your laptop and select **Setup** from the Actions section of the Quick Start screen. You'll then see a screen showing the different devices for setup. Select **TE Radar**.



STARnext will attempt to connect to the Traffic Engineering Radar and, if successful, show the current status of the unit.



Once connected, the middle of the screen will show the Counter Info, which includes:

- **Main Battery** – the current voltage of the external battery. A fully charged battery should be around 13V or higher.
- **Date/Time** – this is the date & time current programmed in the unit. You will be shown a warning that the date and time are not correct if they are not within a minute of the computer's date and time. This will be automatically corrected the next time you upload settings to the unit.

The buttons along the bottom of the screen are used to access other features of the setup which are discussed later in this chapter.



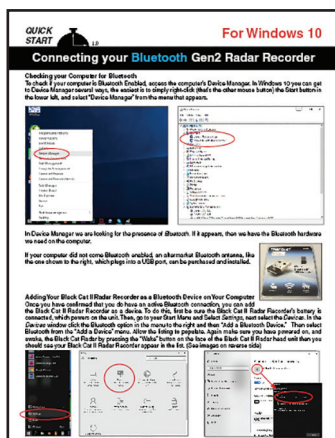
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# Connecting to the Traffic Engineering Radar – Wireless

Traffic Engineering Radars have wireless Bluetooth capability which allows you to connect without a hard wire.

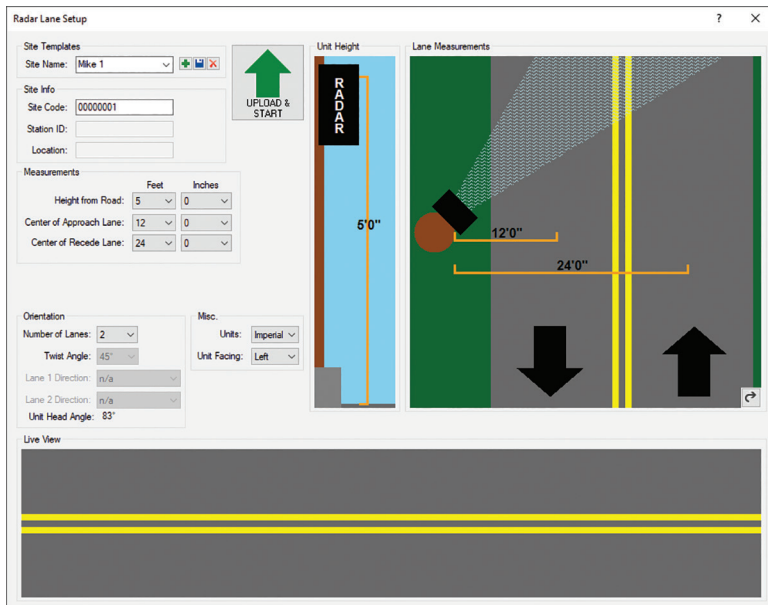
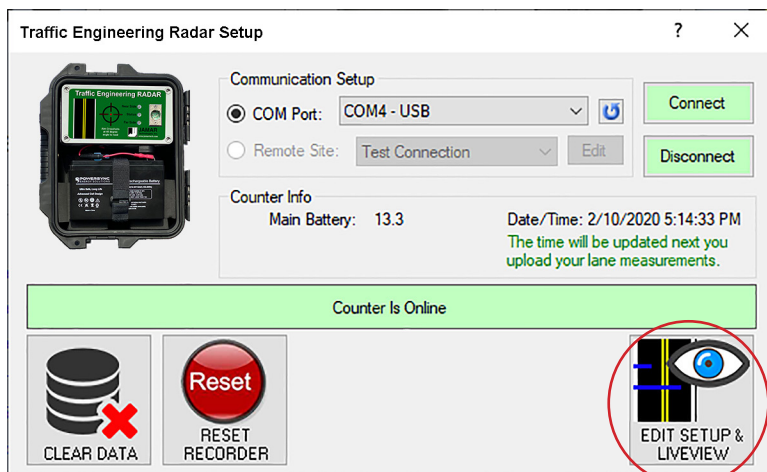
If you would like to use Bluetooth to communicate with the Traffic Engineering Radar, refer to the Quick Start Guide 'Connecting Your Bluetooth Traffic Engineering Radar' for more information on how to connect. The Quick Start Guide provides step-by-step instructions for Windows 10 computers.

This guide is included with the documentation provided with your Traffic Engineering Radar and can also be downloaded from our web site at [www.jamartech.com](http://www.jamartech.com).



## Setting Up a Study

To setup a study, click the *Edit Setup & LiveView* button on the Radar Setup screen.



Once the Radar Lane Setup screen appears, you will need to enter the details of how the unit is installed.

The **Site Templates** fields can be used to save location details of where the data is being collect.

The **Site Info** fields can be used to enter location details of the site. The data in the Traffic Engineering Radar includes the date and time that the study was done, but no direct information on *where* the study was done. Use of the Site Code is a way for you to identify the assigned study location, which can make data processing easier.

The **Measurements** fields can be used to enter the details of how the radar is installed. These include:

- **Height from Road** – Enter how high the Radar is mounted above the road.
- **Center of Approach Lane** – Enter the distance from the Radar to the center of the first lane.
- **Center of Recede Lane** – Enter the distance from the Radar to the center of the second lane.

The **Orientation** fields can be used to enter how the Radar is set up with respect to traffic.

- **Number of lanes** – select either 1 or 2
- **Unit Head Angle** – provides the angle the radar head should be pointed based on the height from the road and the distance to the road. To set the angle, adjust the radar bracket, which is discussed on page 2-6.

The **Misc.** fields can be used to enter two specific settings for the radar:

- **Units** – Select either Imperial (US) or Metric.
- **Radar Facing** – Enter which direction the Radar is pointing, either Right or Left.

Once you have the settings you want, click the *Upload & Start* button.

**IMPORTANT NOTE:** Uploading new settings into the Traffic Engineering Radar will delete any data currently in the Traffic Engineering Radar. STARnext prompts you with this warning before allowing you to continue. Press 'YES' to delete data in memory and continue the upload. Press 'NO'

to cancel the settings upload and download the data in memory instead. The download process is described in Chapter 4.

If the upload is successful, you'll see the confirmation message.

## LiveView

After settings have been uploaded into the Radar, the LiveView section of the setup screen allows you to view and verify the accuracy of the data you are currently collecting, compared to what you are actually seeing on the road.

The LiveView screen will display the data in real time, as it is recorded, including vehicle length and speed. *Note that if you have just installed the Traffic Engineering Radar, it can take up to 5 vehicles in each lane to fully configure the Radar head.*

In addition to speed and length, the LiveView also displays the signal strength. The maximum signal strength is 9. If the signal strength for a lane is low, try slightly rotating the Radar Head toward that lane.



On the Traffic Engineering Radar itself, the Status light should flash every few seconds, to let you know the unit is operating correctly. The Near Side light should flash any time a vehicle passes in the near lane. Similarly, the Far Side light should flash any time a vehicle passes in the far side lane.

**IMPORTANT:** We highly recommend that you use the LiveView to verify that the Traffic Engineering Radar is correctly recording vehicles before you leave the site. If the LiveView is not showing vehicles as they pass, the recorder is not getting good data. Double check all setup settings and refer to the Troubleshooting chapter for more items to check.

## Clear Data

The *Clear Data* button will delete all data from the memory of the Traffic Engineering Radar, but will not affect other settings.



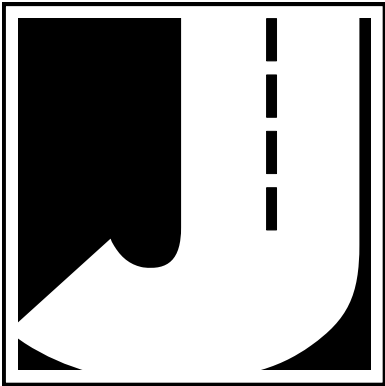
## Reset Recorder

The *Reset Recorder* button will clear all data from the memory AND reset all the settings of the Recorder to their factory defaults.



## Data Memory

The Traffic Engineering Radar contains 4 MB of internal memory. With this memory, it will record up to 500,000 vehicles.



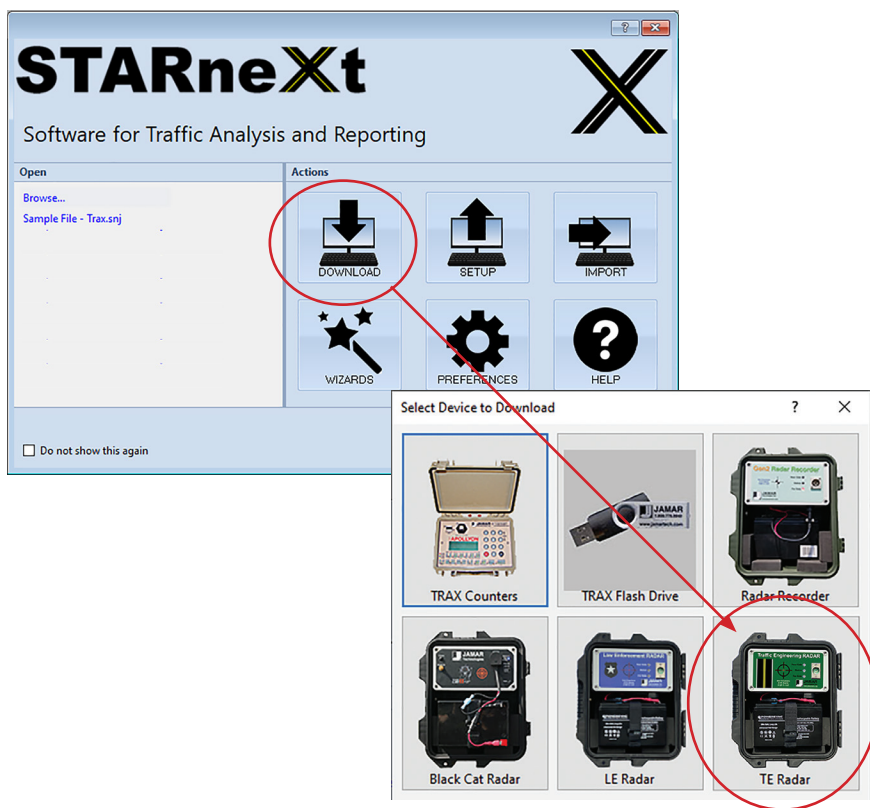
## **Chapter 4**

# **Downloading Data**

## Downloading Data

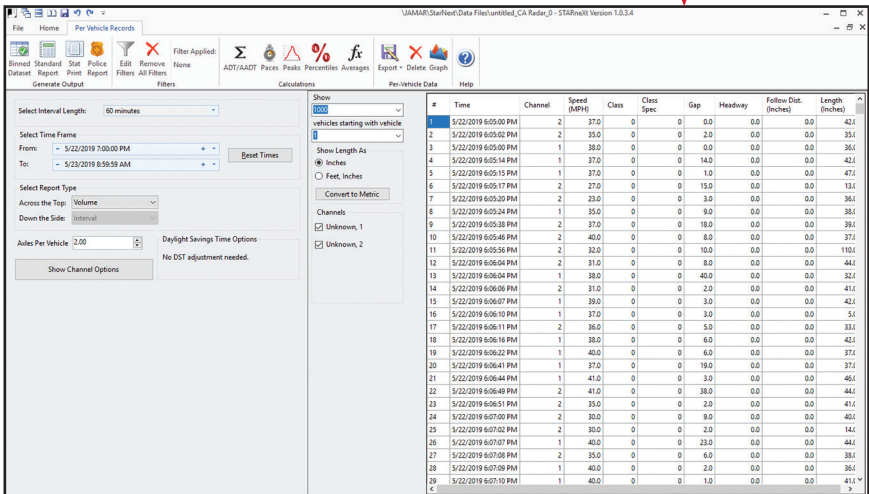
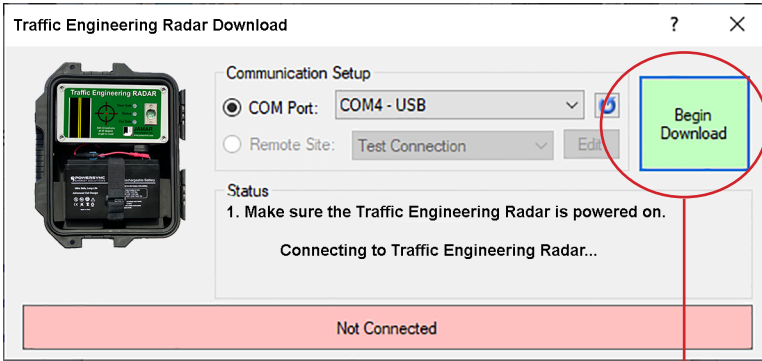
Once the data collection is complete, you can retrieve the data from the Radar Recorder using your computer and the STARnext software. To do this you will need to connect the Radar to the STARnext software, using one of the methods found in Chapter 3 of this manual.

However, instead of selecting Setup, as referenced in Chapter 3, you will now select **Download**. After selecting Download, select TE Radar.

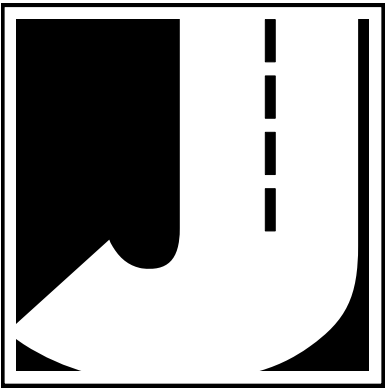




Click the *Begin Download* button and STARnext will then attempt to connect to the TE Radar. If the connection is successful, once the download is complete you'll see the vehicle data in STARnext.



From this point, refer to the STARnext manual for information on how to process the files and produce reports.



## **Chapter 5**

# **Battery Care**

## Maintaining Your Battery

The following information regarding battery care is furnished to assist you in the use and maintenance of rechargeable batteries. Battery life is dependent on the user's preventative maintenance procedures. Establish regular routines for all of your batteries regardless of their usage.

Charging a battery is very important for obvious reasons. Your Traffic Engineering Radar depends on a fully charged battery to operate efficiently and to produce reliable and correct data. Batteries should not be allowed to sit in a discharged state for any length of time. Once the battery discharges below 11.0 volts, damage to the cells has already begun. Symptoms of a damaged battery are:

1. The battery will not charge to its full capacity of 13.4 volts or higher.
2. The battery will only hold a charge for a short time under load conditions.
3. The battery will discharge faster than normal during storage under no load.

With this in mind, recharge the battery to its highest potential (normally from 13.4 volts and up) once it has fallen between 11.2 and 11.5 volts. The battery can be charged using the NOCO Genius 2 Battery Charger that came with the unit.

## Battery Charging

Monitor your battery voltage by checking the *Traffic Engineering Radar Setup* screen of the STARnext software. We recommend that the battery be recharged to its highest charge level (usually 13.2 volts and above) once it discharges to between 11.2 & 11.5 volts. A good battery may charge as high as 13.6 volts or better. A defective battery may not charge any higher than 13.0 volts after a reasonable charge time. Charge time will vary with the level of



the battery voltage. Usually, a battery of 11.2 volts can be charged to its highest potential in 12 hours or less.

To charge the battery, first remove it from the Traffic Engineering Radar. Plug the NOCO Genius 2 Battery Charger (shown below) into an outlet, then connect it to the terminals of the battery.



*Note that the NOCO Genius charger can charge several types of batteries, including both 6V and 12V batteries. If the charger is set to 6V, press and hold the **Mode** button until the battery lights are flashing. Then press the Mode button until 12V Lithium is selected.*

\*\*\*\*\*CAUTION\*\*\*\*\*

**Never plug a charger into a battery unless you are absolutely sure of the voltage output and polarity.**

The charger has four (4) Charge LEDs - 25%, 50%, 75% and 100%. These Charge LEDs indicate the connected battery's state-of-charge as shown in the chart below.

**Understanding Charge LEDs.**

LED	Explanation
25% Red LED	The 25% Charge LED will slowly pulse "on" and "off", when the battery is less than 25% fully charged. When the battery is 25% charged, the red Charge LED will be solid.
50% Red LED	The 50% Charge LED will slowly pulse "on" and "off", when the battery is less than 50% fully charged. When the battery is 50% charged, the red Charge LED will be solid.
75% Orange LED	The 75% Charge LED will slowly pulse "on" and "off", when the battery is less than 75% fully charged. When the battery is 75% charged, the orange Charge LED will be solid.
100% Green LED	Pulsing Green LED - Bulk charge complete, optimizing battery for extended life. Solid Green LED - When the battery is 100% charged, the Charge LED will be solid green.
Maintenance Green LED	After the battery is fully charged, the charger will continue monitoring the battery, and provide ongoing maintenance and optimization. The 100% Charge LED will pulse "on" and "off" slowly during these cycles. The charger can be left connected to the battery indefinitely.

**Understanding Error LEDs**

Error Conditions will be indicated by the following LEDs.

LED	Reason/Solution
Solid	Charger is in Standby mode or Battery voltage is too low for charger to detect.
Solid	Battery voltage is too high for the selected charge mode. Check the battery and charge mode.
Solid	Possible battery short / Battery will not hold a charge. Have battery checked by a professional.
Solid	Reverse polarity. Reverse the battery connections.
Flashing	Charger internal temperature too high / Charger will resume function once the Charger internal temperature drops. Charger ambient temperature too cold / Charger will resume function once the Charger ambient temperature rises.

After a battery has been charged, allow it to sit for several hours then check the voltage to determine if the battery kept its charge. Some reduction in voltage is acceptable. However, if the battery falls below 13.0 volts, recharge it for a longer period of time. If this does not improve the charge, the battery is most likely defective and should be replaced.

**Monitor your battery voltages frequently, charging when necessary, and you will extend the life of your battery.**

### **Additional Notes**

- **Do not** expose the battery to moisture or rain.
- **Do not** drop, hit or abuse the battery — it may break and expose the contents, which are highly corrosive.
- **Do not** short circuit battery terminals. Some batteries are protected with self-resetting fuses, but short circuits may still cause severe damage to the battery.
- It is normal for a battery to become warm to the touch during charging.
- It is normal for a battery to “self discharge” during prolonged storage. Always fully charge a battery prior to storage. While in storage, periodically check the batteries with a voltmeter to ensure they have not discharged below a level that may cause permanent damage.
- Always store in a cool, dry location.
- Keep batteries away from fire and do not incinerate — they may explode.
- Under no circumstances should you attempt to open the battery case.
- Always observe polarity when connecting your battery to any electronic/electrical device. If your device is not protected for improper battery hookup, you may cause severe damage to the electronic circuitry. The positive terminal may be indicated by a plus (+) sign or red mark. The negative terminal may be indicated by a minus (-) sign or black mark.
- The effectiveness of the solar panel can be reduced if it is dirty or scratched up. For best results, try to keep the panel clean.

## Chapter 6

# Troubleshooting

## Troubleshooting

The following are some frequently asked questions related to the Traffic Engineering Radar. The possible answers that are stated with them are not necessarily the only answer, but should be checked first. If you cannot find the answer to your question, do not hesitate to contact us. Contact information is listed on page iii of this manual.

### **The Status Light is not flashing at all. What's wrong?**

The Status light should flash every few seconds if the Traffic Engineering Radar is running. If the light is not flashing at all, the unit has most likely lost power. First, check that the battery connections are secure. If they are, next check to see what the voltage level of the battery is. A fully charged battery should read 13V volts or higher.

### **The Status Light is flashing rapidly. What's wrong?**

The Status light will flash rapidly if the time and date on the Traffic Engineering Radar have not been set up. This often indicates that the battery has drained (see above) and the unit's internal clock has reset itself. Connecting a computer with the STARnext software installed will synchronize the Recorder's clock to that of the computer. We recommend that the main battery be left connected after resetting the time to allow the backup battery to recharge.

### **When using LiveView, no vehicles are displayed as they pass the site. What's wrong?**

There may be a problem with either how the Traffic Engineering Radar was installed or one of the settings that was entered during set up.

First, make sure that you are aiming the correct area of the Traffic Engineering Radar toward the road. You should be aiming the crosshairs printed on the radar head, as shown in the picture here, at a 45 degree angle toward the road you want to record.



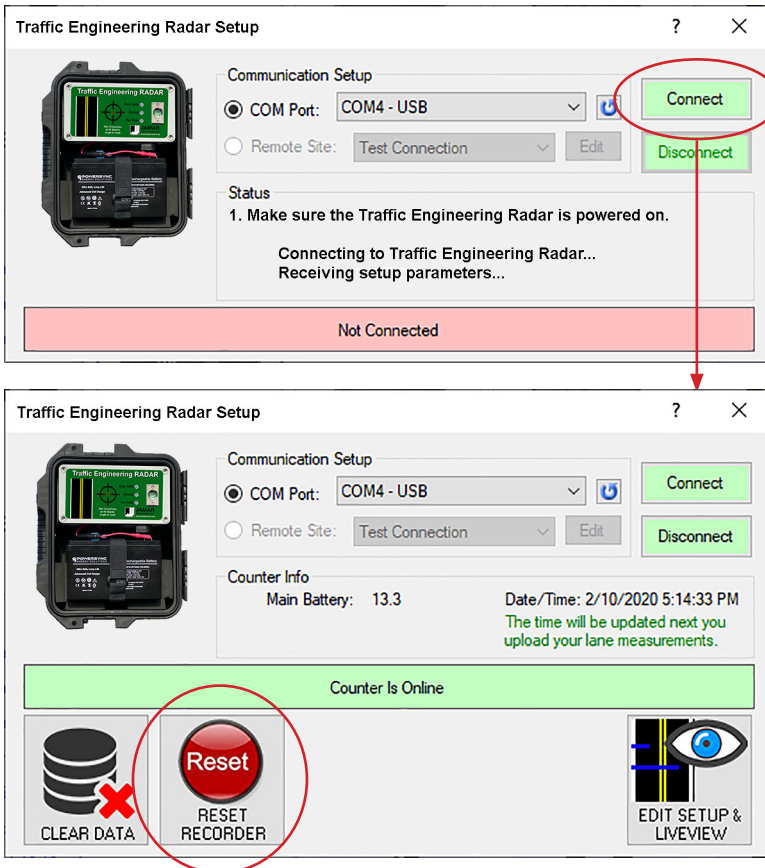
Second, check to see if there is anything between the Traffic Engineering Radar and the Road that may be obstructing the 'view' of the recorder.

Third, double checking the distance values entered during the installation and setup of the Traffic Engineering Radar.



## I'm having trouble with the Traffic Engineering Radar and want to 'reboot' it. Can I do that?

Yes, you can reset the Traffic Engineering Radar to its factory default settings. To do this, connect your computer to the Traffic Engineering Radar then start the STARnext software. In STARnext, go to the *Setup Traffic Engineering Radar* then click the *Connect* button. Once connected, click *Reset Recorder*. You'll then be asked if you are sure you want to reset the recorder. If you answer *Yes*, the recorder will begin the resetting process, which takes about 30 seconds. Note that resetting the recorder will remove any data from memory.



**I want to clear the memory of the Traffic Engineering Radar. Can I do that?** Yes, you can clear the memory of the Traffic Engineering Radar. To do this, follow the same steps described above, but click on the *Clear Data* button instead.



**When I mount the unit close to the road, it sometimes misses vehicles. Is there anything I can do?**

It is recommended that the Traffic Engineering Radar be installed at least 6 feet from the road way. However, if you must install it close, the angle of the Radar Head is critical to ensuring that all vehicles are properly recorded.

**Additional support information can be found on our web site at [www.jamartech.com](http://www.jamartech.com). If you are unable to find a solution to your problem, contact us using the information on page iv of this manual.**

# Appendix

## Appendix #1 - Installing USB Drivers

The first time you connect the Traffic Engineering Radar to a computer using the USB adapter, you will need to install the drivers for the USB adapter. There are two drivers that will be installed, one right after the other.

The Windows 'Found New Hardware' message will pop up, then the *Found New Hardware Wizard* will appear.

One of the features of Windows is to use your Internet connection to search the Windows Update web site for any available drivers for USB devices you connect to your computer, like the USB adapter. If you have not used this feature before, you'll first see a screen like the one shown to the right when you first connect the adapter.



The drivers for the adapter are available through this feature, so if you'd like to allow the wizard to connect to the Internet, select one for the first two options and click Next.

After you click Next (or if you have previously instructed Windows to always check the Windows Update web site for drivers), you'll see the screen shown to the right.

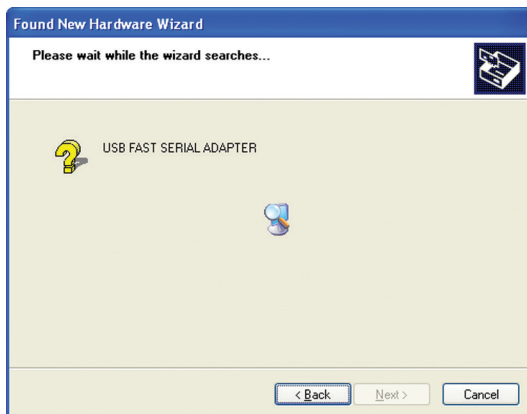
This screen is used to tell Windows where to look for the drivers it needs. We recommend using the first selection, *Install the Software Automatically*.



Note that whenever possible we recommend you use the drivers available through the Windows Update web site as this is the easiest method for loading the drivers. However, if you are not able to use the Windows Update web site, the drivers are also available on the Downloads section of the JAMAR web site.

Once you are ready to proceed, click Next. The Wizard will then start searching for the best available drivers and you'll see a screen like the one shown to the right.

Once the wizard is finished searching, it will begin to load the driver it has found.



When the driver is finished installing you'll see a screen like the one shown to the right.

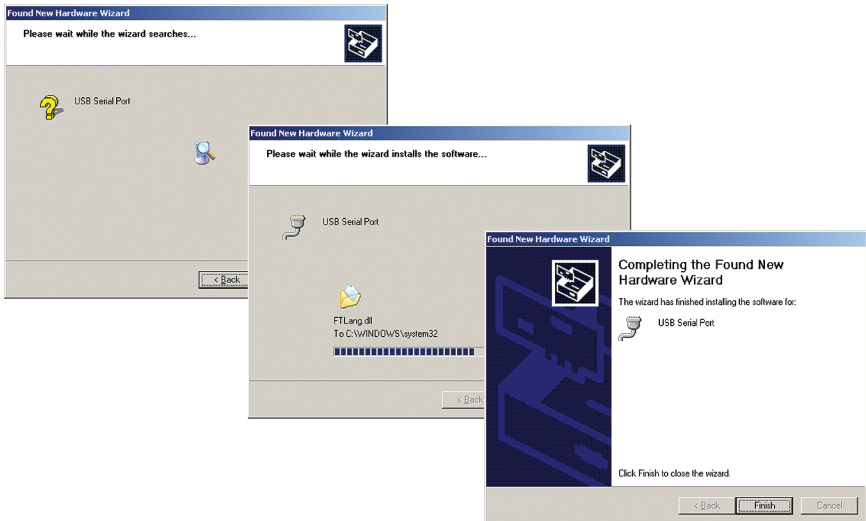
Click Finish and you'll complete installing this driver, but there's still one more to go.



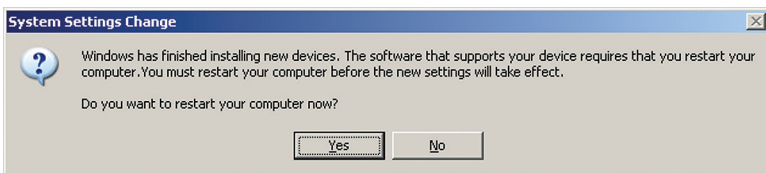
Once you click Finish, the Windows 'Found New Hardware' message will pop up again, referencing a USB Serial Port, and the *Found New Hardware Wizard* will reappear. Don't be alarmed, this is what's supposed to happen. There is a second driver that needs to be installed to create a virtual comm port.



To install this second driver, follow the same steps as the first.



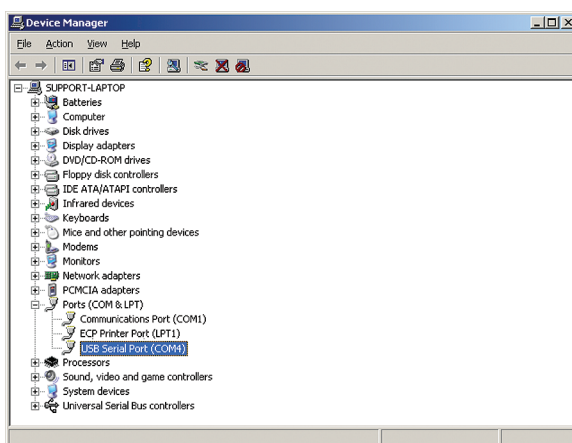
Once the second driver is installed, you may see a message like the one below, prompting you to restart your computer.



Restart your computer to complete the process of installing the drivers.

The process of installing the USB drivers has created a virtual comm port on your computer and assigned this port a number from 1 to 16. You will need to select this comm port number in STARnext when you go to connect to your Traffic Engineering Radar. STARnext makes this easier to do by only listing the comm ports that are available in the connection screen. However, if you want to check to see what port number the virtual comm port has been assigned, you can do so through the computer's Device Manager list.

To access this information, right-click on the My Computer icon then select Properties. In the System Properties window, click on the Hardware Tab, then click the Device Manager button. Click the plus sign (+) next to Ports and you should see a list similar to the one shown below, showing the port number that your computer has assigned.



## Appendix #2 - Specifications

**Sensor:** Microwave 24.2 GHz, power output 5 Mw

**Speed Range:** 8-130 Mph

**Radar Range:** Up to 100 Feet

**Setup Range:** Up to 80 Feet

**Size:** 11.5" x 13" x 7"

**Weight (Battery Installed):** 12 lbs.

**Power:** Rechargeable lithium battery

**Approx. Accuracy:** Near Lane >98%; Far Lane > 96%

**Battery Charge Life:** 7 Days

**Operating Temperature:** Minus 40° F (-40°C) to 158° F (70°C)

**Interface:** RS-232 serial comm port, 3 pin XLR male socket

**Memory:** 4 MB Internal Memory. Will record up to 500,000 vehicles in Per Vehicle mode and up to 1 year of data in binned mode

**Data Collection Formats:** Per Vehicle data, which can be processed for Volume, Speed, Length & Gap

**Units:** Speed - MPH or KPH; Length - Feet or Meters

**Output:** Binary file capable of being read by STARnext software

We are pleased that you have chosen the Traffic Engineering Radar for your traffic data collection needs. We have strived to develop a unit that is easy to use and has the options that our customers require. The Traffic Engineering Radar 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 suggested 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 and discontinue use of the unit until we have verified its operation.

