enfora®

A Novatel Wireless Company

AT 3000 Series

User Guide

GSM5218UG001

Version: 1.00

01 March, 2011

General

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Warranty Information

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Enfora warrants to the original purchaser of the product from Enfora or its authorized distributor (as applicable) that, for a period of one (1) year from the date of shipment of the product from Enfora, the product hardware will be substantially free from defects in material or workmanship under normal operation, and the product firmware will perform substantially in accordance with the product documentation provided by Enfora. Enfora does not warrant that (a) the product hardware or firmware will meet the purchaser's requirements; (b) the operation of the product hardware or firmware will be uninterrupted or error-free; or (c) the product, when integrated in, or combined with, other products or software not supplied by Enfora, will continue to perform substantially in accordance with the product documentation. This limited warranty is for the benefit of the original purchaser, and is not transferable.

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Enfora shall not have any obligation to provide any firmware bug fixes, upgrades or new releases except as may be necessary to correct any covered defect of which purchaser notifies Enfora in writing during the warranty period. Enfora, from time to time and in its sole discretion, may make available for download on its website (www.enfora.com), or may provide via email, certain firmware bug fixes, upgrades or new releases for the product. Download and use of any such bug fixes, upgrades or new releases is subject to all of the applicable terms and conditions of Enfora's technical support policy as posted and updated on its website. Enfora shall have no obligation under this limited warranty for (a) normal wear and tear; (b) the cost of procurement of substitute products; or (c) any defect that is (i) discovered by purchaser during the warranty period but for which purchaser does not request an RMA number from Enfora, as required above, until after the end of the warranty period, (ii) caused by any accident, misuse, abuse, improper installation, handling or testing, or unauthorized repair or modification of the product, (iii) caused by use of any materials not supplied by Enfora, or by use of the product other than in accordance with its documentation, or (iv) the result of electrostatic discharge, electrical surge, fire, flood or similar causes. The purchaser (or its customers, as applicable) shall be solely responsible for the proper configuration, testing and verification of the Enfora product prior to deployment in the field, and for ensuring that any end user product or system into which the Enfora product is integrated or incorporated operates as intended and meets the requirements of purchaser (or its customers). Enfora shall have no responsibility whatsoever for the integration, configuration, testing, verification, installation, upgrade, support or maintenance of any such end user product or system, or for any liabilities, damages, costs or expenses associated therewith.

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Regulatory Compliance

FCC

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits pursuant to Part 15 Subpart B, Part 22, and Part 24 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in an appropriate installation. This equipment generates, uses, and can radiate radio frequency energy and, if not used in accordance with instructions, can cause harmful radiation to radio communication. However, there is no guarantee that interference will not occur in a particular installation.

FCC RF EXPOSURE

Your Spider AT 3000 series device is a radio transmitter and receiver. It is designed and manufactured not to exceed the emissions limits for exposure to radio frequency (RF) energy set by the Federal Communications Commission (FCC) of the U.S. Government. These limits are part of comprehensive guidelines and establish permitted levels of RF energy for the general population. These guidelines are based on the safety standards previously set by the U.S. and international standards bodies. The standards include a substantial safety margin designed to assure the safety of all persons, regardless of age and health.

The exposure standard for wireless RF devices, such as the Spider AT 4000, employs a unit of measurement known as the Specific Absorption Rate, or SAR. The SAR limit set by the FCC is 1.6W/kg. SAR values at or below that limit are considered safe for the general public.

The Spider AT 3000 series conforms with the RF exposure requirements for portable devices in accordance with FCC Part 2.1093.

The Spider AT 3000 series transmitter is configured with a less than 10% transmission duty factor, for GPRS Multislot class 8 operation, and is excluded from routine RF exposure evaluation in accordance with FCC Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies, KDB447498 D01, V04.

Canadian Compliance (Industry Canada)

IC ID: 4160A-GSM5218 MODEL NUMBER: GSM5218

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

The Spider AT 3000 series transmitter is configured with a less than 10% transmission duty factor, for GPRS Multislot class 8 operation, and is excluded from routine RF exposure evaluation in accordance with the requirements of RSS-102 section 2.5.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

L'émetteur de la série Spider AT 3000 est configuré avec un facteur de devoir de transmission de 10 %, pour l'opération de classe 8 GPRS Multislot, au moins et est exclu de l'évaluation de l'exposition RF conformément aux exigences de RSS-102 article 2.5 de la routine.

R&TTE Directive (CE)

The Spider AT 3000 series modem has been fully tested and complies with all applicable requirements of EN301 489-1, EN301 489-7 and EN60950-1. Compliance to EN301 511 has been demonstrated by testing on both the GSM5218 and the integrated LPP0208 module

ROHS COMPLIANCE

The Spider AT 3000 series complies with the European Union Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (RoHS) Directive (2002/95/EC), effective since July 1, 2006.

DISCLAIMER

The information and instructions contained within this publication comply with all applicable FCC, GCF, PTCRB, R&TTE, IMEI and other applicable codes that are in effect at the time of publication. Enfora disclaims all responsibility for any act or omissions, or for breach of law, code or regulation, including local or state codes, performed by a third party. Enfora strongly recommends that all installations, hookups,

transmissions, etc., be performed by persons who are experienced in the fields of radio frequency technologies. Enfora acknowledges that the installation, setup and transmission guidelines contained within this publication are guidelines, and that each installation may have variables outside of the guidelines contained herein. Said variables must be taken into consideration when installing or using the product, and Enfora shall not be responsible for installations or transmissions that fall outside of the parameters set forth in this publication.

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1 Introduction

An extension to the Enfora Spider® family of integrated asset management solutions, the Spider AT 3000 series are certified quad-band integrated platform that provides GSM/GPRS/GPS functionality for mobile asset monitoring. The Spider AT 3000 for long life reporting, Spider AT 3001 for long life reporting in Intrinsic Safety environments, Spider AT 3010 for more frequent reporting, and Spider AT 3011 for more frequent reporting in Intrinsic Safety environments.

The Spider AT 3000 series has the following features:

- Fully Integrated - no need for external antenna or power source
- Wireless Connection Reliability
- Superior GPS Sensitivity & Geofencing
- Simplified Over the Air Configuration & Provisioning

The Spider AT 3000 series are based on Enfora's innovative Enabler III Low Power Platform, with a built-in programmable software environment.

Designed for the intelligent monitoring of non-powered mobile and fixed assets the Spider AT 3000 is easily installed and managed.

The Spider AT 3000 series can be provisioned through the Enfora CMS and configured to optimize:

- Motion detection
- Location monitoring
- Reporting geofence settings

1.1 Reference Documents

The following Enfora documents may be necessary to configure the Spider AT 3000 series:

- CMS User Guide
- Provisioner User Guide
- Provisioner Quick Start Guide
- Device Configuration Utility User Guide

 The following instructions and information relate to all Spider AT 3000 series products, however for clarity, only the Spider AT 3000 product will be referenced.

2 Physical Description

2.1 Overview

The Spider AT 3000 series is a quad-band integrated platform. Inside the gray plastic case is an Enfora Enabler LPP0208 modem, USB connector, SIM holder and battery connector for the attached battery. See 2.1 "Overview" .
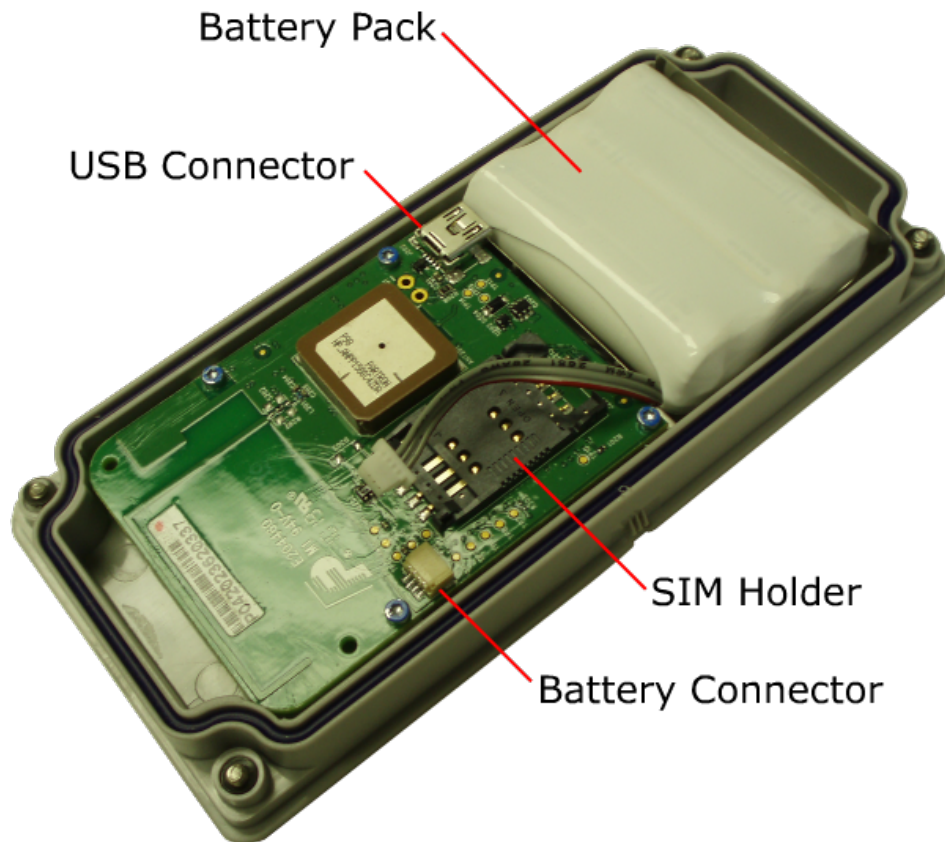
Figure: 1 - Spider AT 3010 Circuit Board and Battery Pack

Figure: 2 - Top View of Spider AT 3000 Series

LED Indicator and Power Switch
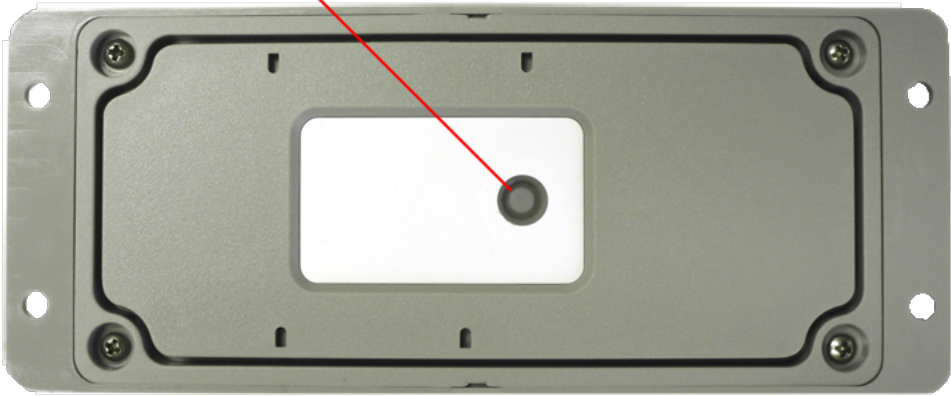
Figure: 3 - Bottom View of Spider AT 3000 Series

2.1 Controls and Indicators

The button on the underside of the Spider AT 3000 functions as both the power switch and the activation switch.

To deactivate the Spider AT 3000, press and hold the power switch, located on the underside of the unit, for three to five seconds. The LED will become solid red then go off. When the light is off, the unit is deactivated.

When you are ready to activate the Spider AT 3000, press and hold the power switch for three to five seconds until you see a blinking light. The LED will blink 12 times within a 3 second period if the battery voltage is in its highest range. If the battery is within its normal voltage range, the LED will blink on for one second, off for one second, then on for one second. The LED will then go off. When the light is off, the unit is activated.

2.1 Dimensions

The measurements of the Spider AT 3000 and 3001 are:

- Length 170 mm
- Width 69 mm
- Height 21 mmSee "Dimensions" on page 6
- Weight (with battery) 207 grams
- Weight (without battery) 150 grams

The measurements of the Spider AT 3010 and 3011 are:

- Length 170 mm
- Width 69 mm
- Height 21 mm
- Weight (with battery) 198 grams
- Weight (without battery) 150 grams
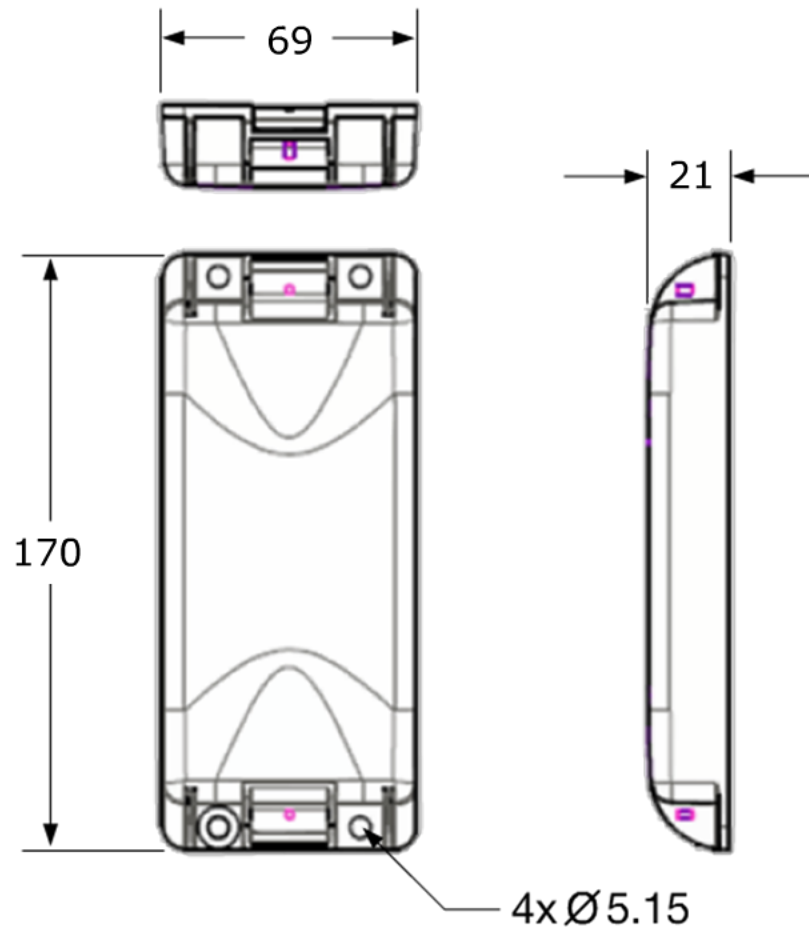
Figure: 4 - Spider AT 3000 Dimensions

2.1 Environmental Specification

2.2 Temperature

Spider AT 3000 and Spider AT 3001

Compliant -20℃ to 60℃

Operating -30℃ to 85℃

Storage -40℃ to 85℃

Spider AT 3010 and Spider AT 3011

Compliant -20℃ to 60℃

Operating -40℃ to 60℃

Storage -40℃ to 70℃

2.1 Water Resistance

The Spider AT 3000 series is an ingress resistant device, pursuant to the IP-66 and IP-68 ratings. This rating specifies that the device is fully protected against dust, and can be immersed in water.

2.1 Radio Performance Specifications

Frequency	850 / 900 / 1800 / 1900 MHz
Sensitivity	108 dBm (typical)
Transmit Power	Class 4 (2W @ 850 / 900 MHz)
	Class 1 (1W @ 1800 / 1900 MHz)

Table: 1 - Radio Performance Specifications

2.1 GSM/GPRS Compliance Specifications

The following list shows the certifications for the Spider AT 3000.

FCC	Parts 15, 22 & 24
GCF	Version 3.37.1
PTCRB	Version 5.3
CE Mark	Yes
Industry Canada	Yes
RoHS Compliant	Yes

Table: 2 - GSM GPRS Compliance Specifications

2.1 Battery Specifications

Spider AT 3000

The Spider AT 3000 uses a battery pack. The features of this battery include:

- Greater energy density
- Higher capacity
- Higher temperature range
- Higher operating voltage
- Longer life
- Patented safety features
- Environmentally friendly

Battery Pack Characteristics	
Enfora PN	BAT-5208-02
Chemistry	Lithium-Thionyl Chloride (LI-SOCl2)
Shelf Life	10 years @ <30 °C
Lithium Metal Content	Approx. 1.3 g
Weight	60 g (max)

Spider AT 3010

The Spider AT3010 uses a battery pack. The features of this battery include:

- Greater energy density
- Higher capacity
- Extended lower temperature range
- Allows for more rapid device reporting capability
- Higher operating voltage
- Long life
- Patented safety features
- Environmentally friendly

Battery Pack Characteristics	
Enfora PN	BAT-5208-01
Chemistry	Lithium Iron Sulfide (LiFeS2)
Shelf Life	10 years @ <30 °C
Lithium Metal Content	<1.0 gram per cell
Weight	50 g (max)

2.1 Intrinsic Safety Specification

Intrinsic safety is important in environments where flammable substances (gases or solid particles) may exist. Two variants of the Spider AT 3000 series product line are certified for use in Intrinsically Safe environments. These products include unique labels which identify to the interested parties what certifications are in place.

The Spider AT 3001 has been designed and tested to meet the following Intrinsic Safety Certifications: EU Directive 94/9/EC, according to the standards EN 60079-0: 2006 and EN 60079-15: 2005, the product has been certified for Zone 2, Category 3.

The Spider AT 3011 has been designed and tested to meet the following Intrinsic Safety Certifications: Class I Division 1, groups C and D according to the requirements of UL913 and CSA 22.2, for use in the United States of America and in Canada. The product is specifically marked with Exia along with other wording to indicate to the user that this is an intrinsically safe certified device.

	Warning: Do not remove or modify the labels on the Spider AT 3001 or Spider AT 3011, doing so will invalidate the intrinsic safety certification.

2.1 GPS Functionality

Channels:	16
Sensitivity:	
Monitoring:	-158 dBm (typical)
Reacquisition:	-157 dBm (typical)
Cold Start:	-147 dBm (typical)
Position Accuracy (horizontal)	
	-130 dBm, Autonomous CEP (50%): <2m (typical)
	-150 dBm, Autonomous CEP (50%): <2m (typical)
	-130 dBm, Autonomous CEP (50%): <5m (typical)
	-150 dBm, Autonomous CEP (50%): <5m (typical)

Table: 3 - GPS Functionality

3 Initial Setup

Please follow these steps to start using the Spider AT 3000 series:

1. Make sure you have the following items:
- Spider AT 3000 series device.
- USB Drivers.
- USB cable (USB-A to 5-Pin Mini USB)
2. Remove the Spider AT 3000 from the packaging material.
3. The Spider AT 3000 will be assembled loosely with four screws. Fully loosen the screws and separate the two halves of the unit.
4. Make sure the battery is connected (See "Connect the Battery" on page 31).
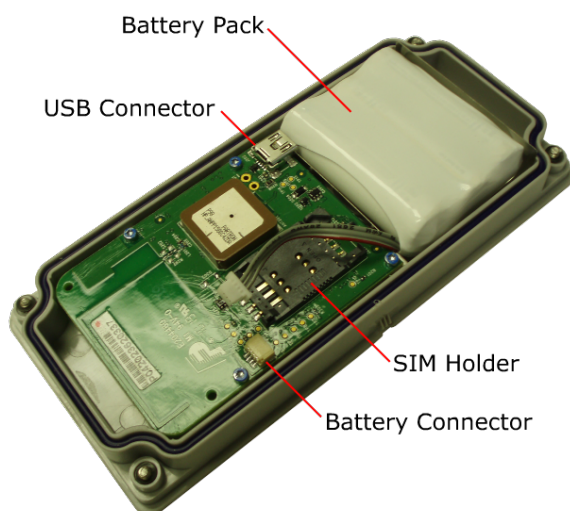

Figure: 5 - Internal View of Spider AT 3010 with Circuit Board and Battery Pack

> ⚠ To Reduce the risk of ignition of a flammable or explosive atmosphere; batteries must be inserted or changed only in a location known to be non-hazardous.

5. Remove the battery pack from the half of the Spider AT 3000 that contains the circuit board. You don't need to disconnect the battery connector – just move the battery pack out of the way, so you can access the USB connector.
6. Remove the battery pack from the half of the Spider AT 3000 that contains the circuit board. You don't need to disconnect the battery connector – just move the battery pack out of the way, so you can access the USB connector.
7. Install the SIM (See "SIM Card Installation" on page 56).
8. Turn the device on (See "Powering Up and Down" on page 32).
9. Connect the USB cable to the circuit board and to your computer.
10. Install the drivers (See "USB Driver Installation" on page 39).
11. Configure the Spider AT 3000 (See "Configure the Device" on page 17).
12. Once configuration is complete, remove the USB connector, and replace the battery pack.
13. Close the Spider AT 3000, and replace the screws.
14. The Spider AT 3000 is now activated, and will begin transmitting data.

Verify the Server is receiving messages from the device.

If you are ready to deploy the Spider AT 3000, mount the unit on the asset you need to locate (See "Mounting the Unit" on page 20). If you are not ready to deploy, deactivate the unit until you are ready (See "Powering Up and Down" on page 32).

3.1 Configure the Device

Once the USB drivers are installed, and you can communicate with the Spider AT 3000, you can begin configuring the unit to transmit data.

> Before using the Enfora Provisioner to configure the device over-the-air, basic communication parameters must be configured using a terminal program and USB connection.

The only supported method of configuring the Spider AT 3000 with the basic parameters is to use the Device Configuration Utility. The Spider AT 3000 requires Device Configuration Utility version 1.0.3 or later.

3.1 Configure the Spider AT 3000 series Manually using the Device Configuration Utility

Installation of the Device Configuration Utility and configuration of the device using this tool are detailed in the Device Configuration Utility User Guide.

Once the initial configuration has been performed with the Device Configuration Utility you will be able to communicate with the server that is hosting the Provisioner software, and configure the Spider AT 3000 over-the-air. Refer to the Provisioner User's Guide for detailed device configuration instructions.

> The default Spider AT 3000 parameters result in the device reporting to the server when activated and then once per day. When not actively reporting to the server, the device will be in sleep mode and will not receive commands from the Provisioner server until it wakes up for its daily report.

3.1 Provision the Spider AT 3000 Series Using the Provisioner

Once the device has been configured it will be ready to be provisioned by the Provisioner. To provision the Spider AT 3000 over-the-air, refer to the Provisioner User's Guide for detailed device configuration instructions.

4 Mounting the Unit

The unit can be mounted to a variety of surfaces including wood, metal and plastic. Any of the following mounting hardware (not included) can be used:

- Four #8 washers, four #8 Self-Drilling Sheet Metal Screws.
- Cable Ties.
- Double-sided Pressure Sensitive Adhesive (PSA) Tape

The optimal mounting position of the Spider AT 3000 is outdoors, ensuring that the top of the device has clear access to the sky.

It is recommended that the user conducts testing in various situations, in order to determine if the unit will:
• Transmit data.
• Acquire a GPS lock

This procedure describes the mounting of the Spider AT. Please read this entire procedure and ensure that all equipment is available and personnel are trained before starting the work.

4.1 Hardware Needed To Mount the Device

The following is a list of mounting hardware that may be used with the Spider AT 3000. (See   4.1 "Hardware Needed To Mount the Device")

- Appropriate Mounting Screws- Qty 4.
- Appropriate Lock-Washers- Qty 4.
- Appropriate Flat-Washers- Qty 4.
- User defined hardware may also be used to mount the Device.

 Mounting hardware is not included with the device.

Figure: 6 - Spider AT 3000 and Mounting Hardware

4.1 Selection of Mounting Locations

Care should be taken in selecting the mounting location for the Spider AT 3000. Some considerations for choosing the mounting location are:

- Ideally the label should be mounted facing down (Towards the ground) such that the top of the unit has a clear view of the sky. Mounting in this orientation provides optimum antenna performance.
- If the above mounting is not possible the unit may be mounted on its side where the label is mounted against the asset and the top of the unit faces towards the sky as much as possible.
- The selected mounting surface must not allow water to pool around the device.
- Care should be taken to avoid damaging wiring, electronics, plumbing, etc, when drilling holes to mount the device.
- The device should be mounted where it is protected from being impacted during operation.

4.1 Pre-Drilling of Mounting Holes

After selecting the proper location for the device, hold the device in position. Use the four screw-hole openings to mark the center points for pre-drilling. Place the device aside and pre-drill with the appropriate drill bit.

Figure: 7 - Spider AT 3000 Screw Hole

4.1 Mounting the Device

Place a Lock-Washer on one of the Screws. Now place a Flat-Washer on the Screw, See "Mounting the Device". Repeat this process with the remaining three Screws.
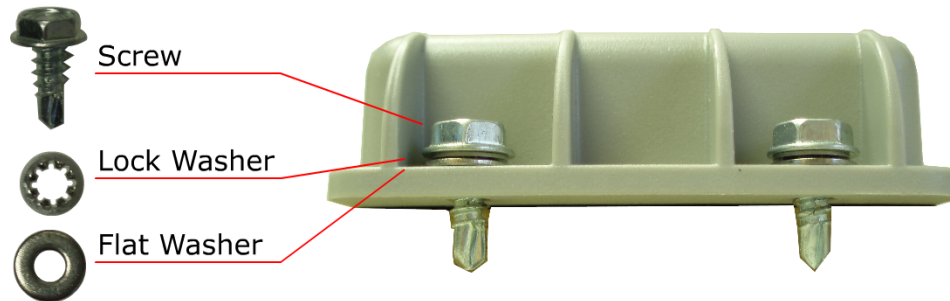

Figure: 8 - Spider AT 3000 and Mounting Hardware

Insure the Device is activated (See "Powering Up and Down" on page 32). Align the Device with the pre-drilled screw holes. Insert one of the screws (assembled above) through one of the screw holes in the Device. Partially tighten the Screw into the mounting surface. Repeat this process until all four screws are started into the mounting surface. Now tighten the four screws until they are snug. Tighten the Screws to 2.5 in-lb torque.

4.1 Alternate Mounting of the Device

The Device can also be mounted using Cable Ties. The screw holes are sized so the Cable Ties can be inserted through them, See   4.1 "Alternate Mounting of the Device" .

Figure: 9 - Mounting – Cable Ties

⚠️ Take care not to fasten Cable Ties over sharp edges, as this may cause excessive wear causing the Cable Ties to break.

4.1 Mounting Bracket

The BRK5002 bracket was designed to survive rigorous use and the most extreme outdoor environments.

Figure: 10 - Mounting Bracket BRK5002 – Bottom

Figure: 11 - Mounting Bracket BRK5002 – Top

The BRK5002 bracket has passed vibration testing of 24 hrs at 20g (from 50 to 2000 Hertz). In addition, the release clasp has been tested to hundreds of cycles including temperature shock with near freezing liquid immersion.

Both the Spider AT 3000 series housing and BRK5002 bracket have been produced with UV stabilized plastic. UV Stabilization prevents plastics from oxidizing and becoming brittle over time due to exposure to the sun.

Note: For optimum performance mount the device on a vertical or inclined surface

4.1 Attaching the Bracket Using Tape

Preparation

1. Clean the surface of the bracket and the mounting surface well.
   A typical surface cleaning solvent is IPA/water mixture (rubbing alcohol)
2. Remove all grease, dirt and oxide particles from the bonding surface.
3. Wipe the surface dry.
4. Refer to the 3M documentation to obtain more detailed guidance:
   http://training.enfora.com/docs/3MVHBTape.html

Pressure sensitive adhesives use viscous flow to achieve substrate contact area.

The ideal tape application temperature range is 70°F to 100°F (21°C to 38°C).

The minimum suggested application temperature is 50°F (10°C)

Note: Initial tape application to surfaces at temperatures below the suggested minimum is not recommended because the adhesive becomes too firm to adhere readily. However, once properly applied, low temperature holding is generally satisfactory. To obtain good performance with all 3M™ VHB™ Tapes, it is important to ensure that the surfaces are dry and free of condensed moisture.

Attachment

1. Insert the device into the bracket.
2. Apply the tape provided to the surface of the bracket, as shown.
3. Remove the tape covering and attach the bracket to the surface.
4. Apply firm pressure (Greater than 15 psi is recommended)
5. It is recommended to wait at least 20 Minutes for the adhesive to bond.

4.1 Attaching the Bracket Using Screws

Preparation

1. Mark the location of the 4 self-tapping screws on the mounting surface.
2. For heavy gauge metals use the table below:

Pilot Hole Diameter for Self Tapping Screws			
Sheet Thickness (mm)		Sheet Material	
From	To	Steel	Aluminum
0.89	1.38	3.2	3.3
1.3	3	3.3	3.4
3.01	3.5	3.4	3.5
3.51	10	3.5 – 3.6	3.6 - 3.7

Table: 4 - Pilot Hole Diameter for Self Tapping Screws

Attachment

1. Screw the bracket in place using the 4 provided self-tapping screws.
2. Firmly tighten the screws.
3. Mount the device in the bracket.

5 Replacing the Battery

When the device requires the battery to be changed use the following instructions:

 Warning: To Reduce the risk of ignition of a flammable or explosive atmosphere; batteries must be inserted or changed only in a location known to be non-hazardous.

5.1 Disconnect the Battery

1. Remove the Spider AT 3000 from its mounted location.
2. Fully loosen the four screws, so the two halves of the unit are separated.

Figure: 12 - Open Unit

3. Disconnect the old battery by grasping the battery cable close to the connector and gently pull sideways
4. Remove the battery from the case.

5.1 Connect the Battery

1. Insert the Battery into the Bottom Housing Assembly with the cable up and to the right, See   5.1 "Connect the Battery"

Battery Pack

USB Connector

SIM Holder
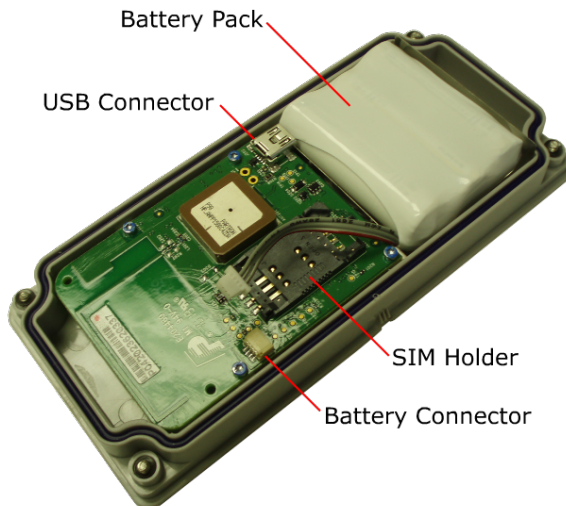
Battery Connector

Figure: 13 - Insert New Battery

2. Connect the new battery by attaching the connector to the battery terminals.
3. Close the Spider AT 3000 and replace the screws.

Take care to Tighten the Screws to 2.5 in-lb torque.

4. Remount the device in its original location.

6 Powering Up and Down

The button on the underside of the Spider AT 3000 functions as both the power switch and the activation switch.

After the provisioning process is complete, the Spider AT 3000 will be activated. If you do not plan to deploy the unit immediately, you should deactivate the Asset Tag, so as not to drain the battery.

To deactivate the Spider AT 3000, press and hold the power switch, located on the underside of the unit, for three to five seconds. The LED will become solid red then go off. When the light is off, the unit is deactivated.
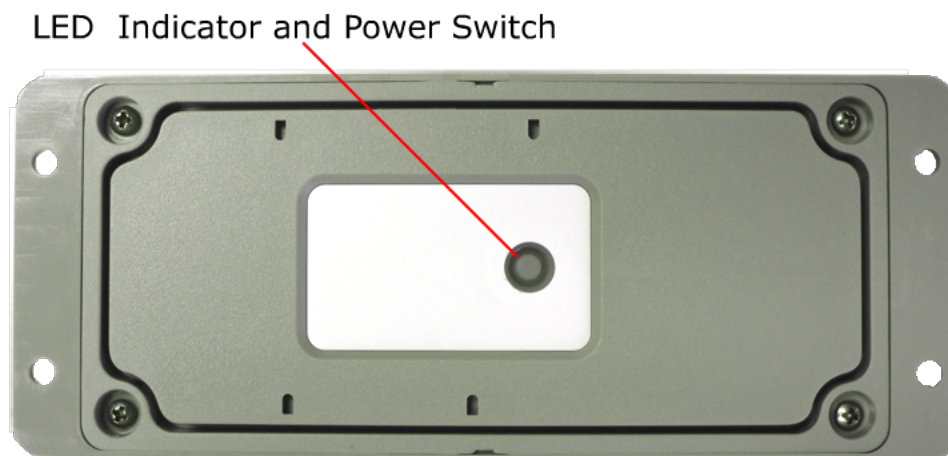

Figure: 14 - LED Indicator and Power Switch

When you are ready to activate the Spider AT 3000, press and hold the power switch for three to five seconds until you see a blinking light. The LED will then go off. When the light is off, the unit is activated.

7 Device Operation

7.1 Power Management

The Spider AT 3000 has been designed to minimize power consumption to maximize battery life. The device has different power states to optimize system-level power consumption. The Spider AT 3000 uses a low-power microcontroller to control the power states. Between position reports, the microcontroller enters an idle state until the next scheduled position check. When it is time to check for a new position, the microcontroller can use the motion sensor and GPS receiver to determine if the device has moved. If the device has not moved, the microcontroller can quickly return to the idle state without generating a position report.

The power states are:

- Microcontroller idle – This is the lowest power state. The microcontroller is powered on but the processor is idle waiting for a timer expiry based upon the next scheduled position check.
- Motion sensor – The motion sensor is used as an ultra-low power detection of movement. This state only lasts a few seconds while the motion sensor is measured to detect movement. If no motion is detected, then the device may return to the idle state. If motion is detected, then the GPS receiver is turned on.
- GPS receiver – The microcontroller and GPS receiver are powered. The GPS receiver acquires the GPS satellites and determines the current position. A geofence may be used to determine if the new position is a significant (configurable) distance from the previous position.. If the device is still located with the geofence boundary, then the device may return to the idle state.
- GSM modem – The GSM modem is turned on only if a position report is needed. The modem registers on the GSM network and sends the position report to the remote server. After transmitting the position report, the modem remains registered on the GSM network for a period of time and listens for new over-the-air configuration messages from the server.

External power does not guarantee that the device will be in "tracking" mode where the modem and GPS receiver are always powered on. Now, the device will be in tracking mode if the next report is scheduled in <5 minutes based upon the CFGIP and CFGOP parameters.

7.1 Position Reporting

The Spider AT 3000 transmits two types of position data. If the GPS receiver is able to determine a valid GPS position, then the GPS position information is transmitted. If the Spider AT 3000 is unable to acquire a valid GPS position, then PCELL information is transmitted. This PCELL information describes the GSM cellular network environment viewed by the Spider AT 3000 and can be used to determine an approximate location.

The Spider AT 3000 will send a position report to the server immediately after being activated (See "Powering Up and Down" on page 32). After activation, the Spider AT 3000 can be configured to periodically report its position based upon several usage scenarios. These usage scenarios include:

- Static Asset Monitoring with time interval reporting
- Static Asset Monitoring with time-of-day reporting
- Basic Motion Monitoring
- Mobile Asset Monitoring with pre-defined geofence(s)
- Mobile Asset Monitoring with dynamic geofence

Refer to the Provisioner User's Guide for detailed device configuration instructions.

7.1 Report Exceptions

Several conditions may prevent the position report from being sent at the expected time. These conditions include:

- Delayed position reports – Several environmental factors may cause a position report to be delayed temporarily. If a position report is delayed, then a new position report will be calculated and transmitted when the environmental factor has been cleared.
  - Extreme temperature – If the temperature is outside of the recommended operating range of the Spider AT, then the GPS receiver and GSM modem will not be powered on. The report will be delayed until the temperature is within the product's acceptable temperature range.
  - Marginal temperature - If the temperature is marginal, then there is a minimum time interval required between reports to insure that the battery is sufficiently recharged to successfully transmit the position report. If a position report is scheduled before this minimum time interval has expired, then the report will be delayed until the minimum time interval has expired.
  - Low voltage – If the battery voltage is too low, then the position report will be delayed until the battery voltage is above the product's minimum battery threshold. This delay provides an opportunity for the battery to recharge.
- No GSM coverage – If the Spider AT 3000 cannot register on the GSM network or cannot transmit the position report, then the report is stored in internal memory. The stored message will be sent at the next opportunity when the GSM modem is powered on to transmit the next scheduled position report. A maximum of 10 messages will be stored.
- Time of day reporting without RTC – The Spider AT 3000 uses valid GPS data to automatically set the RTC time. If the Spider AT 3000 has not detected valid GPS data since the last activation, then the RTC time will not be accurate. If the Spider AT 3000 is configured to use the Static Asset Monitoring with Time-of-Day Reporting service and the RTC time is not accurate, then the Spider AT 3000 will still report at the desired time intervals, but it will report at a random day/time. For example, it will report each day but not at the desired time of day.
- Delta time reporting drift – The time between position reports (unless using Time-of-Day) is a delta time interval since the last report. This time interval does not include the time to gather the position data and register on the GSM network. The GPS receiver acquisition and GSM registration times vary and will cause the time between reports to be several minutes longer than the specified reporting time interval. For example, if the Spider AT 3000 is configured to report once per day and the device is activated at 12:00 PM on Monday, then the next several reports will occur approximately at 12:05 PM Tuesday and then 12:10 PM on Wednesday.
- UDP packet lost in network – The Spider AT 3000 uses the UDP data transport protocol. Although the vast majority of position reports will be delivered successfully to the server, a small number of position reports may be dropped in transit by the GSM or internet network.

7.1 Over the Air Configuration

After transmitting a position report to the server, the Spider AT 3000 remains registered on the GSM network for a period of time and listens for new over-the-air configuration messages from the server. Using the Provisioner, the position reporting time or usage scenario may be modified. The Spider AT 3000 can only receive new configuration commands when registered on the GSM network.

7 Software Upgrade

7.1 Over the Air Upgrade

The Spider AT 3000 software may also be upgraded using the GSM network to program the device remotely over-the-air. Refer to the Provision User Guide for details of the FOTA service.

7.1 USB Upgrade

A Windows application is available to upgrade the Spider AT 3000 software using the USB port. See "Initial Setup" on page 15 for instructions to access the Spider AT 3000 USB port.

8 USB Driver Installation

The first time the user provisions the Spider AT 3000, it must be via the USB connection. After the first time, it can be configured over-the-air. Follow these steps to begin provisioning the device. These instructions illustrate how to correctly install the USB drivers in Windows XP. The procedure will vary for other Operating Systems.

1. Connect the Spider AT 3000 to the USB port on a Windows-based computer.
2. Install the USB drivers (as described in this Appendix).

8.1 Connect the Spider AT 3000 to a USB Port

Supported Operating Systems include Windows 2000, Windows XP, and Windows Vista. When you connect the Spider AT 3000 to the computer, you will be prompted to install the drivers.

Note: In order to access the USB port on the Spider AT 3000, you will need to remove the cover. The USB connector is located on the circuit board inside the unit.

Follow the steps in the next section to install the drivers.

8.2 Install the USB Drivers

After you download the USB drivers, make sure you note the location on your computer where the drivers are located.

Note: Drivers can be downloaded from the Enfora® Website.

After connecting the Spider AT 3000 to the computer, follow these steps to complete the installation of the USB drivers:

There are three steps to installing the USB drivers. The first will install the Locosto drivers. Once this installation is complete, the process will automatically begin again. The second step will install the Enabler®III LPP Trace. The third step will install the Enabler®III LPP Modem.

1. The Windows Operating System will detect the new USB device.
2. You will see the following screen:

Figure: 15 - Found New Hardware Wizard Window

3. Click on **No, not this time.**
4. Click **Next**.
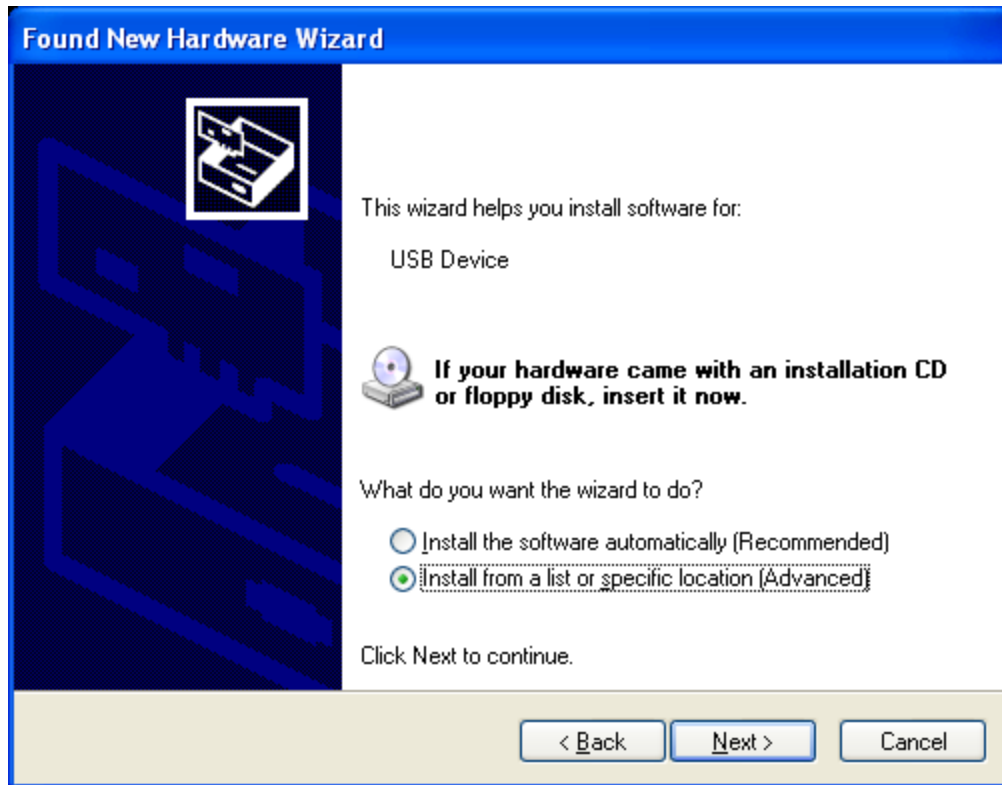5. You will see the following screen:
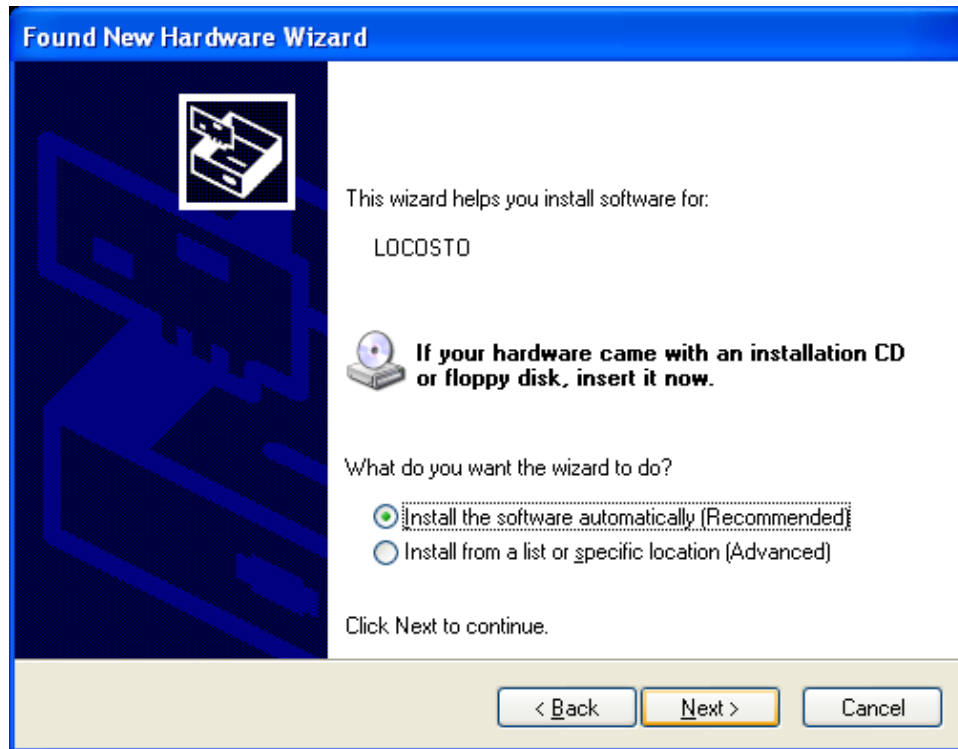
Figure: 16 - Hardware Wizard – Install from specific location

6. Click the radio button next to **Install from a list or specific location (Advanced)**.
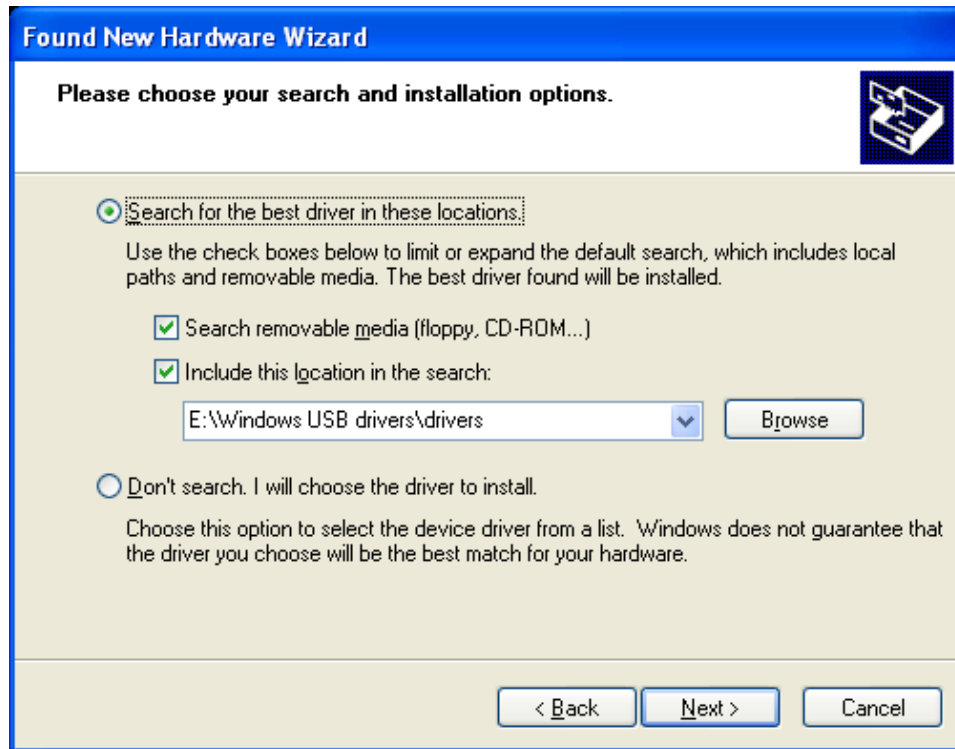7. Click **Next**.
8. You will see the following screen:
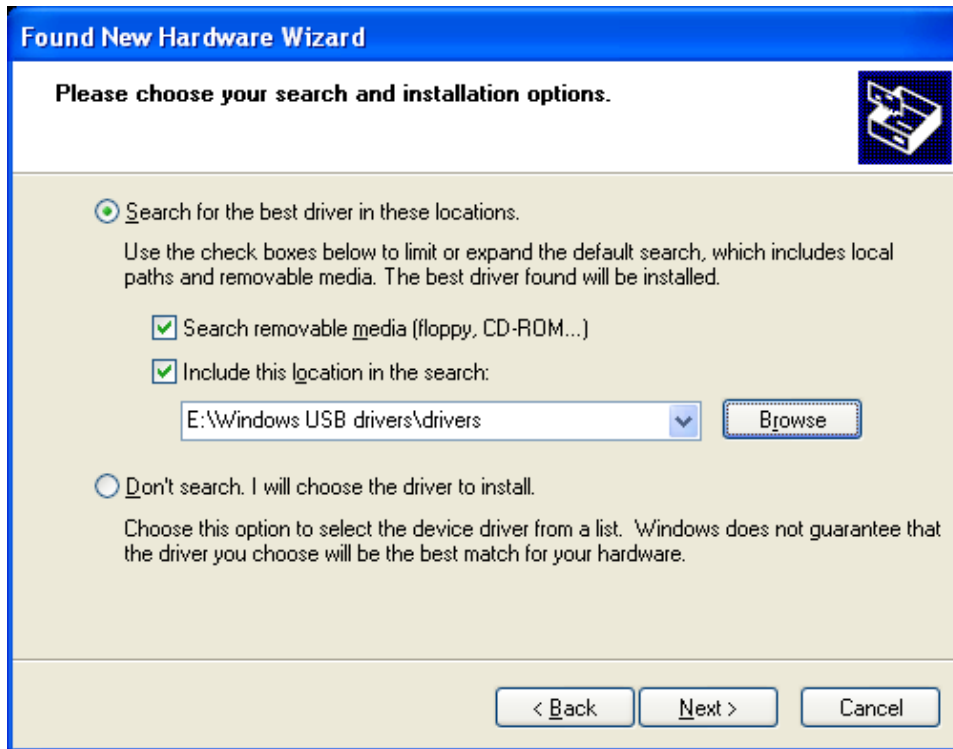
Figure: 17 - Hardware Wizard – Search for best driver

9. Click on the check box marked **Include this location in the search.**
10. Browse to the location on your computer where the USB drivers are located.
11. Click **Next**.
12. You will see the screen that shows the installation progress:
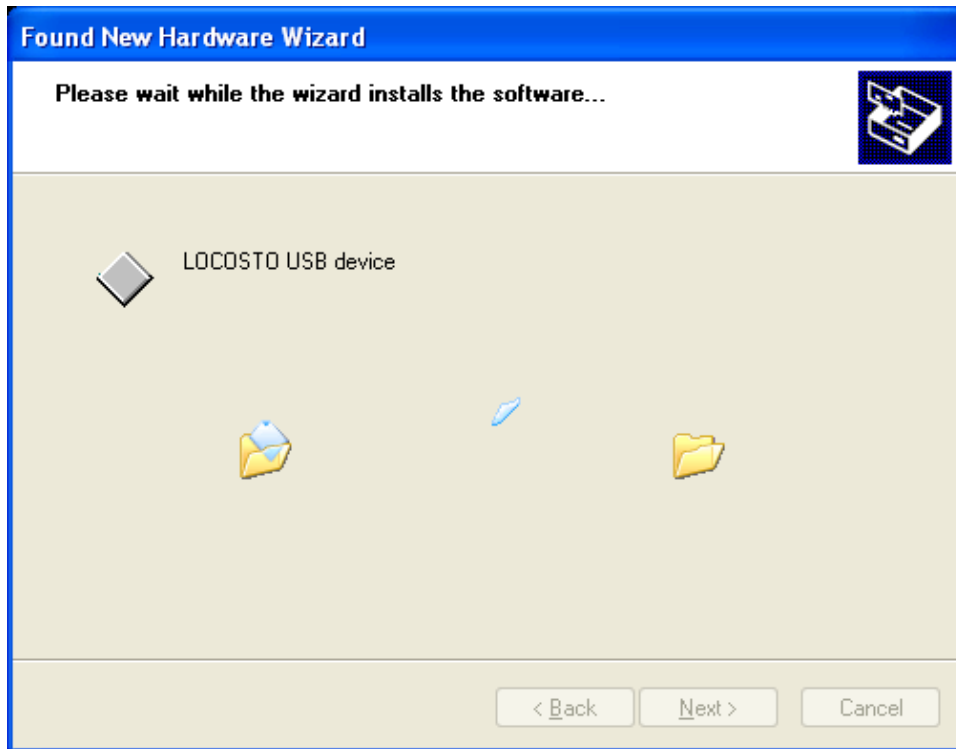
Figure: 18 - Hardware Wizard – Install Progress

13. When the installation of the Locosto USB device is complete, you will see the following screen:
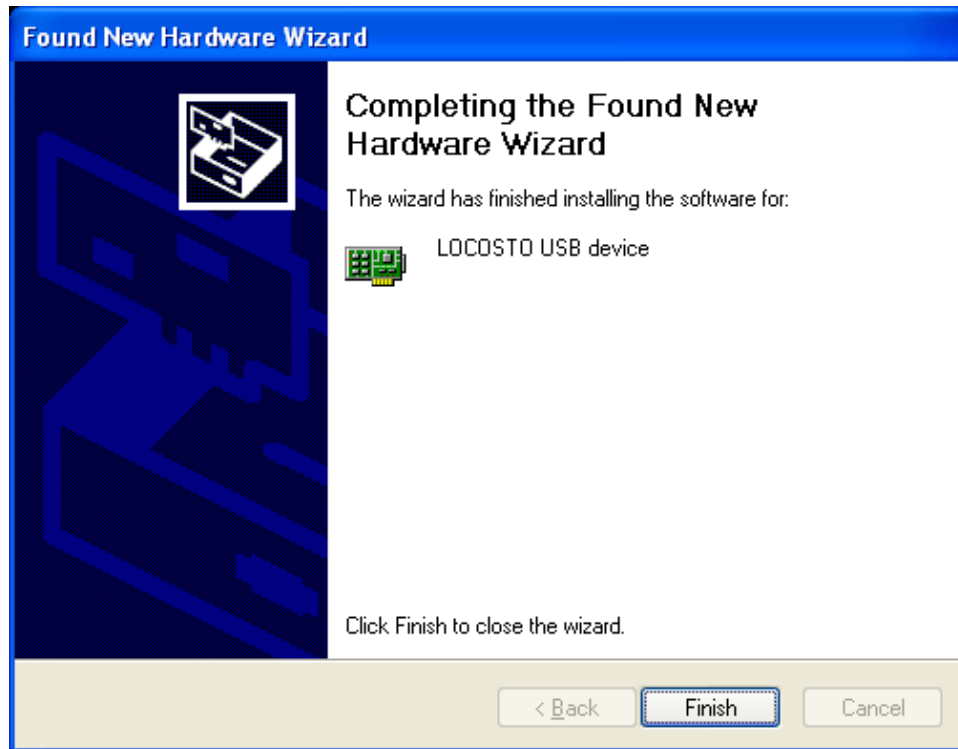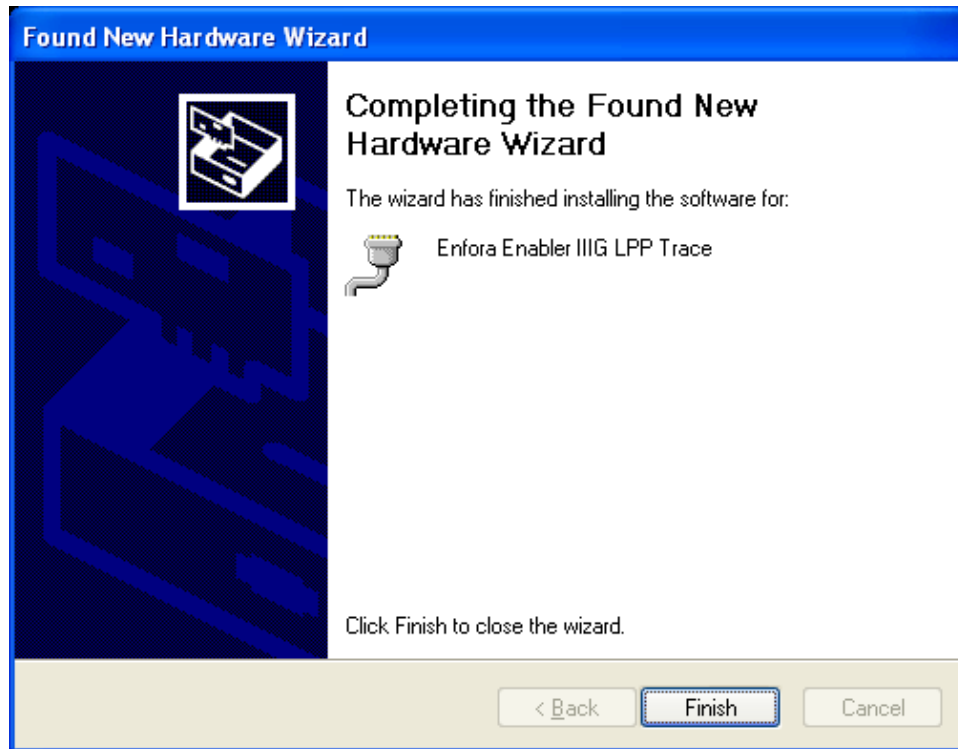
Figure: 19 - Hardware Wizard – Completing

14. Click **Finish**.

When this installation is complete, the installation process for the USB device will begin. You will see the following screen:

Figure: 20 - Hardware Wizard – Install from specific location

15. Click on **No, not this time**.
16. Click **Next**.
17. You will see the following screen:

Figure: 21 - Hardware Wizard – Install from List

18. Click the radio button next to **Install from a list or specific location (Advanced)**.
19. Click **Next**.
20. You will see the following screen:

Figure: 22 - Hardware Wizard – Search for best driver

21. Click on the check box marked **Include this location in the search**.
22. Browse to the location on your computer where the USB drivers are located.
23. Click **Next**.
24. You may see the following screen:

Figure: 23 - Hardware Wizard – Windows Logo testing

Note: If you see this warning, click on Continue Anyway

25. You will see the screen that shows the installation progress:
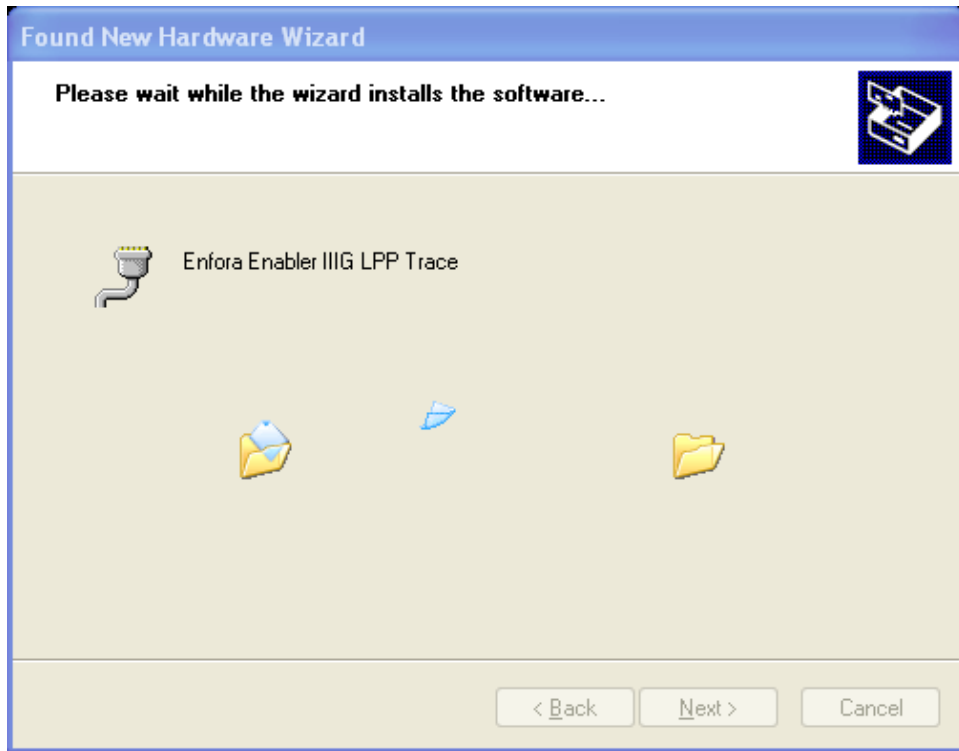
Figure: 24 - Hardware Wizard – Installation Progress

26. When the installation of the Enfora® Enabler®III LPP Trace is complete, you will see the following screen:

Figure: 25 - Hardware Wizard – Installation Complete

27. Click **Finish**.

When this installation is complete, the installation process for the USB device will begin. You will see the following screen:

Figure: 26 - Hardware Wizard – New Hardware

28. Click on **No, not this time**.
29. Click **Next**.
30. You will see the following screen:
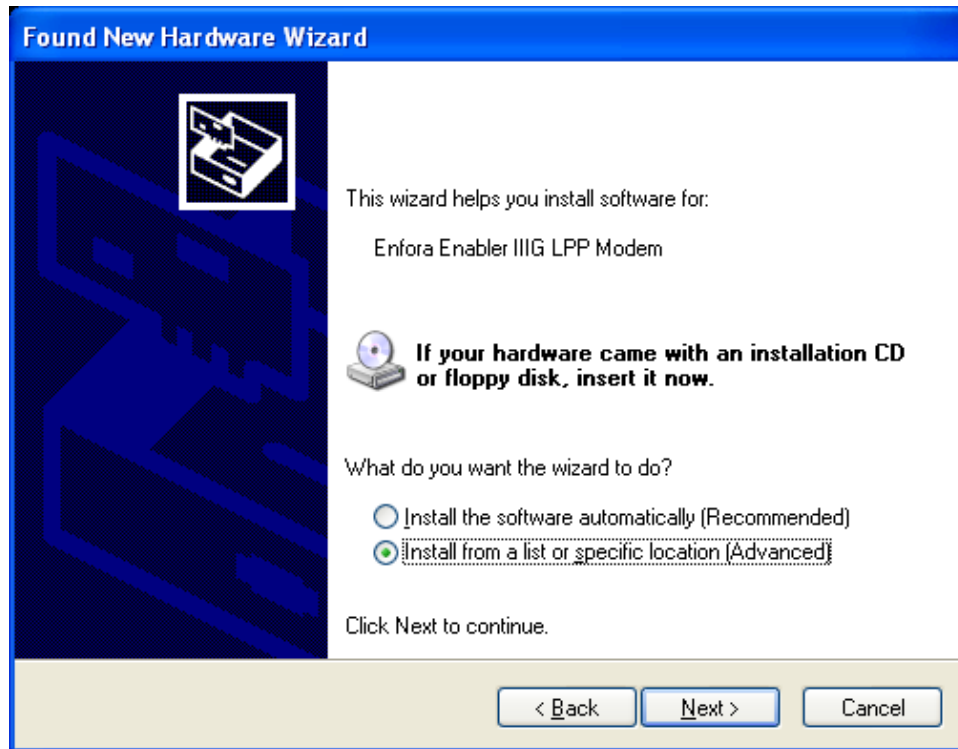
Figure: 27 - Hardware Wizard – Install from List

31. Click the radio button next to **Install from a list or specific location (Advanced).**
32. Click **Next**.
33. You will see the following screen:
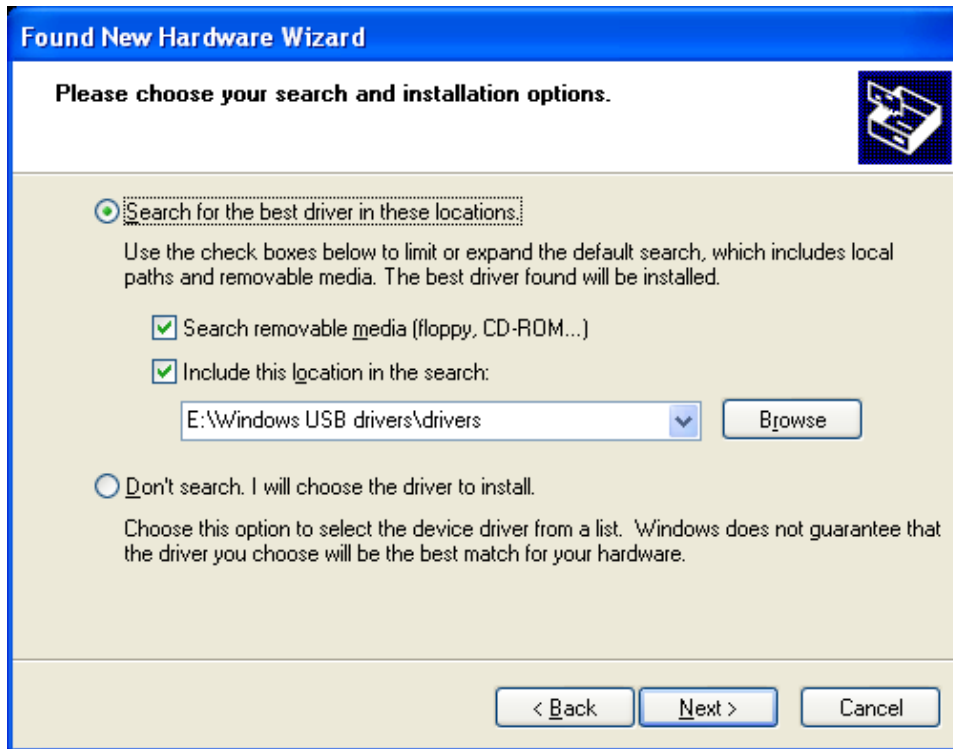
Figure: 28 - Hardware Wizard – Search for best driver

34. Click on the check box marked **Include this location in the search.**
35. Browse to the location on your computer where the USB drivers are located.
36. Click **Next**.
37. You may see the following screen:

Figure: 29 - Hardware Wizard – Windows Logo testing

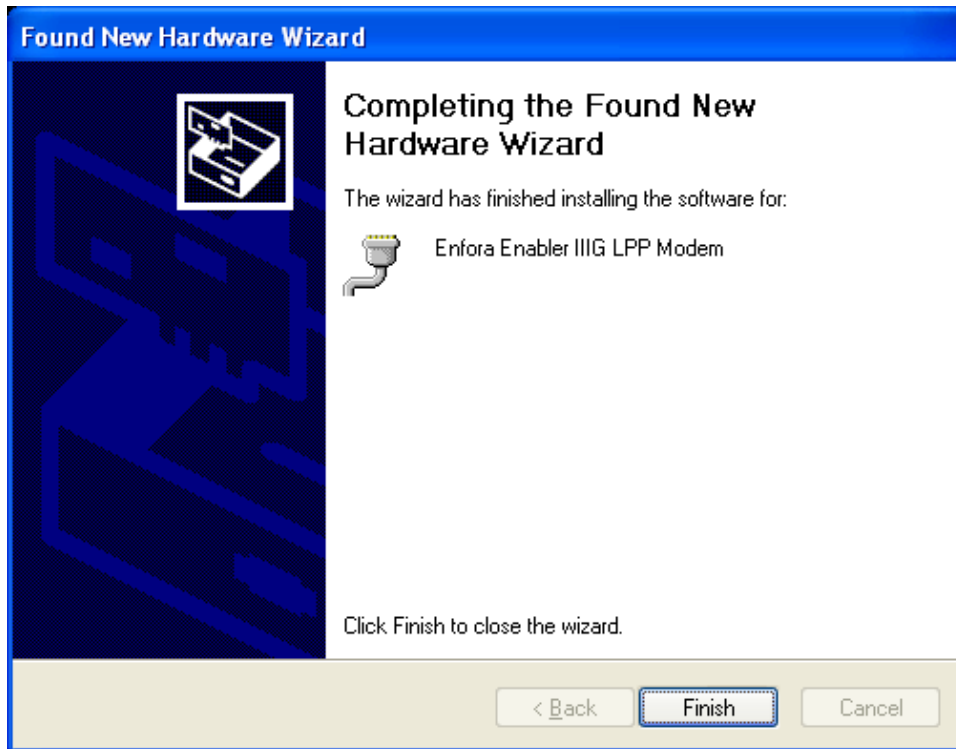Note: If you see this warning, click on Continue Anyway

Figure: 30 - Hardware Wizard – Installation Complete

38. Click Finish to complete the installation of the Enfora® Enabler®III LPP Modem drivers.
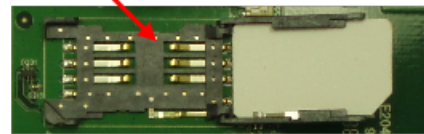
9 SIM Card Installation

9.1 SIM Card Holder

The SIM holder is located inside the Spider AT 3000. It is a standard flip-type SIM holder that must be completely closed in order for the SIM card to make a secure connection.
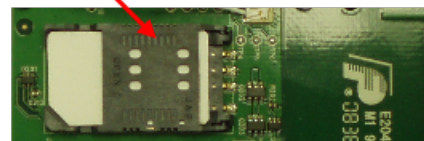

Figure: 31 - Spider AT 3000 SIM Holder

9.2 SIM Card Installation

1. Slide the SIM card into the open SIM holder.
2. Make sure the SIM card notch is lined up properly (See   9 "SIM Card Installation").
3. Close the holder, and slide it until it is completely closed.

> Note: The SIM card is not provided with the Spider AT 3000 device. The SIM must be obtained from the GSM/GPRS service provider and must be provisioned by the operator for data. Always take care to protect the SIM