

Aqua User Manual

Draft
June 11, 2007

Aqua User Manual.....	1
1 Introduction	3
Welcome	3
Related Information	3
Technical Assistance.....	3
Your Comments	3
2 Getting Started	3
Introduction.....	3
Hardware Specification.....	4
AQUA Description	4
Features	5
Frequency Band	5
3 Configuring the AQUA.....	6
Introduction.....	6
Default Settings.....	Error! Bookmark not defined.
WinFlash Configuration Software	7
Connecting to the AQUA.....	7
Configuring the AQUA.....	7
Network.....	Error! Bookmark not defined.
Mode	Error! Bookmark not defined.
Serial Port Baud Rate and Parity	Error! Bookmark not defined.
Defaults	Error! Bookmark not defined.
Diagnostics and Firmware Upgrade.....	9
Installing the AQUA.....	9
Introduction.....	9
Physical Description	9
Connectors and Indicators.....	9
Mounting the AQUA on a Machine.....	10
Machine Mount Kit (PN 35087-00).....	10
Machine Mounting.....	10
Cabling Configurations	11
Power and I/O Cable for Machine Installations.....	11
Machine Service Cable	11
Antenna Description	11
Antenna Considerations	12
A Technical Specifications.....	12
Technical Information.....	12
Pinout Information	13
Glossary	14
Index.....	14

1 Introduction

Welcome

This manual describes how to set up and use an Aqua radio modem.

This publication assumes that you know how to use the Microsoft® Windows® operating system.

Related Information

Sources of related information include the following:

Readme.txt file – a Readme.txt file contains information added after the documentation was completed. To read this file, double-click it or use a text editor to open it. The installation program also copies it into the program directory.

Release notes – the release notes describe new features of the product, information not included in the manuals, and any changes to the manuals.

Update notes – there is a warranty activation sheet with this product. Send it in to automatically receive update notes containing important information about software and hardware changes.

Contact your local dealer for more information about the support agreement contracts for software and firmware, and an extended warranty program for hardware.

Technical Assistance

If you have a problem and cannot find the information you need in the product documentation, contact your local dealer.

Alternatively, do one of the following actions:

- Request technical support using the website at:

- Send an e-mail to:

Your Comments

Your feedback about the supporting documentation helps us to improve it with each revision. E-mail your comments to:

2 Getting Started

Introduction

The Aqua radio-modem is a family of products. Products are available in the 450, 900 and 2400 MHz bands. These products share a common housing and electrical interface to simplify machine installation and integration.

The 450 MHz band radios are used to receive GNSS data in Compact Measurement Record (CMR) format from a reference receiver to one or more roving receivers for precise machine positioning.

The 900 MHz band radios are used to receive GNSS data in Compact Measurement Record (CMR) format from a reference receiver to one or more roving receivers for precise machine positioning. These radios can also communicate 2-way data between an office computer and the machine.

The 2400 MHz band radios are used to communicate ATS location information and commands from a base station to a machine for precise positioning.

Some of these radios are offered alone and as well as in GNSS/ATS combination radios.

Hardware Specification

The AQUA meets stringent hardware requirements and is designed to survive in harsh environments.

It has the following features:

- Flexible antennas for machine installations.
- Physical connection by means of the same 8-pin male Bendix connector previously used on SN/SNR/TC-series radios. For a description of the connector pinout, see Pinout Information, page 36.
- In addition, Aqua is designed for use with unconditioned 9 VDC to 32 VDC power.

450 MHz Description

The 450 MHz is a multi-channel, ultra high frequency (UHF) radio unit and data modem packaged in a rugged, waterproof, metal case and is designed to withstand severe environmental stress.

Features

- Low latency CMR receiver
- Compatible with TRIMTALK 450 and TRIMMARK radios
- Selectable frequencies
- License-free operation in some European countries
- Upgradeable software
- Ruggedized, weatherproof casing
- Typical 3–5 km range
- Low power consumption
- Two CAN (J1939) ports (250K and 1 M bit)
- One RS-232 interface at either 9600, 38400, or 57600 baud
- Flexible antenna for machine applications
- Machine mounting kit option (for more information, see Mounting the Aqua on a Machine, page 20)

Frequency Band

Broadcast frequency, transmit power, channel spacing, and antenna gain are regulated by countries-of-use. These are unique on a per-country basis. When you order, you must specify the broadcast frequencies, channel spacing, and country-of-use for the radio-modem.

For more information, contact your local dealer.

Note – Specifications and descriptions are subject to change without notice.

900 MHz Description

The Aqua 900 MHz is a frequency-hopping, spread-spectrum radio unit and data modem packaged in a rugged, waterproof, metal case and is designed to withstand severe environmental stress.

Features

- Low latency CMR transmission
- Compatible with SiteNet and TRIMCOMM radio networks
- Upgradeable software
- Forty selectable networks
- License-free operation in the U.S., Canada, Australia, and NewZealand
- Ruggedized, weatherproof casing
- Typical 3–5 km range
- Low power consumption
- Two CAN (J1939) ports (250K and 1 M bit)
- One RS-232 interface at either 9600, 38400, or 57600 baud
- Flexible antenna for machine applications
- Machine mounting kit option (for more information, see Mounting the Aqua on a Machine, page 20)

Frequency Band

The 900 MHz radio operates in the 902 to 928 MHz frequency band. It is certified for unlicensed use in this band as a transmitter pursuant to 47 C.F.R. §§ 15.247, 15.249 (1993) (unlicensed, low-power devices) Subpart C of Part 15 of FCC Rules regarding Spread Spectrum Systems for the United States. License-free operation in Canada is covered by RSS-210 of Industrie Canada.

The AQUA can be purchased with a reduced frequency range for use in Australia and New Zealand. It is available in single-frequency mode for other countries.

Note – The 902–928 MHz band is a shared-use band and as such is subject to interfering signals.

This frequency band is allocated to other uses in other parts of the world, including cellular telephony. Regulations regarding its use vary greatly from country to country.

Use of the AQUA outside the United States must be approved by the local radio authority. Contact your local radio communications governing authority for regulations and restrictions on operation in the country or area where you want to use the AQUA.

2400 MHz Description

The Aqua 2400 MHz is a frequency-hopping, spread-spectrum radio unit and data modem packaged in a rugged, waterproof, metal case and is designed to withstand severe environmental stress.

Features

- License-free in the EU, U.S.A., Canada, Australia and New Zealand*
- Direct operation on 12- or 24-volt machine power
- Flexible 2.4 dBi antenna (no need for antenna cables)
- LED status indicators
- Heavy-duty 8-pin Bendix connector
- Power and data via a single cable
- Designed for machine mounting
- Rugged and waterproof (fully sealed)
- Frequency-hopping, spread-spectrum technology
- Compatible with Trimble ATS Total Stations
- High data rate
- Low power consumption
- Typical >1000m, line-of-sight range
- Two CAN (J1939) ports (250K and 1 M bit)
- One RS-232 interface at either 9600, 38400, or 57600 baud
- Machine mounting kit option (for more information, see Mounting the Aqua on a Machine, page 20)

Frequency Band

The Trimble SNR2400/TC2400C operates in the 2400 to 2483.5 MHz frequency band (2400 to 2454 MHz in France). It contains a transmitter module that is certified for unlicensed use in this band as a transmitter pursuant to 47 C.F.R. §§ 15.247 Subpart C of Part 15 of FCC Rules regarding Spread Spectrum Systems for the United States. License-free operation in Canada is covered by RSS-210 of Industry Canada; in the European Union is covered by harmonized standard EN 300 328; in Australia and New Zealand by gazetted standard AS/NZS 4771:2000.

For more information about use in other countries, please contact Trimble.

3 Configuring the Aqua Radio

Introduction

450, 900 and 2400 radios are all configured via WinFlash. Each radio has unique configuration parameters specific to the radio band used.

WinFlash Configuration Software

The Trimble WinFlash software is a Microsoft Windows-based application that configures the AQUA for use in a network. Use WinFlash to configure all AQUA radios required for a project.

To configure a AQUA using WinFlash, complete the following procedures:

- Connect the office computer to the AQUA.
- Configure the AQUA using WinFlash.

These procedures are discussed in the following sections.

Connecting to the AQUA

1. Connect a radio service cable to the AQUA.
2. Connect the I/O DB-9 connector of the service cable to a serial port on your office computer.

Note – Figure 4.7 on page 27 shows an infrastructure cable (PN 38968-25) connected to the AQUA. Figure 4.10 on page 30 shows the service cable (PN 40942-xx) connected to the AQUA and an office computer.

3. Provide power to the radio through the power lead of the service cable.

Configuring the AQUA

The following general steps are used to configure an Aqua radio. See the specific radio section for information on radio configurations.

1. Start WinFlash on your office computer. The following dialog appears:
2. Select the appropriate Device type option and PC serial port option and click Next.
3. Select the Configure radio option in the Operations group and click Next.
4. Click Finish on the next screen to establish a connection with the radio. The following dialog appears while WinFlash is connecting to the radio:
5. When WinFlash has successfully connected to the radio, the Properties window appears:
6. From the Properties window, configure radio. Once these settings are correct, click Set to send the settings to the radio.
7. To finish, click Exit. To make further changes, click Menu. The Operation Selection dialog shown in Step 2 on page 11 appears. The following sections describe the settings that are available for the AQUA.

450 MHz Radio Features

- **Note:** No dealer version required as this is a receive only radio
- Configure Radio
 - Mode – fixed as rover (can't be used as base/repeater)
 - Channel Sharing
 - Enable ID Call Sign
 - Data port setting
 - CMR output on Serial Port (data)
 - Wireless settings
- Upgrade Radio Firmware
- Retrieve Radio Diagnostic Information
- Load Frequency Update
- Create Frequency update file
 - Edit Frequency
 - Up to 20 frequencies can be stored
 - Save frequency update file

900 MHz Radio Features

- Configure Radio
 - Easy IP
 - Name
 - Network #
 - Traditional IP
 - Name
 - Kea
 - Network #
 - Radio mode – Rover Only
 - GPS Port
 - METS Port
 - MAC address
- Upgrade Radio Firmware
- Retrieve Radio Diagnostic Information
- Reset Radio Configuration
- Change Radio Protocol between Kea and IP

2400 MHz Radio Features

- Upgrade Radio Firmware
- Retrieve Radio Diagnostic Information
- Reset Radio Configuration

Unique 450/2400 Combination Radio Features

- Reset Radio Configuration Slot 1 Default

Unique 900/2400 Combination Radio Features

- Reset Radio Configuration Slot 1 Default

Diagnostics and Firmware Upgrade

Use WinFlash to download a diagnostics file from the AQUA to an office computer or to upgrade the radio firmware. These options are available in the *WinFlash Operation Selection* window. For firmware upgrades, contact your Trimble dealer. The dealer will supply a new software file to perform the upgrade.

Installing the AQUA

Introduction

It is recommended that you read this chapter before installing your Aqua radio.

Physical Description

The Aqua radio-modem is encased in a rugged, waterproof metal case. It has an antenna mounts on the top, a connector on the bottom and a LED on the front . The physical aspects of Aqua hardware are outlined below, followed by details covering interface connections and antenna installations.

Connectors and Indicators

The Aqua radio is fitted with an 8-pin male Bendix connector and an LED indicator light. See Figure 4.1.

Figure 4.1 AQUA Connectors

The LED can be orange and/or green depending on the situation, as shown in Table 4.1.

Note – The top cap of the AQUA has an antenna contact tip. The tip is designed for maximum efficiency and very low loss. Please take care not to damage this tip. Keep the low-profile antenna or flexible antenna base screwed on to the top of the radio when storing the AQUA, see page 32.

Table 4.1 Operational Status

LED Color	Status
LED Off	No Power
LED On Solid	Radio has power No communication w/ base station
LED Flashing (1Hz)	Radio has power Communication w/ base station

Mounting the AQUA on a Machine

When mounting the AQUA on a machine consider the following:

- Reduce damage by minimizing shock and vibration to the AQUA: Mount the radio-modem on a solid part of the cab.

Locate the best antenna position: Mount the entire antenna above the roofline so that it has an uninterrupted view. This improves the performance of the AQUA.

Prevent signal interference: Position the antenna away from other antennas (particularly if the other antenna is a two-way radio), rotating beacons and strobe lights.

Figure 4.4 shows a typical installation.

Machine Mount Kit

The machine mounting kit for the AQUA comprises:

- Radio mount bracket (upper)

Radio mount bracket (lower)

Machine mount adapter plate (with U-bolts)

Rubber shock mount kit

Figure 4.3 shows the AQUA mounting kit and how the parts fit together.

Figure 4.3 AQUA mounting kit

Machine Mounting

To mount the AQUA onto a machine:

1. Bolt the AQUA into the radio mounting bracket (upper and lower brackets). Ensure that the radio mounting screws are all fitted with washers and lock washers.
2. Securely mount the adapter plate to the machine. Do one of the following actions:
 - Use existing weld bosses (see Figure 4.4)
 - Weld some weld bosses to the cab
 - Clamp the plate to the top of a handrail at the top of the cab using the U-bolts
3. Bolt the radio mounting bracket to the adapter plate using the rubber shock mount kit. The bolts are included with the adapter plate.

Tip – Use threadlocking Loctite (PN 33803) or equivalent to secure the bolts when you assemble the shock mounts.

Figure 4.4 shows a AQUA mounted at the rear of a cab roof. Notice how this installation ensures that all of the antenna is above the roof of the cab.

Figure 4.4 AQUA mounted at the rear of a cab roof

Cabling Configurations

The AQUA is typically configured as a rover, but the cables and adapters necessary for other configurations are also available.

Table 4.2 summarizes the cabling items available or provided with the AQUA unit or available accessories.

Table 4.2 AQUA cabling and power accessories

Item	Part number
Power and I/O cable for machine installations, 5 m (17 ft) 8-pin female Bendix connector on each end	32942-17
Infrastructure/Base Station power and I/O cable, 7.5 m(25 ft) 8-pin female Bendix, with Y-split to TA-3 power connector, DBF-9, plus 12-pin Conxall	38968-25
Machine service cable (21-pin female Bendix, with Ysplit to bare power leads and dual DBF-9 connector	36938
DC power adapter cable with TA-3 connector and battery clips	44087-00
Reference Station/Configuration cable, 30 m (99 ft)	40942-99

Power and I/O Cable for Machine Installations

Machine Service Cable

Figure 4.10 shows cable 40942-xx when used to configure AQUA radios with a laptop.

Figure 4.10 Machine service cable (PN 40942-xx)

Antenna Description

The standard AQUA antenna is a 0 dB, low-profile antenna. An optional infrastructure installation kit comes with an antenna base and 5 dB whip antenna tip. The 5 dB antenna measures 81 cm (32") in length, including the base. See Figure 4.11.

Figure 4.11 AQUA with antennas

Antenna Considerations

Note – Please use care when removing the radio antenna. The AQUA antenna contact tip is designed for maximum efficiency and very low loss.

To maintain its integrity, do not remove the top cap from the radio housing.

Figure 4.12 Proper Antenna Mounting

A Technical Specifications

Technical Information

Table A.1 shows the technical information for the AQUA radio-modem. This information is subject to change without notice.

Table A.1 Technical information

Specification

Physical	
Size	220 mm W x 440 mm H x 85 mm D
Weight	2.7 kg
Environmental	
Operating temperature	–40° to +70°C
Storage temperature	–40° to +85°C
Humidity	Exceeds MIL-STD-810E (aggravated cyclic humidity), sealed to ±34.5 kPa ±5 psi), immersible to 1 m
Vibration	9.8 gRMS, 20–2000 Hz random vibration
Electrical	
Power consumption:	
Receive	380 mA (4.6 W at 12 VDC) ₁
Transmit (peak current)	1100 mA (13.2 W at 12 VDC) ₁
Protection	Reverse polarity; load dump
Input range	10 VDC to 32 VDC unconditioned
Connector	
Type	8-pin male Bendix
Provides	Power, 2 serial ports, CAN interface
Indicators	Power, status, and network sync LED
Radio Performance	
450 MHz	
Range	
Optimal	10 km (6 miles), line-of-sight
Typical	3–5 km (2–3 miles) Varies with terrain and operating conditions. Repeaters may be

	used to extend range.
Frequency range	902–928 MHz ²
Networks	40 user selectable networks
Transmit power	Meets FCC requirements of 1 W maximum power output
Wireless data rates	128 kbps
Modes	Base/Repeater/Rover
900 MHz	
Range	
Optimal	10 km (6 miles), line-of-sight
Typical	3–5 km (2–3 miles) Varies with terrain and operating conditions. Repeaters may be used to extend range.
Frequency range	902–928 MHz ²
Networks	40 user selectable networks
Transmit power	Meets FCC requirements of 1 W maximum power output
Wireless data rates	128 kbps
Modes	Base/Repeater/Rover
2400 MHz	
Range	
Optimal	10 km (6 miles), line-of-sight
Typical	3–5 km (2–3 miles) Varies with terrain and operating conditions. Repeaters may be used to extend range.
Frequency range	902–928 MHz ²
Networks	40 user selectable networks
Transmit power	Meets FCC requirements of 1 W maximum power output
Wireless data rates	128 kbps
Modes	Base/Repeater/Rover

1 Power consumption, as well as the permissible number of repeaters in a network, depends on the information content and wireless data rate (that is, CMR vs RTCM SC-104 Ver. 2.x packets at 1 Hz epoch rates).

2 Broadcast frequency and radiated power are regulated by countries-of-use. These are unique on a per country basis. The broadcast frequencies, and country-of-use for the radio-modem must be specified at time of order.

Pinout Information

Figure A.1 shows the pinout information for the 8-pin male Bendix connector on the base of the AQUA radio-modem.

Figure A.1 AQUA connector (8-pin Mil-Spec)

Note – This pinout is the same as that on the SiteNet 900 radio. The AQUA is a plug-in replacement for any application using the SiteNet 900 radio.

Glossary

The following terms are defined as:

Term	Definition
Frequency	
Channel	
Frequency Hopping Spread Spectrum	
CMR	

Index

Corporate Office

Trimble Navigation Limited
935 Stewart Drive
Sunnyvale, CA 94085
USA
www.trimble.com

Construction Business Area

Trimble Navigation Limited
Construction Business Area
5475 Kellenburger Road
Dayton, Ohio 45424-1099
USA

800-538-7800 (toll free in USA)
+1-937-245-5600 Phone
+1-937-233-9004 Fax
www.trimble.com
E-mail: trimble_support@trimble.com

Legal Notices

© 2006, Trimble Navigation Limited. All rights reserved.
Trimble, and the Globe & Triangle logo are trademarks of Trimble Navigation Limited, registered in the United States Patent and Trademark Office and in other countries. TSC2, TSCe, and VRS are trademarks of Trimble Navigation Limited.

The Bluetooth word mark and logos are owned by the Bluetooth SIG, Inc. and any use of such marks by Trimble Navigation Limited is under license.

Microsoft, Windows, and Windows NT are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries.

All other trademarks are the property of their respective owners.

Release Notice

This is the February 2006 release (Revision A) of the *SPSx50 Modular GPS Receiver User Guide*. It applies to version 1.0 of the SPSx50 Modular GPS receiver.

Limited Warranty Terms and Conditions

Product Limited Warranty

Subject to the terms and conditions set forth herein, Trimble Navigation Limited ("Trimble") warrants that for a period of (1) year from date of purchase this Trimble product (the "Product") will substantially conform to Trimble's publicly available specifications for the Product and that the hardware and any storage media components of the Product will be substantially free from defects in materials and workmanship.

Product Software

Product software, whether built into hardware circuitry as firmware, provided as a standalone computer software product, embedded in flash memory, or stored on magnetic or other media, is licensed and not sold. If accompanied by a separate end user license agreement, use of any such software will be subject to the terms of such end user license agreement (including any differing limited warranty terms, exclusions and limitations), which shall control over the terms and conditions set forth in this limited warranty).

Software Updates

During the limited warranty period you will be entitled to receive such Fix Updates and Minor Updates to the Product software that Trimble releases and makes commercially available and for which it does not charge separately, subject to the procedures for delivery to purchasers of Trimble products generally. If you have purchased the Product from an authorized Trimble distributor rather than from Trimble directly, Trimble may, at its option, forward the software Fix Update or Minor Update to the Trimble distributor for final distribution to you. Major Upgrades, new products, or substantially new software releases, as identified by Trimble are expressly excluded from this update process and limited warranty. Receipt of software updates shall not serve to extend the limited warranty period.

For purposes of this warranty the following definitions shall apply: (1) "Fix Update" means an error correction or other update created to fix a previous software version that does not substantially conform to its published specifications; (2) "Minor Update" occurs when enhancements are made to current features in a software program; and (3) "Major Upgrade" occurs when significant new features are added to software, or when a new product containing

new features replaces the further development of a current product line. Trimble reserves the right to determine, in its sole discretion, what constitutes a significant new feature and Major Upgrade.

Warranty Remedies

If the Trimble Product fails during the warranty period for reasons covered by this Limited Warranty and you notify Trimble of such failure during the warranty period, Trimble at its option will repair OR replace the nonconforming Product, OR refund the purchase price paid by you for the Product, upon your return of the Product to Trimble in accordance with Trimble's standard return material authorization procedures.

How to Obtain Warranty Service

To obtain warranty service for the Product, please contact your Trimble dealer. Alternatively, you may contact Trimble to request warranty service at +1-408-481-6940 (24 hours a day) or e-mail your request to trimble_support@trimble.com. Please be prepared to provide:

- your name, address, and telephone numbers
- proof of purchase
- this Trimble warranty card
- a description of the nonconforming Product including the model number
- an explanation of the problem.

The customer service representative may need additional information from you depending on the nature of the problem.

Warranty Exclusions and Disclaimer

This Product limited warranty shall only apply in the event and to the extent that (i) the Product is properly and correctly installed, configured, interfaced, maintained, stored, and operated in accordance with Trimble's applicable operator's manual and specifications, and; (ii) the Product is not modified or misused. This Product limited warranty shall not apply to, and Trimble shall not be responsible for defects or performance problems resulting from (i) the combination or utilization of the Product with hardware or software products, information, data, systems, interfaces or devices not made, supplied or specified by Trimble; (ii) the operation of the Product under any specification other than, or in addition to, Trimble's standard specifications for its products; (iii) the unauthorized, installation, modification, or use of the Product; (iv) damage caused by: accident, lightning or other electrical discharge, fresh or salt water immersion or spray; or exposure to environmental conditions for which the Product is not intended; or (v) normal wear and tear on consumable parts (e.g., batteries). Trimble does not warrant or guarantee the results obtained through the use of the Product. NOTICE REGARDING PRODUCTS EQUIPPED WITH GPS TECHNOLOGY: TRIMBLE IS NOT RESPONSIBLE FOR THE OPERATION OR FAILURE OF OPERATION OF GPS SATELLITES OR THE AVAILABILITY OF GPS SATELLITE SIGNALS.

THE FOREGOING LIMITED WARRANTY TERMS STATE TRIMBLE'S ENTIRE LIABILITY, AND YOUR EXCLUSIVE REMEDIES, RELATING TO PERFORMANCE OF THE TRIMBLE PRODUCT. EXCEPT AS OTHERWISE EXPRESSLY PROVIDED HEREIN, THE PRODUCT AND ACCOMPANYING DOCUMENTATION AND MATERIALS ARE PROVIDED "AS-IS" AND WITHOUT EXPRESS OR IMPLIED WARRANTY OF ANY KIND, BY EITHER TRIMBLE OR ANYONE WHO HAS BEEN INVOLVED IN ITS CREATION, PRODUCTION, INSTALLATION, OR DISTRIBUTION, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, TITLE, AND NON-INFRINGEMENT. THE STATED EXPRESS WARRANTIES ARE IN LIEU OF ALL OBLIGATIONS OR LIABILITIES ON THE PART OF TRIMBLE ARISING OUT OF, OR IN CONNECTION WITH, ANY PRODUCT.

SOME STATES AND JURISDICTIONS DO NOT ALLOW LIMITATIONS ON DURATION OR THE EXCLUSION OF AN IMPLIED WARRANTY, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU.

Limitation of Liability

TRIMBLE'S ENTIRE LIABILITY UNDER ANY PROVISION HEREIN SHALL BE LIMITED TO THE AMOUNT PAID BY YOU FOR THE PRODUCT. TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, IN NO EVENT SHALL TRIMBLE OR ITS SUPPLIERS BE LIABLE FOR ANY INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGE WHATSOEVER UNDER ANY CIRCUMSTANCE OR LEGAL THEORY RELATING IN ANYWAY TO THE

PRODUCTS, SOFTWARE AND ACCOMPANYING DOCUMENTATION AND MATERIALS, (INCLUDING, WITHOUT LIMITATION, DAMAGES FOR LOSS OF BUSINESS PROFITS, BUSINESS INTERRUPTION, LOSS OF DATA, OR ANY OTHER PECUNIARY LOSS), REGARDLESS OF WHETHER TRIMBLE HAS BEEN ADVISED OF THE POSSIBILITY OF ANY SUCH LOSS AND REGARDLESS OF THE COURSE OF DEALING WHICH DEVELOPS OR HAS DEVELOPED BETWEEN YOU AND TRIMBLE. BECAUSE SOME STATES AND JURISDICTIONS DO NOT ALLOW THE EXCLUSION OR LIMITATION OF LIABILITY FOR CONSEQUENTIAL OR INCIDENTAL DAMAGES, THE ABOVE LIMITATION MAY NOT APPLY TO YOU.

PLEASE NOTE: THE ABOVE TRIMBLE LIMITED WARRANTY PROVISIONS WILL NOT APPLY TO PRODUCTS PURCHASED IN THOSE JURISDICTIONS, SUCH AS COUNTRIES OF THE EUROPEAN ECONOMIC COMMUNITY, IN WHICH PRODUCT WARRANTIES ARE OBTAINED FROM THE LOCAL DISTRIBUTOR. IN SUCH CASE, PLEASE CONTACT YOUR TRIMBLE DEALER FOR APPLICABLE WARRANTY INFORMATION.

Registration

To receive information regarding updates and new products, please contact your local dealer or visit the Trimble website at www.trimble.com/register. Upon registration you may select the newsletter, upgrade or new product information you desire.

Notices

Class B Statement – Notice to Users. This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules and Part 90. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communication. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Changes and modifications not expressly approved by the manufacturer or registrant of this equipment can void your authority to operate this equipment under Federal Communications Commission rules.

Canada

This apparatus complies with Canadian RSS-310.
Cet appareil est conforme à la norme CNR-310 du Canada.

Europe

This product (the SPSx50 Modular GPS receiver) is intended to be used in all EU member countries.

This product has been tested and found to comply with the requirements for a Class B device pursuant to European Council Directive 89/336/EEC on EMC, thereby satisfying the requirements for CE Marking and sale within the European Economic Area (EEA). Contains Infineon radio module PBA 31307. These requirements are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential or commercial environment.



Australia and New Zealand

This product conforms with the regulatory requirements of the Australian Communications Authority (ACA) EMC framework, thus satisfying the requirements for C-Tick Marking and sale within Australia and New Zealand.



Taiwan – Battery Recycling Requirements

The product contains a removable Lithium-ion battery. Taiwanese regulations require that waste batteries are recycled.



廢電池請回收

Directive 1999/5/EC

Hereby, Trimble Navigation, declares that the SPSx50 GPS Receiver is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.

Notice to Our European Union Customers

For product recycling instructions and more information, please go to www.trimble.com/ev.shtml.

Recycling in Europe: To recycle Trimble WEEE (Waste Electrical and Electronic Equipment, products that run on electrical power.), Call +31 497 53 24 30, and ask for the "WEEE Associate". Or, mail a request for recycling instructions to:

Trimble Europe BV
c/o Menlo Worldwide Logistics
Meerheide 45
5521 DZ Eersel, NL

