Trimble® ACU

User Guide

Copyright and Trademarks

Release Notice

This is the June 2005 release 02.00 of the *Trimble ACU User Guide,* part number 571702151. It applies to the Trimble ACU controller.

The following limited warranties give you specific legal rights. You may have others, which vary from state/jurisdiction to state/jurisdiction.

Hardware Limited Warranty

Trimble Navigation Limited warrants that this hardware product (the "Product") will perform substantially in accordance with published specifications and be substantially free of defects in material and workmanship for a period of one (1) year starting from the date of delivery. The warranty set forth in this paragraph shall not apply to software products.

Software License, Limited Warranty

This Trimble software product, whether provided as a stand-alone computer software product, built into hardware circuitry as firmware, embedded in flash memory, or stored on magnetic or other media, (the "Software") is licensed and not sold, and its use is governed by the terms of the relevant End User License Agreement ("EULA") included with the Software. In the absence of a separate EULA included with the Software providing different limited warranty terms, exclusions and limitations, the following terms and conditions shall apply. Trimble warrants that this Trimble Software product will substantially conform to Trimble's applicable published specifications for the Software for a period of one (1) year, starting from the date of delivery.

Warranty Remedies

Trimble's sole liability and your exclusive remedy under the warranties set forth above shall be, at Trimble's option, to repair or replace any Product or Software that fails to conform to such warranty ("Nonconforming Product") or refund the purchase price paid by you for any such Nonconforming Product, upon your return of any Nonconforming Product to Trimble in accordance with Trimble's standard return material authorization procedures.

Warranty Exclusions and Disclaimer

These warranties shall be applied only in the event and to the extent that (i) the Products and Software are properly and correctly installed, configured, interfaced, maintained, stored, and operated in accordance with Trimble's relevant operator's manual and specifications, and; (ii) the Products and Software are not modified or misused. The preceding warranties 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 or Software with hardware or software products, information, data, systems, interfaces or devices not made, supplied or specified by Trimble; (ii) the operation of the Product or Software 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 or Software; (iv) damage caused by accident, lightning or other electrical discharge, fresh or salt water immersion or spray; 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.

THE WARRANTIES ABOVE STATE TRIMBLE'S ENTIRE LIABILITY, AND YOUR EXCLUSIVE REMEDIES, RELATING TO PERFORMANCE OF THE PRODUCTS AND SOFTWARE. EXCEPT AS OTHERWISE EXPRESSLY PROVIDED HEREIN, THE PRODUCTS, SOFTWARE, AND ACCOMPANYING DOCUMENTATION AND MATERIALS ARE PROVIDED "AS-IS" AND WITHOUT EXPRESS OR IMPLIED WARRANTY OF ANY KIND BY EITHER TRIMBLE NAVIGATION LIMITED 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 NONINFRINGEMENT. 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 PRODUCTS OR SOFTWARE. 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.

TRIMBLE NAVIGATION LIMITED IS NOT RESPONSIBLE FOR THE OPERATION OR FAILURE OF OPERATION OF GPS SATELLITES OR THE AVAILABILITY OF GPS SATELLITE SIGNALS.

Limitation of Liability

TRIMBLE'S ENTIRE LIABILITY UNDER ANY PROVISION HEREIN SHALL BE LIMITED TO THE AMOUNT PAID BY YOU FOR THE PRODUCT OR SOFTWARE LICENSE. 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 DAMAGES WHATSOEVER UNDER ANY CIRCUMSTANCE OR LEGAL THEORY RELATING IN ANY WAY TO THE PRODUCTS, SOFTWARE AND ACCOMPANYING DOCUMENTATION AND MATERIALS, (INCLUDING, WITHOUT LIMITATION, DAMAGES FOR LOSS OF BUSINESS PROFITS, BUSINESS INTERRUPTION, LOSS OF BUSINESS INFORMATION, OR ANY OTHER PECUNIARY LOSS), REGARDLESS 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.

NOTE: THE ABOVE LIMITED WARRANTY PROVISIONS MAY NOT APPLY TO PRODUCTS OR SOFTWARE PURCHASED IN THE EUROPEAN UNION. PLEASE CONTACT YOUR TRIMBLE DEALER FOR APPLICABLE WARRANTY INFORMATION.

Regulatory information

This section contains legal information for the U.S and Canadian markets.

USA

Class B statement - Notice to the 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. 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 communications. 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 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 expressively approved by the manufacturer or registrant of this equipment can void your authority to operate this equipment under Federal Communications Commissions rules.

Canada

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus as set out in the radio interference regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de Classe B prescrites dans le règlement sur le brouillage radioélectrique édicté par le Ministère des Communications du Canada.

The term "IC:" before the certification/registration number only signifies that the Industry Canada technical specifications were met.

Important Information

Environmental Information

NOTICE FOR TRIMBLE'S EUROPEAN UNION CUSTOMERS

Trimble is pleased to announce a new recycling program for our European Union customers. At Trimble, we recognize the importance of minimizing the environmental impacts of our products. We endeavor to meet your needs, not only when you purchase and use our products, but also when you are ready to dispose of them. That is why Trimble is actively pursuing, and will continue to pursue, the expanded use of environmentally friendly materials in all its products, and why we have established a convenient and environmentally friendly recycling program.

As Trimble makes additional recycling facilities available for your use, we will post their locations and contact information to our Recycling Instructions web page.

For product recycling instructions and more information, please go to

www.trimble.com/environment/summary.html

Recycling in Europe:
To recycle Trimble WEEE,
Call +31 497 53 2430, 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

Trimble

Declaration of conformity.

Manufacturer:

Trimble AB
Box 64
Rinkebyvägen 17
S-182 11 Danderyd
Sweden

Telephone: +46 8 622 10 00
Telefax: +46 8 753 24 64

Trademark: Trimble

Instrument model: Trimble ACU (Advanced Control Unit)
Part.no: 571 225 500

Conformity with the following standards listed below:

EMC Immunity

ETSI EN 301 489-17 V1.1.1 (2000-09)
EN 61000-4-3
EN 61000-4-2

Radio and EMC Emission

ETSI EN 300 328-1 V.1.3.1 (2001-12)
ETSI EN 300 328-2 V.1.2.1 (2001-12)

LVD

EN 60 950:2000

As manufacturer / manufacturers authorized representative within EEC, we declare under our sole responsibility that the equipment follows the provisions of the Standards stated above.

Danderyd 2002-10-11

Peter Fredriksson, President

Contents

Introduction

In this chapter:

■ Welcome

■ About the Product

■ Related Information

■ Technical Assistance

■ Your Comments

Welcome

This manual describes the features of the ACU and how to operate it.

Even if you have previous experience of earlier Trimble control units, we recommend you spend some time reading this manual to learn about the special features of this product.

Related Information

Sources of related information include the following:

- Help – the software has built-in, context sensitive help that lets you quickly find the information you need. The Help is also available on the CD.

Technical Assistance

If you have a problem and cannot find the information you need in the product documentation, *contact your local Distributor.* Alternatively, do one of the following:

- Request technical support using the Trimble website at www.trimble.com/support/support.htm
- Send an e-mail to trimble_support@trimble.com.

Your Comments

Your feedback about the supporting documentation helps us to improve it with each revision.

E-mail your comments to ReaderFeedback@trimble.com.

Unpacking and Inspection

In this chapter:

■ Inspection

■ What's in the box

Inspection

Inspect the shipping container. If it is received in poor condition, examine the equipment for visible damage. If damage is found, immediately notify the carrier and the Trimble sales representative. Keep the container and packing material for the carrier's inspection.

What's in the box?

Part	Part Number	Connection / Use
ACU controller	571 225 500	
ACU controller pouch	571 906 345	
Software CD[1]		
Multiport adaptor	RGR-MultiADPT	ACU 26-pin D-sub to LAN or USB
Power cord, and power supply with adaptors for Europe, UK, USA, and Australia	571 906 344	Mains power to the ACU. Use it to power the ACU and charge the internal battery.
PC adaptor	571 202 204	PC COM port to ACU COM1
2.5 m system cable	571 202 216	ACU to PC adaptor
USB cable	1-44016	ACU to PC Use with the multiport adaptor when transferring files with Microsoft® ActiveSync®.
Adaptor 26-to-9 pin D-Sub	1-RGR-A26TO9PIN	Convert the ACU 26-pin connector to a 9-pin COM2 connector
Screen protector	1-RGR-ALCDPELOFF	
Other available accessories	**Part Number**	
ACU holder	571224091	

[1]Included only if the Trimble ACU is sold with software.

The Trimble ACU Controller

In this chapter:

- Introduction
- Attaching the ACU
- Power supply
- Screen
- Backligt
- Clock
- Storage Card
- Rebooting
- Entering information
- Connecting to your PC
- Setting up and Running ActiveSync
- Bluetooth Wireless Technology

Introduction

The following chapters will go through some basic functions and features of the Trimble®
ACU in order to get you started using your controller.

Figure 3.1   The ACU controller – front view

Attaching the ACU

> ⚠ **Warning –** Switch off the ACU when attaching it to the holder or when changing the
> batteries in the holder with the ACU attached. Otherwise, the on/off status of the ACU
> and the holder may become unsyncronised.

To attach the ACU:

1. Hold the controller with both hands.
2. Fit the groove on the back of the controller over the lower lip on the front of the holder.
3. Press down and rest the back of the controller flat against the holder.
4. Gently release downward pressure and guide the controller so that the teeth on the front
   of the holder click into the notches on top of the controller.

Figure 3.2 shows how to attach the ACU to the holder.

Figure 3.2   Attaching the ACU

Power Supply

Under normal operation, the ACU draws power from the device it is attached to or from one of the following external batteries:

- 12V NiMH
- 7.4 Lithium-ion

The ACU has an internal, rechargeable 4.8 volt 1000 mAh NiMH battery, which provides two hours running time when fully charged.

If power is lost during operation the ACU will automatically switch over to the internal battery if the *Run On Battery* option is selected in the *Control Panel*.

To select *Run On Battery* do the following:

1. Tap *Start* and select *Settings/Control Panel/Power*
2. Tap *Run On Battery* and check the *Enable Running on Internal Battery* box.

The ACU holder has dual 7.4V 1.8Ah lithium-ion batteries. When fully charged, these provide approximately 15 hours running time to the ACU through the 7-pin backplane.

> **Warning –** Do not attempt to replace the battery or you may seriously damage the ACU. Contact your local distributor for battery replacement.

Battery safety

This section contains important safety information:

- Do not attempt to replace the battery. For battery replacement, contact your local dealer.

- Do not disassemble, mutilate, or puncture the battery pack. A battery pack can burst or explode, releasing hazardous chemicals. There are no serviceable parts inside. Do not expose to temperatures above 60°C (140°F).

- Handle a leaking battery with extreme care. If you come in contact with the electrolyte, wash the exposed area with soap and water. If it contacts the eye, flush the eye with running water for 15 minutes and seek medical attention.

- Do not expose the battery pack to storage temperatures above 60º C (140º F) for extended periods.

- Do not charge the battery pack if the ambient temperature exceeds 40º C (104º F) or is below 0º (32º F).

- When discarding a battery pack, contact your local waste disposal provider regarding disposal or recycling of batteries.

Charging the batteries

The internal battery of the ACU is automatically charged when the controller is connected to an external power supply of more than 10V. This means that the ACU will charge its internal battery when attached to a 5600 instrument or a CU Holder. The battery will not be charged when the unit is attached to a 3600 instrument or an ACU holder, since these devices supply less than 10V.

To charge the internal battery:

- Connect the AC adaptor from the ACU 4-pin Hirose port to the mains power supply.

The ACU detects the following low power levels from the external batteries:

- 10 volts (12V NiMH battery)
- 6 volts (Lithium-ion battery)

The ACU alerts you when power level is critically low. If this happens, turn the equipment off and change the external battery. If the Run on Battery option is selected, as described in the previous chapter, the ACU will switch over to its internal battery.

Power cords and AC adaptors

International and US AC adaptor: This unit is a wall mount unit that does not require an additional power cord. The adaptor is supplied with replaceable socket adaptors. Use the adaptor that match the plug and voltage requirement of your local area. When traveling to another country bring the adaptor for that country.

Rated Voltage: 100-240 V AC 47-63 Hz

AC adaptor safety

- Use only the AC adaptor intended for the ACU.
- Using another AC adaptor can damage your product and may void your warranty.
- AC adaptors are designed for "INDOOR USE ONLY". Avoid using the AC adaptor in wet outdoor areas.
- Unplug the AC adaptor from power when not in use.
- Do not short the output connector.
- Do not attempt to repair a defective unit. There are no serviceable parts inside the unit.

Screen

The ACU reflective LCD screen can be viewed easily in direct sunlight or in overcast conditions. It also incorporates a passive touch interface for navigation. Tap elements on the display screen with a stylus or your finger.

Recalibrating the touch screen

If the touch screen does not respond properly when you tap it, recalibrate it as follows:

1. Tap and select *Settings / Control Panel / Stylus*. The *Stylus Properties* dialog appears.
2. In the *Calibration* tab, tap [Recalibrate].
3. Follow the prompts on the screen.

Disabling the touch screen

To clean the ACU screen during a survey, press $\overline{\text{Ctrl}}$+ Repeat the key combination to enable the screen again.

Backlight

To modify the display backlight settings:

- Select *Display* / *Backlight* from the Control Panel.
- If the *Auto on* option is disabled, press **Shift** and .

Press **Shift** and to switch between these backlight modes:

- screen on
- screen off

To enable the keyboard backlight:

- Select *Keyboard/Backlight* from the Control Panel.

When enabled, the keyboard backlight will use the same settings as the display backlight.

Note – Due to power consumption, both display and keyboard backlight should be disabled as much as possible.

Clock

To change time and date settings on the ACU:

1. Tap *Start* and select *Settings / Control Panel / Date/Time*.

   The *Date/Time Properties* dialog appears.

2. Change the date and time as required. Press = to accept the new settings or E to cancel.

Note – When you connect the ACU to a GPS receiver or to your PC using Microsoft®® ActiveSync®, the date and time are automatically updated.

Storage Card

The ACU has a built-in storage card for your data and programs. This appears in the Windows CE files system as the *\Disk* folder.

Note – The system maintains several special files on the card, such as nk.bin and ranger.reg, which contain information crucial to the correct operation of the ACU. Directly modifying these files may result in the ACU failing to operate correctly.

Safeguarding data

Back up your work regularly using Microsoft® ActiveSync®. For further information see chapter called *Data/File transfer using ActiveSync®.*

Rebooting

If the ACU fails to respond to keystrokes, then perform one of the following resets, which shut down the hardware and restart the Trimble Survey Controller software.

Soft reset (warm boot)

This method retains all data.

To perform a soft reset:

- Select \programs\utilities\reset\soft reset from the start menu.

or:

- Hold down *Shift + Ctrl,* while you press and release .

The ACU resets to the default Microsoft® Windows desktop view.

Hard reset (cold boot)

This method retains any data on the built-in storage card (the *\Disk* folder). However, a hard reset clears the contents of the RAM memory, including any desktop shortcuts that you have created.

To perform a hard reset:

- Select \programs\utilities\reset\hard reset from the start menu.

or:

1. Hold down the power button.

   After approximately 5 seconds, a countdown timer appears, indicating that the controller will reset.

2. Continue to hold the power button for another 5 seconds, then release.

The controller briefly displays the boot screen and then resets to the default Microsoft® Windows desktop view.

Entering information

There are several ways of entering information on the Trimble ACU. The most obvious way is to type the information using the keyboard. This kind of data entry is similar to that of a cell phone. The "α*"* button scrolls between two different states of data entry: 123, ABC, and abc. Multiple presses on one key scrollthrough the letters on that key depending on which state you're in. To type capital letters, press shift just as on any regular keyboard. The Trimble ACU also offers the standard Microsoft® Windows® functions of cut (Ctrl+X), copy (Ctrl+C), and paste (Ctrl+V).

Entering text using the Soft Input Panel

Tap once on the Input Panel icon located in the taskbar at the bottom of the screen, indicated by a circle. Then tap on Keyboard to show the Soft Input Panel (SIP).

The SIP allows you to input data as if you were typing on a physical keyboard. Tapping the [áü] key, identified in the circle below, changes the keyboard to show international symbols. Additional symbols may be shown by tapping [Shift].
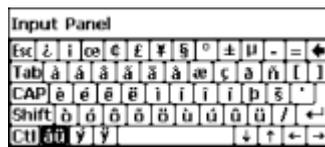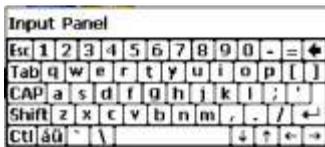
Entering text using the Microsoft Transcriber

Transcriber is a porogram that converts your handwritten notes to text in programs like Notepad. To start Transcriber, go to *Start/Programs/Transcriber*. The Transcriber icon will show up in the taskbar at the bottom of the screen. Below the icon is identified in the circle.

You can toggle the Transcriber on and off by tapping the icon. Double tapping or holding the stylus on the icon for a few seconds will bring up the options menu. To close Transcriber, open the Options menu and select *Close Transcriber.*

Transcriber has a variety of tools and modes that allows you to customize it. To get aquainted with the tools, consult the Transcriber online help. The Help can be accessed from either the Start menu or from the Transcriber Options menu.

Connecting to your PC

By using the Multiport adaptor and the USB cable that came with your Trimble ACU, you can easily connect the ACU to your desktop computer or to your laptop. Connect the Multiport adaptor to the ACU serial port and make sure to tighten the screws carefully. Finally, use the USB port on the Multiadaptor to connect to your computer.

Figure 3.3   ACU serial and hirose ports

Transferring data or files using Microsoft ActiveSync®

Microsoft ActiveSync provides a way for devices such as the Trimble ACU to communicate with desktop computers and laptops that run on Windows operating systems. ActiveSync is already integrated into the operating system on the Trimble ACU. However, you must install ActiveSync on the computer or laptop. You can install the software from CD that was shipped with the ACU or you can download the current version of Active Sync from:

http://www.microsoft.com/mobile/pocketpc/downloads/

There are two types of ActiveSync connections. The table below summarizes the advantages and disadvantages of each choice.

Guest	Fewer questions to answer on initial connection	Slower subsequent connections (one more steps per connection that requests partnership)
	Safer because synchronization cannot adversely impact data either on the Trimble ACU or the computer	
	For use on borrowed or shared computers	
Partnership	Fast subsequent connections (one less step per connection)	More questions to answer on initial connection

The clock on the Trimble ACU is set to match the computer clock	Synchronization not supported on the Trimble Recon® handheld
	If the clock on the computer is wrong, it will make the clock on the Trimble ACU wrong
	Partnership is deleted when the Trimble ACU is hard reset.

Setting Up and Running ActiveSync

1. Connect the Trimble ACU to the office computer using the USB cable.

2. Install ActiveSync on the computer. The following dialog appears:
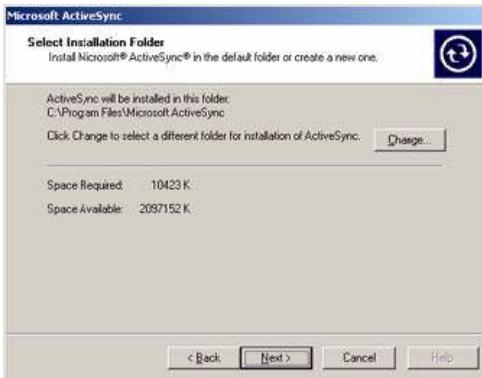
3. Click Next. The following dialog appears. Trimble recommends that you use the the default setting:
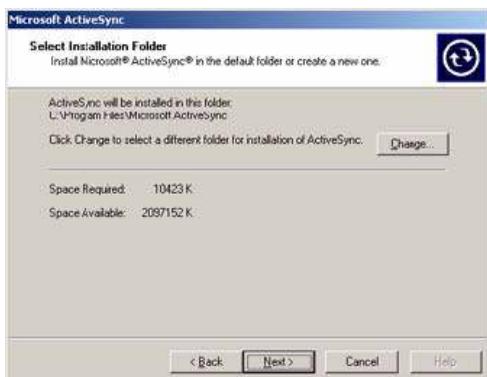
4. Click **Next**.

5. If necessary, reboot the computer.

6. **Once** the software is installed, the following dialog appears:

7. Click Next. In the dialog that appears select whether to set up as a partnership or a guest and then click **Next**:

If you select No, you are set up as a guest and the Select Number of Partnerships dialog does not appear. Go to Step 10.

8. If you select **Yes**, select a synchronization setting from the following dialog:

9. Click **Next** to continue.

10. In the dialog that appears, Trimble recommends that you clear all the check boxes.

11. Click Next and then click Finish in the Setup Complete dialog:

ActiveSync opens:
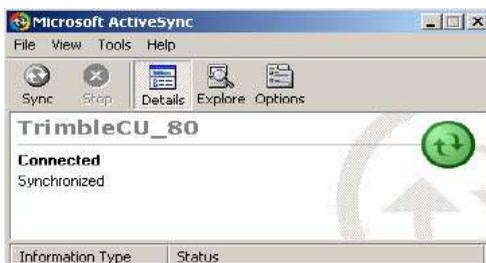
12. To view files on the Trimble ACU, click the Explore icon. The file structure looks and functions the same as Windows Explorer on the office computer.

Disconnecting ActiveSync

To avoid disconnection problems, disconnect ActiveSync on the Trimble ACU before removing the cable from either the computer or the controler.

1. Double-tap the connection icon in the task bar at the bottom of the screen:

2. Tap disconnect and then remove the cable:

For more information about ActiveSync, refer to the help or visit the Microsoft website.

Bluetooth Wireless Technology

The Trimble ACU is equipped with Bluetooth® wireless technology. The function is enabled by default and makes wireless communication with most other devices that have Bluetooth wireless technology possible. Uses for Bluetooth wireless technology include:

- Survey application software (for example Trimble Survey Controller™) to connect to the Trimble 5800/R8 GPS receiver.
- File transfer application in the Start menu to transfer data to and from other Trimble data collectors, including the Trimble ACU and the TSCe™ controller (with BlueCap®).
- Browse and transfer files to and from your Trimble ACU.
- Connect to the Internet through a cellphone equipped with Bluetooth wireless technology.

Modifying your Bluetooth settings

To modify your Bluetooth settings:

1. Tap the Start Menu and then select Settings/Control Panel/Bluetooth Device Properties.

2. Make your changes.

3. Tap OK.

Caring for the unit

In this chapter:

- Operating temperature
- Storage temperature
- Shock
- Environment
- Cleaning the case
- Care of the touch screen
- Applying a screen protector
- Transportation

Maintenance

Trimble recommends the following to maintain the unit during everyday use, and to prevent potential physical damage and data loss.

Operating temperature	–20° C to +50° C
Storage temperature	–30° C to +70° C
Shock	The ACU is designed to withstand a drop from 90 cm on a concrete floor coated with a plastic carpet. It also withstands a drop from 1.5 m on sand.
Environment	The ACU is designed to withstand driving rain and dust
Cleaning the case	Clean the controller with a soft cloth dampened with clean water or with water containing a mild detergent. If the keyboard has dirt or grime on it, use compressed air or a vacuum cleaner, or gently rinse it with clean water.
Care of the touch screen	Clean the touch screen with a soft cloth dampened with clean water or glass cleaner. Do not apply any cleaner directly to the screen. Apply the cleaner to the soft cloth and then gently wipe the screen. Do not use abrasive cleaners.
Applying a screen protector	Use a screen protector to help keep the touch screen clean and protected. Clean the screen thoroughly and leave it slightly wet. Peel the backing from the screen protector and then apply the protector to the screen. Use a soft cloth to squeeze the excess water and air from under the screen protector.
Transportation	The ACU should not be transported long distances attached to any instrument.